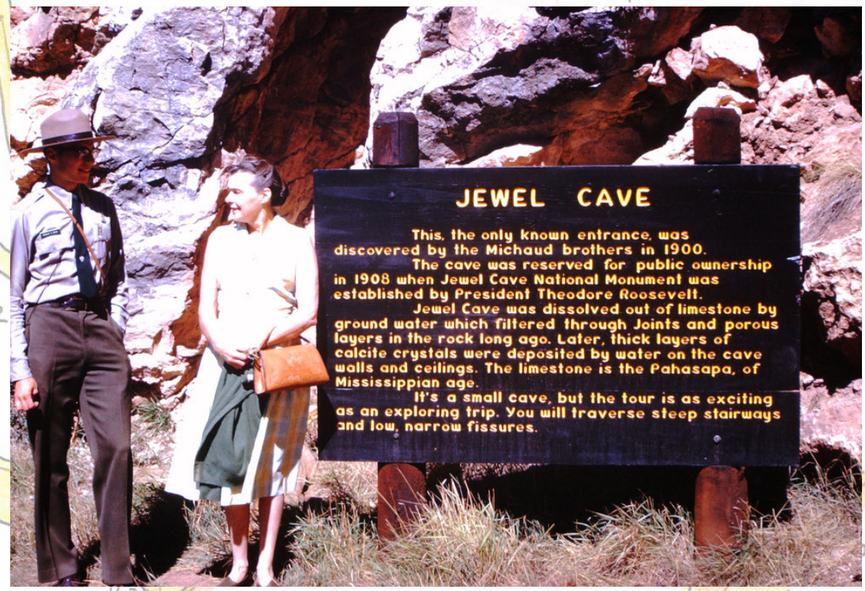
A SMALL CAVE NO MORE:AN ADMINISTRATIVE HISTORY OF JEWEL CAVE NATIONAL MONUMENT, SOUTH DAKOTA

2020

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Historical Research Associates, Inc.

A Small Cave No More: An Administrative History of Jewel Cave National Monument, South Dakota

U.S. Department of the Interior

National Park Service

Midwest Regional Office/DOI Region 3, 4, 5

Omaha, Nebraska

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Table of Contents

LIST OF ACRONYMS xiii

INTRODUCTION 1

PROJECT TEAM 1
METHODOLOGY 1
ACKNOWLEDGEMENTS 1
PURPOSE 2
THE CAVE 2

CHAPTER 1: GEOLOGY AND EARLY HUMAN HISTORY OF JEWEL CAVE AREA 5

GEOLOGY OF JEWEL CAVE 5
EARLY HUMAN USE OF THE AREA 9
PALEOINDIAN (CA. 13,000 TO 6000 BP) 10
ARCHAIC (CA. 7500 TO 1500 BP) 10
PRE-CONTACT (1500 BP TO 1750 CE) 11
CONTESTED LANDS 12
OCCUPATION AND USE OF THE BLACK HILLS, 1700S–1800S 12
GOLD RUSH AND THE 1877 SIOUX TREATY 15
FOREST RESERVE ACT AND CREATION OF BLACK HILLS NATIONAL FOREST 16
EUROPEAN AMERICANS FIND JEWEL CAVE 18
DRAWING TOURISTS TO JEWEL CAVE 20
MODIFYING AND PROMOTING JEWEL CAVE 22
WIND CAVE'S ROAD TO BECOMING A NATIONAL PARK 24
A SECOND ROUND OF MINING CLAIMS 27
CONCLUSION 29

CHAPTER 2: ESTABLISHMENT AND FOREST SERVICE MANAGEMENT OF JEWEL CAVE NATIONAL MONUMENT 31

ESTABLISHMENT OF THE NATIONAL MONUMENT 31
FOREST SERVICE MANAGEMENT (1908–1933) 35
MINING CLAIMS INVESTIGATIONS 35
DEFINING AND PROTECTING AGAINST VANDALISM 41
GARNERING LOCAL SUPPORT FOR THE CAVE 47
JEWEL CAVE CORPORATION 50
OTHER CAVES UNDER FEDERAL PROTECTION, 1900–1930 53
CONCLUSION 54

CHAPTER 3: THE NATIONAL PARK SERVICE TAKES OVER (CA. 1933–1957) 55

JEWEL CAVE CORPORATION, THE CIVILIAN CONSERVATION CORPS, AND THE NATIONAL PARK SERVICE (1933–1939) 55
HIGHWAY 16 REALIGNMENT 58

Development by the CCC 62
Natural Resource Management 69
Tours, Surveys, and Exploration 70
End of the CCC and JCC Era 72
National Park Service Management (ca. 1940–1959) 72
Staffing 72
Tours and Interpretation 80
Informational Brochure 85
Cooperating Associations and Partnerships 86
Belowground Resource Management 88
Aboveground Resource Management 89
Water Rights 93
Planning for the Future: Develop or Deauthorize? 93
First Master Plan (1942) 93
Assessing Jewel Cave's Significance 96
Updated Master Plan (1952) 98
Mission 66 Prospectus (1955) 102
Revised Master Plan and Prospectus (1957–1958) 105
Conclusion 111

CHAPTER 4: INVESTMENT IN VISITOR SERVICES AND CAVE EXPLORATION (CA. 1957–1972) 113

Management and Staffing 113
Effects of Exploration on NPS Planning and Management 117
Exploration in the Late 1950s 118
Mineral Withdrawal 122
Search for New Tour Routes 123
1962 Formation Discoveries 128
New Development Plans 132
Determining the Cave's Surface Footprint 138
Land Exchange with the Forest Service 142
Monument Operations 145
Research 145
Brochure 147
Natural History Association 147
Aboveground Natural Resources 149
Law Enforcement and Safety 152
Construction of the New Visitor Center and Associated Development 152
Groundwork: Roads and Utilities 154
Cave Tour and Elevator Shaft 157
Interpretation During Development 168
Museum Exhibits and the New Visitor Center 171
Housing and Maintenance Buildings 172
Visitor Center Construction and Opening 174
Conclusion 178

CHAPTER 5: MANAGING A LARGER CAVE (1972–1989) 179
GENERAL ADMINISTRATION 179
STAFFING AND BUDGETS 179
VOLUNTEERS IN PARKS 185
GENERAL MANAGEMENT PLANNING 185
COOPERATING ASSOCIATION 186
COMMUNITY PARTNERSHIPS 188
NATURAL RESOURCES 190
CAVE EXPLORATION AND MAPPING 190
CAVE RESOURCE MANAGEMENT 194
OUTSIDE STUDIES OF JEWEL CAVE 198
INTERAGENCY CAVE RESOURCE PROTECTION 200
SURFACE RESOURCE MANAGEMENT 205
FIRE MANAGEMENT 207
CULTURAL RESOURCES 208
ARCHEOLOGICAL INVESTIGATIONS 210
ADMINISTRATIVE HISTORY 210
MUSEUM COLLECTION 211
INTERPRETATION AND EDUCATION 212
TOURS AND VISITOR SERVICES 213
BROCHURE AND MAPS 222
MAINTENANCE AND FACILITIES MANAGEMENT 223
VISITOR CENTER MAINTENANCE 226
CAVE TRAIL MAINTENANCE 227
SURFACE ROADS, TRAILS, AND MAINTENANCE BUILDINGS 228
HOUSING 229
UTILITIES 232
LAW ENFORCEMENT 235
CONCLUSION 236

CHAPTER 6: INDEPENDENT ADMINISTRATION (CA. 1990–1999) 237
GENERAL ADMINISTRATION 237
PERSONNEL 237
BLACK HILLS ADMINISTRATIVE GROUP 239
PARTNERS 240
GENERAL PLANNING 241
CONCESSIONS 242
LAW ENFORCEMENT AND SAFETY 243
FACILITIES MANAGEMENT 244
ELEVATOR 244
VISITOR CENTER 247
CAVE TOUR STRUCTURES 248
SEWAGE 249
SOLID WASTE 250
HOUSING 251
HIGHWAY 16 252

Surface Trails 254
Natural Resource Management 254
Cave Exploration 255
Cave Research and Resource Management 257
Cooperation with Other Caves 262
Cooperation with Forest Service on Cave Management (including Pass Creek Land Exchange) 264
Fire 267
Surface Resources 271
Cultural Resource Management 272
Archeological Studies 272
Historic Ranger Cabin 273
Museum Collection 275
Interpretation 277
Conclusion 280

CHAPTER 7: JEWEL CAVE IN THE NEW MILLENNIUM (2000–PRESENT) 281

Jasper Fire and Aftermath 281
General Administration 288
Personnel 288
Shared Administrative Services 294
Volunteer Program 296
Planning and Evaluations 297
Black Hills Parks and Forest Association 301
Partnerships 303
Concessions 306
Law Enforcement 306
Facilities Management 309
Parking Lot and Roads 309
Highway 16 311
Historic Area 313
Elevator 313
Scenic Tour Infrastructure 315
Visitor Center 317
Housing 319
Sewage 320
Water 321
Utilities 321
Natural Resource Management 321
Cave Exploration and Mapping Pre-Cave and Karst Management Plan 323
Cave and Karst Management Plan Environmental Assessment (EA) 325
Cave Exploration and Rescue Post-CKMP 328
Resource Management Projects and Research 330
Forest Service Cooperation 332
Exotic Plant Management 334
Fire Management 335
Cultural Resource Management 337
Museum Collection 339

Interpretation and Education 340
Tours and Visitor Services 341
Fee Collection 345
Brochures and Maps 347
Junior Ranger and Youth Education/Outreach 347
Exhibits 350
Conclusion 351

CHAPTER 8: BEYOND 200 MILES 353

APPENDIX A: LEGISLATION AND EXECUTIVE ORDERS RELATED TO ESTABLISHMENT OF JEWEL CAVE NATIONAL MONUMENT AND ITS BOUNDARIES 357

APPENDIX B: WITHDRAWAL FROM MINERAL ENTRY OF FOREST SERVICE LANDS ABOVE JEWEL CAVE 371

APPENDIX C: LEGISLATION PERTAINING TO CAVE RESOURCE MANAGEMENT 381

APPENDIX D: PERSONNEL 391

APPENDIX E: VISITATION NUMBERS 395

APPENDIX F: ANNUAL PARK BUDGETS 397

APPENDIX G: ORGANIZATIONAL CHARTS 401

BIBLIOGRAPHY 413

Archives 413
Government Documents and Contracted Studies 413
Oral History Interviews 416
Books and Articles 417
Theses and Dissertations 419
Newspapers and Periodicals 419

INDEX 421

List of Figures

Figure 1. The NPS long assumed that Jewel Cave was a "small cave," as this sign from 1958 attests. Photo by Richard Hart, 1958. 3

Source: Jewel Cave NM. 3

Figure 2. Jewel Cave is named for the calcite crystals that line much of its walls. Pictured here, photo undated. 7

Figure 3. Herb Conn holds a handkerchief to illustrate the strong wind blowing through a cave passageway, undated. 8

Figure 4. The Black Hills, pictured here from Black Elk Peak, are sacred to the Lakota people. Pictured here, August 2011. 13

Figure 5. Custer, South Dakota, pictured here looking west, 1890. 15

Figure 6. Ponderosa pine forests, which are typical in the Black Hills, at Jewel Cave NM, ca. 1965. 17

Figure 7. Frank and Albert Michaud, ca. 1906. 19

Figure 8. A stereograph image of Mammoth Cave, 1866. 21

Figure 9. The Michauds blasted through the cliffs on the eastern side of Hell Canyon an entryway to Jewel Cave—first as a vertical tube, and later as this horizontal tunnel. Pictured here as it looked in 2019. 23

Figure 10. The Michauds built this two-story log cabin and hotel near the cave entrance. Pictured here ca. 1917. 24

Figure 11. W. R. Cross photograph from inside of Wind Cave, with the caption, "In Wind Cave, S.D. 350 feet below the surface at Odd Fellows' Hall. . . ." William Jennings Bryan and Governor Andrew E. Lee are in the center front of the group, ca. 1897. 25

Figure 12. This 1908 Forest Service map was included in President Theodore Roosevelt's February 7, 1908, proclamation authorizing Jewel Cave National Monument. 34

Figure 13. Father Paul Dobberstein, a Catholic Priest in Iowa, purchased five tons of calcite crystals from Frank Michaud for use in Dobberstein's "Grotto of the Redemption" in West Bend, Iowa. Pictured here in 2008. 41

Figure 14. Forest Service Surveyor W. C. Danielson took this image of what he called "crackerjack formation" in Jewel Cave in 1916. 44

Figure 15. Danielson took this picture in Hell Canyon. The Michaud's timbered entryway to the cave entrance is visible in the center of the image, with a person standing next to it for scale, 1916. 45

Figure 16. This Bureau of Public Roads map shows how the road grading project was split into sections by funding source. The National Park Approach Road is "Project 'A'," and references Wind Cave National Park because Jewel Cave NM was managed by Wind Cave at the time. 59

Figure 17. Crews grade the new road between Custer and Newcastle (*now known as Highway 16*) near Jewel Cave NM, ca. 1932. 60

Figure 18. Looking out over Hell Canyon, new road between Custer and Newcastle after being graded, ca. 1933. 61

Figure 19. Civilian Conservation Corps crews pictured at Jewel Cave, ca. 1935. 62

Figure 20. CCC crews constructing the ranger cabin at Jewel Cave, ca. 1933. 64

Figure 21. The nearly completed ranger cabin in Jewel Cave, ca. 1936. 64

Figure 22. The CCC built a retaining wall and wooden stairs to the cave entrance, pictured here in partial completion. CCC crews eventually covered the retaining well with dirt to provide a more natural appearance. They also removed all wooden structures, including the stairs, and left only a steel gate at the rectangular cave entrance. 1935. 65

Figure 23. Map showing the existing trail from the entry road to the cave entrance and the proposed new trail, which the CCC eventually built. It also shows the existing ranger's tent and the proposed cabin, 1935. 65

Source: NPS, Western Office of Design and Construction. 65

Figure 24. CCC workers wrote their names on the walls of the cave in the Kittycombs area. Pictured here in 2017. 66

Figure 25. Design of the entrance sign for Jewel Cave, drawn by NPS Branch of Plans and Design, 1936. 67
Figure 26. Plan of the proposed campground at Jewel Cave NM, drawn by NPS Branch of Plans and Design, 1937. 68
Figure 27. The Jewel Cave Corporation gave tours from the entrance in Hell Canyon, pictured here from inside the cave, ca. 1946. 70
Figure 28. "Map of Jewel Cave Showing Underground Passages and Trails," Office of the Chief Engineer, NPS, July 1936. 71
Figure 29. Ranger Lyle Linch, pictured here in front of the entrance to Jewel Cave. 74
Figure 30. Jewel Cave tour tickets, 1942. 81
Figure 31. A tour through Jewel Cave, ca. 1950. 82
Figure 32. Jewel Cave NM informational brochure, 1947. 85
Figure 33. Ponderosa pine forests at Jewel Cave NM, ca. 1950s. 89
Figure 34. An existing truck trail through the monument. 94
Figure 35. There were many caves in the Black Hills, as this map by Lyle Linch shows, 1946. 97
Figure 36. The NPS proposed blasting a new passageway to connect two existing passageways within the cave to create a loop tour, 1952. 100
Figure 37. Trail to the cave entrance, 1958. 101
Figure 38. New entrance sign for Jewel Cave NM, ca. 1958. 109
Figure 39. A new sign at Jewel Cave erected in 1958 called Jewel Cave and Jasper Cave "small caves." This sign was near the park entrance and was in addition to the sign in front of the cave entrance that also called Jewel Cave a "small cave." Richard Hart, 1958. 110
Figure 40. Seasonal staff at Jewel Cave, ca. 1959/1960. 113
Figure 41. Park Ranger Keith Miller stands next to a patrol car, ca. 1950s. 115
Figure 42. Wally Elms, the first person to hold the title "management assistant" at Jewel Cave. Pictured here at Wind Cave, ca. 1963. 116
Figure 43. Park Ranger P. J. Ryan leading a cave tour, 1961. 118
Figure 44. Herb and Jan Conn, ca. 1959. 121
Figure 45. Jan Conn, Herb Conn, Dave Schnute, and Dwight Deal, 1959. 122
Figure 46. Jan Conn (*far left*) and Herb Conn (*fourth from left standing*) with cavers, including Jewel Cave Management Assistant Wally Elms (*second from right*) and his wife (*far right*). Photo taken by Seasonal Ranger Mike Kaback, 1963. 124
Figure 47. Herb Conn surveying Jewel Cave, pictured here in a photo by the South Dakota Highway Department, ca. 1963. 125
Figure 48. Jan Conn with Myrna Sheie, Karen Dilts, and Lynn Svatos, photo by Larry Dilts, ca. 1975. 126
Figure 49. The Conns and other cavers discovered new formations in Jewel Cave. Here, Jan Conn is holding frostwork. Photo by Dave Schnute, 1962. 129
Figure 50. Herb Conn examines cave "bacon," in photo by South Dakota Highway Department, ca. 1963. 129
Figure 51. Discoveries made by the Conns and their caving partners included massive rooms, such as "King Kong's Cage," pictured here with Jan Conn in the foreground and two other cavers in the background (*their headlamps are visible as white dots to the right of Jan's knee*). Photo by Dave Schnute, 1962. 131
Figure 52. Soda straws in Jewel Cave, ca. 1963. 132
Figure 53. Herb and Jan Conn discovered hollow stalagmites in the cave, which they called "logomites." At left is a photograph of one, ca. 1963, and on the right is Herb Conn's drawing of them. 134
Figure 54. A cave tour in 1964. This image ran in Don Hipschman's article on Jewel Cave and the Conns in *South Dakota Highway Magazine* in March 1964. 135
Figure 55. Herb Conn's drawing of where to drill a hole to hit the Target Room, 1964. 139
Figure 56. Radiolocating the underground cave from the aboveground surface. Father Paul Wightman uses the equipment aboveground, while others wait belowground, 1964. 139

Figure 57. The test hole into the Target Room, 1964. 141
Figure 58. John A. Ronscavage of the NPS Western Office of Design and Construction completed this color conceptual drawing, the first to show a proposed visitor center above the Target Room, in September 1964. 143
Figure 59. Banding bats at Jewel Cave, 1962. 145
Figure 60. Bats at Jewel Cave. Photo by Richard Hart, 1958. 146
Figure 61. A bat in Jewel Cave, with a hand for scale. Photo by Richard Hart, 1959. 146
Figure 62. The ticket booth outside of the ranger station, erected in 1963, with Wind Cave Natural History Association publications displayed for sale on the right-hand side, ca. 1965. 148
Figure 63. A schematic drawing of Jewel Cave as it would look after development, if one were south of the monument and looking north into Hell and Lithograph Canyons. Drawn by James B. Thompson, November 1965. 153
Figure 64. Grading for the entrance road to the new development area. Photo by John Tyers, 1965. 154
Figure 65. Power line construction near the location of the new visitor center, 1967. 155
Figure 66. Excavation for the 100,000-gallon reservoir at Jewel Cave National Monument, 1965. 156
Figure 67. The graded future site of the sewage lagoon, 1965. 157
Figure 68. Cavers in the Formation Room, which Herb and Jan Conn included in their proposed tour route. Photo by Alan Howard, September 1962. 158
Figure 69. Earth-moving in preparation for construction of the elevator shaft, 1966. 160
Figure 70. Elevator shaft excavation and the partially graded visitor center site, July 18, 1967. 161
Figure 71. Excavation of the elevator shaft. Photo by Don Gillespie, 1966. 161
Figure 72. Inside the elevator shaft during construction, 1967. 161
Figure 73. When excavating the elevator shaft, Frontier hit fractured rock that required lining of the shaft in those zones, 1966. 162
Figure 74. When drilling the elevator shaft, rock and muck fell into the cave and blocked a passageway. Drawn here by Herb Conn, August 31, 1967. 163
Figure 75. Construction of the access tunnel, pictured here at its entrance in Lithograph Canyon, ca. 1967. 164
Figure 76. Installing wiring along the new cave tour route. 165
Figure 77. Laying asphalt for the new cave tour trail, ca. 1968. 166
Figure 78. Herb Conn and maintenance workers installing aluminum stair treads along the new cave tour route. Photo by Don Gillespie, 1968. 167
Figure 79. A 1968 photo of the Target Room, with caption on back reading: “View of Target Rm. showing first 3 stairs locations - prior to construction of 2 & 3.” The upper landing in the photo is still used to access the elevator portal, but no stairs were ever built between the upper and lower landing. Instead, after issues with rockfall from the Target Room ceiling, the lower landing was camouflaged with large rock and abandoned. If the photo were taken in 2020, the Target Room platform would fill the lower third of the image. 168
Figure 80. Tours continued from the Hell Canyon entrance to the cave during development of the new area. Pictured here, staircases on the old tour route, 1963. 169
Figure 81. This ticket booth by the CCC ranger cabin was installed in 1963. The soda machine and the water fountain in the foreground, in front of the cabin, were also installed in the 1960s. 170
Figure 82. Housing at Jewel Cave near the Hell Canyon entrance, 1967. 173
Figure 83. Transa-Hut at Jewel Cave, 1963. 173
Figure 84. Maintenance shed in Lithograph Canyon, ca. 1966. 174
Figure 85. Drawings for the Jewel Cave Visitor Center, 1969. 175
Figure 86. As shown here, the elevator was built first and then the visitor center was built around it, ca. 1970–1971. 176

Figure 87. Visitor center construction was delayed briefly when a cement truck backed into the restroom building in 1971. 176
Figure 88. The Jewel Cave visitor center, built in the Mission 66/Parkscape style, opened to the public in 1972. 177
Figure 89. US Representative James Abourezk (D-SD) (*center, with hands on scissors*) and former US Representative Ellis Y. Berry (R-SD) (*left, with hand on scissors*) cutting the ribbon to open the Jewel Cave visitor center, 1972. 177
Figure 90. Herb and Jan Conn, pictured here in 1967 just inside the cave's historic entrance in Hell Canyon, explored over 10 miles of Jewel Cave in the 1960s. Their discoveries convinced the NPS to develop a new cave entrance and visitor center, rather than delist the national monument. 178
Figure 91. Steve Hurd became management assistant around 1973. 180
Figure 92. Dennis Ditmanson in the cave, examining a hollow stalagmite. Photo by Art Palmer, ca. 1984. 182
Figure 93. Herschel Schulz was chief ranger of interpretation, protection, and visitor protection for part of the 1980s. 183
Figure 94. Larry Dilts was the chief ranger at Jewel Cave, left for several years, and then returned as maintenance lead. Pictured here with Herb Conn in a state of South Dakota photograph, 1975. 184
Figure 95. Herb Conn drew and explained the "Very Important Shortcut" (VISC) in a letter to Father Paul Wightman, 1977. 191
Figure 96. Mike Wiles, the first staff person whose position was dedicated to managing cave resources, paints an updated cave map to replace an old one (on the wall behind him). Wiles completed the work on his own time, with $1,000 of support from the NHA. It took 234 hours to complete. ca. 1984. 196
Figure 97. A photograph of hydromagnesite balloons by Art Palmer, ca. 1984. 199
Figure 98. A park ranger staffs the information desk at the Jewel Cave visitor center, ca. 1974. 212
Figure 99. A tour group passes through the "Torture Room" along the Scenic Tour route, 1973. 213
Figure 100. Herb Conn with a Spelunking Tour, state of South Dakota photograph, 1975. 214
Figure 101. Jim Basinger leads a Historic Tour in the 1980s. 215
Figure 102. Jewel Cave managers developed a "Handspan Squeeze" to put outside of the visitor center, so that people thinking of going on the spelunking tour could simulate fitting through tight passages. 216
Figure 103. Park rangers developed short interpretive programs to give outside of the cave, so that people waiting for cave tours had something to do. 217
Figure 104. Jewel Cave had Youth Conservation Corps (YCC) crews assisted with trail maintenance and other tasks, ca. 1984. 224
Figure 105. This cabin, built by the US Biological Survey at Wind Cave in 1916 and transferred to Jewel Cave in 1959, was torn down in 1980. 230
Figure 106. Relining the sewage lagoon, ca. 1989. 234
Figure 107. Caver in a fissure near Corrigan Passage, ca. 1984. 236
Figure 108. Kate Cannon became superintendent of Jewel Cave in 1990. 238
Figure 109. Exploration of Jewel Cave continued in the 1990s. 255
Figure 110. Volunteer D. Kruse monitors temperature in Jewel Cave, 1991. 259
Figure 111. Jewel Cave held several prescribed burns in the 1990s, in partnership with other NPS units, the Forest Service, and the state of South Dakota. Here, a prescribed burn in 1990. 267
Figure 112. Hazardous fuel reduction at Jewel Cave through mechanical thinning, 1991. 268
Figure 113. A prescribed fire at Jewel Cave National Monument, 1990. 270
Figure 114. Historic rehabilitation and restoration of the ranger cabin began in 1999. 275
Figure 115. Ranger Michelle Gleicher gives a Historic Candlelight Tour in July 1991. 279
Figure 116. The Jasper Fire burned 3,655 acres in its first day, 2000. 282
Figure 117. The Jasper Fire burned close to the Jewel Cave Visitor Center, pictured here during the fire, 2000. 283

Figure 118. The Jasper Fire in 2000 burned 83,508 acres, making it the largest fire in the recorded history of the Black Hills. 284
Figure 119. The Jasper Fire burned close to the monument's residential structures, pictured here in background, 2000. 285
Figure 120. Flash flooding caused major erosion and runoff issues after the Jasper Fire burned much of the ponderosa pine forest around Jewel Cave. Here, deeply eroded channels in Lithograph Canyon in 2002. 286
Figure 121. The Jasper Fire burned many acres of the monument and resulted in increased erosion and altered hydrology after the fire. Here, the sewage lagoon is left of center and the visitor center and parking lot are visible to the upper left, 2000. 287
Figure 122. Todd Suess served as superintendent of Jewel Cave National Monument from 2001 to 2010. 289
Figure 123. Mike Wiles, chief of resource management at Jewel Cave starting in 1997, pictured here in 2013. 290
Figure 124. Jewel Cave permanent staff in 2007. 291
Figure 125. Jewel Cave interpretive staff in 2010. 293
Figure 126. Volunteers In Parks (VIPs) assist with interpretation, resource management, exploration, administration, and maintenance. Here, a VIP brushes lint from the Scenic Tour trail, ca. 2004. 296
Figure 127. The Midwest Regional Office completed the Foundation Document for Jewel Cave National Monument in February 2016. 300
Figure 128. Steve Baldwin, who had previously caved in Jewel Cave, was executive director of the Black Hills Parks and Forests Association for many years. Pictured here in 2013. 301
Figure 129. Black Hills Parks and Forests Association bookstore in the Jewel Cave visitor center, 2018. 302
Figure 130. Volunteer cavers donate thousands of hours to exploring, surveying, and mapping the cave. Here, Chris Pelczarski and Adam Weaver. Photo by Ben Smith, 2018. 304
Figure 131. Jewel Cave search and rescue training, 2004. 305
Figure 132. Nancy Martinz became chief of law enforcement at Jewel Cave in 2016. 308
Figure 133. Reconstruction of the parking lot, 2018. 311
Figure 134. South Dakota realigned Highway 16 to eliminate dangerous curves. Photo of construction work in 2014. 313
Figure 135. The NPS removed the wooden structure in the Target Room that had been installed in the late 1960s to protect people from rockfall. Here, the structure before it was removed, ca. 2004. 316
Figure 136. Every year, maintenance crews replaced between one-fifth and one-fourth of the aluminum steps along the Scenic Tour. Here, after replacement in 2007. 316
Figure 137. Split Rock Studios completed a blueprint for visitor center renovations in 2011. 318
Figure 138. Jewel Cave partnered with the Forest Service to build a 10-unit apartment building on Forest Service land in Custer, pictured here in 2005. 319
Figure 139. Maintenance crews relined the sewage lagoon in 2005. 320
Figure 140. Underground resource management has focused on monitoring and studying cave resources. Here, photomonitoring in 2018. 322
Figure 141. Dan Austin making his way through Dingo Pass, 2018. 323
Figure 142. Volunteers have explored and surveyed over 200 miles of Jewel Cave's passageways. Here, on an exploration trip in 2017. 324
Figure 143. Rene Ohms and Mike Wiles, pictured here on a cave exploration trip in 2004, worked on the Jewel Cave Cave and Karst Management Plan in the early 2000s, in partnership with Wind Cave staff. 325
Figure 144. Rene Ohms, pictured here in the cave near the Curio Shop in 2005, worked with Mike Wiles and Andy Armstrong to develop the trip leader training program for Jewel Cave. 327
Figure 145. Marc Ohms, Blase Lasala, and Mike Wiles on a cave rescue pre-planning trip to the VACC (Victory After Continuous Contortions) in 2015. 328
Figure 146. Deep Camp near Hourglass Lake is one of several camps that allows cavers to extend the distance of exploration trips. Photo by Jonathan Venner, 2016. 329

Figure 147. In 2002, Father Paul Wightman returned to Jewel Cave to assist with radiolocation work, as he had in 1964 and 1977. 330
Figure 148. James McClean looking at aragonite frostwork in Rambling Loft. In the background is rope used to mark known routes and mitigate damage to cave resources. 2014. 330
Figure 149. Dan Austin installs a lint collection tarp underneath a bridge on the Scenic Tour route, 2016. 331
Figure 150. NGPN crews released beetles to control leafy spurge, 2008. 334
Figure 151. The Fire Use Module at Jewel Cave, 2002. 336
Figure 152. Bradley Block, chief of interpretation starting in 2008, pictured here 2008. 340
Figure 153. A park ranger leads visitors on a Scenic Tour, pictured here on the platform in the Target Room, 2010. 342
Figure 154. Interpretive rangers continued to offer aboveground programs while visitors waited for cave tours. Here, in 2006. 342
Figure 155. The Wild Caving Tour is an off-trail opportunity for both experienced and novice cavers, 2008. 343
Figure 156. Jewel Cave Rangers giving cave tours from the historic entrance in ca. 1938 replica NPS uniforms. 344
Figure 157. A ranger helps someone at the visitor center desk, while Jan Conn passes by in the background. 2013. 345
Figure 158. Ranger Rene Ohms talks to students as part of the Adopt a Classroom program, 2011. 348
Figure 159. Jewel Cave held “Belt Loop-a-looza” events at the monument, in partnership with other NPS units, Custer State Park, and the BHPFA. Here, the event in 2011. 349
Figure 160. Jan Conn checks out the new visitor center exhibits, 2013. 350
Figure 161. Cavers have discovered over 200 miles of passageways in Jewel Cave, but there is much left to explore. Here, inside the cave in 2015. 351
Figure 162. Jan Conn reaches out a helping hand to a fellow caver. 353
Figure 163. Much of Jewel Cave remains unexplored. Here, an NPS employee inside of the cave. 355

List of Acronyms

ADA	Americans with Disabilities Act
ANCS	Automated National Catalogue System
AO	administrative officer
ARPA	Archaeological Resources Protection Act
BAER	Burned Area Emergency Rehabilitation
BHAA	Black Hills Area Association
BHAG	Black Hills Administrative Group
BHNHA	Black Hills Natural History Association
BHPFA	Black Hills Parks and Forests Association
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BOR	US Bureau of Reclamation
BPR	Bureau of Public Roads
CCC	Civilian Conservation Corps
CCESO	Custer County Emergency Services Office
CIP	Comprehensive Interpretive Plan
CKMP	Cave and Karst Management Plan
CLR	Cultural Landscape Report
CRS	Congressional Research Service
CUA	Commercial Use Authorization
DAR	Daughters of the American Revolution
DOI	Department of the Interior
DSC	Denver Service Center
ECW	Emergency Conservation Work
EDB	ethylene dibromide
EIS	Environmental Impact Statement
EO(s)	Executive Order(s)
EPA	Environmental Protection Agency
FCRPA	Federal Cave Resource Protection Act
FLREA	Federal Lands Recreation Enhancement Act

FMP	Fire Management Plan
FMU	Fire Management Unit
FOIA	Freedom of Information Act (FOIA)
FTE	full-time equivalent
GAO	General Accountability Office
GEMS	Green Environmental Management System
GLO	General Land Office
GMP	General Management Plan
HFC	Harpers Ferry Center
HFR	Historic Furnishing Report
HINEC	Howe Investments and Northwestern Engineering Company
HR	human resources
HRS	Historic Resource Study
ICS	International Congress of Speleology
IT	information technology
JCC	Jewel Cave Corporation
LENA	Law Enforcement Needs Assessment
LPF	Land Protection Fund
MMS	Maintenance Management System
MABOs	Major Acquisition Buying Offices
MEMS	Modified Environmental Management System
MOA	memorandum of agreement
MOU	memorandum of understanding
MSHA	Mine Safety and Health Administration
MWAC	Midwest Archeological Center
NCKRI	National Cave and Karst Research Institute
NCRI	Northwest Cave Research Institute
NEPA	National Environmental Policy Act
NGPN	Northern Great Plains Inventory & Monitoring Network
NHA	natural history association
NIOSH	National Institute for Occupational Safety and Health
NPRS	National Park Reservation Service

NPS	National Park Service
NSS	National Speleological Society
NTE	not to exceed
ONPS	Operation of the National Park System
OSHA	Occupational Safety and Health Administration
PHS	Public Health Service
PLO	Public Land Order
PRIP	Park Restoration and Improvement Program
RMP	Resource Management Plan
RMRO	Rocky Mountain Regional Office
SAR	Search and Rescue
SCA	Student Conservation Association
SDDHS	South Dakota Department of Human Services
SDDOT	South Dakota Department of Transportation
SHPO	State Historic Preservation Office
SHROs	Servicing Human Resources Offices
STEO	Student Temporary Employment Program
TKE	Thyssen-Krupp Elevator
TNC	The Nature Conservancy
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VACC	victory after continuous contortions
VIP	Volunteers In Parks
VISC	Very Important Shortcut
VRAP	Visitor Management-Resource Protection Assessment Program
VUA	Visitor Use Assistant
WCNHA	Wind Cave Natural History Association
WODC	Western Office of Design and Construction
YCC	Youth Conservation Corps

Introduction

Project Team

The Midwest Regional Office of the National Park Service (NPS) contracted Historical Research Associates, Inc. (HRA), in 2018 to write this administrative history of Jewel Cave National Monument (Jewel Cave). Dr. Emily Greenwald managed the project, conducted research and oral history interviews, and assisted with writing and revisions. Dr. Jackie Gonzales conducted research at several repositories, conducted oral history interviews, and wrote the bulk of the report. Dr. Robert Gardner assisted with the writing. Dawn Vogel copyedited the report and compiled the index, and Jessi Frank formatted the report. Teresa Bergen (a subcontractor to HRA) transcribed the oral history interviews.

Methodology

HRA conducted research for this project in the following collections: Jewel Cave National Monument's central files and digitized records, held at the monument's headquarters in Custer, South Dakota; archival records of the NPS Midwest Regional Office and Wind Cave National Park, held at the National Archives and Records Administration branch in Kansas City, Missouri; images of Jewel Cave museum files stored at Mount Rushmore Curatorial Facility; NPS files held in the National Park Service Electronic Technical Information Center (eTIC); and the Chief Historian's Park Unit Files.

HRA conducted 15 oral histories with former NPS staff and partners, as per our contract, and three supplemental interviews during the 200-mile reunion. We were fortunate that the reunion, a gathering of dozens of people who have worked or volunteered at Jewel Cave over the last 50 years, occurred while we were writing the administrative history of the monument. We learned a great deal from the many knowledgeable cavers, NPS staff, and partners who attended the reunion.

Acknowledgements

Many individuals helped make this administrative history possible. Above all, we would like to express our gratitude to Mike Wiles, chief of resource management at Jewel Cave, for sharing his deep knowledge of the cave. Based on his 40 years of service at the cave, Mike possesses an institutional memory that is difficult to find at most NPS units. We are grateful for Mike's insights, which have greatly enhanced this administrative history.

We have written several administrative histories under the guidance of Ron Cockrell, Senior Historian at the Midwest Regional Office. He has helped us navigate these complex projects with ease, and we appreciate the wisdom and experience he brings to them. Superintendent Michelle Wheatley, new to Jewel Cave when we began this project, pointed us in the right direction when we had questions and made sure we had access to the resources we needed. Katie Atkins and Beckie Carder helped us find what we were looking for in Jewel Cave's files and made sure we were set up well to do research at monument headquarters. Bradley Block let us explore the resources of the

interpretation library. Patty Ressler of the Black Hills Parks and Forest Association kindly welcomed Jackie to Custer, even during a crazy week of preparation for the 200-mile reunion. Zane Martin helped arrange informal oral history interviews during the reunion and made sure we had the museum files we needed.

We especially want to thank the 18 individuals we interviewed as part of this project for their kindness and generosity. They not only let strangers ask them detailed questions for a couple of hours, but they welcomed us into their homes and offices, supplied personal files and materials to aid our research, and followed up with us when they thought of additional information. Sitting for an oral history is often a deeply personal experience for both the interviewee and the interviewer, and we feel lucky to have had the chance to talk with these wonderful people. Special thanks to Rene Ohms, who not only agreed to be interviewed without being on our list but also introduced us to other cavers who shared valuable information about the exploration program, and to Al Hendricks, who shared his duty logs with us.

Purpose

Administrative histories are intended to assist future managers as they make decisions about a site. In large institutions like the NPS, managers and superintendents rarely serve for a long period of time. An administrative history is therefore an important tool for preserving the institutional memory. For example, when a manager 20 years from now grapples with whether to modify elevator service to the cave, it may be helpful to know why the elevators were built where they are, what issues they have had over the years, and where to find the documents containing more information about them. This administrative history can help to answer those questions.

In addition to its value for future managers of Jewel Cave, this administrative history provides data and context that can inform interpretation, resource management, outreach, partnerships, and collaboration with other agencies.

The Cave

No humans entered Jewel Cave before 1900—none of the blowholes connecting the underground cavity with the surface landscape were large enough for a human to fit through. Had Frank and Albert Michaud not blasted an opening into the cave, it might have remained a mystery, an unknown source of cool air that sometimes flowed into Hell and Lithograph Canyons from little cracks in the rock.

Instead, we now know that Jewel Cave contains well over 200 miles of underground passageways, making it (as of 2020) the third-longest cave system on the planet. Its walls are lined along many of these miles with the calcite crystals that prompted the Michauds to give it the name "jewel," but explorers have also found countless unique formations, diverse rooms, long passageways, and even lakes where the cave intersects with the Madison Aquifer. Exploration to discover and survey this complex cave has been ongoing since 1959, with no sign of slowing down.

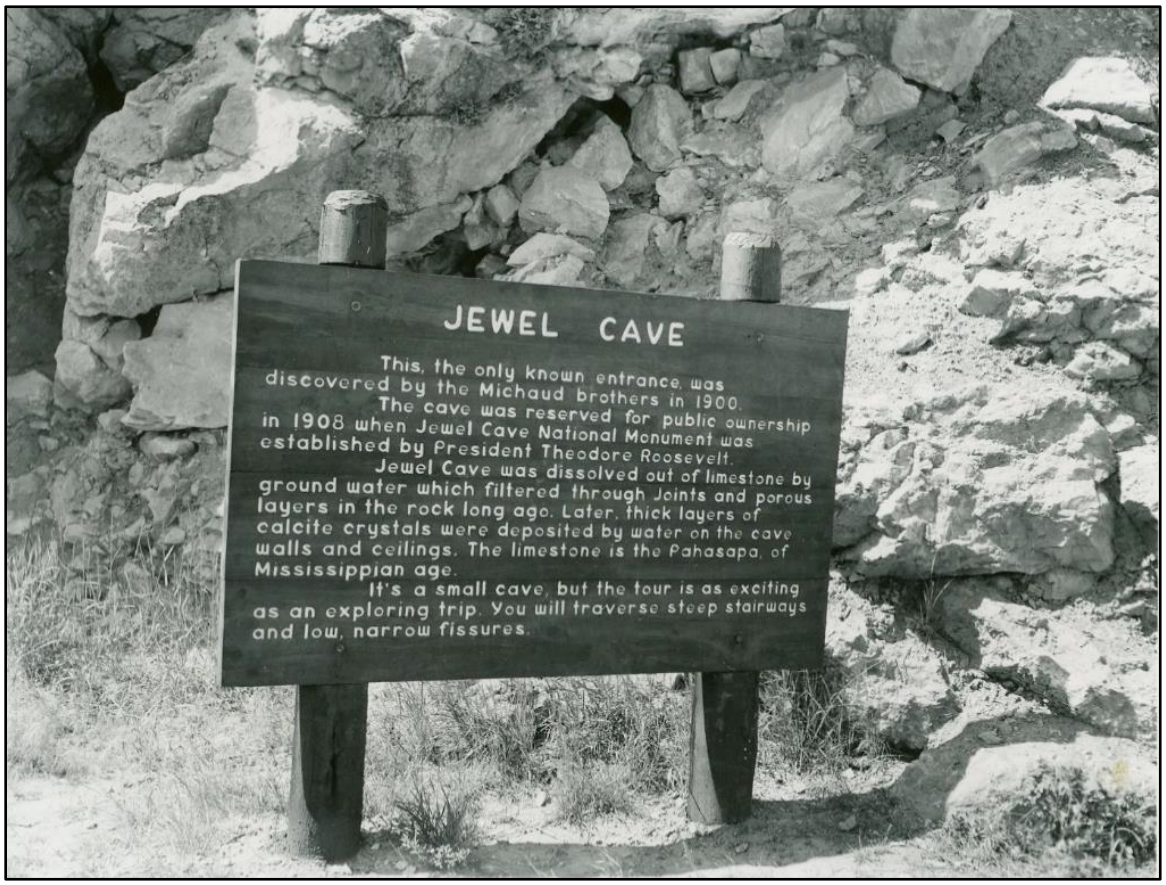


Figure 1. The NPS long assumed that Jewel Cave was a "small cave," as this sign from 1958 attests. Photo by Richard Hart, 1958.

Source: Jewel Cave NM.

More than any other variable, the changing size of the cave has been the central factor governing NPS management of Jewel Cave. As explorers found more passageways, the NPS had to adjust its plans for the cave. In the 1930s, the NPS contracted out guide service for the "small cave," and the Civilian Conservation Corps (CCC) made minor infrastructure improvements, which paled in comparison to the elevator and visitor center that the CCC constructed at nearby Wind Cave National Park. No more than a handful of seasonal employees staffed the cave through the 1950s, during which time the NPS seriously considered removing the cave from the National Park System, due to its assumed small size and insignificance (see Figure 1). However, Herb and Jan Conn began explorations of Jewel Cave in 1959 that shattered those assumptions. As the Conns and cavers who followed them found more and more cave, managers had to figure out how to accommodate increasing crowds, protect cave resources under private and Forest Service lands, study the ever-larger cave, and manage exploration in its far reaches.

Herb and Jan Conn explained the joys and frustrations of exploring Jewel Cave:

> From that day until this, there has always been unfinished business for the explorer and surveyor of Jewel Cave. The satisfaction and excitement of adding a new section to the map is always tempered by wonder and bewilderment at what remains to be done. . . .

> At the end of a long day underground the task ahead often seems insurmountable. Sometimes we find too many leads, while at other times we cannot find any. When we leave the cave in the evening, we are often tired, frustrated, and discouraged. Fortunately, those feelings are quickly forgotten during the ensuing week, whereas curiosity lingers to lure us back.[1]

Cavers, park managers, and friends in the local community have protected Jewel Cave over the years by carrying on this curiosity for exploration. Their discoveries have enabled the NPS to better understand, and therefore better manage, this previously hidden gem.

[1] Herb and Jan Conn, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota* (St. Louis: Cave Books, 1977), 63–64.

Chapter 1: Geology and Early Human History of Jewel Cave Area

Jewel Cave weaves its way through limestone in the southern Black Hills, where a layer of sandstone rests on top of the cavitied limestone. It is south of the major uplift portions of the Black Hills, such as Mount Rushmore and Black Elk Peak (formerly Harney Peak). We know only fragments of the thousands of years of human history of the area, but the archeological record suggests that groups tended to use the Black Hills seasonally. The Lakota people occupied the Black Hills most recently, until the US government forced them out in 1877. Although the Lakota had knowledge of Wind Cave, we do not currently have evidence that they or other American Indians knew that Jewel Cave existed. There are no written accounts of Jewel Cave prior to the 1890s. In the early 1900s, European Americans blasted a new cave entrance and developed the surrounding areas. Jewel Cave was promoted as a local tourist attraction, but, despite the efforts of local boosters, it never attracted as many visitors as nearby Wind Cave.

Geology of Jewel Cave

Since the 1930s, geologists have proposed a variety of theories about the origin of Jewel Cave. In recent years, cave exploration and detailed geological mapping have offered new ways of viewing the relationship between surface and subsurface geological features. The most recent studies suggest that Jewel Cave was formed by the same geologic processes that shaped the area's current surface topography.[1] Because the understanding of Jewel Cave's speleogenesis continues to evolve, the following discussion provides an approximation of the cave's geologic history while acknowledging that this is not settled science.

Jewel Cave lies entirely within the Pahasapa limestone that formed in the Mississippian Period about 360–320 million years ago ("Paha Sapa" is the Lakota name for the Black Hills). Limestone is a sedimentary rock formed by deposition of marine organisms, many with hard, calcium-rich components (think relatives of shellfish and corals) at the bottom of a shallow inland sea. Over millions of years, these deposits chemically changed into layers of limestone, often containing fossil remains of the sea creatures.[2]

After the Mississippian period, subsequent geological environments deposited an additional 5,000 feet of sedimentary layers on top of the Pahasapa, beginning with the basal sandstone of the Minnelusa formation.[3] Around 60–30 million years ago, the Black Hills uplifted in what geologists call the Laramide Orogeny. As the hills rose, most of the 5,000 feet of overburden was removed by

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[1] Michael E. Wiles, "The Origin Of Jewel Cave And Its Relationship To Landscape-Scale Processes – Part 1," *Proceedings of the 17th International Congress of Speleology*, 312.

[2] Wiles, "The Origin Of Jewel Cave . . . Part 1," 312; Katie Kellerlyn, NPS, Natural Resource Program Center, "Jewel Cave National Monument Geologic Resources Inventory Report," March 2009, 29.

[3] Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 29.

erosion. Much of the Pahasapa and Minnelusa was also removed, but an exposed remnant remains, encircling and tilting away from the uplifted area. Joints and faults associated with the uplift formed the pattern along which cave passages later developed.[4]

Most of the world's large cave systems formed in limestone, since it can be dissolved by slightly acidic groundwater. When water absorbs carbon dioxide from the soil, it becomes a weak solution of carbonic acid that can enlarge fractures in the limestone by dissolving some of the limestone and carrying it away. Jewel Cave formed around 30–15 million years ago (perhaps more recently), after uplift and erosion had shaped the topography and related geological features to nearly their present-day configuration. All Black Hills caves over 500 feet in length occur in limestone that is still capped by the Minnelusa sandstone formation. This suggests that something about the Minnelusa formation created ideal conditions for the formation of limestone caves.[5] Recent studies suggest that the basal Minnelusa sandstone functioned as a confined aquifer, transmitting water from lateral recharge sites (higher elevation), across the Pahasapa where passages would develop, to discharge sites (lower elevation) where the sandstone was again exposed and water could exit the aquifer. [6]

The entire cave system formed under phreatic conditions, which means that it was completely saturated with water, with no air space. Under such conditions, water from the aquifer could circulate through fractures in the underlying limestone, back up to the aquifer, and on to the discharge areas. Since the aquifer was confined, it would not have lost carbon dioxide to degassing, speeding up the dissolution of the limestone.[7]

Given these conditions, Jewel Cave could have formed in as short a time as 1.1 million years, which is relatively fast on a geologic time scale. The presence of microbial life in the water (which scientific studies show to be increasingly likely) could have accelerated the rate of cave development.[8] The calcite spar would have formed when conditions changed, so that the water stopped dissolving the limestone and began depositing it as a crystalline coating on all the surfaces within the newly created cave passage. The changes most likely resulted from the reduction of hydrostatic pressure as the cave drained, allowing the carbon dioxide to degas. This caused the water to lose its acidity, forcing the previously dissolved limestone to precipitate as the spar coating (see Figure 2). A single radiometric date suggests the spar stopped forming around 15 million years ago, when the water last drained from the cave.[9]

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[4] Michael L. Strobel, et al., US Geological Survey, "Potentiometric Surface of the Madison Aquifer in the Black Hills Area, South Dakota," 1999; Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 29.

[5] Wiles, "The Origin Of Jewel Cave . . . Part 1," 312; Arthur N. Palmer and Margaret V. Palmer, "Geologic History of the Black Hills Caves, South Dakota," *National Speleological Society Bulletin* (December 1989): 74.

74; Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 29–30.

[6] Michael E. Wiles, "Paleohydrology and the Origin of Jewel Cave," [2013?], Jewel Cave National Monument Digital Files (hereafter Jewel Cave NM DF), 2–3.

[7] Wiles, "The Origin Of Jewel Cave . . . Part 1," 313.

[8] Michael E. Wiles, "The Origin Of Jewel Cave And Its Relationship To Landscape-Scale Processes – Part 2," *Proceedings of the 17th International Congress of Speleology*, 315.

[9] Wiles, "The Origin Of Jewel Cave . . . Part 1," *Proceedings of the 17th International Congress of Speleology*, 314; Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 30; Author's communication with Mike Wiles, February 9, 2020.



Figure 2. Jewel Cave is named for the calcite crystals that line much of its walls. Pictured here, photo undated. Source: NPS, Jewel Cave NM.

Drip zones formed near canyons, where erosion breached impermeable shale layers.[10] Travertine, hydromagnesite, and aragonite precipitated from this dripping and seeping water after the cave drained the last time. The currently known cave passages range from 5,406 to 4,775 feet above sea level, and the deepest known point of the cave is 749 feet below the ground surface.[11]

Jewel Cave has a naturally occurring breathing effect, caused by changes in barometric pressure. Air blows into the cave when the outside air pressure rises, and it blows out of the cave when outside air pressure falls. This is apparent to any observer, as early discovery stories of the cave make

[10] Michael E. Wiles, "Infiltration [of groundwater] at Wind and Jewel Caves, Black Hills, South Dakota" (master's thesis, South Dakota School of Mines and Technology, 1992).

[11] Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 11, 30.

clear. A 1907 Forest Service report noted that the early cave developers, Frank and Albert Michaud, had studied this phenomenon and noticed other blowing holes in the vicinity:

> They have discovered that ordinarily the wind blows in and out of the cave for regular periods. The periods of blowing in and out being fifteen hours each, although they have known the periods to be of seventy-two hours duration. Furthermore they have discovered five other wind passages in the vicinity of the cave, within a radius of two miles, one of which, Jasper Cave, located one and one-half miles to the westward, is similarly held as a mining location by S. V. and Vance I. Coe, and is a considerable passage as yet unexplored.[12]

In the early 1960s, Stan Arlton became the first person to calculate an estimated volume of Jewel Cave using airflow and its response to changes in barometric pressure. Since changes in barometric pressure create changes in the volume of air in the cave, Arlton mathematically solved for the volume using the known pressure change and measurements of airflow.[13] In 1966, Herb Conn completed the first detailed study of Jewel Cave's airflow (see Figure 3). Conn measured wind speed and air pressure over 11 to 16 days at entrances to Wind Cave and Jewel Cave and calculated probable cave volume from those measurements.[14] Conn determined that Jewel Cave could be at least four billion cubic feet, which meant that it either had huge, wide chambers or was very long. Because exploration up until then had revealed few wide cavities, the cave was likely to be long. Conn also concluded that the winds at the Jewel Cave entrance were weaker than those at Wind Cave. He described wind behavior at the openings to Jewel Cave:

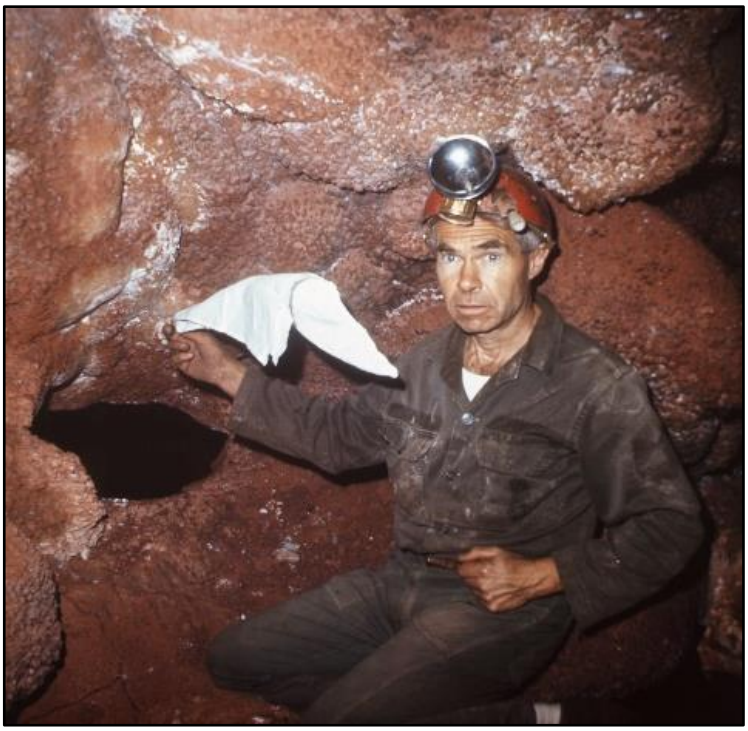


Figure 3. Herb Conn holds a handkerchief to illustrate the strong wind blowing through a cave passageway, undated.

Source: NPS, Jewel Cave NM.

[12] H. C. Neel and C. W. Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," September 1907, 2, in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF).

[13] Herb Conn and Jan Conn, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota* (St. Louis: Cave Books, 1977), 40; Mike Wiles, comments on draft administrative history, April 7, 2020.

[14] Herbert W. Conn, "Barometric Wind in Wind and Jewel Caves, South Dakota," *National Speleological Society Bulletin* 28, no. 2 (April 1966): 67.

> [Wind] persists for many hours after the barometer becomes steady. Much of Jewel Cave must lie far from the entrance, separated perhaps by many constrictions. At these constrictions the wind may be fast, even far within the cave, as it is known to be at Hurricane Corner. . . .
>
> After a pressure jump at the Jewel Cave entrance it will take about 24 hours for *one-half* of the air necessary to equalize the cave pressure to enter the cave. If the mercury rises ¼ inch and then steadies, Jewel Cave will continue to blow for over three days before the wind velocity drops to one mile per hour.[15]

Conn added that several local well drillers had reported striking caves that emanated strong winds (which may or may not have been connected to the Jewel Cave system), and he noted, "The well drillers with whom we talked are not eager for work in this area."[16]

Early Human Use of the Area

A complete archeological inventory for Jewel Cave was completed in 1993, and Bruce Jones of the NPS Midwest Archeological Center (MWAC) conducted the first large-scale evaluation of recorded archeological sites at the monument from 2000 to 2003. Jones' and previous project-specific archeological investigations resulted in finds dating from the Early Archaic through the Late Precontact periods (all dates below are approximate).[17] Other archeological investigations general to the Black Hills provide information about human use of the area. For a more detailed discussion of early human habitation of the Black Hills, see Patricia Albers, *The Home of the Bison: An Ethnographic and Ethnohistorical Study of Traditional Cultural Affiliations to Wind Cave National Park*; Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study*; and Linea Sundstrom, *Storied Stone: Indian Rock Art of the Black Hills Country*.

Human history prior to the arrival of Europeans to the Black Hills falls into three broad periods: Paleoindian (approximately 13,000 to 6,000 years before present [BP]), Archaic (approximately 7500 to 1500 BP), and Pre-Contact (1500 BP to 1750 common era [CE]).[18] The archeological evidence does not indicate use of the cave itself during these phases. The original cave opening was a blowing hole, too small for human entry, and while there is no evidence of cave entry, early people could have been aware of the blowing hole.

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[15] Conn, "Barometric Wind in Wind and Jewel Caves," 68.

[16] Conn, "Barometric Wind in Wind and Jewel Caves," 68; Kellerlyn, "Jewel Cave National Monument Geologic Resources Inventory Report," 11.

[17] Bruce A. Jones, "Archeological Investigations at Jewel Cave National Monument, Custer County, South Dakota, 2000-2003," Midwest Archeological Center Technical Report No. 94a, NPS, 2006, 1; Glenna J. Sheveland, "An Intensive Cultural Resources Survey of Jewel Cave National Monument: Preliminary Report," July 10, 1993, Cabinet 3, Drawer 1, Jewel Cave NM CF; E. Steve Cassell, *Prehistoric Hunters of the Black Hills* (Boulder: Johnson Books, 1986).

[18] Different scholars periodize the eras differently. We have merged several sources to define the eras here. See Linea Sundstrom, *Storied Stone: Indian Rock Art of the Black Hills Country* (Norman: University of Oklahoma Press, 2004), 11; Patricia Albers, *The Home of the Bison: An Ethnographic and Ethnohistorical Study of Traditional Cultural Affiliations to Wind Cave National Park, Volume One*, September 29, 2003, 17–20; Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study* (Omaha: NPS Midwest Regional Office, 2006), 8–22.

Paleoindian (ca. 13,000 to 6000 BP)

Due to an incomplete and complicated archeological record, it is not clear when the first humans reached the Black Hills region. While some artifacts from the Clovis period (12,000 to 11,000 BP) have been found west of the Black Hills, and a few remains linked to the Folsom period (11,000 to 9000 BP) are located in the southwestern Black Hills, the first widespread evidence of human habitation of the area comes from the Plano period (9000 to 2400 BP). Plano groups were hunter-gatherers who relied heavily on bison and other large game for food. Archeologists have found chisels and other tools from this period, primarily near springs on the limestone plateau of the western Black Hills.[19]

Archaic (ca. 7500 to 1500 BP)

A shift in climate ushered in the Archaic period. As the ice age ended around 8000 BP, the area transitioned to a drier and warmer climate, with greater seasonal variations. The largest concentrations of archeological sites in the Black Hills are from the Middle Archaic period (starting about 5000 BP). During this time, according to Albers, "a clear separation between mountain and plains adapted populations developed in the Black Hills." One group used high elevation areas in the summer and winters in the exterior "Hogback zone" (the area of sandstone, with some limestone and shale, that surrounds the "Red Valley" or "Race Track" of exposed red sandstone that encircles the Black Hills), while others used the Hogback in the winter months and went to the open plains in the summer months. On the land that is now Jewel Cave National Monument, archeologists have found evidence of human occupation from as early as 4500 to 4200 BP.[20]

Based on archeological evidence, the number of people in the Black Hills area likely dropped during the Late Archaic period, although there is some evidence of human use of springs at Jewel Cave National Monument during this period. The Comanche and the Shoshone may have been present, or at least had an influence on rock art motifs. Both Northwestern Plains and Plains Woodland cultures expanded into the Black Hills during this era. Archeologists have found a variety of sites in the region, including base camps, rock shelters, fire pits, hearths, and tepee rings, indicating that people in this era moved seasonally to take advantage of a variety of food sources. Rock art from the Late Archaic period is abundant in the Black Hills.[21]

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[19] Evans-Hatch and Evans-Hatch, *Place of Passages*, 8–11; Albers, *Home of the Bison*, 17–18; Jones, "Archeological Investigations at Jewel Cave National Monument," 12–13.

[20] Evans-Hatch and Evans-Hatch, *Place of Passages*, 12; Albers, *Home of the Bison*, 18; Jones, "Archeological Investigations at Jewel Cave National Monument," 109–114.

[21] Alice M. Tratebas, "Black Hills Settlement Patterns: Based on Functional Approach" (PhD diss., Indiana University, 1986), 114; Jones, "Archeological Investigations at Jewel Cave National Monument," 31–40; Albers, *Home of the Bison*, 18–21; Evans-Hatch and Evans-Hatch, *Place of Passages*, 16.

Pre-Contact (1500 BP to 1750 CE)

Archeological evidence from the pre-contact period is sparse and reflects seasonal occupation. Anthropologist Patricia Albers acknowledged that it is difficult to identify which culture groups were present in the Black Hills in this era:

> While archeologists are generally confident about the general technologies and adaptive strategies of some of the prehistoric populations who occupied the Black Hills, they are much less certain of their ethnic and language affiliations.[22]

Bow and arrow technology arrived on the Northern Plains between 2000 and 1000 BP and altered hunting patterns. Gradual climate change resulted in an increase in grasses in the Late Archaic period, which allowed bison to flourish on the Northern Plains. The growing numbers of bison, along with bow and arrow technology, created new opportunities for human communities in the region.[23]

In addition to sustaining the year-round occupants of the Black Hills, bison drew people from Missouri River farming communities into the Black Hills for seasonal hunts. These groups included ancestors of the Mandan, Hidatsa, and Arikara, all of which had large farming villages along the Missouri beginning around 900 CE. After planting crops in the spring, hunters traveled to the Black Hills to pursue bison during the summer, and then returned to villages along the Missouri River for the fall harvest. Archeologists have found bison remains at Jewel Cave National Monument dating to around 700 CE.[24]

The Lakota arrived in the Black Hills as a result of both push and pull factors. The push first came from the Iroquois, who had dislodged the larger Sioux population from the Great Lakes region in the mid-1600s, and then from the Chippewa and Cree, who forced the Sioux farther west. This led to the division of Sioux people into three broad groups: Dakota (referred to by anthropologists as Santee), Nakota (or Yankton-Yanktonai), and Lakota (or Teton). The pull came from bison. The Lakota bands, in particular, adopted an equestrian lifeway that emphasized bison hunting in the first half of the 1700s, drawing them farther west than other Sioux groups. As pressure from hunting shifted bison populations to the west, the Lakota followed.[25] There is evidence of human habitation within the boundaries of Jewel Cave National Monument itself from this period. As of 1995, archeologists had identified 14 pre-contact sites in Jewel Cave National Monument—more than from any earlier period—but evidence does not indicate knowledge or use of Jewel Cave.[26]

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[22] Albers, *Home of the Bison*, 21.

[23] Albers, *Home of the Bison*, 19; Evans-Hatch and Evans-Hatch, *Place of Passages*, 16.

[24] Jones, "Archeological Investigations at Jewel Cave National Monument," 114; Sundstrom, *Storied Stone*, 16; Evans-Hatch and Evans-Hatch, *Place of Passages*, 16.

[25] Sundstrom, *Storied Stone*, 18; Evans-Hatch and Evans-Hatch, *Place of Passages*, 26–28.

[26] Jones, "Archeological Investigations at Jewel Cave National Monument," 31–40; Glenna J. Sheveland, "An Intensive Cultural Resources Survey of Jewel Cave National Monument: Preliminary Report," July 10, 1993, Cabinet 3, Drawer 1, Jewel Cave NM CF; Evans-Hatch and Evans-Hatch, *Place of Passages*, 17–18.

Contested Lands

Beginning in the 1700s, the Black Hills increasingly became a contested space. American Indian groups competed for resources in the region, with the Lakota achieving control of the territory by the early 1800s. European American westward migration to Oregon, Utah, and California put new pressures on the region, although the main travel corridor was south of the Black Hills. From the 1850s to the 1870s, the United States at first made the Black Hills a reserve for the American Indian people and attempted to keep white settlers out. The federal government then used diplomacy, military action, and other tactics to take territorial control away from the Lakota, ultimately opening the region to European American mining and settlement. By the end of the 1800s, the United States had asserted federal jurisdiction over most of the area through the creation of national forest reserves. Jewel Cave does not appear to have played a role in any of these events.

Occupation and Use of the Black Hills, 1700s–1800s

During the 1700s, American Indian groups who lived in the Black Hills (whether year-round or seasonally) likely included the Crow, Kiowa-Apache, Kiowa, Comanche, Suhtai, Arapaho, Padouca Apache, and Ponca.[27] The people who occupied or used the Black Hills felt the effects of European colonization before Europeans entered the region themselves, through disease, trade, dislocations, and introduction of the horse. European-introduced horses arrived in the region in the early 1700s through intertribal trade and the spread of feral herds. The horse and the new mobility and hunting lifeways it made possible led Arapaho and Cheyenne people to move into the Black Hills. They pushed out the Crow and Kiowa people, only to be dislodged themselves by the Lakota in the late 1700s (see Figure 4).[28]

Meanwhile, contagious European diseases devastated Mandan, Hidatsa, and Arikara farming communities along the Missouri River. The three tribes experienced epidemics of smallpox and other diseases during the winters of 1779–1780, 1780–1781, and 1801–1802, decimating their populations. The epidemics marked the end of their seasonal use of the Black Hills.[29]

While the Lakota people were never the sole occupants of the Black Hills, and the Black Hills were not the only place that Lakota people lived, the area had become the center of Lakota life by the mid-1800s. Most Lakota people wintered along the Missouri River, but they spent summer and autumn in the Black Hills and in the area around Wind Cave.[30]

Wind Cave is a sacred site for Lakota people, as their point of origin.[31] All geological features in the Black Hills have sacred significance for the Lakota, but no Lakota stories mention Jewel Cave

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[27] Evans-Hatch and Evans-Hatch, *Place of Passages*, 20, 22; Albers, *Home of the Bison*, 63.

[28] Warren A. Beck and Ynez D. Haase, *Historical Atlas of the American West* (Norman: University of Oklahoma Press, 1989), map 9; Evans-Hatch and Evans-Hatch, *Place of Passages*, 22.

[29] Evans-Hatch and Evans-Hatch, *Place of Passages*, 19.

[30] Evans-Hatch and Evans-Hatch, *Place of Passages*, 23; Albers, *Home of the Bison*, 57.

[31] Geoff Montes, "Sacred Native American Sites: Bear Butte and Wind Cave," June 16, 2015, National Trust for Historic Preservation website, https://savingplaces.org/stories/sacred-native-american-sites-bear-butte-and-wind-

specifically.[32] Although the Lakota were the primary occupants of the Black Hills by the mid-1800s, the Arapaho and Cheyenne also retain "strong cultural attachments" to the Black Hills.[33] (For a more detailed discussion of Lakota, Cheyenne, and Arapaho use and occupation of the Black Hills, see Albers, *The Home of the Bison*, 71–83.)



Figure 4. The Black Hills, pictured here from Black Elk Peak, are sacred to the Lakota people. Pictured here, August 2011.

Source: Flickr, Navin75.

It is not clear exactly when Europeans first arrived in the Black Hills. The earliest Europeans in the region were probably French fur trappers and traders in the mid-1700s.[34] Trappers reported reaching the Black Hills occasionally in the early 1800s, including a party led by Wilson Hunt in 1811, Jedediah Smith in 1823, and some unnamed (possibly) European visitor who carved a date in a stone in 1834. Europeans and European Americans began using the Platte River (in present-day

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cave#.XNshlY5KiUl; Linea Sundstrom, "The Sacred Black Hills: An Ethnohistorical Review," *Great Plains Quarterly* 17 (Summer/Fall 1997): 185–212, here 197–203.

[32] Albers, *Home of the Bison*, 444–52, 486–89, 530–77; Elaine Marie Nelson, "Dreams and Dust in the Black Hills: Race, Place, and National Identity in America's 'Land of Promise'" (PhD diss., University of New Mexico, 2011), 46, 52.

[33] Albers, *Home of the Bison*, 57.

[34] Evans-Hatch and Evans-Hatch, *Place of Passages*, 34; Jones, "Archeological Investigations at Jewel Cave National Monument," 21.

Nebraska and Wyoming) as a travel corridor for the fur trade in the 1820s. By the mid-1840s, with the expansion of the United States to the Pacific Coast, European Americans increasingly migrated west across the Great Plains, using the Platte River route. The migration at first had little effect on the Black Hills, since the Platte River was about 120 miles to the south.[35] The number of European Americans traveling through the Great Plains increased further in the late 1840s, following reports of gold in California. While most overland travelers never entered the Black Hills, they moved through territory claimed by the Lakota and other Great Plains tribes. European American migration affected bison populations, both through hunting and through consumption of forage by the migrants' livestock. The increasing number of migrants and the cascading ecological effects of their presence disrupted the economies of Great Plains tribes and exacerbated intertribal conflict.[36]

The US government sought to ease tensions among Plains tribes to permit safe passage for overland migrants. In 1851, the US government convened representatives of the Arapaho, Assiniboine, Arikara, Cheyenne, Crow, Gros Ventre, Sioux, Mandan, and Shoshone tribes to negotiate a treaty to end intertribal hostilities. The resulting Treaty of Fort Laramie delineated territories for each tribe, the government's solution for achieving peace. It placed the Black Hills within the territory belonging to the "Sioux or Dahcotah Nation."[37] The treaty allowed the United States "to establish roads, military and other posts" within the tribal territories. It also provided livestock and implements to encourage tribes to adopt European American style agriculture.[38]

During the 1850s and 1860s, conflicts between the Lakota and the United States led to casualties on both sides. Meanwhile, the United States began sending scientific explorers into the Black Hills, which resulted in discoveries of gold. Gold finds in Colorado (1858) and Montana (1862) brought more overland travelers through Lakota territory along the Bozeman Trail.[39] The problems of continuing encroachment on Lakota territory and increasing armed conflict led the United States and a number of Sioux bands to negotiate a new treaty. The 1868 Treaty of Fort Laramie established new boundaries around Sioux territory, setting it apart "for the absolute and undisturbed use and occupation of the Indians herein named, and for such other friendly tribes as they may be willing, with the consent of the United States, to admit amongst them . . . ." The United States pledged to keep unauthorized persons out of the area that became known as the "Great Sioux Reserve." The Black Hills remained within Sioux territory under the 1868 treaty.[40] While some Lakota bands signed the treaty, others refused to.[41]

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[35] Evans-Hatch and Evans-Hatch, *Place of Passages*, 36.

[36] Nelson, "Dreams and Dust in the Black Hills," 49.

[37] Nelson, "Dreams and Dust in the Black Hills," 50; Treaty of Fort Laramie, September 17, 1851, in Charles J. Kappler, ed., *Indian Affairs: Laws and Treaties*, vol. II (Washington, DC: Government Printing Office, 1904), 594.

[38] Treaty of Fort Laramie, September 17, 1851, in Kappler, *Indian Affairs: Laws and Treaties*, II, 595.

[39] Nelson, "Dreams and Dust in the Black Hills," 53–55; Evans-Hatch and Evans-Hatch, *Place of Passages*, 37–40, 43–45.

[40] Treaty of Fort Laramie, April 29, 1868, 15 Stat. 635; Nelson, "Dreams and Dust in the Black Hills," 2011, 55; Evans-Hatch and Evans-Hatch, *Place of Passages*, 46–47.

[41] Great Plains Tribal Chairman's Association, "Fort Laramie Treaty, 1851 and 1868," accessed May 18, 2019, http://www.nativepartnership.org/site/PageServer?pagename=airc_hist_laramietreaty.

Gold Rush and the 1877 Sioux Treaty

The 1868 treaty did not succeed in resolving tensions. The Lakota people suffered as bison herds shrank and the United States failed to supply food and other goods as specified in the 1868 treaty.[42] Matters grew worse when, in 1874, General George Custer led a US Army survey expedition into the Black Hills and reported finding gold. A massive gold rush followed.[43]

Initially, the US government enforced its treaty obligation to keep white settlers out of the Black Hills. In December 1874, the US Army escorted the Gordon prospecting party out of the French Creek area, since it was within Lakota territory. However, a few prospectors evaded the Army and stayed behind.[44] Custer City, first platted in July 1875 as the townsite of Stonewall, quickly became a booming settlement (see Figure 5). Prospective miners poured into the Black Hills, in violation of the 1868 treaty.[45]

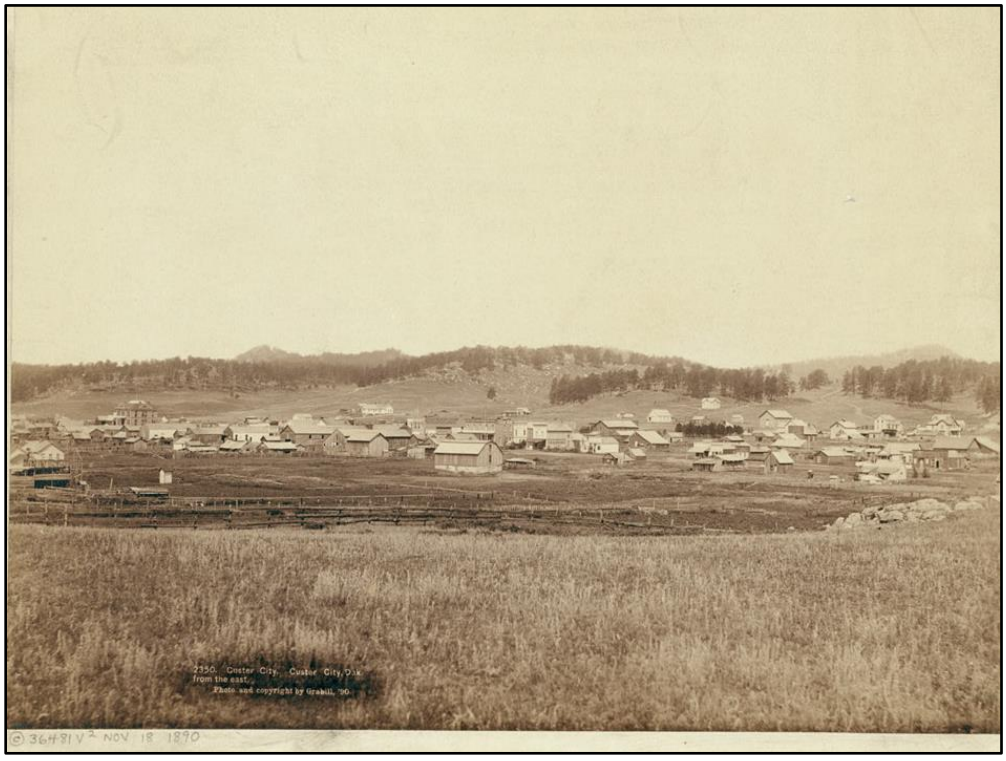


Figure 5. Custer, South Dakota, pictured here looking west, 1890.

Source: Library of Congress.

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[42] Nelson, "Dreams and Dust in the Black Hills," 59–60; Evans-Hatch and Evans-Hatch, *Place of Passages*, 47–50; Albers, *Home of the Bison,* 103.

[43] Walter P. Jenney, E. M., "Report of Geological Survey of the Black Hills," in *Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior* (1875), 181; Evans-Hatch and Evans-Hatch, *Place of Passages*, 51–52.

[44] Evans-Hatch and Evans-Hatch, *Place of Passages*, 51–57.

[45] Nelson, "Dreams and Dust in the Black Hills," 59; Evans-Hatch and Evans-Hatch, *Place of Passages*, 60, 64–66.

Recognizing that it could not stem the tide of trespassers, the US government launched efforts to acquire the Black Hills, initially seeking to purchase the area. The Sioux refused to sell. Ultimately the United States resorted to armed force and refused to provide rations until the Sioux gave up the Black Hills. In 1877, US negotiators succeeded in getting enough signatures to claim that that they had a valid treaty ceding the Black Hills to the United States. (A century later, the Supreme Court awarded Sioux tribes compensation for the wrongful taking of the Black Hills, but the Sioux want the land returned and have refused to accept the money.[46])

Now legally allowed to enter the Black Hills, more miners arrived, along with farmers and ranchers. The relatively dry landscape was better suited to cattle ranching than to farming. Ranches between Jewel Cave and Custer as of 1884 included the Y 4 Ranch, Kelly's Ranch, Smith Ranch, and Felix Michaud's ranch at Lightning Creek. In 1891, the railroad service arrived in Custer, which helped stabilize the economy somewhat, since products could now more easily be exported.[47]

Forest Reserve Act and Creation of Black Hills National Forest

Congress passed the Forest Reserve Act on March 3, 1891, to protect the nation's timber reserves and to stop the damage to watersheds caused by deforestation.[48] The measure was part of the Creative Act, which included various public lands provisions. By the time his term ended in spring 1891, President Benjamin Harrison had established 15 forest reserves (totaling 13 million acres) under the authority of the Forest Reserve Act.[49] The Black Hills were not part of this initial round of forest creation.

In the Black Hills, Theodore Reder built the Sylvan Lake Hotel six miles north of Custer. The hotel and lake became a popular tourist spot, with visitors arriving on the newly built railroad. Two years later, a drought precipitated an economic slump, known as the "Great Dakota Bust," along with a series of large forest fires that killed most of the trees in the northern Black Hills but left healthy ponderosa pine forests in the eastern, southwestern, and northwestern corners of the region.[50] In 1896, during a survey of western forested lands, the National Forest Commission (created by the Forest Reserve Act) visited Hot Springs, Custer, and the Sylvan Lake Hotel to assess the extant Black Hills timber stands.[51]

On February 11, 1897, utilizing the recommendations of the National Forest Commission, President Grover Cleveland established 13 new forest reserves in the west (called "Washington's

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[46] Evans-Hatch and Evans-Hatch, *Place of Passages*, 66–75; John F. Freeman, *Black Hills Forestry: A History* (Boulder: University Press of Colorado, 2014), 22–23.

[47] Evans-Hatch and Evans-Hatch, *Place of Passages*, 99–103, 109–10.

[48] Freeman, *Black Hills Forestry*, 27.

[49] An act to repeal timber-culture laws, and for other purposes, May 3, 1891, 26 Stat. 1095 (P.L. 51-561); Gerald W. Williams, "The USDA Forest Service—The First Century," US Forest Service (April 2005), 8.

[50] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 5; Evans-Hatch and Evans-Hatch, *Place of Passages*, 118.

[51] Gerald W. Williams and Char Miller, "At the Creation: the National Forest Commission of 1896–97," *Forest History Today* (Spring–Fall 2005): 33–37; Freeman, *Black Hills Forestry*, 29.

Birthday Reserves"), including the Black Hills in South Dakota. Settlers protested the government removing such a large area of the Black Hills from settlement. Under pressure from these settlers, President William McKinley signed the Sundry Act on June 4, 1897, which suspended the creation of the Washington's Birthday Reserves for nine months. Through the legislation, Congress acknowledged settlers' concerns without giving in to them. By the time the nine months had expired, opposition to the new reserves had died down. The Black Hills quietly became part of the forest reserve system (see Figure 6). The Sundry Act also included the "Pettigrew Amendment" (later called the Organic Act). The Pettigrew Amendment opened forests to development and granted the secretary of the Interior (who oversaw forest reserves at the time) powers to regulate and permit activities taking place in national forest reserves.[52]

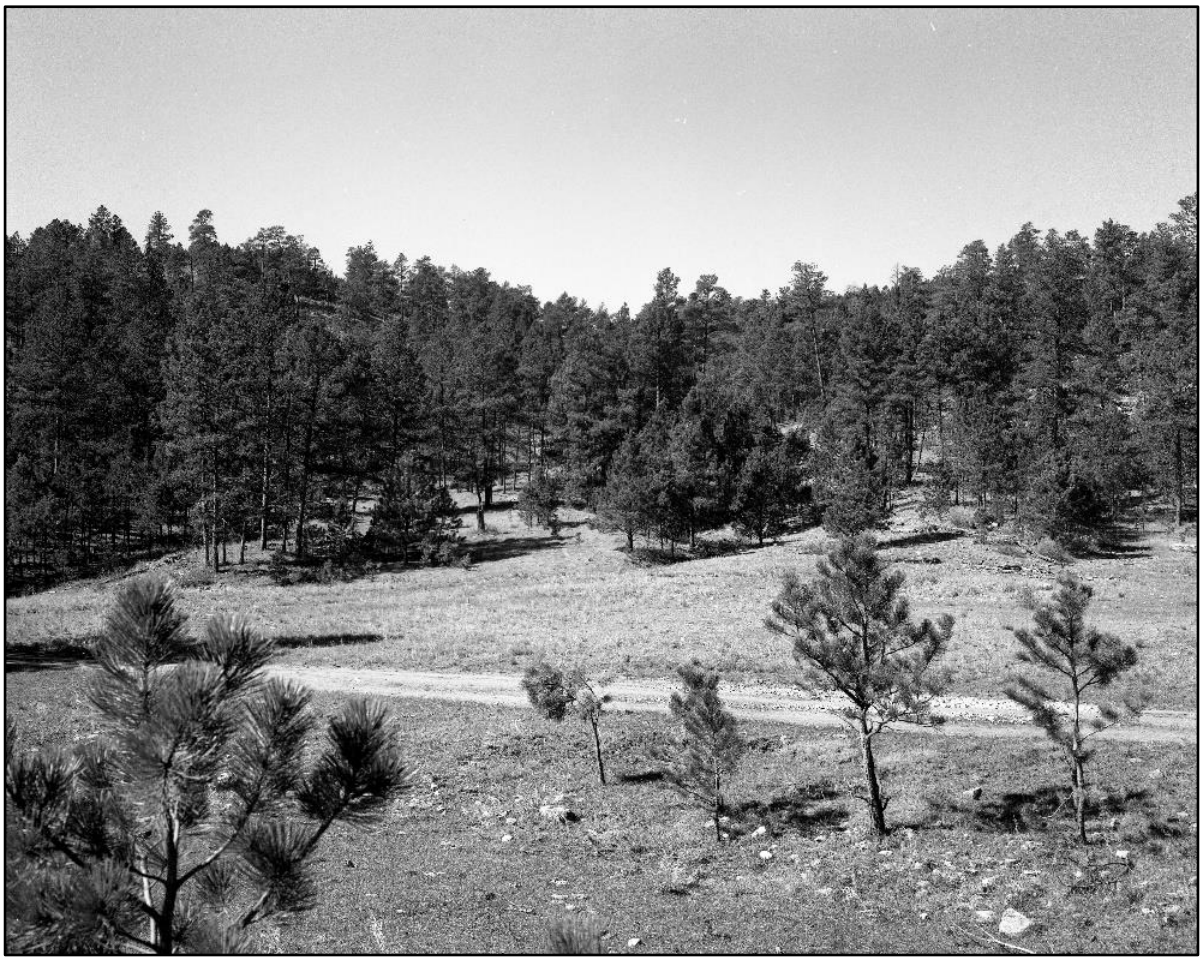


Figure 6. Ponderosa pine forests, which are typical in the Black Hills, at Jewel Cave NM, ca. 1965.

Source: NPS, Jewel Cave NM.

[52] Williams, "The USDA Forest Service—The First Century," 9–10; James G. Lewis, *The Forest Service and the Greatest Good: A Centennial History* (Durham, NC: Forest History Society, 2005), 19–21.

By July 1897, the Department of the Interior had sent survey parties to the Black Hills to map the topography and to assess mining and agricultural activities. Forester Henry Graves' resulting report on the Black Hills discussed the forest around Hell Canyon, but it did not mention any caves in the canyon.[53] Only a year later, two dozen sawmills were operating in and around Custer. Grazing and mining also boomed within the new Black Hills National Forest Reserve, and by 1901, the Black Hills National Forest Reserve supervisor had issued more grazing permits than any other national forest.[54]

European Americans Find Jewel Cave

Since there are several blowing holes in the southern Black Hills, it is possible that Indigenous people noticed the phenomenon, but no evidence exists to indicate whether they definitively did.[55] No one has ever found rock art or human remains in the cave—the blowing hole was too small for human entry prior to its enlargement in 1900. And while Wind Cave is central to Lakota creation stories, Jewel Cave specifically is not part of Lakota or other Indigenous traditions.[56] However, because Jewel Cave, like Wind Cave, is a breathing cave, and since Lakota people see all natural features as significant, Jewel Cave can still be considered important in Lakota culture.[57]

The earliest European American encounters with Jewel Cave may have occurred in the late nineteenth century. In the 1940s, Custer resident Joseph Riley told NPS Ranger Lyle K. Linch that he and five other boys (Clyde Holmes, Mark Holmes, Buck Raver, Martin Riley, and Ray Sideley) happened upon a blowing hole emanating wind in Hell Canyon

and assumed a cave might lay beyond it, as was the case at Wind Cave, which was already world-famous. However, it is not clear exactly where in Hell Canyon this blowing hole was.

The Michaud family is credited as the first to enter Jewel Cave. Felix Michaud was from Quebec, Canada, and had moved to the United States sometime before 1864. In 1875, Michaud's wife died, leaving him with five children. He took them to live with family in Colorado while he joined prospectors in the Black Hills. At one point, he owned a livery stable in Custer, and he was involved in ranching and prospecting for minerals. It appears that no one, including Michaud, could have entered the cave, because the opening was too small.[58]

The earliest historical record of discovery says that Albert and Frank Michaud (sons of Felix) and Charles Bush found the cave on September 18, 1900 (see Figure 7). Bush was a Michaud family friend from the Cache la Poudre River Valley, a French settlement in Colorado.[59] John Sanford

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[53] Henry S. Graves, *Black Hills Forest Reserve* (Washington, DC: US Government Printing Office, 1899), 76–78, 106–8.

[54] Evans-Hatch and Evans-Hatch, *Place of Passages*, 96, 121–122.

[55] Evans-Hatch and Evans-Hatch, *Place of Passages*, 124.

[56] Cheyenne River Sioux Tribe, "Lakota Creation Story," accessed May 15, 2019, http://sioux.org/lakota-creation-story.html; NPS, "The Lakota Emergence Story," accessed May 15, 2019, https://www.nps.gov/wica/learn/historyculture/the-lakota-emergence-story.htm.

[57] Albers, *Home of the Bison*, 444.

[58] Evans-Hatch and Evans-Hatch, *Place of Passages*, 127–28, 133.

[59] Evans-Hatch and Evans-Hatch, *Place of Passages*, 129.

attributed the cave's discovery to the Michaud brothers in his 1902 tourism promotional book, *The Black Hills Souvenir*. In this first published narrative account of the cave, Sanford wrote,

> It was discovered in 1900 by the Michaud brothers, who were prospecting in Hell's can[y]on, one of the rockiest, most precipitous can[y]ons and one of the most beautiful, notwithstanding its infernal name, in the Hills. They were letting themselves carefully down a chimney in the rocks and remarking the favorable character of the place for a cave, when one of them noticed a hole a couple of inches in diameter and called his brother's attention to it, saying: "There is the entrance to a cave." The brother began pulling away the earth with his hand when the strong current of air blew a cloud of dust in his face. They knew so strong a current could come only from an immense cavern, and that they had indeed discovered a cave of great extent.
>
> Subsequent exploration opened thirteen miles of passageways and 270 chambers, some of them among the grandest to be seen in any cave. A commodious log hotel of two stories has been built, providing hospitable shelter for the visitor, who will ever cherish the memory of a visit to the romantic place.[60]

Sanford exaggerated the size and extent of the known cave, as was common in stories about caves at the time. Sanford included photos of the cave features—frostwork and the Milk River—in the publication.[61] In a 1907 report, Forest Service Assistant H. C. Neel and Surveyor C. W. Fitzgerald wrote that the Michaud brothers first found the cave when their "attention was attracted by the noise of wind coming from a small hole in the lime-stone cliffs on the east side of Hell Can[y]on."[62]

The Michauds and Bush were the first to file paperwork establishing any claim to the cave. On October 31, 1900, Frank Michaud, Albert Michaud, and Bush filed a "Placer and Water Rights Location Certificate" with the Register of Deeds of Custer County (this filing is referred to in other NPS documents as the Jewel Tunnel Lode mining claim). This was a preliminary step in the process of establishing a mining claim.[63] On the location certificate, they listed the date of discovery as September 18, 1900.[64]

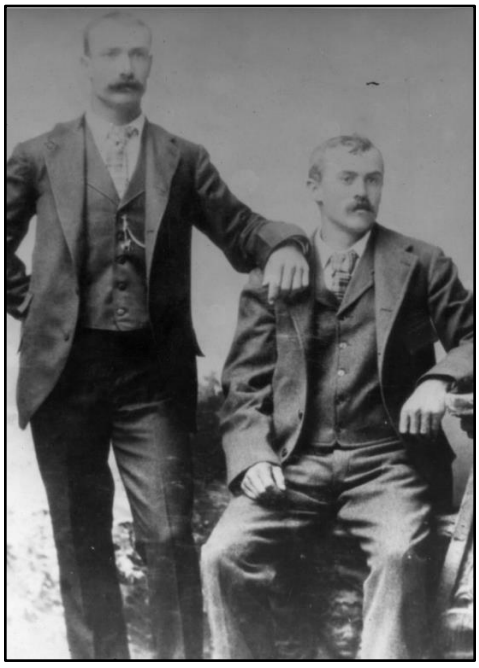


Figure 7. Frank and Albert Michaud, ca. 1906. Source: NPS, Jewel Cave NM.

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[60] John I. Sanford, *The Black Hills Souvenir: A Pictorial and Historic Description of the Black Hills* (Denver: The Williamson-Haffner Engraving Co., 1902), 218.

[61] Sanford, *Black Hills Souvenir*, 221–22.

[62] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 1.

[63] Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*, March 2005, 28; Custer County, Placer and Record Book Y, 552.

[64] Ira Michaud to Alex Mitich, December 20, 1970, 3, File 1686, Jewel Cave National Monument Museum Files, Custer, SD (hereafter Jewel Cave NM MF).

A mining claim was different from a fee-simple title to land.[65] First, the claimant "discovered" the site, which could be as simple as seeing something on the surface that someone with a geology background would consider worth investing in to search for valuable minerals. Filing a location certificate meant the claimant could then identify the boundaries of the claim and leave public notice that the mining claim was theirs. If the claim thereafter produced minerals in paying quantities, the claimant could then file a patent, which, if approved, meant that the claimant owned the land in fee-simple title. Before receiving a patent, the filer had to spend at least $100 per year in order to maintain the mining claim (in labor and/or materials).[66] In the Michauds' case, it made no difference that the claim was in the Black Hills National Forest Reserve; they still filed the location certificate with the county, and if they applied for a patent, they would apply to the General Land Office (GLO).

Drawing Tourists to Jewel Cave

Caves had been desirable tourist destinations since at least the 1700s. In 1784, British travel writers promoted tours of "caves and other natural curiosities," for "[w]hile some are pleased with the gay and beautiful, others are only to be roused and affected by the grand and terrible."[67] In the United States, George Washington was rumored to have scrawled his name on the walls of caves in Virginia and, while the stories have been disputed, the signatures attracted tourists to those caves for centuries.[68]

Mammoth Cave in Kentucky, the longest known cave system in the world, opened to tourists in the 1810s.[69] Visitors arrived at Mammoth Cave by stagecoach until the railroad came in the 1850s.[70] Literature describing tours through Mammoth Cave extolled its beauty, the purity of its air, and its quietness.[71] Visitation peaked at Mammoth Cave in the 1860s, when the railroad brought in tourists daily (see Figure 8).[72] Railroad companies promoted caves as a way to get passengers on their trains.

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[65] "Fee-simple" title is owning property outright, with the power to possess, use, and dispose of the property as desired. It is the most common and most absolute form of land ownership in western society.

[66] Approximately $3,000 in 2020 dollars.

[67] "Extract from A Tour to the Caves in the West-Riding of Yorkshire, in a letter to a Friend," in Thomas D. West, *A guide to the lakes in Cumberland, Westmorland and Lancashire* (London: B. Shaw, Richardson, and Urquhart, 1784), 235.

[68] William R. Halliday, *Depths of the Earth: Caves and Cavers of the United States* (New York and London: Harper & Row, Publishers, 1966), 4–5.

[69] NPS, "The Great Shake-Up," in *A Brief History of Mammoth Cave,* updated May 23, 2018, https://www.nps.gov/maca/learn/historyculture/history5.htm.

[70] NPS, "Getting There is Half the Fun," in *A Brief History of Mammoth Cave,* updated May 23, 2018, https://www.nps.gov/maca/learn/historyculture/gettingthereishalfthefun.htm; NPS, "Oh, Innkeeper!" in *A Brief History of Mammoth Cave,* updated May 23, 2018, https://www.nps.gov/maca/learn/historyculture/ohinkeeper.htm.

[71] Rev. R. Davidson, *The Mammoth Cave and the Barrens of Kentucky, with Some Notices of the Early Settlement of the State* (Lexington: A. T. Skillman & Son, 1840), 69–72; John Croghan, *Rambles in the Mammoth Cave: During the Year 1844, by a Visiter* (Louisville, KY: Morton & Griswold, 1845), ii–ix; A. D. Binkerd, *The Mammoth Cave and its denizens; a complete descriptive guide* (Cincinnati: R. Clarke & Co., 1869).

[72] NPS, "The National Park Idea," in A Brief History of Mammoth Cave, updated May 23, 2018, https://www.nps.gov/maca/learn/historyculture/thenationalparkidea.htm

The Virginia Midland Railway, Cumberland Valley Railroad Company, Norfolk and Western Railway, and the Shenandoah Valley Railroad Company all published, or supported the publication of, guidebooks to the sights along the rail lines, which included Luray Caverns in Virginia, Mammoth Cave, and smaller caves along the routes. And in the Black Hills, railroads brought visitors to Crystal Cave (now called Bethlehem Cave) and in close proximity to Wind Cave before the turn of the century.[73]

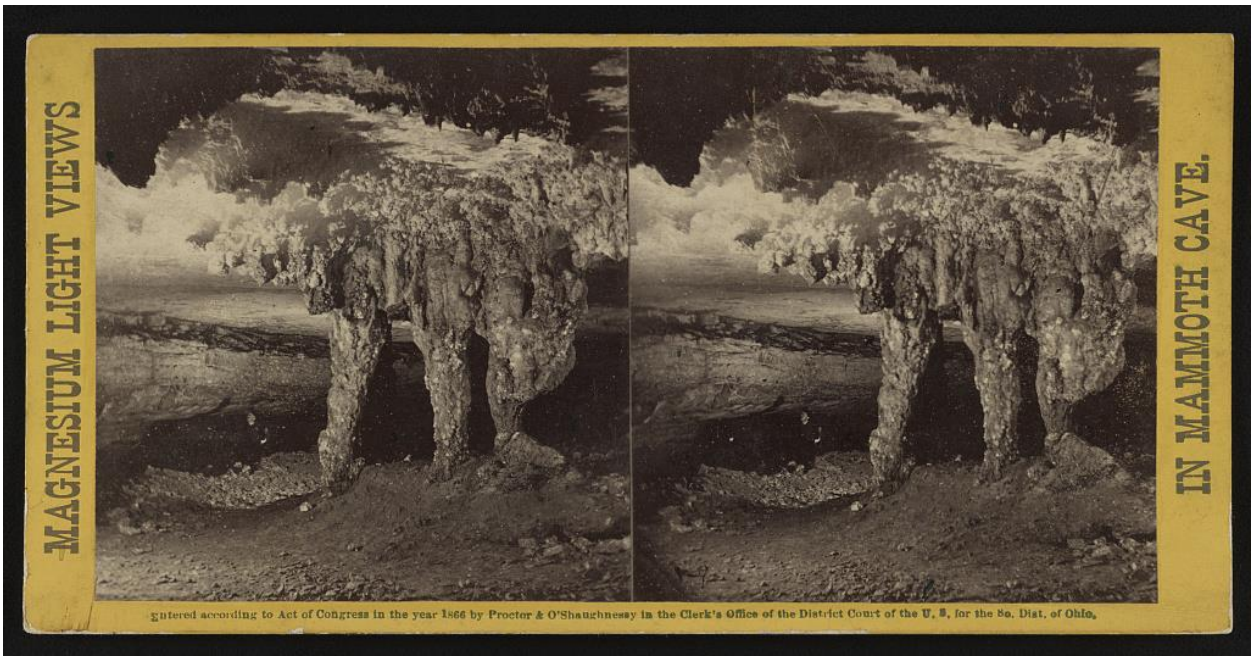


Figure 8. A stereograph image of Mammoth Cave, 1866.

Source: Library of Congress.

Travel literature from the late 1800s described caving as a more exciting form of mountain climbing:

> . . . it may be worth while for the lover of adventure to try these unexplored depths. The present writer who has tried both lines of exploration, is inclined to consider the cavern-work as, perhaps, the more fascinating of the two. Certainly, the explorer more quickly finds his way into the realm of the unknown than in mountain-climbing, and is less often met by the discouraging evidence that, after all, the ground is not untrodden.[74]

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[73] The Virginia Midland Railway, *Excursion Guide of the Virginia Midland Railway, the Short-Line Through-Car Route Between the North and South, The Virginia Springs, Western North Carolina and North Georgia Summer Resorts* (New York: The Aldine Press, 1882), 8–11; The Cumberland Valley Railroad Company, *Rural resorts and summer retreats along the line of the Cumberland Valley Railroad, Including Picnic Parks and Pleasure Places* (Philadelphia: Allen, Lane & Scott, 1881), 39–46; Norfolk and Western Railway, "Luray Caverns," 1898; Ernest Ingersoll, *Through the Shenandoah Valley: The chronicle of a journey through the uplands of Virginia* (New York: Liberty Printing Company, 1886).

[74] N. S. Shaler, "Caverns and Cavern Life," *Scribner's Magazine* II (July–December): 452–53.

Newspapers and magazines reported cave discoveries, highlighting their massive features and "unknown depths."[75] Much of the mystique of caves had to do with recently developed theories on humans' origins and evolution. For instance, one reporter wrote,

> It is curious but true that a hole in the ground has a powerful fascination for man. This may be due to the fact that we are seventeenth cousin to the rat and the ground hog, according to Darwin's Peerage; or, perhaps, because our ancestors 200,000 years ago were all cave dwellers, and we still have a remnant of their instinct prompting us to dive into the first pit that yawns in our pathway.[76]

European Americans' stories about caves often involved human exploits, mysterious happenings, or Indigenous uses of the cave in the distant past.[77] In 1896, Horace Carter Hovey wrote one of the first comprehensive books on caves in the United States, *Celebrated American Caverns*. He profiled caves in Virginia's Shenandoah Valley and in southern Indiana; Luray Cavern; Howe's Cavern in Schoharie County, New York; and Mammoth Cave, to which he devoted several chapters.[78] In 1900, Hovey's father published an article on Wind Cave in *Scientific American*.[79] These books and articles encouraged Americans to visit caves in the late 1800s. Back at Jewel Cave, the Michauds and Bush wanted to capitalize on this widespread enthusiasm for seeing and experiencing caves.

Modifying and Promoting Jewel Cave

After filing the discovery paperwork for the Jewel Tunnel Lode, the Michaud brothers and Bush began making improvements to the cave. One of their first tasks was building a road to the cave entrance.[80] By summer 1901, they had completed a one-and-a-half-mile entry road that connected Jewel Cave to the 37-mile automobile road between Custer and Newcastle, Wyoming, which had been built in the 1890s and went down Lithograph Canyon and then wound up the west side of Hell Canyon.[81]

The Michaud brothers and Bush enlarged the existing entrance to the cave using chisels and black powder. The original entrance was a vertical tube that people had to be let down into. Later, they blasted a horizontal passageway wide enough to walk through (the current historic entrance) (see Figure 9). They lined the tunnel with pine timbers for 75 feet, starting at the new cave entrance.[82] Farther inside, the Michauds and Bush added ladders, steps, and timber poles to facilitate

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[75] "Discovery of a Wonderful Cave," *New York Times*, August 10, 1883, 2.

[76] "Cave Hunting in Catskill," *New York Times*, June 28, 1885, 10.

[77] J. W. Buel, *America's Wonderlands: A Pictorial and Descriptive History of our Country's Scenic Marvels* (New York: John Williams, 1893), 91–92, 136–44, 300–302

[78] Horace C. Hovey, *Celebrated American caverns, especially Mammoth, Wyandot, and Luray. Together with historical, scientific, and descriptive notices of caves and grottoes in other lands* (Cincinnati: The Robert Clarke Company, 1896), ix–xi; 53–122.

[79] Edmund Otis Hovey, "The Wind Cave of South Dakota," *Scientific American* 49 (June 16, 1900): 20458–59; Luella Agnes Owen, *Cave Regions of the Ozarks and Black Hills* (Cincinnati: Editor Publishing Co., 1898), 103–61.

[80] Walt Lienau, notes on interview with Mamie Michaud, August 4, 1959, File 1692f, Jewel Cave NM MF.

[81] Evans-Hatch and Evans-Hatch, *Place of Passages*, 143–44; Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area*, 29–30.

[82] F. C. Schrader, USGS, "Report on the Jewel and Four Other Lode Claims," April 15, 1909, 8, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF; H. M. Booth, for USDA,

moving through the cave. Within a few years, they had widened passageways and developed tour routes extending one-and-a-half miles into the cave.[83] They made these modifications with a goal of attracting tourists. They charged an entry fee for guided tours and built a two-story log house outside of the cave to lodge visitors.[84] In the first years of guided tours, the Michauds and Bush allowed visitors to remove specimens as souvenirs.[85]

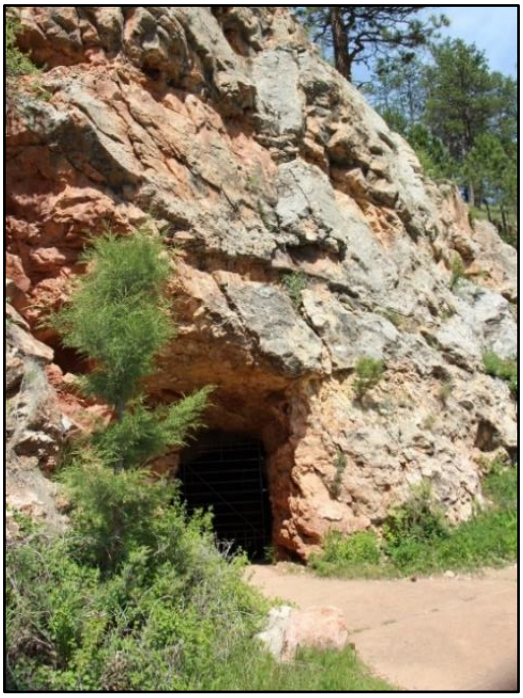


Figure 9. The Michauds blasted through the cliffs on the eastern side of Hell Canyon an entryway to Jewel Cave—first as a vertical tube, and later as this horizontal tunnel. Pictured here as it looked in 2019.

Source: Jackie Gonzales.

The Michauds and Bush promoted the cave and sought attention from the press in efforts to attract visitors. In 1901, they shipped several hundred pounds of cave specimens to the "Mineral Palace" in Deadwood, South Dakota, for exhibition.[86] In autumn 1902, they started the Jewel Cave Dance Club, held in the two-story log cabin hotel (see Figure 10).[87] The *Custer Chronicle* reported often on happenings at the cave, and in 1902, John Sanford of Hot Springs visited the cave with a photographer to prepare his book for Black Hills tourists, the *Black Hills Souvenir*. The *Black Hills*

USFS, Rapid City Land District, Black Hills National Forest, Custer (Unorganized) Mining District, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," June 1911, 4, in *Government Geologic Investigations and Reports on Jewel Cave (1909–late 1920s)*, Interpretation Division Binder, Jewel Cave NM Visitor Center; Ira Michaud, "Jewel Cave: What I Have Heard and Seen," December 1970, 2, File 1687, Jewel Cave NM MF; Wiles, comments on draft, April 7, 2020.

[83] Schrader, "Report on the Jewel and Four Other Lode Claims," 8–9; Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 1–2; Evans-Hatch and Evans-Hatch, *Place of Passages*, 133–35.

[84] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 3; Lienau, notes on interview with Mamie Michaud; Schrader, "Report on the Jewel and Four Other Lode Claims," 9.

[85] Lienau, notes on interview with Mamie Michaud.

[86] "Exhibit of Minerals," *Weekly Pioneer-Times (Deadwood, SD)*, July 11, 1901, 7, accessed via newspapers.com; Evans-Hatch and Evans-Hatch, *Place of Passages*, 147.

[87] Evans-Hatch and Evans-Hatch, *Place of Passages*, 148–49.

Weekly Journal reported that Sanford and the photographers were "loud in their praise of the beautiful and interesting features of the cave, and not to be seen in the other caves in the hills."[88]

Despite the publicity, the Michauds and Bush never attracted as many tourists as Wind Cave managed to draw. The brothers thought that Custer area promoters undersold Jewel Cave. Some locals, as Frank's son Ira later remembered, called it a "rat hole in the ground" and did little to help promote it.[89] After the Michauds and Bush spent three years developing the cave almost full time, Bush moved on and left Frank and Albert at the cave. From around that point on, the two brothers worked only part of the year at the cave.[90]



Figure 10. The Michauds built this two-story log cabin and hotel near the cave entrance. Pictured here ca. 1917.

Source: NPS, Jewel Cave NM.

Wind Cave's Road to Becoming a National Park

The Michauds took inspiration for their promotion of Jewel Cave from Wind Cave. European Americans happened upon Wind Cave in the early 1880s, when some hunters noticed wind coming out of the ground that, according to local legends, blew their hats off.[91] In 1886, 1889, and 1890, different individuals filed location certificates at Wind Cave. The last of those was purchased from the original owner by the South Dakota Mining Company, which then hired Jesse McDonald to manage the claim.[92]

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[88] "Peculiar to the Jewel Cave," *Black Hills Weekly Journal (Rapid City, SD)*, March 21, 1902, 1 (quoting the *Tribune-Pilot)*, accessed via newspapers.com.

[89] Evans-Hatch and Evans-Hatch, *Place of Passages*, 150–51.

[90] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 1; Lienau, notes on interview with Mamie Michaud; Evans-Hatch and Evans-Hatch, *Place of Passages*, 129.

[91] Kathy S. Mason, "Adapting to Endure: The Early History of Wind Cave National Park, 1903–1916," *South Dakota History* 32, no. 2 (Summer 2002): 151; John W. Bohi, "75 Years at Wind Cave: A History of the National Park," 1962, 3.

[92] Bohi, "75 Years at Wind Cave," 6; Mason, "Adapting to Endure," 151.

After realizing that Wind Cave had little in the way of valuable minerals, the South Dakota Mining Company fired McDonald, but he stayed on the land and developed it for tourism.[93] McDonald benefited from a new railroad line to Hot Springs, which made traveling to the cave easy for tourists. To promote the cave, McDonald and John Stabler (who soon built a hotel next to the cave) formed the Wonderful Wind Cave Improvement Company and sent rocks from Wind Cave to Custer, Hot Springs, and the World's Fair in Chicago for display.[94]

Wind Cave attained an elevated status thanks to publicity efforts, strong community allies, and laudatory scientific reports about the cave's size and importance. Several local entrepreneurs incorporated a second improvement company in 1898—the Black Hills Wind Cave Company—to manage and promote the cave. They had raised $500,000 in capital stock by January 4, 1899.[95] They partnered with civic groups in the region that held events in the cave and named rooms after these organizations, including the Grand Army of the Republic, Masons, Eastern Star, Odd Fellows, YMCA, Daughters of the American Revolution (DAR), Knights of Pythias, Epworth League, Elks, Women's Christian Temperance Union, Modern Woodmen of America, Ancient Order of United Workmen, South Dakota Federation of Women's Clubs, and the South Dakota Teachers' Association (see Figure 11).[96]



Figure 11. W. R. Cross photograph from inside of Wind Cave, with the caption, "In Wind Cave, S.D. 350 feet below the surface at Odd Fellows' Hall. . . ." William Jennings Bryan and Governor Andrew E. Lee are in the center front of the group, ca. 1897.

Source: NPS, Jewel Cave NM.

[93] Bohi, "75 Years at Wind Cave," 7–8, 10–13.

[94] Mason, "Adapting to Endure," 152; Evans-Hatch and Evans-Hatch, *Place of Passages*, 101; John Milner Associates, Inc., and Rivanna Archaeological Consulting, "Wind Cave National Park Cultural Landscape Report," May 2005, 2–35.

[95] This would be equivalent to approximately $15 million in 2020 dollars.

[96] Bohi, "75 Years at Wind Cave," 38, 46–47.

In 1898, professors from the South Dakota School of Mines visited Wind Cave and prepared a scientific report that called it one of the country's "most extensive" caves and extolled its formations.[97] The following year, GLO Agent C. W. Greene reported to the Department of Interior (DOI) that Wind Cave was large and important enough to be a national park. The GLO granted the DOI permission to temporarily withdraw land at Wind Cave from settlement as it awaited the possibility that Congress would establish it as a national park.[98]

Political momentum built when US Representative Eben W. Martin (R-SD-B)[99] of Deadwood suggested that Secretary of the Interior Ethan A. Hitchcock add Wind Cave to the Black Hills National Forest, which GLO Commissioner Binger Hermann also recommended. Secretary Hitchcock took a different approach, however, and directed Interior staff to draft legislation to establish Wind Cave National Park.

A 1902 GLO report called Wind Cave an "extinct geyser," as some geologists considered it at the time.[100] US Representative John F. Lacey (R-IA) said on the floor of Congress that Wind Cave

> is substantially what the Yellowstone country would be if the geysers should die. It has been excavated by hot water in the same manner that the geyser land is now being excavated in the Yellowstone. The active forces are no longer in operation there; there is no hot water, and the conditions that formerly prevailed there have ceased; but a series of very wonderful caves remain, and the Land Department has withdrawn this tract from settlement.[101]

Promoters used this geyser theory to associate Wind Cave with the already famous Yellowstone National Park. They also speculated that Wind Cave rivaled the legendary Mammoth Cave in size.[102] Congress passed legislation authorizing Wind Cave National Park in 1902, and President Theodore Roosevelt signed it into law on January 9, 1903. McDonald and Stabler, who had developed the cave as a tourist attraction, received no compensation from the government for their improvements.

Wind Cave attained federal protection because it had several advantages that Jewel Cave did not. Local entrepreneurs and boosters were heavily invested in Wind Cave—financially and otherwise—before the turn of the century. The cave was on a railroad line, which made it easy for tourists to access. A handful of politicians championed the issue in Congress and were willing to fight for the cave's protection—something Jewel Cave would find later, but not in its first ten years. And the

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[97] Bohi, "75 Years at Wind Cave," 39.

[98] Bohi, "75 Years at Wind Cave," 40–41, 52. The GLO often removed lands with unique natural or cultural features from the public domain through "temporary withdrawals," which could be justified if the area had value for anything other than agriculture. After the passage of the Antiquities Act, the GLO worked with President Theodore Roosevelt to convert many of the temporary withdrawals to national monuments. Hal Rothman, *America's National Monuments: The Politics of Preservation* (Lawrence: University Press of Kansas, 1994), 54–55.

[99] At this time, South Dakota had two at-large congressional representatives who occupied "Seat A" and "Seat B."

[100] Bohi, "75 Years at Wind Cave," 53–55; Owen, *Cave Regions of the Ozarks and Black Hills*, 141–59.

[101] 36 Cong. Rec. 1902 (December 6, 1902).

[102] Mason, "Adapting to Endure," 156.

supporters of Wind Cave used networks of promoters and local partners to spread (sometimes exaggerated) information about the cave, which attracted more tourists.[103]

Only a few months after the establishment of Wind Cave National Park, the Custer *Chronicle* suggested that the government should buy Jewel Cave and reimburse the Michauds for their work. Another article speculated that Jewel Cave could become a national park just like Wind Cave had.[104] In mid-April, the *Capital*, a newspaper out of Mitchell, South Dakota, reported on the possibility of Jewel Cave gaining federal protection, evidence that news of Jewel Cave had begun to travel:

> The government may set apart the land on which is situated the Jewel cave, sixteen miles west of Custer, as a national reserve. Recent explorations have proven that the cave is one of the most remarkable underground vaults in the world, containing miles of passages and chambers, lined with glittering crystals.[105]

The Michauds used Wind Cave's success to continue promoting Jewel Cave's potential size and geologic features. They donated rocks from the cave to Rufus J. Pilcher, whose father, Joseph R. Pilcher, owned a drug store in Custer. Pilcher displayed the specimens at the 1904 Louisiana Purchase Exposition in St. Louis, Missouri, which helped create some buzz about Jewel Cave.[106] In 1905, a newspaper in Deadwood talked up Jewel Cave's "handsome" specimens, and tourist pamphlets had started including Jewel Cave alongside Sylvan Lake and Wind Cave in a list of attractions in the southern Black Hills.[107]

A Second Round of Mining Claims

The Michauds may have tried to obtain a patent on their mining claim around 1904, but there are no records of this apart from Ira Michaud's recollection years later. In 1970, Ira wrote,

> As a considerable distance of the main passages in the cave had by this time been explored and plotted both inside and on the surface, and sufficient claims validated to cover same, the partners decided it was time to apply for a patent for the claims. The necessary work and expenditures had been made and the partners claimed this natural wonder by rights of discovery and location. This was when things started going badly. The Government patent office located at Washington D.C. held up patent proceedings regarding the cave, saying they needed more legal advice before they could complete the patent for the claims.

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[103] 36 Cong. Rec. 1902 (December 6, 1902); Act of January 9, 1903, 32 Stat. 765 (Ch. 63); Bohi, "75 Years at Wind Cave," 55–59.

[104] *Custer Chronicle,* April 4, 1903; Evans-Hatch and Evans-Hatch, *Place of Passages*, 165–66

[105] The "miles of passages" that the paper described was an exaggeration, typical of cave descriptions at the time. "Wonderful Jewel Cave: Government May Set it Aside as a National Reserve," *Mitchell Capital (Mitchell, SD)*, April 17, 1903, 1, accessed via newspapers.com; Wiles, comments on draft, April 7, 2020.

[106] Rufus J. Pilcher, "Jewel Cave," March 12, 1969, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

[107] "Summer Resorts: Black Hills Hotels Getting Ready for Business," *Argus-Leader (Sioux Falls, SD)*, March 12, 1905, 3, accessed via newspapers.com; "Splendors of the New Cave," *Daily Deadwood Pioneer-Times (Deadwood, SD)*, January 29, 1905, 1, accessed via newspapers.com.

> This wrangling between the claim owners and the federal government went on and on, and by the fall of 1904 it was quite evident that a legal patent would not be very probable.[108]

As part of the patent application process, the holder of a mining claim was required to post notice of application for patent in a local newspaper for at least 60 days. We have not found any notice for the Michauds' claim. Whether or not they filed a patent application—and the Forest Service believed that they never did (see Chapter 2)—no patent was ever granted to them. The Michauds did not own the land, and they remained in possession only of a mining claim covering the entrance to Jewel Cave.[109]

Without a patent, the Michauds shifted their strategy. On November 10, 1905, they sold part of their interest in the Jewel Tunnel Lode claim to Bertha Cain of St. Louis, Missouri. Cain never did any work on the claim; she simply invested, and the Michauds continued to do the required upkeep work.[110] On November 15, the three of them filed a new location certificate for the Jewel Lode claim. They may have taken that step in order to secure their control over the cave in response to another claim in the area (filed by Henry Pilger on October 2, 1905).[111] The new Jewel Lode claim encompassed 20 acres of unsurveyed territory in Hell Canyon.[112]

Over the next two months, Cain and the Michauds filed claims for four additional lodes in or near Hell Canyon: Golden Rod, Cleveland, Gem, and Denver. The Golden Rod Lode claim was adjacent to the Jewel Lode claim, and the others were on the other side of Hell Canyon. They listed gold, silver, manganese, and iron as prospective metals for all five claims. None of these minerals produced in paying quantities in the years following the filings.[113]

After filing the new claims, the Michauds slowed down. Albert moved to British Columbia, and Frank married Mamie Riley and started a family. Frank and Mamie lived at least part of the year in a house near Prairie Dog Spring in Hell Canyon.[114] By 1906 or so, in addition to the house, they had built a log barn, a spring house, a chicken coop, and several sheds near the cave.[115] They continued to try to attract tourists to the cave, but they had only minimal success.

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[108] Ira Michaud, "Jewel Cave: What I Have Heard and Seen," December 1970, 4, File 1687, Jewel Cave NM MF.

[109] Michaud, "Jewel Cave."

[110] Bertha Cain to Overton W. Price, July 16, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[111] Indenture recorded by the Clerk of the Circuit Court of Custer County, South Dakota, November 10, 1905; Evans-Hatch and Evans-Hatch, *Place of Passages*, 153; Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area*, 31–32.

[112] W. F. Hill, Report on Mining Claim, Jewel Lode, February 19, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF.

[113] W. F. Hill, Report on Mining Claim, Jewel, Golden Rod, Gem, Denver, and Cleveland Lodes, February 19, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF.

[114] Lienau, notes on interview with Mamie Michaud.

[115] Schrader, "Report on the Jewel and Four Other Lode Claims," 8.

Conclusion

Although we now know of Jewel Cave and have at least some grasp of its extent (more than 200 miles have been mapped at the time of this writing), it remained obscure until the late 1800s. Early inhabitants of the region visited the Black Hills seasonally for many thousands of years, but there is no archeological evidence or oral tradition to indicate that they were aware of the cave. The Lakota people, for whom the Black Hills are sacred, have cultural associations with nearby Wind Cave, but there are no specific relationships documented between the Lakota and Jewel Cave.

Treaties in 1851 and 1868 acknowledged Lakota ownership of the Black Hills. But after European American discovery of gold in the Black Hills, the United States allowed miners and settlers in and forced the Lakota out. The area around and including Jewel Cave subsequently became part of a national forest. The newcomers to the region, perhaps because of their focus on belowground minerals, became aware of caves in the Hell Canyon area in the late 1800s, although there is no clear evidence of whether they encountered Jewel Cave specifically. In 1900, the Michaud brothers and Charles Bush found Jewel Cave while prospecting, and they filed a mining claim. They did not obtain minerals in significant paying quantities from their claim but instead developed the cave for tourism.

Tourists came to Jewel Cave, but nearby Wind Cave drew much more attention and was more accessible to visitors. Partly due to the success of local boosters in promoting protection for Wind Cave, Congress established Wind Cave National Park in 1903. For the first few years of the 1900s, Jewel Cave remained in Wind Cave's shadow.

Chapter 2: Establishment and Forest Service Management of Jewel Cave National Monument

By 1906, Custer residents had finally started to notice Jewel Cave. The local paper reported on the wonders of the cave. Bertha Cain, who owned a share in the Michaud mining claims surrounding Jewel Cave, later recalled the great public support for Jewel Cave in the first decade of the 1900s:

> The citizens of Custer and vicinity came in great numbers to see the cave. They were excited and enthusiastic over it and begged us to allow them to make an effort to have the Government reserve the cave as a National Monument and improve it along the lines of the Wind Cave near Hot Springs, S.D.[1]

This enthusiasm helped gain federal protection for Jewel Cave in 1908, when President Theodore Roosevelt used the power of the 1906 Antiquities Act to designate the cave as a national monument. In the years that followed, the US Forest Service had authority over the monument but did little to manage it, due to confusion surrounding the mining claims of Cain and the Michaud brothers. Until the late 1920s, Jewel Cave remained mostly closed to the public.

Establishment of the National Monument

In 1906, Custer area residents, with support of local attorney and US Representative William H. Parker (R-SD) and attorney C. E. Smith, circulated a petition to establish a Jewel Cave Game Preserve.[2] Game preserves had become popular with some eastern conservationists as a way to protect wild game for wealthy sportsmen. Black Hills area promoters hoped a preserve would protect surface fauna, whose numbers were declining with increasing settlement in the area, and draw in sport hunters and their wallets. The idea had little to do with protecting the cave.[3] Still, Frank and Albert Michaud, the brothers who possessed a mining claim covering the entrance to Jewel Cave, favored the idea of a game preserve. They were frustrated with the paltry numbers of tourists at Jewel Cave—especially compared to Wind Cave National Park—and their correspondingly low revenues.[4]

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[1] Bertha Cain to the President of the United States, May 29, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF).

[2] Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study* (Omaha: NPS Midwest Regional Office, 2006), 167.

[3] Evans-Hatch and Evans-Hatch, *Place of Passages*, 123, 160–61.

[4] H. C. Neel and C. W. Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," September 1907, 3, in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave NM CF.

In mid-1907, Parker sent the petition to the Black Hills National Forest supervisor.[5] The proposal worked its way up through higher levels in the US Forest Service, and eventually Chief Forester Gifford Pinchot ordered a study of it. After some discussion about who would conduct the study, Forest Service Surveyor C. W. Fitzgerald and Forest Assistant Harry Campbell Neel were assigned to the task.[6]

Neel and Fitzgerald completed their "Report on the Proposed Jewel Cave Game Preserve" in September 1907. The proposed preserve would include 38,400 acres of forest land (16,400 acres of merchantable timber), several permanent springs that grazing stock relied on, a few potential homestead sites (depending on the availability of water), and, beneath it all, the cave.[7] Neel and Fitzgerald, like Wind Cave promoters before them, cited geologists who described the caves of the Black Hills as "extinct geyser channel[s]."[8] They also noted that there were other cave openings in the vicinity of Jewel Cave, including one called "Jasper Cave":

> The explorers [Michauds] have been careful observers of the action of the wind within the cave. They have discovered that ordinarily the wind blows in and out of the cave for regular periods. The periods of blowing in and out being fifteen hours each, although they have known the periods to be of seventy-two hours duration. Furthermore they have discovered five other wind passages in the vicinity of the cave, within a radius of two miles, one of which, Jasper Cave, located one and one-half miles to the westward, is similarly held as a mining location by S. V. and Vance I. Coe, and is a considerable passage as yet unexplored. Several hundred dollars have been expended in developing this claim [Jasper Cave] in a search for manganese, but mineral in paying quantities was not found. They have also observed the action of the wind in these openings and have found it to correspond very closely with that of Jewel cave.[9]

Neel and Fitzgerald concluded, "It is believed that Jewel Cave, Jasper Cave and the nearby wind passages are objects of scientific interest."[10]

Neel and Fitzgerald ultimately advised against creating a game preserve but favored protection of the cave itself. They cited local opposition to the game preserve, saying that some Custer County settlers wanted to graze livestock in the area, which a preserve would prevent. Some local leaders worried that loss of grazing and mining lands would hurt the county's chances of economic development in the future.[11] Instead of a game preserve, Fitzgerald and Neel wrote,

> It is recommended that the N. l/2 of Section 2, the N. 1/2 of Section 3, T. 4 S., R. 2 E, the S. l/2 of Section 34, the S. 1/2 of Section 35, T. 3 S., R. 2 S., B. H. Mer. [Black Hills Meridian], approximately

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[5] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 3–4.

[6] Chief Inspector, USFS District 2, to the Chief Forester, July 26, 1907; C. W. Fitzgerald to Smith Riley, July 30, 1907; and Smith Riley to C. W. Fitzgerald, August 1, 1907, all in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave NM CF.

[7] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 6–7.

[8] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 2; 36 Cong. Rec. 80 (December 6, 1902).

[9] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 2.

[10] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 7.

[11] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 6.

> 1,280 acres, be withdrawn from settlement and that this in area be declared a "National Monument," to be known as the Jewel Cave National Monument.

Fitzgerald and Neel proposed that the Michauds be "partially reimbursed" for the investments they had made to develop the cave and its entrance area, and they recommended that the Forest Service make "a thorough investigation and appraisement of this work" to calculate proper compensation.[12]

Forest Service District Chief Inspector Smith Riley agreed with Neel and Fitzgerald's recommendation against a game preserve but recommended a smaller "game refuge" around the cave.[13] Associate Forester Overton Price responded to Riley's suggestion:

> I talked over your plan of a Game Refuge with Mr. Pinchot and we decided that it was not necessary or desirable to set aside such a Refuge in the Black Hills National Forest. I have written Congressman Parker informing him what action would be taken and enclose a copy of my letter to him.

Price concluded that the Forest Service would not recommend creation of the preserve. He cited "lack of scientific need" to protect the flora and fauna of the Black Hills "because these animals are identical to those found in the Rocky Mountains" and those found at Yellowstone.[14]

Price instead favored establishing 1,280 acres around the entrance to Jewel Cave as a national monument, justified "by the great natural and scientific interest of the cave."[15] The president of the United States had the power to create national monuments through the authority of the Antiquities Act of June 8, 1906, which provided a way for the federal government to protect land without requiring an act of Congress (see Appendix A).[16] By early 1908, President Theodore Roosevelt had created 12 national monuments, covering cultural, historical, and natural sites.[17] Roosevelt used the "scientific interest" clause in the Antiquities Act liberally, granting national monument status to such places as the Grand Canyon, Muir Woods, and the forests of the Olympic Peninsula.[18]

On January 20, 1908, Acting Secretary of Agriculture Willett Martin Hays sent Secretary of the Interior James R. Garfield a Forest Service map of the area proposed as Jewel Cave National Monument. The area of the proposed monument included Jewel Cave, Jasper Cave, the Michaud's two-story log hotel, and Hill Spring (later known as Jewel Cave Spring) (see Figure 12).[19] Forest Service officials remained uncertain about the validity of existing mining claims. On February 4, 1908, Associate Forester Price asked the Black Hills National Forest to "have an examination made

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[12] Neel and Fitzgerald, "Report on the Proposed Jewel Cave Game Preserve," 7.

[13] Smith Riley to Chief Forester, December 10, 1907, in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave NM CF.

[14] Overton Price, Associate Forester, to Smith Riley, January 6, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave NM CF.

[15] Overton Price, Associate Forester, to Smith Riley, January 6, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Proposed Game Preserve, Jewel Cave NM CF.

[16] An act for the preservation of American Antiquities, June 8, 1906, 34 Stat. 225 (P.L. 59-209).

[17] Hal Rothman, *America's National Monuments: The Politics of Preservation* (Lawrence: University Press of Kansas, 1994), 86.

[18] Rothman, *America's National Monuments*, 66–69.

[19] Willet M. Hays to the Secretary of the Interior, January 20, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Proclamation, Jewel Cave NM CF.

to determine the validity of this filing and if mineral can not be found in sufficient quantities to warrant exploitation, the claims can be proved invalid. Please submit full reports on other claims if there are any within the area recommended."[20]

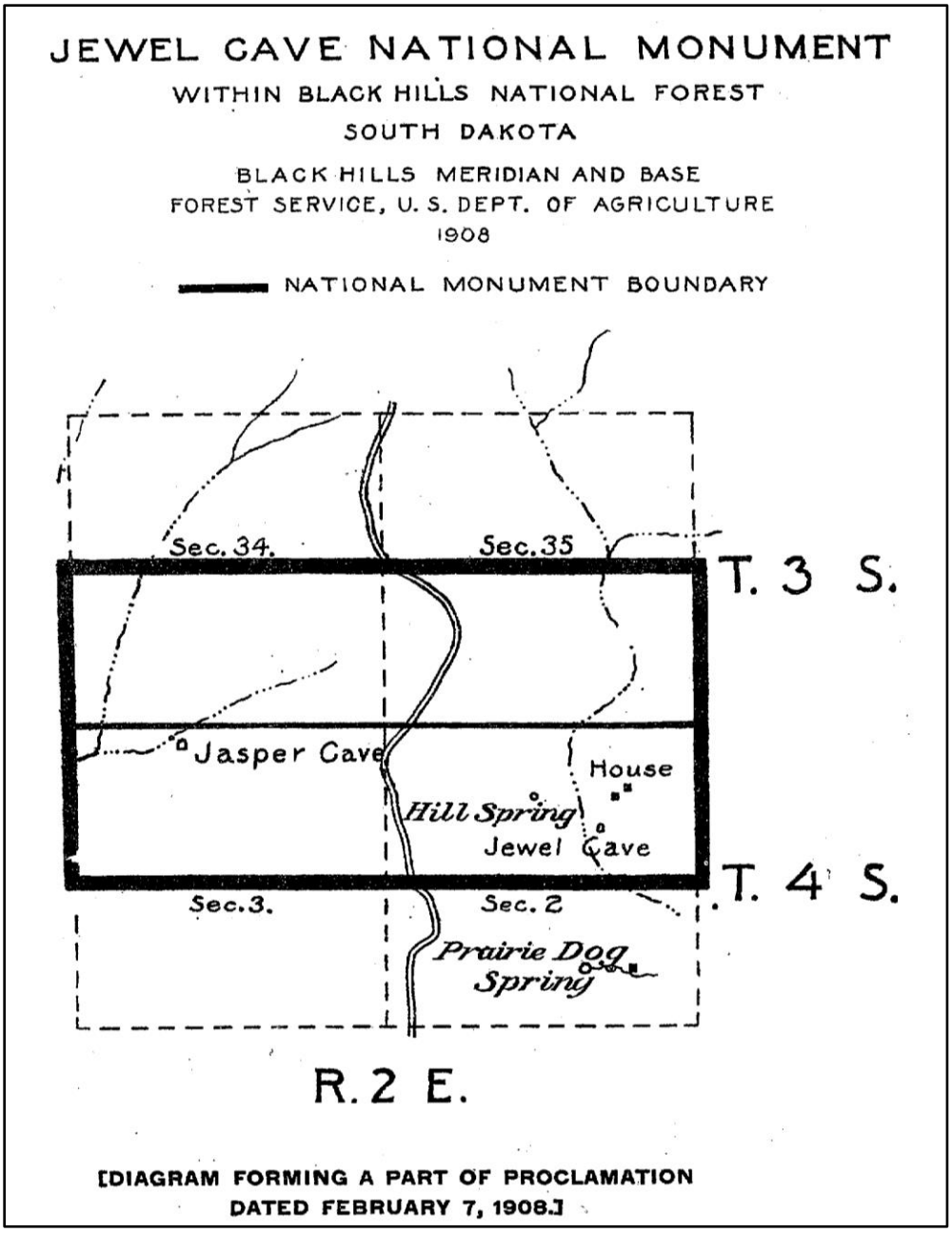


Figure 12. This 1908 Forest Service map was included in President Theodore Roosevelt's February 7, 1908, proclamation authorizing Jewel Cave National Monument.

Source: Library of Congress.

[20] Overton Price, Associate Forester, to E. M. Hamilton, Black Hills National Forest, February 4, 1908, Files 1655c–1655d, Jewel Cave National Monument Museum Files, Custer, SD (hereafter Jewel Cave NM MF).

On February 7, 1908, President Theodore Roosevelt used the authority of the Antiquities Act to proclaim the proposed 1,280 acres around the opening to Jewel Cave as the nation's fourteenth national monument (see Appendix A). Jewel Cave was the first national monument authorized to protect a cave. The 1908 Forest Service map showing the openings to both Jewel and Jasper Caves was included in the proclamation, but only Jewel Cave (not Jasper Cave) was mentioned in the text of the proclamation. The order stipulated that the Forest Service would manage Jewel Cave National Monument, but the national monument designation would be the "dominant reservation" of the land, taking precedence over the national forest designation. Roosevelt's executive order creating Jewel Cave National Monument stated that the cave was "of scientific interest" and removed it from all "settlement, entry, and all forms of appropriation under the public land laws, subject to all prior valid adverse claims."[21]

Forest Service Management (1908–1933)

The US Forest Service has its roots in several small government agencies. In 1881, the federal government established a Division of Forestry within the Department of Agriculture (USDA) as an education and research agency that lacked any land management responsibilities. Congress passed the Forest Reserve Act in 1891, through which the federal government established the nation's first 15 forest reserves. In 1897, President William McKinley signed into law the Sundry Act, which granted the General Land Office (GLO) authority for managing the nation's forest reserves. With the responsibility for forests spread over several agencies, influential forester Gifford Pinchot began a movement to consolidate federal forest management. Pinchot's efforts resulted in the creation of the Bureau of Forestry within the USDA in 1905. Later that year, the bureau was renamed the Forest Service.[22]

Initially, the Forest Service did little to manage Jewel Cave National Monument as distinct from surrounding forest lands. The continued uncertainty about the validity and extent of the mining claims posed an obstacle to management. Ultimately, Forest Service inaction on Jewel Cave was symptomatic of the agency's larger tendency to neglect the national monuments under its jurisdiction. At other Forest Service national monuments in the early 1900s—as well as those under the supervision of the War Department or the GLO—agency representatives usually visited only once or twice per year. From 1908 to 1933, the Forest Service investigated mining claims and attempted to protect the cave from vandalism, but it did little else to manage, protect, or promote Jewel Cave.[23]

Mining Claims Investigations

Within two weeks of Roosevelt establishing Jewel Cave National Monument, the Forest Service sent W. F. Hill, a forest ranger, to conduct a preliminary investigation of the Michauds' mining

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[21] Theodore Roosevelt, Presidential Proclamation No. 799, February 7, 1908.

[22] Gerald W. Williams, "The USDA Forest Service—The First Century," US Forest Service (April 2005), 5–17.

[23] For more on vandalism at national monuments, see Rothman, *America's National Monuments*, 74–75, 188.

claims. Hill reported that the claimants had not applied for a patent on any of the five claims within the monument (Jewel Lode, Golden Rod Lode, Gem Lode, Denver Lode, and Cleveland Lode).[24] Hill wrote that the Jewel Lode was "not located in any known mineral belt" and that the Michauds were not regularly removing ore from the cave. He concluded,

> Undoubtedly the original location of this claim was for the purpose of holding the ground on account of the Jewel cave, which was discovered about the year 1900, and an entrance opened up and excavations made at different places from time to time. But mineral has since been found in different places in the cave.[25]

Hill noted, however, that the minerals found within the Jewel Lode "are regarded as of only moderate value."[26]

For the Cleveland, Denver, Golden Rod, and Gem lodes, Hill wrote that each of the claims "would undoubtedly be considered a valid claim under the mining laws," since they were situated along well-defined, possibly mineral-bearing veins in limestone. However, the claimants had not developed those claims to the extent that they had developed Jewel Cave, and, "the fact . . . of the entrance to Jewel Cave being located on adjoining claim is probably a great inducement to [the] applicant for holding the claim." Hill recommended that a mineralogist examine the Jewel Lode and the four surrounding claims in order to verify that there were not minerals of paying quantities present at any of them.[27]

Having learned of the cave's new national monument status via Hill, the Michaud brothers and Bertha Cain wondered what to do. On May 26, 1908, Cain wrote to President William H. Taft,

> I fear that I am going to be wronged out of my property . . . So far as I can learn the petition of the citizens of Custer County was not presented to Congress and no bill appropriating money to pay the owners was introduced, as we were led to believe it would be.

Cain explained that C. E. Smith, the Custer attorney who promoted the game preserve with Parker, was the person who had led them to believe that federal protection of Jewel Cave would include reimbursement to the claimants for the work they had done at the site. She called Smith an "an irresponsible person" and reported that he had since left the state. Cain requested remuneration for her investment in the claim.[28]

Associate Forester Price reassured Cain that the national monument designation would not interfere with existing mining claims: the Antiquities Act authorized the secretary of the Interior to accept relinquishments of mining claims, but it did not give him the power to purchase such

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[24] W. F. Hill, Report on Mining Claim, for Jewel, Gem, Denver, Golden Rod, and Cleveland Lodes, February 19, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF.

[25] W. F. Hill, Report on Mining Claim, Jewel Lode, February 19, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF.

[26] Hill, Report on Mining Claim, Jewel Lode.

[27] Hill, Report on Mining Claim, for Jewel, Gem, Denver, Golden Rod, and Cleveland Lodes.

[28] Bertha Cain to the President of the United States, May 29, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

claims.[29] Although there was no legal mechanism for the Forest Service to purchase the claim, Price still asked Cain for a figure at which she and the Michauds would be willing to sell it, if they could. Cain replied that the Michauds would be willing to accept $1,000 each, which meant $4,000 total if Cain received the same price for her 50 percent stake in the claim.[30] Price later reiterated that the Forest Service could not legally purchase the claim and informed Cain that she and the Michauds would need to develop the claims as required by federal mining laws if they wanted to retain ownership of them.[31]

In an appeal to President Theodore Roosevelt, Cain had also asked if her father (who had entered the cave many times) could be appointed superintendent of the national monument, to help with her family's financial troubles.[32] Price responded that the Forest Service planned to administer the national monument "by the executive force of this Forest without extra expense to the Government." The Forest Service followed through on its decision not to hire anyone to manage Jewel Cave specifically.[33]

The Forest Service did, however, continue to investigate the mining claims on the monument. In April 1909, F. C. Schrader, a geologist with the US Geological Survey, sent the secretary of the Interior a report on the claims.[34] Schrader reported that none of the claims were in good shape: ladders into the cave were rotting and broken (which hindered Schrader's investigation) and only small amounts of ore had been removed from the cave, "principally for testing." While the deposits in the Jewel and Cleveland claims contained manganese, iron, jasper, and lithographic limestone, the claimants had already extracted most of the valuable minerals. Schrader estimated that the claimants had spent $5,000 in labor and materials for developing the mine, and $1,200 for surface improvements.[35] He wrote, "A large part of this work perhaps was done with the view of attracting to the cave the patronage of tourists, from whom a moderate fee for board and lodging and underground guide was collected."[36]

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[29] Overton W. Price to Bertha Cain, May 12, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[30] Roughly equivalent to $28,000 and $108,000, respectively, in 2020 dollars. Bertha Cain to Overton W. Price, July 16, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[31] Overton W. Price to Bertha Cain, July 29, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[32] Bertha Cain to the President of the United States, May 29, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[33] Overton W. Price to Bertha Cain, May 12, 1908, in *Historical Documents of Jewel Cave National Monument* binder, File B. Cain Letters, Jewel Cave NM CF.

[34] George Otis Smith to USFS Forester (unnamed), April 15, 1909, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF.

[35] Roughly equivalent to $141,000 and $33,000, respectively, in 2020 dollars. F. C. Schrader, USGS, "Report on the Jewel and Four Other Lode Claims," April 15, 1909, 2–5, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims, Jewel Cave NM CF.

[36] Schrader, "Report on the Jewel and Four Other Lode Claims," 9.

Forest Service officials took no immediate action in response to Schrader's report, in part because it appears to have gone missing for a few years.[37] The situation may have been caused or exacerbated by the President Taft's 1910 division of the Black Hills National Forest: the southern half (which included Jewel Cave National Monument) became the Harney National Forest, while the northern half remained the Black Hills National Forest.[38]

When the Schrader report resurfaced, officials still did not know what action they should take, since Schrader had stopped short of declaring the claims invalid. Acting District Forester Fred W. Morrell complained that "it's impossible to tell from Schrader's report whether or not he considers them valid, but there seems to be a pretty fair indication that they are." Morell commissioned a second study of the claims so that the Forest Service could determine whether to declare them invalid, or, if the claims were still valid, to figure out a legal way to purchase them from the Michauds and Cain for $4,000.[39]

Frank and Albert Michaud became discouraged when the Forest Service took no steps to protect the cave and failed to reimburse them for their improvements. In January 1911, they asked Secretary of Agriculture James Wilson to reimburse them for improving and protecting the cave.[40] The national monument designation had attracted more tourists, but the government had provided no funds for protecting the cave or guiding visitors through it, so Frank Michaud began locking the cave entrance.[41] "If the Government wishes to preserve the beauties of this cave in their natural state," Frank and Albert wrote to Wilson, "then we advise that they take steps to having it protected." In an attempt to secure additional allies in their quest for reimbursement, the Michauds asked US Representative Eben Wever Martin (R-SD) for help "securing a reasonable reimbursement for our labor and improvements upon said ground."[42] They were unsuccessful.

Secretary Wilson confirmed in March 1911 that the mining claims would need either to be relinquished by the Michauds and Cain, for which they could not receive reimbursement, or to be substantiated as valid, patented claims. Wilson told the Michauds that developing the area as a tourist attraction was not a valid use for the land under their mining claim, so it would not be proper for the Forest Service to pay them for improvements they had made that were unrelated to mining.[43]

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[37] P. G. Redington to USFS Chief Forester, June 4, 1910; Willis L. Moore, Acting Secretary of Agriculture, to the Secretary of the Interior, June 10, 1910, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF.

[38] Jewel Cave remained within Harney National Forest until 1954, when the two Black Hills forests were consolidated into one Black Hills National Forest. John F. Freeman, *Black Hills Forestry: A History* (Boulder: University Press of Colorado), 70, 124.

[39] Around $108,000 in 2020 dollars. Fred W. Morrell, Acting District Forester, to the Chief Forester, February 27, 1911, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[40] Frank Michaud and Albert Michaud to James Wilson, Secretary of Agriculture, January 2, 1911 in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[41] Evans-Hatch and Evans-Hatch, *Place of Passages*, 184.

[42] Frank Michaud and Albert Michaud to E. W. Martin, March 4, 1911, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[43] James Wilson to F. W. Michaud, March 9, 1911, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

The Michauds and Cain were in a bind. They could relinquish their claims, but they would get no money for them. Or they could continue to maintain their claims, which required at least $100 in investments (labor or improvements) annually, but they would likely never be able to own them in fee-simple title because there were no valuable mineral deposits on the site. They would never be able to obtain a patent through the cave's value as a tourist attraction.

	Cut	Location	Potentially Valuable Minerals Present	Dump	Value of Work (1911 dollars)[44]
Cleveland Lode	18 feet (ft) long, 7 ft wide, 12 ft deep	100 ft above canyon floor	None	5 tons of ore	$75.00
Gem Lode	20 ft long, from 6 to 8 ft wide, 15 ft deep	Crevice in limestone above canyon	None	None noted	$100.00
Golden Rod Lode	10 ft long, 6 ft wide, 10 ft deep	Exact location unclear; cut is in carboniferous limestone	Iron and manganese (small amounts)	1.5 tons of ore	$75.00
Denver Lode	16 ft long, 6 ft wide, 10 ft deep	Exact location unclear; cut is in rock that is a reddish-brown color	Calcite and powdered lime (considerable amounts)	None noted	$75.00
Jewel Lode	Tunnel, 4 ft by 6 ft, 75 ft long, timbered	100 ft above canyon floor	Manganese	None noted	$750.00

During summer 1911, the Forest Service again examined the mining claims at Jewel Cave National Monument. This time, it sent H. M. Booth, an "expert miner," accompanied by the Michauds and a forest assistant. Booth reported that there were "no producing mines in the immediate vicinity" and that the nearest successful mine was for mica, nine miles to the southeast.[45] Booth outlined the status of each claim (see Table 1). He estimated that the Michauds and Cain had spent $6,000 for labor and material in development and $1,200 for surface improvements.[46] Expenditures in support of mineral development (which Booth estimated at $2,000) included

[44] As a point of reference, $75.00 in 1911 US dollars is roughly equivalent to $2,000 in 2020 dollars.

[45] H. M. Booth, for USDA, USFS, Rapid City Land District, Black Hills National Forest, Custer (Unorganized) Mining District, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," June 1911, 1, 8, in *Government Geologic Investigations and Reports on Jewel Cave (1909–late 1920s)*, Interpretation Division Binder, Jewel Cave NM Visitor Center.

[46] This would be about $162,000 and $32,000 in 2020 US dollars, respectively.

enlargement and timbering of the main passageway.[47] Booth noted, as had other Forest Service personnel, that "the greater portion of the development work has been directed toward the improvement of the cave for scenic exploration."[48] Improvements that did not support the mining claim included widening of passageways that did not lead to mineral deposits and erecting ladders in the tunnel. Surface improvements included the two-story log cabin hotel, a fence, a surface cellar, a 16 by 18 foot log barn, a spring house, sheds, a trail to the cave, and "about one-half mile of a very fair wagon road along the hillside." The surface area of the claims contained about 150 cords of yellow pine.[49]

Booth found that none of the lode claims within Jewel Cave contained minerals in paying quantities. He identified what almost looked like jasper, but he clarified that "it lacks the peculiar colorings and varigations [*sic*] characteristic of real Jasper." He noted the manganese, calcite crystals, and boxwork that Jewel Cave is now known for.[50] In all, Booth was impressed by the cave, but he did not believe that the work done to improve it substantiated a mining claim:

> The brilliancy of some of these cavities is very beautiful. The Cave as a whole is a wonderful creation of nature, and it worthy of exploration beyond the known limits. . . .
>
> The claims were evidently initiated in good faith for mining purposes, but up to the present time the development work seems to have been more for the purpose of making the cave accessible for scenic exploration, than for practical mining. It is no doubt true that considerable ore has been taken from the Cave, but this, I understand, has been for sample tests only. However, the construction and maintenance of a tunnel directed toward the principal ore deposits would indicate that the extraction of ore for market had been contemplated. . . .
>
> Since the land involved does in fact contain mineral in such state as will justify further exploitation, there can be no question as to the validity of the claims as mining locations. The claimants have not made application for patent; therefore, it would seem that action should be deferred, pending the filing of such application or negotiations with the claimants be initiated looking toward a relinquishment of the claims.[51]

Upon reading Booth's report, Acting Secretary of Agriculture William Hays decided to wait until the Michauds applied for a patent before making the next move. Both Booth and Schrader had reported that the Michauds had never attempted to secure a patent.[52] If the GLO denied the patent, then the proclamation declaring Jewel Cave National Monument would continue being effective. If the GLO approved the patent, the Forest Service could then reexamine the case and possibly undo the monument's establishment. Hays recommended that the Forest Service move slowly, especially since the report, in his opinion, should "give the mineral claimants sufficient equities to justify

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[47] Booth, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," 4.

[48] Booth, "Supplemental Report on the Jewel et al Claims and The Jewel Cave."

[49] Booth, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," 5, 8.

[50] Booth, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," 5.

[51] Booth, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," 7–9.

[52] Booth, "Report on the Jewel et al Lode Mining Claims and the Jewel Cave," 7–9; Schrader, "Report on the Jewel and Four Other Lode Claims," 2.

reimbursing them for work performed while holding the land by means of mining locations."[53] The Forest Service and the claimants (the Michauds and Cain) were at a stalemate.

Defining and Protecting Against Vandalism

By 1911, Frank Michaud was the only claimant left working on the claim in any capacity. Bertha Cain had abandoned all interest in the claim around 1908, and Albert Michaud left Custer County for British Columbia in 1910, became a citizen of Canada, and deeded his interest to Frank.[54] Frank had maintained the claim by investing the required $100 of annual labor or materials in the claims. He also tried to make money by selling the calcite crystals within the cave. In 1911, Booth reported that the Michauds had removed rocks from the cave, but Forest Service officials did not respond to that information with concern. A couple of years later, Frank Michaud extracted large slabs of calcite crystals weighing around five tons and shipped then to a Catholic priest in Iowa, Father Paul Dobberstein, to build a grotto (see Figure 13). This was one of several shipments to Dobberstein.[55]



Figure 13. Father Paul Dobberstein, a Catholic Priest in Iowa, purchased five tons of calcite crystals from Frank Michaud for use in Dobberstein's "Grotto of the Redemption" in West Bend, Iowa. Pictured here in 2008.

Source: NPS, Ben Franske.

The forest ranger in charge of the area that included Jewel Cave was not sure whether Michaud's mining claim gave him the right to remove whatever rocks he wanted from the cave. The national monument proclamation declared any "appropriation, injury, or trespassing" to be a finable offense, which raised questions for Forest Service officials about whether Michaud had violated the executive order.[56] Acting District Forester Morrell ultimately determined that Michaud had the right to remove the rocks, since calcite was classified as a mineral and he owned the mining claim. When asked,

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[53] W. M. Hays, Acting Secretary of Agriculture, to Representative E. W. Martin, August 5, 1911, 2–3, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF.

[54] Affidavit, State of South Dakota, County of Custer, signed by Mamie Michaud, June 23, 1928, Files 51b and 51c, Jewel Cave NM MF.

[55] Michaud appears to have shipped calcite crystals to Dobberstein in 1913 and 1915, and possibly in 1911. Harney National Forest Supervisor to District Forester, Denver, October 25, 1913, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; Judy Love, *Jewel Cave National Monument* (Mount Pleasant, SC: Arcadia Publishing, 2008), 8; Jen Hirt, *Under Glass: The Girl with a Thousand Christmas Trees* (Akron, OH: University of Akron Press, 2010), 77; Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*, March 2005, 36.

[56] Harney National Forest Supervisor to District Forester, Denver, CO, October 15, 1913, 1, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

Michaud said that most of the material he removed had been blasted out of the cave when they first opened up the passage a decade earlier. Forest Service officials in the Black Hills and Denver agreed not to prosecute Michaud, since he believed he was acting within his rights, but they determined they would prosecute anyone not on the claim who removed materials.[57]

Frustrated by the ambiguity of the situation, forest supervisors considered their legal options to cancel Michaud's claims. In 1913, they considered using the precedent set by a legal decision regarding Wind Cave.[58] That case, *South Dakota Mining Company v. McDonald*, hinged on whether a mineral was valuable because it warranted "an ordinarily prudent man in the expenditure of further time and money in exploration and development," or if the mineral had to be present in paying quantities.[59] In the aftermath of that case, the Department of the Interior (DOI) had updated its mineral regulations to clarify that crystalline deposits and other features ordinarily found in caves did not count as minerals of value under mining laws:

> *Crystalline Deposits.*—Crystalline deposits and formations of that character, such as stalactites, stalagmites, geodes, "box work," "frost work," etc., found in caverns, and which substances are valuable solely as natural curiosities, and disposed of as such, are not minerals within the purview of the mining laws. (South Dakota Mining Company *v.* McDonald, 30 L. D., 357.)[60]

Although the Minerals Division of the DOI had adopted this policy in 1900, Forest Service officials did not consider using it to declare the Michauds' claim invalid until 1913. Morrell had apparently not been aware of the regulation, which contradicted his decision.

This meant that if Michaud could not show that Jewel Cave produced more than crystals and other cave features, such as mineral deposits in paying quantities, he could never obtain a patent from the GLO. However, he could still develop other valuable minerals in the claim area. So, once again, the Forest Service decided to wait until Michaud applied for a patent, at which time a study could be made and then, based on those results, the Forest Service could justify cancelling the claim. Michaud, likely aware of his slim chance of obtaining a patent because of this regulation, took no action.[61]

In late 1913, Assistant Forester James B. Adams reported that the Michauds cared about the cave and had been good custodians of it. Adams instructed forest rangers to keep an eye on the cave to be sure no improper removal of specimens occurred, but he advised against prosecuting

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[57] Harney National Forest Supervisor to District Forester, Denver, October 25, 1913, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; G. M. Grander, Acting District Forester, to Harney National Forest Supervisor, October 31, 1913, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[58] Daniel A. Jensen, "Mining Claim Abuse: Has the FLPMA Filing Requirement Helped?" *Utah Law Review* 1987, no. 3 (1987): 636–37.

[59] C. J. Stahl, Acting District Forester, to the Chief Forester, December 18, 1913, 2, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[60] Minerals Division, "Decisions under the mining laws rendered since last report," *Annual Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1901* (Washington, DC: US Government Printing Office, 1901), 424.

[61] C. J. Stahl, Acting District Forester, to the Chief Forester, December 18, 1913, 4–5, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

Michaud.[62] In 1916, Michaud again sold calcite crystals to Dobberstein, and Forest Service officials again opted not to prosecute him.[63] This time, however, Assistant District Forester C. J. Stahl raised the possibility of using the authority in the Antiquities Act interest to protect the cave:

> Since the Government has set aside this cave as a national monument subject to prior valid claims, it is the desire of this office that full protection be given to it. We do not want to interfere with the legitimate prospecting and mining operations of any one, but if an attempt is made to commercialize and exploit the deposits and formations of the cave the right of those so engaged to do so should not go unchallenged until firmly established. However, I think we can rely to some extent upon the penalties prescribed by the Act of June 8, 1906 (34 Stat., 225), as a deterrent to vandalism.

Stahl recommended that a local Forest Service official examine the cave.[64]

Around 1916, the Forest Service sent Surveyor W. C. Danielson to make a topographical survey of Jewel Cave, and, while he was at it, to "make a careful inspection of the effect which the removal of specimens has had upon the beauty of the galleries."[65] He surveyed and described two routes through the cave, only one of which fell entirely within the Jewel Lode claim. Danielson's descriptions are the first thorough descriptions of Jewel Cave tour routes:

> The main passage bears in an easterly direction for about 100 feet and then divides into two passages; one bearing in a northeasterly direction and the other southeasterly. The former, shown on the map as Route 1, has few rapid changes in grade and not many ladders are necessary. This route is composed of narrow winding passages opening into side galleries and chambers of various dimensions. The walls of the small connecting passages are of limestone and in places do not especially appeal to the ordinary observer. However, these narrow passages contain some very picturesque occurrences, the boxwork or honeycomb crystallization being particularly attractive. This route ends in a Gothic dome, 23 feet high, lined with a thick scale of crystalline calcite. The walls at this end are honeycombed, and unexplored passages lead everyway. A small amount of exploration has been done in an endeavor to find a passage of some length, but as yet no passage leading any distance has been found. This route is now in good condition and, with the exception of replacing a few of the wooden ladders with galvanized pipe ladders, no work is necessary.
>
> Route 2 . . . is the longer and is farther under the surface . . . The greater portion of the route is outside the limits of the lode claim and most of the pretty scenery is from what is known as Milk River northwesterly to the end of the route. An entrance could possibly be made here, as this point falls underneath the draw draining southwesterly into Hell Can[y]on. This point is about 65 feet below the surface and is an extremely interesting occurrence. Water seeps through the roof forming stalagmites; flowing over these it drips onto a snowlike bank of limestone crust, falling into a small basin two feet below the top. The effect is that of milk flowing over a small falls into a lake below. From this point on there are no ladders, and passages are quite small in places opening up into larger chambers. At Junction Chamber the walls are honeycombed, and unexplored passages lead in every

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[62] James B. Adams, Assistant Forester, to District Forester, December 22, 1913, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF; C. J. Stahl, Acting District Forester, to the Chief Forester, December 18, 1913, 4, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[63] Conner, Acting Forest Supervisor, to District Forester, Denver, February 26, 1916, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[64] C. J. Stahl, Assistant District Forester, to Harney National Forest Supervisor, May 2, 1916, 3, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[65] Conner, Harney National Forest Supervisor, to District Forester, Denver, May 10, 1916, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

direction. At Station 108 on the Underground Survey Map, the largest and most picturesque chambers of the Cave occur. Many passages open off from these chambers and practically no exploration has been done in here. The walls are lined with a thick scale of crystalline calcite giving the appearance of a room formed of "Cracker-Jack." The majority of the passages leading from Milk River to the explored end are low and most of the distance must be traveled on hands and knees. However, there are places in which some of the difficult travel could be eliminated with a small expenditure of money.

The route, from the entrance to Milk River, has some interesting formations in places. The passages are fairly open and the trip easily made. Quite a few ladders are used and these ought to be replaced by galvanized pipe ladders as the wooden ones rot very quickly, and practically all of them had to be replaced before this survey could be made. The narrow passages connecting the chambers are straighter than in Route 1, but the walls are mostly of limestone formation, and, aside from a few picturesque places, are uninteresting until Onyx Hall and Milk River are reached.[66]

The new Harney National Forest supervisor, James F. Conner (who had grown up in Spearfish and was well-respected locally), relayed from Danielson's report that "With the exception of one gallery practically all of the specimens have been taken from side passages or points which would not tend to mar the scenic beauty of the cave" (see Figure 14).[67]



Figure 14. Forest Service Surveyor W. C. Danielson took this image of what he called "crackerjack formation" in Jewel Cave in 1916.

Source: NPS, Jewel Cave NM.

Danielson reported that few people visited the cave, "due, no doubt, to the fact that they have never heard of it." He suggested that, "if properly administered," the cave could attract tourists visiting Wind Cave and Sylvan Lake. Danielson noted that the road built by the Michauds "connecting the Cave with the main road" had "a maximum grade of about 10 per cent" and would need only minimal investments to make it ready for the public. Danielson wrote that the Michauds'

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[66] W. C. Danielson, "Report on Jewel Cave National Monument," ca. 1916, 3–5, in *Historical Documents of Jewel Cave National Monument* binder, File c.1916 Report on Jewel Cave National Monument, Jewel Cave NM CF.

[67] Conner, Harney National Forest Supervisor, to District Forester, Denver, May 10, 1916, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF. On Conner's background, see Freeman, *Black Hills Forester*, 77. Freeman refers to him as John F. Conner, and while he signed most letters J. F., a Forest Service employee publication from 1921 lists him as James F. Conner. USDA, *List of Workers in Subjects Pertaining to Agriculture, 1920–1921* (Washington, DC: US Government Printing Office, 1921), 20.

two-story log house was in "fair condition," although the spring house and barn were "quite dilapidated" by this point.[68] He recommended that the Forest Service appoint a guard to protect the cave and to repair the crumbling infrastructure inside and outside of it (see Figure 15).[69]



Figure 15. Danielson took this picture in Hell Canyon. The Michaud's timbered entryway to the cave entrance is visible in the center of the image, with a person standing next to it for scale, 1916.

Source: NPS, Jewel Cave NM.

The Forest Service hesitated in adopting Danielson's recommendations. Overall, Forest Service personnel knew little about the cave, both a symptom and a cause of the agency's difficulties in managing it. Conner reported, "Officers have been very reluctant to investigate the different passages without the assistance of a guide who was familiar with the route" for fear of getting lost, despite Michaud's offer to help. The Forest Service never appointed a permanent ranger to the cave, so Michaud remained the only one who really knew how to get around it.[70]

In 1919, Conner learned that Michaud apparently had "a crew of men at work getting out a carload of specimens from Jewell [*sic*] Cave," the first report of specimen removal since 1916.[71] From the time Jewel Cave was designated a national monument, it had been closed to the public. But Conner thought that if the Forest Service developed and opened the cave, "it would be an important factor in increasing the attractiveness of this Forest for recreational purposes." Conner wanted the Forest Service "to finally decide the ownership of this Cave."[72] He asked District Forester John Hatton what he should do.

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[68] Danielson, "Report on Jewel Cave National Monument," 1–2.

[69] Danielson, "Report on Jewel Cave National Monument," 5–6.

[70] Conner, Harney National Forest Supervisor, to District Forester, Denver, May 10, 1916.

[71] Conner, Harney National Forest Supervisor, to District Forester, Denver, June 18, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[72] Conner, Harney National Forest Supervisor, to District Forester, Denver, May 9, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

Hatton, like his predecessors, tried to figure out a legal solution to the Forest Service's issue with Jewel Cave. Hatton noted that rocks removed by Frank Michaud were valuable not as minerals but as "natural curiosities and souvenirs." Hatton called out the Michauds for deliberately holding the claim in limbo:

> None of the minerals proper have ever been extracted in commercial quantities, and this is doubtless so because the locators have realized that the resources of the cave are much more valuable than the mineral substances, and that the latter are of too low a grade to be worth working, – a conclusion which seems to be strengthened by the fact that although the claimants have had to their credit for many years past several times the requisite amount of statutory expenditures in improvements directed to development of the mine proper, they have never risked applying for patent, but for ten years or more have been engaged almost exclusively in the exploitation of the cave.[73]

Hatton suggested invoking *South Dakota Mining Company v. McDonald* to prosecute Michaud for protecting crystalline deposits that had no mineral value under US mining regulations. He wanted to force the issue, since the Forest Service already had several reports claiming that Jewel Cave's chief value was scenic, not mineral. Those reports had "been filed away without action," awaiting Michaud's application for patent.[74] Hatton hoped that if the Forest Service prosecuted Michaud, the claims would be declared invalid and the Forest Service could develop the national monument without the cloud of a mining claim.[75] Hatton also considered prosecuting Michaud under the Antiquities Act.[76]

Conner talked Hatton out of prosecuting Michaud under mining regulations or the Antiquities Act. Instead, Conner spoke with Michaud and asked him to stop selling souvenirs from the cave. Michaud complied, and Conner allowed him to retain his mining claim.[77] Assistant District Forester C. J. Stahl agreed with Conner that the Forest Service should not force the issue. Unlike Conner, however, Stahl wanted to give up on the cave and rescind its protected status:

> Ultimately, I believe, the executive order creating the Jewel [C]ave National Monument ought to be revoked, the land restored to its original status as a Reserved National Forest because it possesses no unusual value that would justify its development and protection as a National Monument.[78]

Other Forest Service officials did not support Stahl's proposal to de-list the national monument.

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[73] John Hatton, Assistant District Forester, to Assistant to Solicitor, June 24, 1919, 2–3, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[74] John Hatton, Assistant District Forester, to Assistant to Solicitor, June 24, 1919, 1–2.

[75] John Hatton, Assistant District Forester, to Assistant to Solicitor, June 24, 1919, 3; Hatton to Forest Service, Custer, SD, June 24, 1919, telegram, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[76] John Hatton, Assistant District Forester, to Assistant to Solicitor, June 24, 1919, 3.

[77] Frank Michaud to District Forester Smith Riley, October 26, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF; C. J. Stahl, memorandum, July 7, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; Harney National Forest Supervisor James Conner to R. P. Stewart, US Attorney, Deadwood, SD, July 2, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[78] C. J. Stahl, memorandum, July 7, 1919.

During this time, Ira Michaud (Frank's son) took care of the cave while Frank worked for the Forest Service as a lookout on Bear Mountain. Ira kept the cave locked, as Frank had done since 1916, but there was little they could do to prevent forced entry and vandalism.[79] It took a lot of time and energy for the Michauds to protect the cave, and yet people still entered. Frustrated, Frank asked the Forest Service to take over the cave. He wanted to get rid of it.[80] After all the work he and Albert had done developing the cave, Frank wrote,

> all we ask is to be reimbursed for it. I have a large Family to support and I am in poor health and a deal of this kind would never come in better time than just now . . . I don't feel like waiting very long for I need the money and not able to do a days work. There is lots of Tourists coming to the Hills now and are getting interested in Jewel Cave it will soon be a great drawing card for the Hills and I think the Government aught to take hold of it soon.[81]

Michaud could no longer make money selling souvenirs, since the Forest Service would prosecute him for that, but neither did he have the resources to develop the cave as a tourist attraction.[82]

The Forest Service again disappointed Michaud when it determined that it could not legally purchase the mining claim without an act of Congress and that the Forest Service lacked the resources to develop the cave for tourists. The Forest Service did, however, want to protect the cave from vandalism, so the agency installed signs warning about trespassing. In 1921, during one of their infrequent visits to the cave, Conner and District Forester A. S. Peck found a locked entrance and no work being done.[83] Peck admitted a few years later,

> We have felt here that it was a waiting game and that the older Michauds would eventually leave the country or in time lose interest in the property and the Government could then improve it to the extent justified.[84]

Neither the Michauds nor the government took any action, so the waiting game continued.

Garnering Local Support for the Cave

In 1923, Conner spoke with US Senator Peter Norbeck (R-SD) about developing Jewel Cave National Monument. Norbeck believed that opening Jewel Cave to tourists would boost the economy of the area. He wanted to secure a congressional appropriation of approximately $1,000 to reimburse the Michauds for their investment, plus additional appropriations to repair ladders and to

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[79] Conner, Acting Forest Supervisor, to District Forester, Denver, February 26, 1916, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[80] Conner to District Forester, Denver, October 23, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[81] Frank Michaud to District Forester Smith Riley, October 26, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[82] Frank Michaud to District Forester Smith Riley, October 26, 1919.

[83] A. S. Peck to the Chief Forester, February 5, 1924, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF.

[84] A. S. Peck to the Chief Forester, February 5, 1924.

hire a superintendent for the cave.[85] District Forester C. J. Stahl thought Norbeck's proposal was "a very happy solution of this vexatious problem" and suggested that Conner work with local civic groups to build political support for it.[86]

Conner was a member of the Custer Commercial Club, and he encouraged the club to get involved. The club agreed, marking the first time that local boosters had expressed significant interest in the future of Jewel Cave since the proposed game preserve in 1907. Club members worked with Norbeck and US Representative William Williamson (R-SD) to secure appropriations to carry out Norbeck's idea, but they were unsuccessful.[87] According to Assistant Forester Leon F. Kneipp, Williamson admitted that "the relative inaccessibility of Jewel Cave and the greater attraction of the Wind Cave Natural [sic] Park rather minimized the importance of the Jewel Cave."[88]

In 1924, with no congressional appropriations forthcoming, Assistant Forester Leon F. Kneipp recommended that the Forest Service build a "stout door at the mouth of the cave and secure it with a stout padlock."[89] Conner had reported considerable damage in the first gallery of the cave, which further justified the added security.[90] Williamson liked the idea and the Forest Service proceeded.[91] The Forest Service also put up several signs at the entrances of both Jewel Cave and Jasper Cave warning against trespassing and the removal of cave specimens.[92]

The Forest Service did not inform the Michauds that it was adding a door and lock to the cave entrance. After finding the cave inaccessible in February 1924, Mamie and Ira Michaud went to the Forest Service office in Custer. Conner told them he had locked the cave under direction from the chief forester's office and that it would be locked permanently.[93] Mamie Michaud wrote a letter to the chief forester the next day. She argued that the reports of vandalism were unfounded and that

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[85] Equivalent to roughly $15,000 in 2020 dollars. J. F. Conner to District Forester, Denver, November 7, 1923, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[86] C. J. Stahl to J. F. Conner, November 13, 1923, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[87] J. F. Conner to District Forester, Denver, February 2, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; Evans-Hatch and Evans-Hatch, *Place of Passages*, 184–185; Freeman, *Black Hills Forestry*, 77.

[88] L. F. Kneipp, Assistant Director, USFS, to A. S. Peck, District Forester, Denver, January 25, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[89] L. F. Kneipp, Assistant Director, USFS, to A. S. Peck, District Forester, Denver, January 25, 1924

[90] A. S. Peck, District Forester, to Supervisor, Harney National Forest, February 4, 1924, in *Historical Documents of Jewel Cave National Monument* binder, Jewel Cave NM CF.

[91] US Representative William Williamson to L. F. Kneipp, Assistant Director, USFS, January 25, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; J. F. Conner to D. F. McGill, February 2, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[92] L. F. Kneipp to District Forester, Denver, February 8, 1924, and J. F. Conner to District Forester, Denver, February 14, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[93] J. F. Conner to District Forester, Denver, February 14, 1924.

the Michauds had been there over the winter. She reiterated that the Michauds had taken specimens only out of side areas and that they had tried to protect the cave, but their locks had been broken by vandals.[94]

Mamie Michaud also protested the locking on the grounds that it prevented the Michauds from continuing the requisite assessment work to maintain the mining claim, which they had been doing for 24 years.[95] Stahl acknowledged this issue:

> If the Forest Service now places a door at the entrance and locks it against the claimants it is doubtful if we can logically or legally maintain an action against the claim for lack of development work.[96]

Throughout 1924 and 1925, the Michauds continued to ask for reimbursement for their mineral rights, while the Forest Service continued to argue that it could not legally do so. The Forest Service maintained that removal of minerals for "commercial exploitation or in such a manner as would destroy or mar the scenic value of the cave, can not be permitted. The rights conferred by the mining laws do not embrace this privilege," as established under the precedent set by *South Dakota Mining Company v. McDonald*.[97]

Conner wanted the Forest Service to develop Jewel Cave and remained frustrated by the continued impasse with the Michauds. He commented,

> I am wondering if in view of this increasing number of tourists to the Black Hills, some action should not be taken to arrange for developing the cave and making it available to tourists. In its present status the government is doing nothing with it but keeping it locked and preventing the Michauds from developing it.[98]

Conner committed to resolve the problem. He secured approval from Assistant District Forester E. W. Tinker to negotiate with the Michauds. Tinker wrote to Conner,

> It seems to me there is only one satisfactory way in which to clear up this case. That is to reach an agreement with the Michauds as to the value of the work they have done in this cave and have local organizations get in back of a bill providing for a compensation to them for the work and make a provision for the administration of the monument, as such. If this cannot be done, I presume, for protection of the cave, we should provide for a new door that will keep people out. My understanding was that the proposal to compensate the Michauds was favorably considered at one time, but no

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[94] Mrs. Frank W. Michaud to the Forester, February 15, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[95] Mrs. Frank W. Michaud to the Forester, February 15, 1924.

[96] C. J. Stahl, Assistant District Forester, to Harney National Forest Supervisor, February 15, 1924, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[97] Quotes from E. W. Tinker, Assistant District Forester, by T. M. Moorman, Acting, to Frank Michaud, March 26, 1925, in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF. See also Albert Michaud to [National Park Service?], March 26, 1924; C. J. Stahl, Assistant District Forester, to Albert Michaud, April 10, 1924; and Frank Michaud to "Friend" (USFS?), March [22?], 1925, all in *Historical Documents of Jewel Cave National Monument* binder, File Michaud Letters, Jewel Cave NM CF.

[98] J. F. Conner to District Forester, Denver, December 30, 1926, memorandum, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

> action obtained. It seems to me if there is real public need or any public purpose commensurate with the cost, we could now get the needed legislation.[99]

Conner approached Mamie Michaud on February 10, 1927, and asked her how much it would take for her to surrender her mining claims. He reported that Mamie Michaud thought $1,000 "was rather small but stated she would be willing to take this figure and have the matter adjusted."[100] Mamie did not consult with Frank, who was in British Columbia at the time. He died there that same week.[101] Conner then got in touch with the Custer Commercial Club, which agreed to lobby South Dakota's congressional delegation to appropriate funds to pay Mamie Michaud and fix the cave.[102]

Jewel Cave Corporation

Residents of Custer, South Dakota, and Newcastle, Wyoming, had for several years wanted a better road between Custer and Newcastle, one that could more easily accommodate automobiles. The alignment of the road between the two cities at that time went down Lithograph Canyon and up the west side of Hell Canyon to Mud Springs Road (different from the route of present-day Highway 16).[103] Since Jewel Cave National Monument was along the way between the towns, not far off of the road, developing the cave as a tourist attraction could help draw attention to the need for an improved road. Civic organizations in both towns believed that developing Jewel Cave "would be of great benefit to the Custer-Newcastle road [the currently existing road] as well as to the two towns."[104]

In 1927, Conner asked the Custer Commercial Club to help secure appropriations to pay the Michauds for the mining claim and refurbish the cave's buildings and ladders, hire guides, and establish campgrounds. At Conner's request, William A. Nevin, a "prominent grocery dealer in Custer" who belonged to the Custer Commercial Club and was later in state and county government, asked Norbeck to introduce legislation appropriating $2,000 to pay the Michauds and to prepare the cave for tourism.[105] Newcastle Lions Club President A. F. Lesley (who was the secretary-treasurer and general manager of the U.S. Oil and Refining Co. in Osage, Wyoming) also asked Norbeck (since Jewel Cave National Monument was in South Dakota) to secure the appropriation. Nothing happened. The next Newcastle Lions Club president, O. C. Kerney,

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[99] Assistant District Forester E. W. Tinker to Harney National Forest Supervisor J. F. Conner, January 4, 1927, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[100] $1,000 in 1911 dollars would be equivalent to about $15,000 in 2020 dollars. J. F. Conner to District Forester, Denver, February 19, 1927, memorandum, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF.

[101] Evans-Hatch and Evans-Hatch, *Place of Passages,* 186–187.

[102] J. F. Conner to District Forester, Denver, February 19, 1927, memorandum.

[103] Conner, Harney National Forest Supervisor, to District Forester, Denver, May 9, 1919, in *Historical Documents of Jewel Cave National Monument* binder, File Mining Claims Correspondence, Jewel Cave NM CF; "Custer-Newcastle Road to Open Up Jewel Cave," *Lead Daily Call*, November 28, 1923, 1, accessed via newspapers.com.

[104] "Discuss Opening of Jewell Cave," *Rapid City Journal*, February 18, 1928, 4, accessed via newspapers.com.

[105] About $30,000 in 2020 dollars. Evans-Hatch and Evans-Hatch, *Place of Passages*, 192.

repeated the request that the South Dakota congressional delegation obtain funds needed to open Jewel Cave to the public, but Congress again took no action.[106]

Getting nowhere on their own, the Newcastle Lions Club and the Custer Commercial Club decided to work together. They met in February 1928 to discuss Jewel Cave. They held a second meeting in April 1928 and decided to form a new, joint corporation dedicated to opening Jewel Cave to the public, believing that the cave would attract tourists to both towns and provide an impetus for better upkeep of the Custer-Newcastle Road.[107]

On June 26, 1928, the following individuals officially incorporated the Jewel Cave Corporation in the state of South Dakota: William A. Nevin (Custer), C. E. Perrin (Custer), Samuel U. Coe (Custer), A. F. Lesley (Osage, WY), and E. E. Wakeman (Newcastle, WY).[108] To raise funds needed to pay Michaud and maintain the cave, they sold $25,000 of capital stock divided into one thousand $25.00 shares.[109] Shareholders included successful business leaders and entrepreneurs in Custer and Newcastle, as well as Conner, the Harney National Forest supervisor.[110]

As one of its first actions, the Jewel Cave Corporation secured a quit-claim deed from Mamie Michaud, in which she attested that she was the sole interest holder in the five claims at Jewel Cave. Through this deed, she surrendered any possible remaining ownership of the mining claims to the Forest Service.[111] Since the Michauds had never owned the land outright, as per mining laws discussed in Chapter 1, the quit-claim deed was sufficient to remove the "prior adverse claims" that the national monument proclamation had been subject to.[112]

Jewel Cave Corporation paid Mamie Michaud $750 total for signing away her claim to the cave. Ira and Mamie both recalled only having received $500 total, but in 1929, Conner reported having paid Mamie $500 for improvements to the cave and $250 for the quit-claim deed, so $750 total.[113] According to both Mamie and Ira, she accepted that amount because she was a widow with children

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[106] Evans-Hatch and Evans-Hatch, *Place of Passages*, 193.

[107] Evans-Hatch and Evans-Hatch, *Place of Passages*, 194.

[108] Articles of Incorporation, Jewel Cave Corporation, June 28, 1928, File 51a, Jewel Cave NM MF; South Dakota Department of State, Certification of Incorporation, Jewel Cave Corporation, June 18, 1928, File JECA Certificate, Jewel Cave NM MF; "Jewel Cave is Formally Opened," *Queen City Mail (Spearfish, SD)*, October 3, 1928, 1, accessed via newspapers.com.

[109] About $380,000 in 2020 dollars. By-Laws of the Jewel Cave Corporation, July 19, 1928, 1, File 49h, Jewel Cave NM MF.

[110] Subscribing Stock Holders of the Jewel Cave Corporation [ca. 1928], File 55a–55b, Jewel Cave NM MF.

[111] Affidavit, State of South Dakota, County of Custer, signed by Mamie Michaud, June 23, 1928, Files 51b and 51c, Jewel Cave NM MF; Jewel Cave Corporation Meeting, minutes, July 19, 1928, 1–2, Files 49l and 49m, Jewel Cave NM MF.

[112] Theodore Roosevelt, Presidential Proclamation No. 799, February 7, 1908.

[113] $750 in 1911 dollars would be roughly equivalent to $11,000 in 2020 dollars. Evans-Hatch and Evans-Hatch, *Place of Passages*, 195–96; Roger W. Toll, "Report to the Director, National Park Service on Jewel Cave National Monument," November 18, 1929, File 62f, Jewel Cave NM MF; Ira Michaud, "Jewel Cave: What I Have Heard and Seen," December 1970, 9, File 1687, Jewel Cave NM MF; Walt Lienau, notes on interview with Mamie Michaud, August 4, 1959, 2–3, File 1692f, Jewel Cave NM MF;

still to raise, and she had no money to protect her claim in court.[114] By signing the quit-claim deed, Mamie Michaud relinquished all remaining mineral rights she or others might have to the claims within Jewel Cave National Monument.

With the obstacle of the mining claims now resolved, the Jewel Cave Corporation leased one square mile of the Jewel Cave National Monument from the Forest Service in order to develop the area around the cave entrance.[115] The Forest Service had outsourced cave management at other national monument caves, such as Lehman Caves in Nevada, where a private operator ran the tourism and guiding services throughout the 1920s.[116] The corporation hired Ira Michaud, Will E. Davis, and Dave Peterson in summer 1928 to make the repairs required to open the cave to the public. They improved the road the Michauds had built connecting the cave entrance to the Custer-Newcastle Highway, cleared space for a parking lot, and put in a foot trail from the parking lot to the cave entrance. Inside the cave, they cleared passageways, rebuilt ladders, and installed stairways.[117] The corporation used the rest of the money to buy lanterns and pay guides, with the idea that the entrance fees collected from visitors would be used to repay investors.[118] Davis (the lead guide) and Ira Michaud lived in the "old Kirk cabin, located below Prairie Dog Spring."[119]

On August 15, 1928, Jewel Cave opened for tours for the first time since it had been declared a national monument.[120] The Jewel Cave Corporation held a picnic for stockholders in September 1928 to showcase the improvements in and around the cave.[121] The corporation gave tours only of Jewel Cave, not of nearby Jasper Cave. Jewel Cave was only open in the summer, and tours were around 25 cents (some sources say 50 cents) per person. From 1928 to 1929, attendance jumped from 834 to 2,200.[122] The support of local organizations and the corporation's investments had finally put Jewel Cave on the tourist map. Davis figured at the end of the 1929 season that visitors had come from almost every state in the country, and even a few from Europe. The Sioux Falls *Argus-Leader* reported, "Mr. Davis stated that a common expression of tourists who had visited many caves was that Jewel Cave was the most beautiful they had seen."[123]

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[114] Michaud, "Jewel Cave: What I Have Heard and Seen," 9; Lienau, notes on interview with Mamie Michaud.

[115] Jewel Cave Corporation Meeting, minutes, July 19, 1928, 2, File 49m, Jewel Cave NM MF; Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area*, 39.

[116] Keith A. Trexler, "Lehman Caves . . . its Human Story," (Baker, NV: NPS, 1966, updated through 1975 by NPS staff), 18–30.

[117] Michaud, "Jewel Cave: What I Have Heard and Seen," 10; Walt Lienau, notes from interview with Eric and Fred Heidepriem, July 9, 1959, File 1692c, Jewel Cave NM MF.

[118] Walt Lienau, notes on interview with Jim Connor, August 5, 1959, File 1692k, Jewel Cave NM MF.

[119] Evans-Hatch and Evans-Hatch, *Place of Passages*, 196.

[120] Roger W. Toll, "Report to the Director, National Park Service on Jewel Cave National Monument," November 18, 1929, 2, File 62f, Jewel Cave NM MF.

[121] Jewel Cave Corporation Meeting, minutes, September 12, 1928, 4, File 49q, Jewel Cave NM MF.

[122] Evans-Hatch and Evans-Hatch, *Place of Passages*, 197.

[123] "Custer Commercial Club Fetes Men From Wyoming," *Argus-Leader (Sioux Falls, SD)*, October 15, 1929, 4, accessed via newspapers.com.

Other Caves Under Federal Protection, 1900–1930

The federal government protected several caves between 1900 and 1930, in addition to Wind Cave and Jewel Cave. Only a few months after establishing Jewel Cave, President Roosevelt signed an executive order establishing Lewis and Clark Cavern National Monument in Montana from lands donated to the federal government by Northern Pacific Railway.[124] The following year, President William Howard Taft proclaimed Shoshone Cavern National Monument in Wyoming and Oregon Caves National Monument in Oregon. Oregon Caves, like Jewel Cave, was formerly national forest land (Siuslaw National Forest), and the Forest Service managed it.[125]

The executive orders establishing these national monuments emphasized the caves' scientific importance, aesthetic beauty, and unknown depth, both to justify protecting them under the Antiquities Act and to validate to their potential for tourism. For instance, Taft's proclamation establishing Shoshone Cavern National Monument began,

> WHEREAS, a cavern in the State of Wyoming, of unknown extent but of many windings and ramifications and containing vaulted chambers of large size, magnificently decorated with sparkling crystals and beautiful stalactites, and containing impenetrable pits of unknown depth, is of great scientific interest and value to the people of the United States, and it appears that the public interest would be promoted by reserving it as a National Monument . . . .[126]

In 1922, Warren G. Harding established Lehman Caves National Monument. As Taft had for Shoshone Cavern, Harding emphasized the "unusual scientific interest and importance of the caves." Lehman Caves National Monument had also been part of a national forest (Nevada National Forest), and the Forest Service managed it.[127] At Lehman Caves and Oregon Caves, as at Jewel Cave, the Forest Service granted a private concessionaire a contract to operate the tourist services.[128]

While these caves were being carved out of Forest Reserves, protected as national monuments, and managed by concessionaires contracted out by the Forest Service, Kentucky legislators fought to make Mammoth Cave a national park. In 1923, NPS Director Steven Mather recommended its protection:

> Many efforts have been made in the past to secure the Mammoth Cave of Kentucky, with sufficient adjoining area, including the recently discovered Onyx Cave, to permit of its full development for a national park, but thus far these efforts have been fruitless. Nature's most magnificent and certainly the largest, limestone cavern, with approximately 40 miles of wonderfully formed underground

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[124] Theodore Roosevelt, Presidential Proclamation No. 807, May 11, 1908; Bob Janiskee, "Pruning the Parks: Lewis and Clark Cavern National Monument (1908–1937)," *National Parks Traveler*, October 17, 2010, www.nationalparkstraveler.org/2010/10/pruning-parks-lewis-and-clark-cavern-national-monument-1908-19377072.

[125] William Howard Taft, Presidential Proclamation No. 876, July 12, 1909; William Howard Taft, Presidential Proclamation, September 21, 1909, 36 Stat. 2501; Bob Janiskee, "Pruning the Parks: Shoshone Cavern National Monument (1909–1954) Would Have Cost Too Much to Develop," *National Parks Traveler*, September 18, 2008, www.nationalparkstraveler.org/2008/09/pruning-parks-shoshone-cavern-national-monument-1909-1954-would-have-cost-too-much-develop2972.

[126] William Howard Taft, Presidential Proclamation, September 21, 1909, 36 Stat. 2501.

[127] Warren G. Harding, Presidential Proclamation, January 24, 1909, 42 Stat. 2260.

[128] Trexler, "Lehman Caves . . . its Human Story," 18–30; NPS, "Oregon Caves National Monument & Preserve Timeline," last updated May 18, 2018, https://www.nps.gov/orca/learn/historyculture/timeline.htm.

> passages and chambers, it is not only known to every school child in the land but is already the mecca of travelers the world over. . . . More national parks are needed in the East, and the inclusion of the Mammoth Cave region would add one of the most remarkable of 'distinguished examples of typical forms of world architecture" to the proud national-park family.[129]

The following year, several local citizens created the Mammoth Cave National Park Association to promote the creation of a park protecting the cave. Their lobbying efforts were successful, and in 1926, Congress passed, and President Calvin Coolidge signed, legislation establishing Mammoth Cave National Park, the second national park to protect a cave (after Wind Cave).[130]

On the other side of the country, Coolidge's administration had taken steps to protect Carlsbad Caverns in New Mexico. In 1923, President Coolidge issued a presidential proclamation establishing Carlsbad Cave National Monument, and supplemental executive orders over the following years withdrew additional land and authorized a possible national park at the caverns.[131] In 1930, Congress passed, and President Herbert Hoover signed into law, legislation creating Carlsbad Caverns National Park, to be administered by the NPS.[132] Thus, as of 1930, the NPS had three national parks dedicated to protecting caves: Carlsbad Caverns, Mammoth Cave, and Wind Cave.

Conclusion

In 1906, Custer-area boosters promoted creation of a Jewel Cave Game Preserve, eager to protect Jewel Cave and draw in tourists as boosters had at Wind Cave. Frank and Albert Michaud and Bertha Cain maintained their mining claims at and near the then-known cave, and Frank and his family lived near the cave part of the year. Although the Forest Service rejected the game preserve idea, President Theodore Roosevelt established Jewel Cave National Monument on February 8, 1908. For the next 20 years, the status of Jewel Cave was in limbo. The Forest Service could not develop the cave because of the Michauds' mining claims, but the Michauds would not relinquish their claims or apply for a patent without reimbursement for their investments in the property.

Finally, thanks to community organizations in Custer and Newcastle and a proactive Harney National Forest supervisor, the Jewel Cave Corporation was formed. The corporation raised money to pay Mamie Michaud to surrender all remaining claims to the site, thus ending the impasse between the Forest Service and the Michauds. Despite almost 30 years of commitment to Jewel Cave, Mamie Michaud received relatively little for the family's investment—less than what Cain had requested in 1908. After paying Michaud, the Jewel Cave Corporation provided the funds to develop and open Jewel Cave to visitors in 1928.

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[129] Stephen T. Mather, "Report of the Director of the National Park Service to the Secretary of the Interior," (Washington, DC: US Government Printing Office, 1920), 84.

[130] An Act of May 25, 1926, 44 Stat. 635 (P.L. 283); NPS, "The National Park Idea."

[131] Calvin Coolidge, Presidential Proclamation, October 25, 1923, 46 Stat. 1929; Calvin Coolidge, Executive Order 3984, April 2, 1924; Calvin Coolidge, Executive Order 4870, May 3, 1928.

[132] An Act of May 14, 1930, 46 Stat. 279 (P.L. 216).

Chapter 3: The National Park Service Takes Over (ca. 1933–1957)

In 1933, a federal executive order transferred Jewel Cave National Monument from the jurisdiction of the Forest Service to the National Park Service (NPS). Within the NPS, Jewel Cave fell under the jurisdiction of Wind Cave National Park. The NPS did not appropriate money specifically for the management of Jewel Cave in the 1930s. Instead, for most of the decade, the Jewel Cave Corporation (JCC) provided guide services at Jewel Cave, and the Civilian Conservation Corps (CCC) carried out infrastructure improvements. When the JCC ceased operations in 1939, the NPS took full responsibility for activities at the monument. Over the next two decades, Wind Cave superintendents created positions at Jewel Cave with increasing management responsibilities.

Both the JCC and NPS confronted an issue that became an ongoing reality for the NPS in later eras: more and more people wanted to tour the cave. The JCC was able to meet the demand with a staff of three guides. Throughout the 1940s and 1950s, the NPS struggled to keep Jewel Cave adequately staffed, due to tight budgets and continually increasing visitor numbers. By the mid-1950s, the NPS reached a tipping point with Jewel Cave. Agency officials debated three options: the agency could (1) invest in the monument and create an experience for visitors like that at Wind Cave (which had an elevator), (2) keep Jewel Cave in its current state and emphasize its "primitive" nature to contrast with more developed tours, or (3) delist the monument altogether and remove it from the care of the NPS.

Jewel Cave Corporation, the Civilian Conservation Corps, and the National Park Service (1933–1939)

Following creation of the NPS in 1916, NPS officials sought to take control of the nation's national monuments, concerned that the Forest Service neglected those under its purview.[1] In October 1929, the NPS sent a representative to report on Jewel Cave, perhaps in response to an August 1929 letter from Albert Michaud to NPS Director Stephen Mather, in which Michaud complained about the Forest Service's lack of interest and investment in Jewel Cave.[2] The development work that the JCC had done at the cave in the preceding year might also have caught NPS officials' attention. Whatever the impetus, on October 20, 1929, Yellowstone National Park Superintendent Roger W. Toll visited Jewel Cave National Monument (Jewel Cave) and prepared a report on its history, geology, operations, and management. Toll concluded,

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[1] Hal Rothman, *America's National Monuments: The Politics of Preservation* (Lawrence: University Press of Kansas, 1994), 202.

[2] Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study* (Omaha: NPS Midwest Regional Office, 2006), 201.

> The cave has much beauty, but crystals, unless extraordinary in variety, can hardly hold the continued interest of visitors, to the same extent as "drip formations." It would seem that the cave is of local and state-wide importance rather than of national interest.[3]

Toll made no further recommendations, and the NPS showed no signs over the next several years of wanting to take over management of Jewel Cave.

On June 10, 1933, in an unrelated action, President Franklin D. Roosevelt issued Executive Order (EO) 6166, which reorganized federal executive agencies in order to reduce expenditures. Section 2 of the order consolidated management of all "public buildings, reservations, national parks, national monuments, and national cemeteries" into one Office of National Parks, Buildings, and Reservations, which would replace the extant NPS but would remain under the Department of the Interior (DOI).[4] One year later, Congress changed the agency's name back to the National Park Service.[5] The reorganization greatly expanded the role and scope of the NPS: when the order went into effect in August 1933, the National Park System immediately acquired 70 new units.[6] These included national monuments, national memorials, national military parks, urban spaces in Washington, DC, and a recreational area. The expanded land area and new site types posed management challenges for the still-fledgling NPS.[7]

EO 6166 affected the Forest Service by moving some lands that it had managed as national monuments, like Jewel Cave, to NPS jurisdiction. Forest Service officials in Washington had been unaware of the impending transfer and, once they learned of it, were displeased with losing control of forest acreage.[8] With the reassignment of Jewel Cave to the NPS, for example, the Forest Service lost around 7,000,000 board-feet of timber, worth an estimated $55,495.44, which included "one of the finest stands of virgin ponderosa pine in the Black Hills."[9]

The JCC did not receive formal notice of the transfer until June 1934. Board members' immediate concern was that the NPS would not honor its lease with the Forest Service for the area around the cave entrance, which enabled the JCC to conduct tours at the site. Under the assumption that the lease was void and that it would no longer be allowed to operate a guide service, the JCC board resolved to recover its investment in the cave from the US government.[10] The JCC held a

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[3] Roger W. Toll, "Report to the Director, National Park Service on Jewel Cave National Monument," November 18, 1929, 2, File 62f, Jewel Cave National Monument Museum Files, Custer, SD (hereafter Jewel Cave NM MF).

[4] Executive Order 6166 of June 10, 1933, Organization of Executive Agencies.

[5] Act of March 2, 1934 (48 Stat. 369).

[6] Rothman, *America's National Monuments*, 202.

[7] Rothman, *America's National Monuments*, 187; Ronald F. Lee, "Family Tree of the National Park System," 1972, http://npshistory.com/centennial/0316/timeline.htm.

[8] Harlan D. Unrau and G. Frank Williss, "C. Reorganization of 1933," *Expansion of the National Park Service in the 1930s: Administrative History* (Denver: NPS, 1983), https://www.nps.gov/parkhistory/online_books/unrau-williss/adhi2c.htm.

[9] DOI, NPS, "Land Ownership Record," September 1944, Cabinet 3, Drawer 4, Folder L1425 Holdings other than Federal, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF).

[10] Jewel Cave Corporation meeting, minutes, September 14, 1933, File 49r, Jewel Cave NM MF; Jewel Cave Corporation meeting, minutes, June 10, 1934, Files 49s–49t, Jewel Cave NM MF.

picnic for over 1,000 people at the monument on June 10, 1934, to raise funds and to celebrate the transfer.[11]

The JCC spent two years waiting for direction from the NPS about how to proceed. Members petitioned the NPS to reimburse them for "monies the Corporation had expended in acquiring title to and improving Jewel Cave."[12] It is not clear whether the JCC continued to give tours between 1934 and early 1936, which overlapped with the beginning of the period that the CCC was active at the cave (1935–1939), or if it took a hiatus while seeking reimbursement. Finally, in June 1936, the JCC received a special use permit from the NPS to conduct a guiding service at Jewel Cave.[13] The JCC paid the NPS $5 for the permit.[14] The agreement provided that "all fees shall revert to the corporation in return for guide service furnished until an investment of $1925 has been paid to the stockholders," after which point profits would go to Wind Cave National Park (Wind Cave) to support management of Jewel Cave.[15]

For the remainder of the decade, Jewel Cave was officially under the management of Wind Cave, but the JCC continued to administer day-to-day operations through the special use permit. Congress did not include a line item for Jewel Cave in NPS budgets during the 1930s, although minimal funding for Jewel Cave came through Wind Cave and the CCC. When the NPS Region 2 office (covering the Midwest) opened in Omaha in 1937, Jewel Cave and Wind Cave fell under it, but the change had little practical effect on management of Jewel Cave. Wind Cave Superintendent Edward D. Freeland oversaw Jewel Cave's partnerships with the JCC and the CCC until he transferred to another post in March 1939. Howard B. Stricklin then served as acting superintendent until Harry J. Liek became the next permanent Wind Cave superintendent on May 26, 1939.[16]

Although the NPS left operation of Jewel Cave tours in the JCC's hands, NPS planners drafted plans for development of Jewel Cave infrastructure to be carried out by CCC workers from a temporary CCC camp on site.[17] The NPS, in partnership with the Public Health Service and other

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[11] Jewel Cave Corporation meeting, minutes, June 10, 1934, Files 49s–49t, Jewel Cave NM MF.

[12] The minutes use the term "acquiring title," but the JCC never owned the land at Jewel Cave. Presumably they are referring to the lease they had with the Forest Service. Jewel Cave Corporation meeting, minutes, March 30 ,1936, File 49u, Jewel Cave NM MF.

[13] Jewel Cave Corporation meeting, minutes, June 4, 1936, File 49v, Jewel Cave NM MF .

[14] Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49dd, Jewel Cave NM MF.

[15] Jewel Cave Corporation meeting, minutes, April 4, 1939, File 49z, Jewel Cave NM MF.

[16] John W. Bohi, "75 Years at Wind Cave," 96–97, 108; Howard Baker, "The Early Days," *Courier* 34, no. 3 (March 1989): 18; Howard B. Stricklin, Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1939, October 7, 1939, 1, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), National Archives and Records Administration, Kansas City, MO (hereafter NARA KC).

[17] Congress passed the Unemployment Relief Act on March 31, 1933 (48 Stat. 22, P. L. 73-5). On April 5, 1933, President Franklin D. Roosevelt signed Executive Order 610 establishing the Emergency Conservation Work program (ECW) under the authority of the Unemployment Relief Act. The ECW was known publicly as the Civilian Conservation Corps (CCC), and its name officially changed to CCC in 1937. For the purposes of clarity in this report, we use the term CCC, although the reader will see in footnotes that sources cited referred to the program as ECW. See Lou Ann Speulda, "History of the CCC and WPA and other Depression-Era Programs in Region 6 of the USFS," 2003, 2, https://www.fws.gov/uploadedFiles/Depression%20Era%20Programs%20-%20Region%206.pdf.

government agencies, considered JCC suggestions for developing the cave, including establishing a campground for visitors, running a pipe from the spring "at the Old Michaud residence down to the proposed campground," constructing a "new log office and residence building," and erecting a maintenance building.[18] Although the NPS did not adopt all of these suggestions, it took them into account when developing plans for the monument. The CCC did not perform any significant work at Jasper Cave, and the JCC continued to give tours of only Jewel Cave.

Highway 16 Realignment

Custer and Newcastle boosters had lobbied the federal government for a more direct route between the two towns for decades. In the 1930s, increasing numbers of tourists used the old road, despite its deteriorating condition. The US Department of Agriculture (USDA) Bureau of Public Roads (BPR), which was responsible for building Forest Service roads, supported the plan to construct a new road between the towns, echoing boosters' hopes that a better road would increase tourist traffic through the southern Black Hills.[19] The new route would be located along "the only logical outlet leading west from the southern portion of the Black Hills," which was just south of the original monument boundary. BPR schematic plans showed the new road passing within a quarter mile of the entrance of Jewel Cave.[20] The JCC and civic groups in Newcastle and Custer hoped a new road would boost visitation to the cave.

The proposed road (the current Highway 16, although it had different designations on Forest Service land) passed through Forest Service, NPS, and private lands in both South Dakota and Wyoming, and its construction was a multiagency effort. In 1931, the BPR completed a location survey of Forest Highway route Number 6, which included a portion of the proposed Custer-Newcastle Road. In 1932, the South Dakota State Highway Department completed four miles of the road, from Custer to Four Mile Creek, "as a federal aid project."[21] Also in 1932, the Forest Service constructed two sections of the road—from Four Mile to Lightning Creek (4.1 miles) and the stretch from Lightning Creek to around Lithograph Canyon (3.62 miles)—as forest highways. The following year, the Wyoming State Highway Department constructed portions of the road in Wyoming, from the state boundary to the intersection with Highway 85.[22]

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[18] Jewel Cave Corporation meeting, minutes, September 14, 1933, File 49r, Jewel Cave NM MF.

[19] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A. Harney National Forest and Jewel Cave National Monument Custer County State of South Dakota," December 12, 1934, 3, National Park Service Electronic Technical Center (hereafter eTIC).

[20] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 2, eTIC.

[21] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 4, eTIC.

[22] DOI, NPS, "Plans for Proposed Custer – Wind Cave Park Approach Road (e) Project 'A' Grading," map, 1932, eTIC.

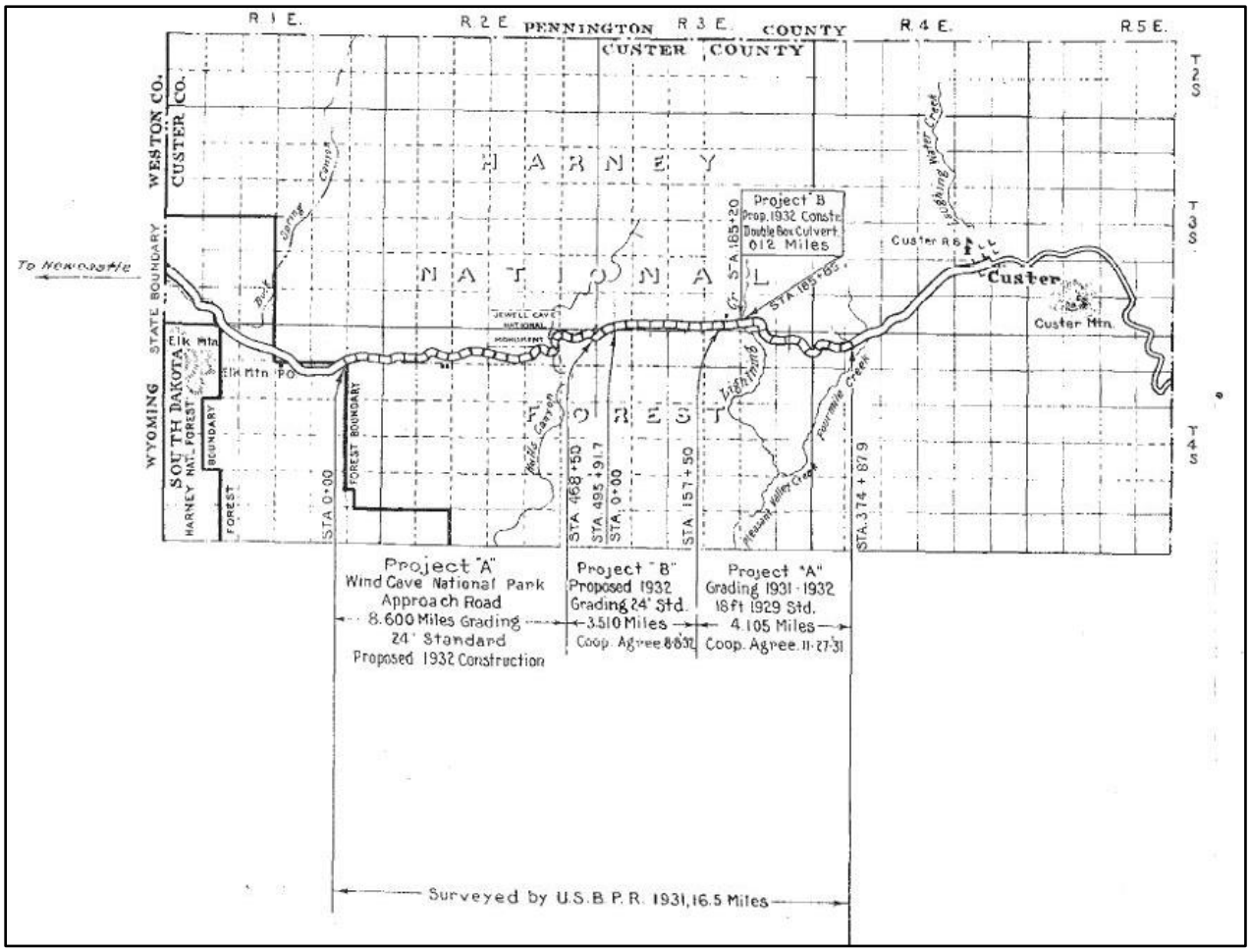


Figure 16. This Bureau of Public Roads map shows how the road grading project was split into sections by funding source. The National Park Approach Road is "Project 'A'," and references Wind Cave National Park because Jewel Cave NM was managed by Wind Cave at the time.

Source: Bureau of Public Roads, US Department of Agriculture.

This left one remaining segment to build: the 8.6 miles around Jewel Cave, from Lightning Creek to the western boundary of Harney National Forest (see Figure 16).[23] The NPS financed this segment as a "National Park Approach Road," made possible under an April 9, 1924, act of Congress that allowed the NPS to fund construction of roads leading to national parks. Laborers carried out the construction pursuant to the Act of January 31, 1931, as amended by the Emergency Relief and Construction Act of July 21, 1932, which enabled emergency funding and labor for public works projects during the Great Depression. The secretary of the Interior and the president approved the 8.6-mile "Custer-Wind Cave Approach Road" to Jewel Cave National Monument as a project to be funded by the Emergency Relief and Construction Act and carried out by CCC

[23] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 4, eTIC.

laborers on July 29, 1932.[24] In early 1933, the secretary of the Interior signed a cooperative agreement with the South Dakota State Highway Commission, which further clarified that the DOI would construct the remaining 8.6 miles of the road as a National Park Approach Road, while the state of South Dakota would be responsible for subsequent repair and maintenance.[25]

During the planning process, US Senator Peter Norbeck (R-SD) proposed that the road include a suspension bridge to span Hell Canyon. BPR engineers estimated that the bridge would cost $500,000, and it would require revamping the already-developed park approach road plans, which did not include a bridge. They delayed the project briefly in case federal funding came through for the bridge, but when it did not, the NPS continued with a plan that did not require a suspension bridge over Hell Canyon.[26]

The NPS hired S. J. Groves and Sons Company of Minneapolis, Minnesota, to grade the highway bed (see Figure 17). In 1932, the company erected "a very modern contractor's camp" in Hell Canyon, about a mile north of the current Highway 16, in a clearing with asphalt, concrete pads, and a nearby water cistern. The camp included year-round quarters for 100 to 150 workers, a kitchen, and dining room. The contractor rigged the camp with electric lights and running water and built a machine shop. Workers were paid between 35 and 45 cents an hour, funded through the Emergency Relief and Construction Act.[27]



Figure 17. Crews grade the new road between Custer and Newcastle (*now known as Highway 16*) near Jewel Cave NM, ca. 1932.

Source: NPS, Jewel Cave NM.

[24] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 3–4, eTIC.

[25] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 5, eTIC.

[26] A. E. Palen, Acting District Engineer, to H. K. Bishop, Chief, Division of Construction, October 15, 1932, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

[27] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 6–8, eTIC.

Workers employed "team and hand methods" to excavate ground for the graded roadway.[28] During this excavation, Groves and Sons found mostly "irregular and broken" rock ledges. The BPR noted in its geology report,

> Comparatively few solid rock ledges were encountered, the general formation being irregular and broken. Where the surfaces would indicate considerable rock, many times the material at these locations would be common with only a few [scattering?] boulders, and vice versa. The best illustration of this was in the heavy cut between stations 376 and 379 [just west of the turnoff to the Jewel Cave historic entrance]. At this location, where the road cut through a ridge just before entering Hell Canyon on the east side, there was every indication that the material would be largely rock. The maximum cut was approximately 42 feet on the centerline, the slope cuts increasing on the left to 53 feet. After breaking through a crust of rock at the edges, the material became a red clay and gray loam with practically no rock. The clay lies in a bed near the bottom of the cut on the left, with a heavy overburden composed of gray loam. Shortly after this cut had been excavated and nearly sloped, a heavy slide occurred in the left cut bank which entirely closed the road.[29]

After enduring landslides and a violent storm that blew down trees but only minimally damaged the new road, Groves and Sons completed the highway bed grading on September 30, 1933 (see Figure 18).[30] The final road was dirt, but the BPR planned to pave it to reduce wear and tear. The BPR noted, "the alignment and grades are designed for fairly high speed which will rapidly wear away any earth road. Until the next step in improvement can be applied, it should be insisted that the project be covered with intensive maintenance."[31] Construction of the 8.6 miles of National Park Approach Road cost the NPS a total of $272,001.84.[32]



Figure 18. Looking out over Hell Canyon, new road between Custer and Newcastle after being graded, ca. 1933.

Source: NPS, Jewel Cave NM.

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[28] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 9–10, eTIC.

[29] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 12–13, eTIC. The slide occurred because the rock is shale and is located adjacent to a fault line. Mike Wiles, comments on draft administrative history, April 7, 2020.

[30] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 6–8, eTIC.

[31] USDA Bureau of Public Roads, District No. 3, "Final Construction Report on Custer-Wind Cave Approach Road 'E' Grading, Section A," 6, eTIC.

[32] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 3002-D-9, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan 1942, Jewel Cave NM CF.

Development by the CCC

From 1935 until 1939, the CCC constructed a variety of improvements at Jewel Cave, including a water and sewer system, a ranger cabin, and roads and trails within the monument. The Jewel Cave CCC camp was a side camp of the Wind Cave CCC camp. The physical camp was located near the current historic area parking lot (a different location from the Groves and Sons temporary camp).[33] In 1935, approximately 20 CCC laborers lived in this camp in what one worker called "old square army tents . . . pitched where ever there was a place" and slept on army cots.[34] During autumn and winter 1935–1936, CCC workers added to the Hell Canyon camp with the construction of barracks and a mess hall from salvaged lumber.[35] For the next three years, workers lived in the barracks from Monday to Friday, working from 7:00 am to 5:00 pm, and then returned to the Wind Cave CCC camp for the weekends (see Figure 19).[36]



Figure 19. Civilian Conservation Corps crews pictured at Jewel Cave, ca. 1935.

Source: NPS, Jewel Cave NM.

Water and Sewer System

In 1935 and 1936, CCC crews built a water and sewage control system at Jewel Cave. Foreman Bill Engelbert, a local plumber, and CCC leader A. E. Tucholke supervised crews as they dug a reservoir, lined it with concrete, dug ditches from the spring (now known as Jewel Cave Spring) to

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[33] Evans-Hatch and Evans-Hatch, *Place of Passages*, 205.

[34] ____ [first name unknown] Schaffer, Answers to questionnaire, undated [ca. 1995], in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

[35] DOI, NPS, Wind Cave National Park, NP-1, Project completion chart, Sixth Enrollment Period, March 31, 1936, and Wind Cave National Park, Justifications for Individual Projects, ECW Program, Sixth Enrollment Period, August 27, 1935, 5, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

[36] Schaffer, Answers to questionnaire, undated [ca. 1995]; Conrad Wirth to Regional Director, Region II, February 10, 1938, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC; Acting Assistant Director, NPS, to Superintendent, Wind Cave National Park, May 11, 1937, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

the reservoir for pipes, laid the pipes, and built a septic tank and filter trench.[37] The US Public Health Service developed plans for the septic system, which included a corrugated half circle of iron, a redwood two-by-four below it, and a sand and gravel backfilled area above the half-circle.[38]

The water supply reservoir was completed in February 1936. This was later than anticipated, because plans changed to accommodate a larger reservoir (3,000 gallons) with adequate storage for drinking water and fire protection.[39] Crews also built a drinking fountain in 1936.[40] Perhaps as a result of the water improvements at Jewel Cave in 1935 and 1936, the NPS formally acquired water rights from the Forest Service for the Jewel Cave land area on August 8, 1937. It is not clear why the water rights transfer occurred four years after the land transfer.[41]

Ranger Cabin

The NPS Branch of Plans and Design drew up the plan for an administration building in February 1935.[42] At the time, JCC guides lived in a tent to the northeast of the proposed building (near where the campground was eventually built).[43] CCC crews built the administration cabin and had completed it by February 1936 (see Figures 20 and 21). Estimated costs for CCC labor and supervision were around $600.[44] The interior was likely not completed until 1938, in order to give the logs "time to season."[45]

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[37] A. E. Tucholke to Bruce Bitz, March 15, 1995, in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD; Schaffer, Answers to questionnaire, undated [ca. 1995]; DOI, NPS, Wind Cave National Park, NP-1, Project completion chart, Sixth Enrollment Period.

[38] U.S. Treasury Department, U.S. Public Health Service, "Septic Tank & Filter Trench, Sewage Disposal Plant, Jewel Cave National Monument South Dakota," November 14, 1935, eTIC.

[39] Wind Cave National Park, Justifications for Individual Projects, ECW Program, Sixth Enrollment Period; DOI, NPS, Wind Cave National Park, NP-1, Project completion chart, Sixth Enrollment Period; Development Outline, Jewel Cave National Monument, Headquarters Area – Utilities, May 15, 1952, Cabinet 3, Drawer 3, Folder D18 Master Plan, Jewel Cave NM CF.

[40] Conrad L. Wirth, Assistant Director, to Superintendent, Wind Cave National Park, May 14, 1936, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC; Wind Cave National Park, Project Application and Accomplishment, Emergency Conservation Work, NPS, undated [1936?], National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

[41] DOI, NPS, "Land Ownership Record," September 1944.

[42] DOI, NPS, Jewel Cave National Monument Ranger's Cabin, blueprint, February 1935, eTIC.

[43] DOI, NPS, "Jewel Cave National Monument: Proposed Foot Trail and Masonry Steps," September 1935, eTIC; Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*, March 2005, 47, 50, map of the ranger's tent at 82.

[44] Schaffer, Answers to questionnaire, undated [ca. 1995].

[45] Alan W. Bright, "Rugged Charm: Ranger Cabin (HS-1) Historic Structure Report, Jewel Cave National Monument, Custer, South Dakota," November 1999, 18–19, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report, Jewel Cave NM CF.



Figure 20. CCC crews constructing the ranger cabin at Jewel Cave, ca. 1933.

Source: NPS, Jewel Cave NM.



Figure 21. The nearly completed ranger cabin in Jewel Cave, ca. 1936.

Source: NPS.

Roads

CCC crews built the access road connecting the cave development area with the new Custer-Newcastle highway. Years later, one worker remembered the road as "quite crude."[46] Crews also assisted with side work for the Highway 16 project, including sloping the road shoulder to reduce erosion and fixing guardrails that had settled.[47] In 1939, the JCC paid Lea Hosback for "services for team of horses at Jewel Cave on construction of roads."[48] While it is not clear which monument roads Hosback and his team of horses worked on, the payment demonstrates that the JCC provided some assistance with development of the entry area for tourism, even while the CCC was on site.

Surface Trails

During summer 1936, the CCC constructed a new foot trail from the entry road, past the planned administration building, and down the limestone cliffs to the cave entrance (see Figures 22 and 23).[49] CCC crews built a stairway with wooden steps in a rock crevice in the cliff, with a width of two to six feet.[50] The wooden steps quickly fell into disrepair, and in 1938, the NPS recommended that the CCC update the stairway.[51] The following year, CCC crews replaced the wooden steps with

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[46] Schaffer, Answers to questionnaire, undated [ca. 1995].

[47] National Park Service, Seventh Period ECW Program, Wind Cave, Camp No. NP-1, April 7, 1936; and NPS, Justifications for Proposed New ECW Projects, February 12, 1936, both in National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

[48] Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49bb, Jewel Cave NM MF.

[49] DOI, NPS, Wind Cave National Park, NP-1, Project completion chart, Sixth Enrollment Period; Development Outline, Jewel Cave National Monument, May 15, 1952, 2, Cabinet 3, Drawer 3, Folder D18 Master Plan, Jewel Cave NM CF.

[50] DOI, NPS, "Jewel Cave National Monument: Proposed Foot Trail and Masonry Steps," September 1935, eTIC.

[51] Howard W. Baker, Regional Landscape Architect, "Jewel Cave National Monument Report," June 5–6, 1938, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

sandstone steps. Landscaping included placing a "large native rock" on the slope-slide of the stairway and addition of a mounted pipe handrail.[52]

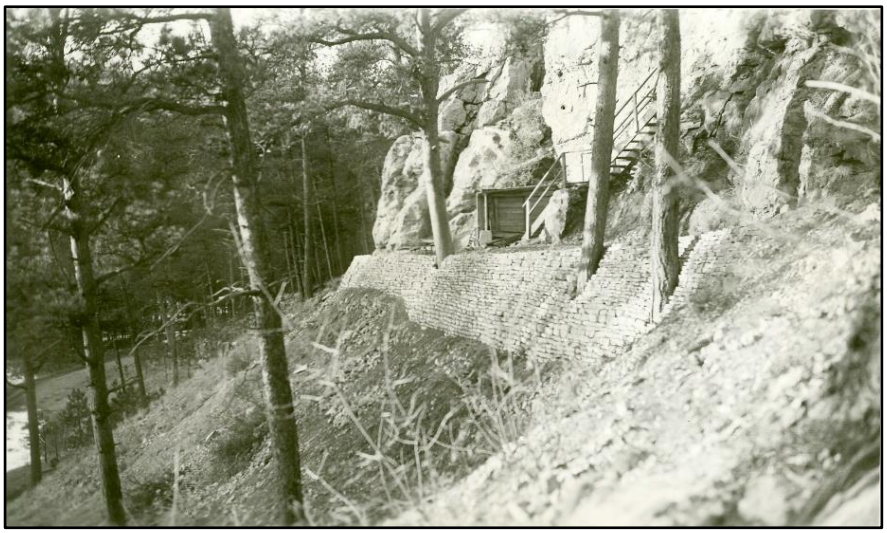


Figure 22. The CCC built a retaining wall and wooden stairs to the cave entrance, pictured here in partial completion. CCC crews eventually covered the retaining well with dirt to provide a more natural appearance. They also removed all wooden structures, including the stairs, and left only a steel gate at the rectangular cave entrance. 1935.

Source: NPS, Jewel Cave NM.

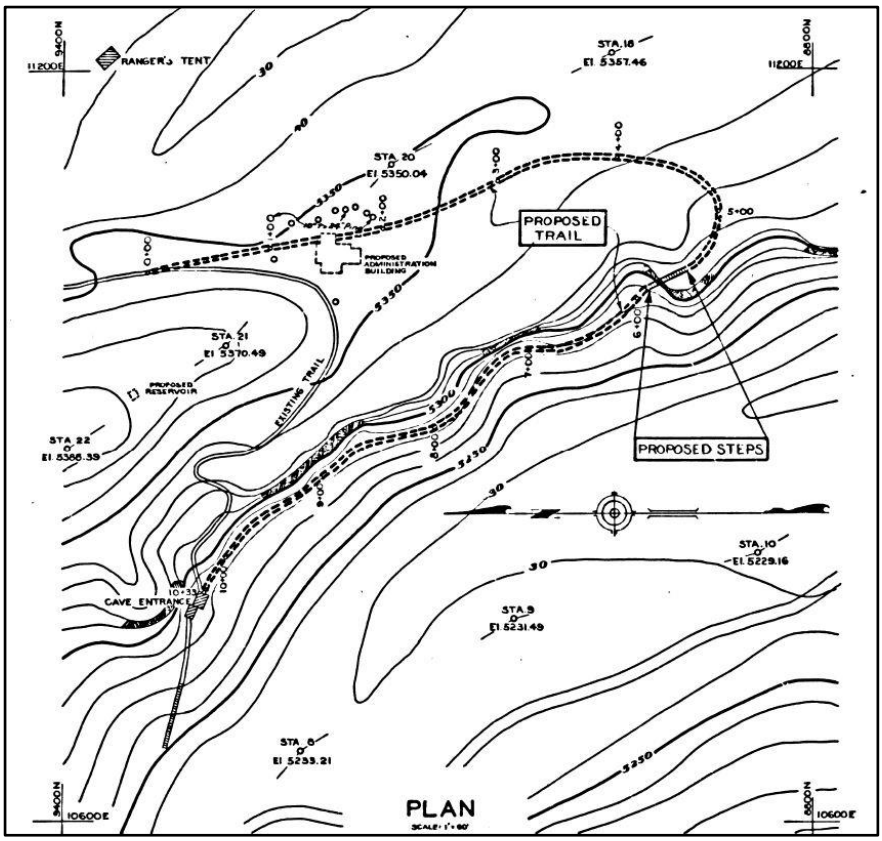


Figure 23. Map showing the existing trail from the entry road to the cave entrance and the proposed new trail, which the CCC eventually built. It also shows the existing ranger's tent and the proposed cabin, 1935.

Source: NPS, Western Office of Design and Construction.

[52] DOI, NPS, Stone Trail Steps, eTIC.

Cave Trails

Inside the cave, the JCC maintained existing wooden ladders, stairways, and cave trails.[53] When NPS Regional Geologist J. Volney Lewis visited in 1935, he reported on the status of cave trails:

> The trails and stairways in the cave will call for improvement in many places as development proceeds. Some of the old wooden stairs are too steep for comfort; and in places they are unsafe, especially for elderly people and for ladies, some of whom still wear high-heel shoes, even in caves.
>
> Improved stairways can probably be designed without injury to any of the essential features of the cave. A geologist should study the cave with a view to the underground improvements and also in order to determine, if possible, its origin and the conditions under which the crystals were formed, so that the story of the cave may be related to the visitors.[54]

Wind Cave managers recommended that the CCC assist with cave trail maintenance, but it does not appear that CCC crews ever conducted significant trail maintenance work.[55]



Figure 24. CCC workers wrote their names on the walls of the cave in the Kittycombs area. Pictured here in 2017.

Source: NPS, Jewel Cave NM.

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[53] Superintendent Harry J. Liek to Region Two Director, memorandum, March 16, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 600-01 Master Plan, Records of the National Park Service Region II (Midwest Region), NARA KC.

[54] J. Volney Lewis, "Jewel Cave National Monument: Geologic Memoranda," July 25, 1935, File 3449zze, Jewel Cave NM MF.

[55] Wind Cave National Park, Justifications for Individual Projects, ECW Program, Sixth Enrollment Period.

NPS Chief Engineer Frank A. Kittredge visited Jewel Cave with Lewis in July and recommended "that a survey be made to determine the extent and exact location of existing trails and major passageways in Jewel Cave, so that an accurate map of this cave may be made."[56] CCC crews completed the survey in March 1936 and sent the data to the chief engineer's office, where staff drew a detailed map showing the location of ladders and other built infrastructure on the cave tour route.[57] When CCC crews improved cave trails, they explored some of the passages. Decades later, cavers found the names of CCC workers and their friends on the wall in the Kittycombs area (see Figure 24).[58] The CCC surveys remained an important resource decades later.[59]

Entry and Approach Signs

Before the NPS took over, the JCC had erected "small roadside signs" advertising Jewel Cave to motorists passing by the monument.[60] In 1936, CCC workers built a new entry sign, designed by the NPS Branch of Plans and Design, and installed it at the point where the monument road from the ranger cabin intersected with Highway 16 (see Figure 25).[61] CCC workers also constructed warning signs along monument roads and installed landscaping in the traffic island around the entry sign.[62]

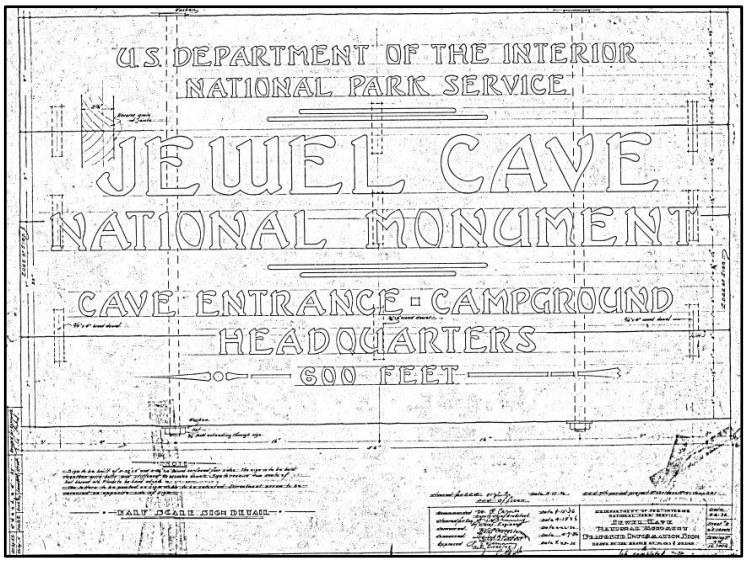


Figure 25. Design of the entrance sign for Jewel Cave, drawn by NPS Branch of Plans and Design, 1936.

Source: NPS.

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[56] Wind Cave National Park, Justifications for Individual Projects, ECW Program, Sixth Enrollment Period.

[57] DOI, NPS, Office of the Chief Engineer, "Map of Jewel Cave Showing Underground Passages and Trails," July 1936, eTIC; DOI, NPS, Wind Cave National Park, NP-1, Project completion chart, Sixth Enrollment Period.

[58] Dwight Deal, "Jewel Cave Exploration late 1800s through 1962," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019.

[59] Alex Mitich, "Cave Questions – Little Jewels," *Bits and Pieces* 7, no. 2 (March–April 1971): 19, in Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park His. Research Documents, Jewel Cave NM CF; Dwight Deal, interview by Jackie Gonzales, June 30, 2019, Custer, SD.

[60] Wind Cave National Park, Justifications for Individual Projects, ECW Supplemental Work Program Plan, Sixth Enrollment Period, December 12, 1935, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

[61] DOI, NPS, Jewel Cave National Monument Proposed Information Sign, April 1936, eTIC.

[62] Wind Cave National Park, Justifications for Individual Projects, ECW Supplemental Work Program Plan, Sixth Enrollment Period; DOI, NPS, Stone Trail Steps, September 1939, eTIC.

Boundaries

NPS officials wanted a boundary fence and a complete survey of the monument's boundaries.[63] Wind Cave officials explained the need:

> The boundaries of Jewel Cave National Monument have never been completely surveyed or marked. As a result, hunters frequently trespass on this monument unintentionally, and occasionally some livestock graze on the area. For these reasons it is considered necessary to fence the entire monument, and an accurate survey is a necessary preliminary to undertaking this work. . . . erection of a 4-wire barbed wire fence will definitely prevent trespassing by either persons or livestock, and will serve also to increase the number of game animals living within this refuge. The fence can be erected at low cost by using posts salvaged from old game fences which are being removed in Wind Cave National Park, leaving only the barbed wire to be purchased.[64]

By 1939, CCC crews had fenced the original rectangular boundary of the national monument with a barbed wire fence, including the right-of-way along Highway 16.[65]

Campground

Wind Cave's CCC funding requests for Jewel Cave first included a campground in 1936, but work on it did not begin until 1938.[66] The campground, which also included a small picnic area, was located to the northeast and across a ravine from the ranger cabin (see Figure 26).[67] Crews defined a roadbed (but did not grade it) for the campground loop road and seven spurs, designed under the "Meinecke system of control," developed by E. P. Meinecke in the 1920s as a way to manage automobile traffic at campgrounds while also mitigating damage to trees and other

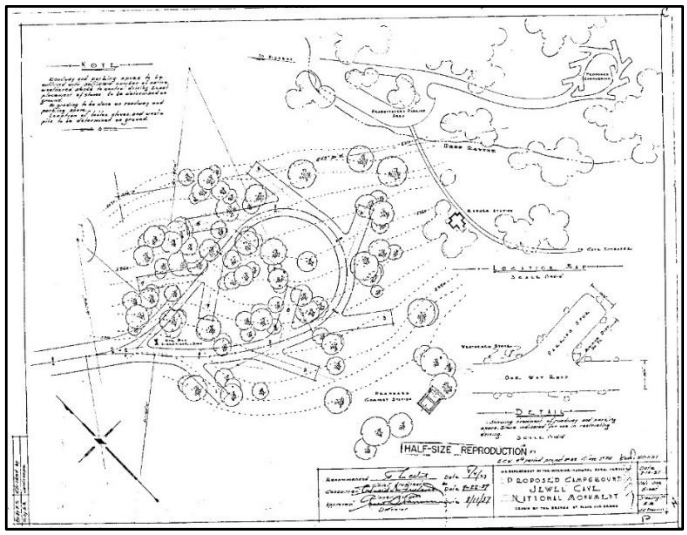


Figure 26. Plan of the proposed campground at Jewel Cave NM, drawn by NPS Branch of Plans and Design, 1937.

Source: NPS.

[63] National Park Service, Seventh Period ECW Program, Wind Cave, Camp No. NP-1.

[64] NPS, Justifications for Proposed New ECW Projects, February 12, 1936, National Parks and Monuments Central Classified Files (1936–52), Box 128, Folder 621 CCC Program, Records of the National Park Service Region II (Midwest Region), NARA KC.

[65] Development Outline, Jewel Cave National Monument, May 15, 1952, 1; DOI, NPS, Stone Trail Steps, eTIC.

[66] National Park Service, Seventh Period ECW Program, Wind Cave, Camp No. NP-1.

[67] DOI, NPS, Proposed Campground: Jewel Cave National Monument, July 14, 1937, eTIC.

vegetation.[68] Crews then surfaced the rough road with a "very loose material" and lined it with boulders, some of which Region Two Landscape Architect Howard W. Baker thought "were placed in rather dangerous positions." Pit toilets were constructed to serve visitors at the campground and picnic area.[69]

Natural Resource Management

Since the NPS did not expend any funds specifically for Jewel Cave, and Wind Cave rarely sent staff to Jewel Cave, very little natural resource management occurred at the monument. In 1935, J. Volney Lewis completed a geologic report, in which he described geology in and above the cave.[70] Other than Lewis' report, there was virtually no management activity regarding the cave resource.

Aboveground, NPS officials and visitors commented on the high quality of the ponderosa forest on monument grounds. Regional Forester Frank Childs attributed this condition to a lack of commercial logging near the monument. "The pines are especially outstanding," he wrote, "because no timber cutting operations have been allowed on the area except for that which was necessary and recommended by the Bureau of Entomology for the control of the Black Hills beetle infestations." Along with fire protection, insect damage spreading through the forest was a major management issue. Childs explained that "this higher percentage of mature to overmature ponderosa pine stand offers a choice breeding ground for the Black Hills beetle."[71]

The NPS first recognized the beetle infestation in 1938, when it threatened "total destruction of the mature and near-mature ponderosa pines on the Monument and lands adjacent to the area." In the past, beetles had killed millions of trees throughout the Black Hills. The response to the 1938 threat included a complete survey of the monument's trees, first in mid-winter 1939 and then again in the spring, after which all infected trees were felled and treated. In total, CCC crews removed 932 affected trees, amounting to approximately 48,000 board feet of timber. This controlled the spread of the beetle for the time being, and the NPS recommended at least one thorough annual survey in subsequent years.[72]

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[68] Development Outline, Jewel Cave National Monument, May 15, 1952, 2; "E. P. Meinecke and Campground Planning," in Linda Flint McClelland, *Presenting Nature: The Historic Landscape Design of the National Park Service, 1916–1942* (National Park Service, 1993), https://www.nps.gov/parkhistory/online_books/mcclelland/mcclelland4e.htm.

[69] Howard W. Baker, Regional Landscape Architect, "Jewel Cave National Monument Report," June 5–6, 1938, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

[70] Lewis, "Jewel Cave National Monument: Geologic Memoranda," File 3449zze.

[71] Frank W. Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 1, Box 192 National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207-01 Annual Report, Records of the National Park Service Region II (Midwest Region), NARA KC.

[72] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 2; Stricklin, Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1939, October 7, 1939, 4; Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1940, July 12, 1940, 3, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA, KC.

Tours, Surveys, and Exploration

From 1936 to 1939, the JCC ran guided tours of Jewel Cave during June, July, and August, led by William A. Nevin (the head guide) and S. E. Ainslie of Custer.[73] One source notes that the NPS funded a temporary "ranger in charge" position at the site "for public contact duties," but it is not clear what that role entailed or who occupied it. As Jewel Cave received no direct federal appropriations in the 1930s, funding for the position would have had to come through Region Two, Wind Cave, or from private funds.[74] The JCC paid its guides $405.24 in 1938 and $680.50 in 1939.[75] Adult visitors paid 50 cents to enter the cave, and children under 16 got in for free.[76] Through these fees, the JCC made enough in 1937 and 1938 to warrant $10 payouts to each of the corporation's shareholders.[77] In 1939, 4,003 people visited Jewel Cave, a 39 percent increase over the previous year. Wind Cave Superintendent Howard B. Stricklin attributed the increase to the JCC, which had hired a third guide for the 1938 season, "permit[ing] visitors to enter the cave in small parties without having to wait for a trip."[78]

JCC guided tours followed two routes (see Figures 27 and 28). The first was a little over a quarter mile long and consisted of narrow, limestone passages that, according to a 1938 NPS report, "do not especially appeal to the ordinary observer." The tour then passed through Flat Top Room, Broken Chamber, Ragged Top Room, and Gothic Dome (a room "23 feet high, lined with a thick scale of crystalline calcite").[79] The second route was longer than the first and took visitors past Milk River, beyond which there were no ladders, and then on to Junction Chamber. According to a 1938 NPS report, guides knew about passages beyond Junction Chamber:



Figure 27. The Jewel Cave Corporation gave tours from the entrance in Hell Canyon, pictured here from inside the cave, ca. 1946.

Source: NPS, Jewel Cave NM.

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[73] Liek to Region Two Director, memorandum, March 16, 1942; Jewel Cave Corporation meeting, minutes, March 9, 1937, File 49w, Jewel Cave NM MF; Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49bb, Jewel Cave NM MF.

[74] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[75] Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49dd, Jewel Cave NM MF.

[76] DOI, NPS, "Jewel Cave National Monument, South Dakota," March 1938, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

[77] Jewel Cave Corporation meeting, minutes, October 20, 1938, File 49y, Jewel Cave NM MF; Jewel Cave Corporation meeting, minutes, December 12, 1937, File 49x, Jewel Cave NM MF.

[78] Stricklin, Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1939, October 7, 1939, 14.

[79] Some of these room names have changed over the years.

> unexplored passages lead in many directions, the walls are honeycombed. Some distance farther the largest and most picturesque chambers of the cave are entered. Their walls are lined with a thick scale of calcite, giving the appearance of a room formed of the confection "Cracker Jack." Most of the passages leading from Milk River to the explored end of the cave are relatively small. . . . there is every probability that some of the numerous passages which radiate from the end [of the second route] and from various places along the route will be found to lead to additional galleries and chambers. [80]

Guides also pursued unexplored passages leading out of Gothic Dome "in every direction" but had not found substantial passages from there as of 1938. The NPS was aware of several openings where the wind blew strongly, and "many small holes have been found into which rocks may be dropped and no sound of their hitting bottom can be heard."[81]

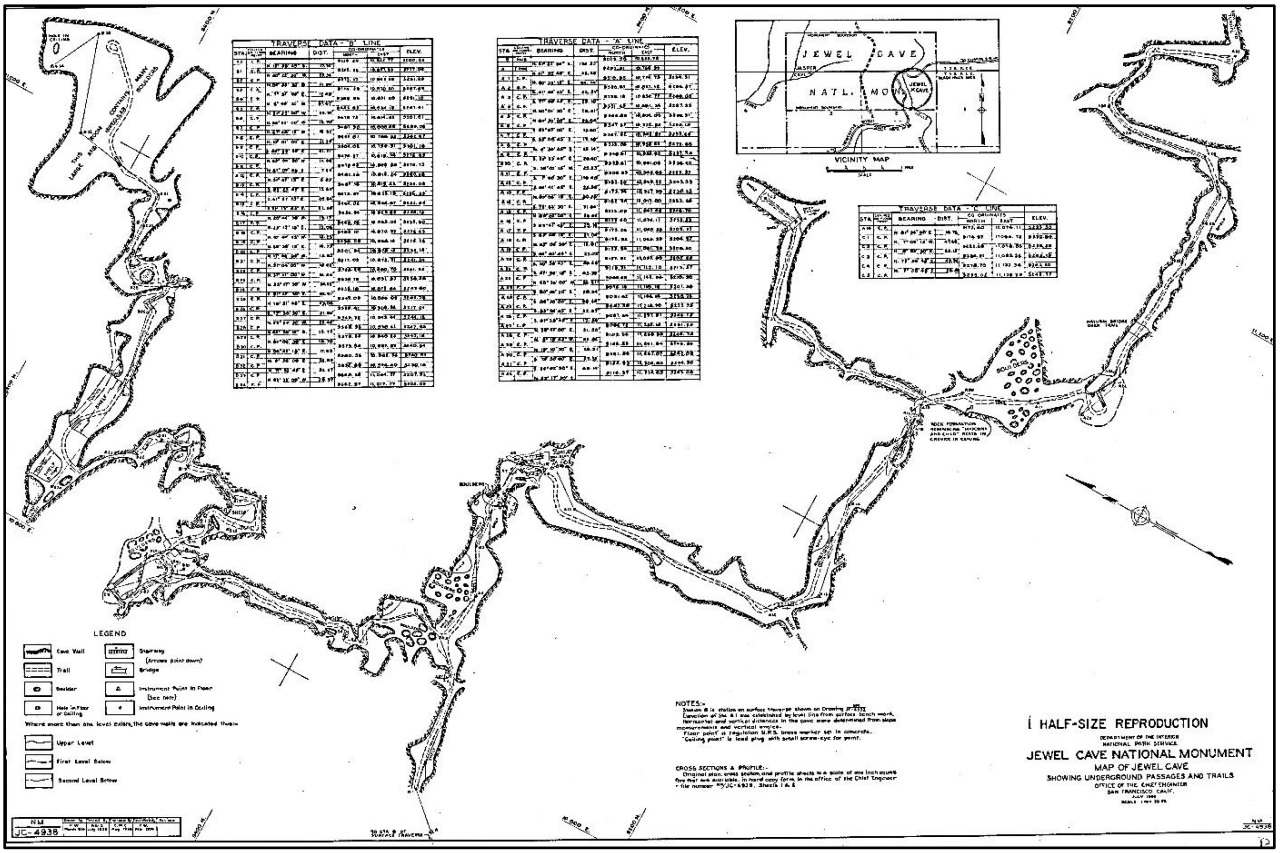


Figure 28. "Map of Jewel Cave Showing Underground Passages and Trails," Office of the Chief Engineer, NPS, July 1936. Source: NPS.

[80] DOI, NPS, "Jewel Cave National Monument, South Dakota," March 1938.

[81] DOI, NPS, "Jewel Cave National Monument, South Dakota," March 1938. Apart from "Milk River" and "Junction Chamber," many of these early names for Jewel Cave passageways did not persist to the present, an indication there was no standardization of names due to lack of continuity in management. Wiles, comments on draft, April 7, 2020.

End of the CCC and JCC Era

In April 1939, the JCC board decided to conclude the affairs of the corporation. It charged Nevin with "cooperat[ing] with the Wind Cave National Park officials to the fullest in bringing about a successful and amicable conclusion" to the corporation and its affairs.[82] After paying out its shareholders, the JCC retained a net profit from 1936 to 1939 of $299.78, which it sent to the Agent-Cashier at Wind Cave National Park, as per the 1939 special use permit.[83] To close out the 1930s, the CCC officially abandoned the Jewel Cave side camp on September 1, 1939.[84]

National Park Service Management (ca. 1940–1959)

Starting in 1940, the NPS managed Jewel Cave on its own. Underfunding of the NPS during the war years led a gap in staffing from 1944 to 1945. After the war concluded, tourists again rushed to parks, and in greater numbers than in the 1930s. Wind Cave managers oversaw Jewel Cave and staffed it with a few rangers each summer, with duties of interpretation, maintenance, and protection. Rangers spent most of their time giving cave tours and maintaining the cave and surface trail system. When the NPS launched the Mission 66 program in 1956, managers at Jewel Cave, Wind Cave, and the Region Two Office prepared development plans for the monument. But not everyone supported development at Jewel Cave: the planning process gave rise to arguments about whether the cave merited inclusion in the National Park System at all.

Staffing

1940 was the first year in which Jewel Cave was "entirely under the operation of the National Park Service."[85] With the JCC and CCC no longer at the monument, vandalism and poaching again became a problem, as had been the case during the years of absentee Forest Service management.[86] Wind Cave Superintendent Howard Stricklin recommended establishing a permanent ranger position and two temporary ranger positions at Jewel Cave to keep an eye on the monument and to replace the JCC cave tour guides. He thought that the money raised in ticket sales would pay for most of the salaries of the new NPS staff.[87] The next Wind Cave superintendent, Harry J. Liek, agreed that adding a ranger position would pay for itself, since people faced with waiting for the next tour often chose to get back in their cars and leave, rather than staying.[88]

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[82] Jewel Cave Corporation meeting, minutes, April 4, 1939, File 49z, Jewel Cave NM MF.

[83] Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49dd, Jewel Cave NM MF; Jewel Cave Corporation meeting, minutes, September 26, 1939, File 49aa–49bb, Jewel Cave NM MF.

[84] Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1940, July 12, 1940, 3.

[85] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 9.

[86] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10.

[87] Stricklin, Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1939, October 7, 1939, 15–16.

[88] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10; Stricklin, Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1939, October 7, 1939, 1.

During June, July, and August 1940 and 1941, two temporary rangers conducted cave tours and performed basic maintenance and protection duties.[89] Liek noted that the JCC had employed three guides and that the NPS would need to increase its staffing of the site to maintain a similar level of service:

> In previous years when the Jewel Cave Corporation operated in the monument, two men and when necessary three rendered guide service, in addition to the temporary ranger in charge who was employed by the [N]ational Park Service for public contact duties. If adequate guide service to the public is to be given, a larger appropriation must be provided for Jewel Cave national monument so that four rangers may be on duty during the tourist season—Three as guides and one for public contacts—so that at least thirty-minute rather than hourly scheduled trips may be maintained.[90]

In September 1941, Liek hired Elwood K. Wolfe Jr. as a permanent "Park Ranger" (grade level 8 on the federal pay scale) at Jewel Cave.[91] Wolfe transferred from Yosemite National Park, where he had been a museum assistant.[92] Liek noted that Wolfe's presence remedied the issues of understaffing and vandalism, since the "appointment of a permanent ranger made it possible to afford year-round protection to the monument and also guide service to the public at all times."[93] Liek soon realized that Wolfe spent most of his time on "public contact work" and suggested hiring a separate ranger for law enforcement, but no funding was allocated for the position.[94]

In the summer, Wolfe and his wife Shirley lived at Jewel Cave in the cabin built by the CCC, and in the winter, they lived at Wind Cave.[95] Wolfe performed ongoing maintenance as part of his duties, such as removing unstable rocks along the cave tour route.[96] Shirley planted a Victory Garden in Hell Canyon with permission from Liek, who required that it remain out of public view.[97] Shirley

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[89] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 9; DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, D-6.

[90] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10.

[91] Liek to Region Two Director, memorandum, March 16, 1942; Elwood K. Wolfe Jr., Monthly Report for September 1941, October 1, 1941, in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD; DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942; Elwood K. Wolfe Jr., "Jewel Cave National Monument Vegetation Cover Type Map, Narrative Description," May 12, 1942, Records of Wind Cave National Park, General File, Box 6, Folder Y18 Forestry & Range Conservation, Records of the National Park Service Region II (Midwest Region), NARA KC.

[92] Superintendent's Annual Report, Wind Cave National Park, Fiscal Year 1941, August 18, 1941, 3, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region).

[93] Harry J. Liek, Superintendent's Annual Narrative Report, Wind Cave National Park, Fiscal Year 1942, October 31, 1942, 4, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[94] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 2501-C.

[95] Shirley Wolfe, interview, undated, in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

[96] Wolfe Jr., Monthly Report for September 1941, October 1, 1941.

[97] Notes from conversation with Shirley Wolf[e], author unnamed, January 13, [1989?], in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

assisted Elwood with duties as needed. She remembered years later, "My job, more or less was to greet people when they came and try to get them to wait to take a tour through the cave."[98] The Wolfes remained at Jewel Cave until 1944, when Elwood took a position with the US military. Liek then closed the monument to visitors for the rest of the year.[99] For the remainder of the war, no one staffed Jewel Cave. This was typical across the country after Congress slashed funding to the National Park System to accommodate wartime military expenses.[100]

In 1946, Acting Region Two Director Howard Baker wrote to Liek, "it appears that a temporary ranger will be available after July 1 if the Congress appropriates the funds," but no funding for that permanent position came through.[101] Instead, the NPS stationed Wind Cave Park Ranger Lyle Linch at Jewel Cave over the summer months from 1946 to 1948 (see Figure 29). Linch spent winters either at Wind Cave or at Badlands National Monument (another unit under the Wind Cave superintendent's jurisdiction).[102] Linch had a degree in geology and "a great deal of enthusiasm" for Jewel Cave.[103] He gave tours, provided basic protection for the cave, and performed general maintenance under the supervision of the Wind Cave



Figure 29. Ranger Lyle Linch, pictured here in front of the entrance to Jewel Cave.

Source: NPS, Jewel Cave NM.

[98] Shirley Wolfe, interview, undated.

[99] Harry J. Liek to Region Two Director, July 3, 1944, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[100] Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven and London: Yale University Press, 1997), 150–51.

[101] Howard W. Baker to Wind Cave National Park Superintendent, March 8, 1946, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 205 Instructions & Orders, Records of the National Park Service Region II (Midwest Region), NARA KC.

[102] Monthly Narrative Report for Wind Cave National Park November 1946, December 3, 1946, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[103] Regional Director Lawrence C. Merriam to files, memorandum, June 20, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 204 Inspections & Investigations, Records of the National Park Service Region II (Midwest Region), NARA KC.

maintenance foreman.[104] Linch left in mid-1948, after which point two seasonal rangers took over operations.[105]

Jewel Cave remained under the jurisdiction of Wind Cave, but starting in the early 1950s, the NPS inserted another layer of management between Jewel Cave and Region Two in Omaha: the Black Hills Area Office in Rapid City. The Black Hills Area Office resulted from earlier efforts to create a large-scale national park in the Black Hills. The process had started in 1939, when the South Dakota State Legislature authorized the state to transfer Custer State Park to the federal government, to turn it into a national park. The NPS then quietly began studying the possibility of combining a number of parks in the Black Hills into one unit. A 1940 NPS report described the hypothetical Black Hills National Park, which would encompass 174,000 acres and would include Wind Cave National Park, Custer State Park, Custer State Game Sanctuaries, parts of Harney National Forest, and some private land. However, the report's authors opposed the creation of such a park, in light of the already extensive federal and state conservation measures in the area. Furthermore, residents of the Black Hills expressed opposition to transferring Custer State Park to the federal government. In 1941, South Dakota Governor Harlan J. Bushfield announced he did not want Custer State Park to be managed by the federal government, and the state legislature repealed the act allowing the transfer.[106]

In 1942, with Custer State Park no longer part of NPS plans in Region Two, Assistant Chief of Planning William G. Carnes proposed a Black Hills-Great Plains National Park, which would tie together Jewel Cave, Wind Cave, Mount Rushmore National Memorial, Badlands National Monument, Devils Tower National Monument, and Theodore Roosevelt National Park. Wind Cave's superintendent already managed Badlands, Mount Rushmore, and Jewel Cave.[107] Carnes claimed his plan went "a step beyond the coordinating superintendency idea," creating not one park that managed other parks, but rather one park that spanned several noncontiguous land areas.[108] An engineer in the Region Two Office was "rather doubtful as to the advisability of trying to combine

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[104] Jewel Cave NM, Annual Report of Motor Vehicles, FY 1944, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207-01 Annual Report, Records of the National Park Service Region II (Midwest Region), NARA KC; Automotive Equipment Use Report, June 30, 1945, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207 Reports - General, Records of the National Park Service Region II (Midwest Region), NARA KC; Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 1, Cabinet 3, Drawer 3, Folder D18 Master Plan, Jewel Cave NM CF.

[105] Coordinating Superintendent's Annual Report, Jewel Cave National Monument, Fiscal Year 1948, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[106] Recreation Planning Division Chief George Ingalls, memorandum for file, April 16, 1942, 1–3, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[107] NPS, "Wind Cave National Park Timeline," accessed December 13, 2019, https://www.nps.gov/wica/learn/historyculture/wica-time-line.htm.

[108] Regional Biologist to Regional Director, May 22, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

the several proposed and rather widely separated areas as one national park."[109] Regional Geologist Caroll H. Wegemann thought that as separated units of one park, the areas slated for inclusion would "lose much of their value," for there was "much of geologic interest in the area of the proposed park, but there is more outside."[110]

Carnes envisioned the Black Hills-Great Plains National Park as having offices in Rapid City. George F. Ingalls, chief of the Region Two Recreation Planning Division, was conflicted as to whether coordinated administration of the parks from Rapid City would increase efficiency:

> A Rapid City office presumably could take over certain fiscal and clerical work now performed in the areas. This might result in a saving in expense of that type of work. On the other hand, it would almost surely result in certain delays. There also might be justification for a central technical staff which no one of the areas could support individually. . . .
>
> The purpose in setting up a coordinating superintendency presumably would be to bring about a better protection and management of the areas, and, if possible, to do so more economically than at present. Other than possible advantages in consolidating clerical, fiscal, and technical staffs and in supplying a Park Service 'focal point' in the heart of an important travel area where the public-relations phase could be particularly important, it is not quite clear to me what benefits would result from a coordinating superintendency.[111]

NPS Region Two Forester Frank W. Childs believed that a Rapid City headquarters "would be considerably more costly than would an administrative control such as is now in effect."[112] Liek, on the other hand, argued that the central position of Rapid City would save travel costs to most parks, including Jewel Cave (which was a slightly shorter drive to Rapid City than to Wind Cave), as well as providing staff with access to 24-hour telephone service, travel information services, supplies, equipment rentals, state agency officials, and the press.[113]

Region Two Director Baker concluded that a Rapid City office would likely increase expenses (there were already offices at Wind Cave, and they would need to rent new space in the city), and he

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[109] Regional Engineer to Regional Director, memorandum, May 22, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[110] Regional Geologist Caroll H. Wegemann to Regional Director, May 19, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[111] George F. Ingalls to Regional Director, memorandum, May 27, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[112] Frank W. Childs, "Forestry Comment with Reference to Mr. Carnes' Report on the Proposed Black Hills-Great Plains National Park," June 5, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[113] Exhibit 'C': Comparative Travel Time and Mileage Table Between Coordinated Areas from Wind Cave Headquarters and Proposed Rapid City Headquarters, undated [c. 1949], National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC; Harry J. Liek to Region Two Director, memorandum, August 13, 1949, 3, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

acknowledged that local opinion was "very much against any such proposal."[114] Instead, Baker argued, Wind Cave Superintendent Liek should continue managing Jewel Cave, Mount Rushmore, and Badlands as coordinating superintendent. He later added Devils Tower to that grouping and suggested increasing Liek's salary to reflect the additional responsibilities.[115]

Despite this continued concern that a Rapid City office might be more expensive, in 1950, Baker approved transfer of the Wind Cave coordinating superintendent's offices to Rapid City.[116] This followed, in the words of Childs, an NPS-wide trend "to centralize and consolidate administrative activities in a large town or city."[117] Staff who moved with Liek (who was a GS-11 superintendent) included a chief clerk (GS-7), clerk (GS-4), clerk-stenographer (GS-4), clerk-typist (GS-2), and ungraded mechanic (the Wind Cave shop moved to Rapid City, too).[118]

As part of the move, Liek became the Black Hills Area Superintendent, and he hired separate superintendents for Mount Rushmore, Badlands, Devils Tower, and Wind Cave. The new Wind Cave superintendent was Earl M. Semingsen, who had previously been chief ranger at Everglades National Park. Semingsen supervised Jewel Cave's "administrative, maintenance, interpretation and protection activities" and reported to Liek, rather than directly to the Region Two director as previous Wind Cave superintendents had done.[119] The area office coordinated correspondence between the units and the regional office, which meant any correspondence regarding Jewel Cave would go through Wind Cave and then to the Black Hills Area Office before proceeding to the

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[114] Regional Director to Director, memorandum, June 5, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[115] Regional Director to Director, memorandum, June 5, 1942; Frank W. Childs, "Forestry Comment Re Proposal to Move Wind Cave and Coordinated Areas Headquarters to Rapid City, South Dakota," undated [ca. 1947?], 2, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[116] Lawrence C. Merriam to Superintendent, Wind Cave National Park, telegram, March 31, 1950; and Stanley C. Joseph, "Comment Regarding Proposal to Move Headquarters of Wind Cave and Coordinated Areas to Rapid City, South Dakota," September 25, 1947, both in National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[117] Childs, "Forestry Comment Re Proposal to Move Wind Cave and Coordinated Areas Headquarters."

[118] Harry J. Liek to Region Two Director, memorandum, February 17, 1950, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[119] Harry J. Liek to Region Two Director, memorandum, March 17, 1952, 1–2, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 0-1 Mtg and Conferences, Records of the National Park Service Region II (Midwest Region), NARA KC; NPS, "Earl M. Semingsen Named Superintendent of Wind Cave National Park, South Dakota," press release, July 27, 1951, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201 Administration - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

regional office.[120] Liek held area superintendent meetings "quarterly or oftener," to keep in touch "and better understand the area picture as a whole."[121]

Semingsen recommended that Jewel Cave have its own superintendent, as Mount Rushmore, Devils Tower, and Badlands then had, but Liek and Baker denied his request.[122] Instead, Semingsen renamed one of the seasonal (GS-4) positions at Jewel Cave as "Ranger-in-Charge" and appointed Harold Jones to fill the role. Jones was on duty at Jewel Cave for three months a year, with "responsibility for coordination and supervision of monument management, protection, interpretation, maintenance and construction programs," and supervision of three other seasonal park rangers.[123] Semingsen continued to supervise overall administration, maintenance, interpretation, and protection of Jewel Cave.[124]

In 1952, Joseph L. Orr took over as the ranger-in-charge at Jewel Cave for the season.[125] As Jones had, Orr staffed Jewel Cave only in the summer and was supported by three other seasonal park rangers. Wind Cave permanent park rangers and maintenance staff assisted with maintenance and managed fiscal and clerical functions. (Wind Cave had requested additional clerical staff to make up for the positions that had been transferred to the area office.)[126] The Black Hills Area Office had responsibility for hiring and accounting functions for all parks under its purview.[127] In 1952, Liek transferred management of Jewel Cave directly to the area office, removing oversight from the Wind Cave superintendent.[128]

Then, in 1953, the Black Hills Area Office in Rapid City closed suddenly, less than three years after it had opened. Fiscal management of Jewel Cave transferred to the Region Two Office at that

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[120] Liek to Region Two Director, memorandum, March 17, 1952, 3.

[121] Black Hills Area Superintendent to Region Two Director, memorandum, November 16, 1951, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 0-1 Mtg and Conferences, Records of the National Park Service Region II (Midwest Region), NARA KC.

[122] Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 1.

[123] Park Warden Elvin T. Aaberg Jr. to Wind Cave National Park Superintendent, memorandum, August 10, 1951, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 0-1 Mtg and Conferences, Records of the National Park Service Region II (Midwest Region), NARA KC; Earl M. Semingsen, Organization and Function as of Feb. 1, 1952, approved by Harry J. Liek March 12, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201-13.1 Organization Charts, Records of the National Park Service Region II (Midwest Region), NARA KC.

[124] Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 1.

[125] Wind Cave National Park Superintendent Earl M. Semingsen to Superintendent, Black Hills Areas, memorandum, August 6, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 208-01.3 Annual Report, Records of the National Park Service Region II (Midwest Region), NARA KC.

[126] Harry J. Liek, Superintendents Annual Report for Jewel Cave National Monument South Dakota, 1953, 2, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1953, Jewel Cave NM CF; Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 2–3.

[127] Liek to Region Two Director, memorandum, March 17, 1952, 2.

[128] Liek, Superintendents Annual Report for Jewel Cave National Monument South Dakota, 1953, 2.

point, rather than reverting back to the Wind Cave superintendent.[129] Baker explained to Semingsen how this new arrangement would work:

> Your position description is not to include any responsibility for Fossil Cycad or Jewel Cave National Monuments. You will continue to be responsible for the areas however, through a delegation from me. This responsibility will be one of the "other duties as assigned."[130]

Meanwhile, Semingsen continued to argue for the need of a permanent ranger at Jewel Cave, but without success. In 1953, Semingsen successfully advocated for converting one of the seasonal park ranger positions to a seasonal park naturalist (GS-5), whose duties would "include the usual guiding, as well as interpretive duties, such as helping set up, care for, and explain special exhibits, conducting wild-life tours, and giving lectures."[131]

Richard Hart, a Wind Cave seasonal park ranger, became the seasonal ranger-in-charge (May 18 to September 8) at Jewel Cave in 1953. Seasonal park rangers Bruce Allen and Harold S. Hanson assisted him until the monument closed at the end of the season, during which time Hart was furloughed. Hart remained ranger-in-charge until 1956, and he and Semingsen continued to argue to the Region Two Office that Jewel Cave needed additional funding and staff to manage the site adequately.[132] After Hart left, John Shepherd became ranger-in-charge (subject to furlough) and Semingsen secured five seasonal rangers, the most ever up to that point.[133] Seasonal staff were generalist rangers who gave guided tours of the cavern, as well as performing other routine maintenance, interpretation, and protection duties.[134]

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[129] Harry J. Liek, Earl M. Semingsen, and Richard T. Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 1, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1954, Jewel Cave NM CF.

[130] Howard W. Baker to Superintendent, Wind Cave, November 22, 1954, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[131] Liek to Region Two Director, memorandum, March 17, 1952, 1–2; Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 2.

[132] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 1, 3; Earl M. Semingsen and Richard T. Hart, 1955 Superintendents Annual Report for Jewel Cave National Monument South Dakota, July 1, 1955, 1, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1955, 1–2, Jewel Cave NM CF; Earl M. Semingsen to Director, memorandum, June 30, 1954, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1954, Jewel Cave NM CF.

[133] Acting Regional Director John S. McLaughlin to Wind Cave National Park Superintendent, memorandum, July 26, 1955, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC; Earl M. Semingsen to Director, July 3, 1956, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1955, Jewel Cave NM CF; John S. Shepherd to Superintendent, Wind Cave National Park, August 31, 1956, 4, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1956, Jewel Cave NM CF.

[134] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 3; Earl M. Semingsen, Superintendent, Wind Cave National Park, to All employees, Wind Cave National Park, Jewel Cave National Park, memorandum, July 13, 1956, 4, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

Throughout the 1940s and 1950s, managers complained that Jewel Cave lacked sufficient funds to meet public demand for cave tours or to complete basic administrative functions. In 1952, Liek reported,

> It was again experienced this fiscal year that insufficient funds were available for administration of the area. The Monument should be open to the public for a longer period each season, from May 1 to October 30, to adequately meet the public demand.[135]

In 1954, Hart, Liek, and Semingsen again complained that "insufficient funds were available for all activities."[136] Yet the entrance fees collected at the cave exceeded park expenditures as visitation rose in the late 1940s.[137] By the late 1950s, budget appropriations began to provide funds for additional activities, and in 1956, cave tour fee revenue was 36 percent of the monument's expenditures.[138]

Tours and Interpretation

As of 1942, the NPS held cave tours on the hour and charged 50 cents per person (see Figure 30).[139] Ranger-in-Charge Wolfe suggested lowering the entry fee, since many potential cave visitors balked at the 50-cent cost.[140] Guides used Coleman lanterns, and tours usually lasted 45 minutes to an hour.[141] Tours usually followed one of the two standard routes that the JCC had established, but Wolfe sometimes varied the route based on "physical ability and interest" of the tour group. Wind Cave Superintendent Liek explained, "As a rule most parties are taken on the left hand trail as it is on this route that the best crystals are found. For those interested in stalactites and wishing a longer trip the right hand trail is used," a route that went as far as Onyx Hall and Milk River.[142]

In 1942, the NPS completed an Interpretive Statement for Jewel Cave as part of the master planning process. It recommended emphasizing Jewel Cave's geologic features, the high-quality stand of ponderosa pines, and the wildflowers on the monument grounds. The prospectus did not mention Jasper Cave.[143] The NPS took no action on the master plan, and visitation plummeted

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[135] Liek, Superintendents Annual Report for Jewel Cave National Monument South Dakota, 1953, 3.

[136] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 3.

[137] Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC; Coordinating Superintendent's Annual Report, Jewel Cave National Monument, Fiscal Year 1948.

[138] Shepherd to Superintendent, Wind Cave National Park, August 31, 1956, 3.

[139] Liek to Region Two Director, memorandum, March 16, 1942; Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10, NARA KC.

[140] Wolfe Jr., Monthly Report for September 1941, October 1, 1941; 6 Fed. Reg. 1633 (March 26, 1941).

[141] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 2501-C.

[142] Liek to Region Two Director, memorandum, March 16, 1942.

[143] Liek to Region Two Director, memorandum, March 16, 1942; Regional Geologist Caroll H. Wegemann, "Preliminary Draft of Interpretive Statement for the Master Plan of Jewel Cave," February 1942, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 600-01 Master Plan, Records of the National Park Service Region II (Midwest Region), NARA KC.

during the war years, due to gasoline rations and most Americans being busy with military or civilian service in support of the war effort. The monument was closed to visitation for most of 1945.[144]

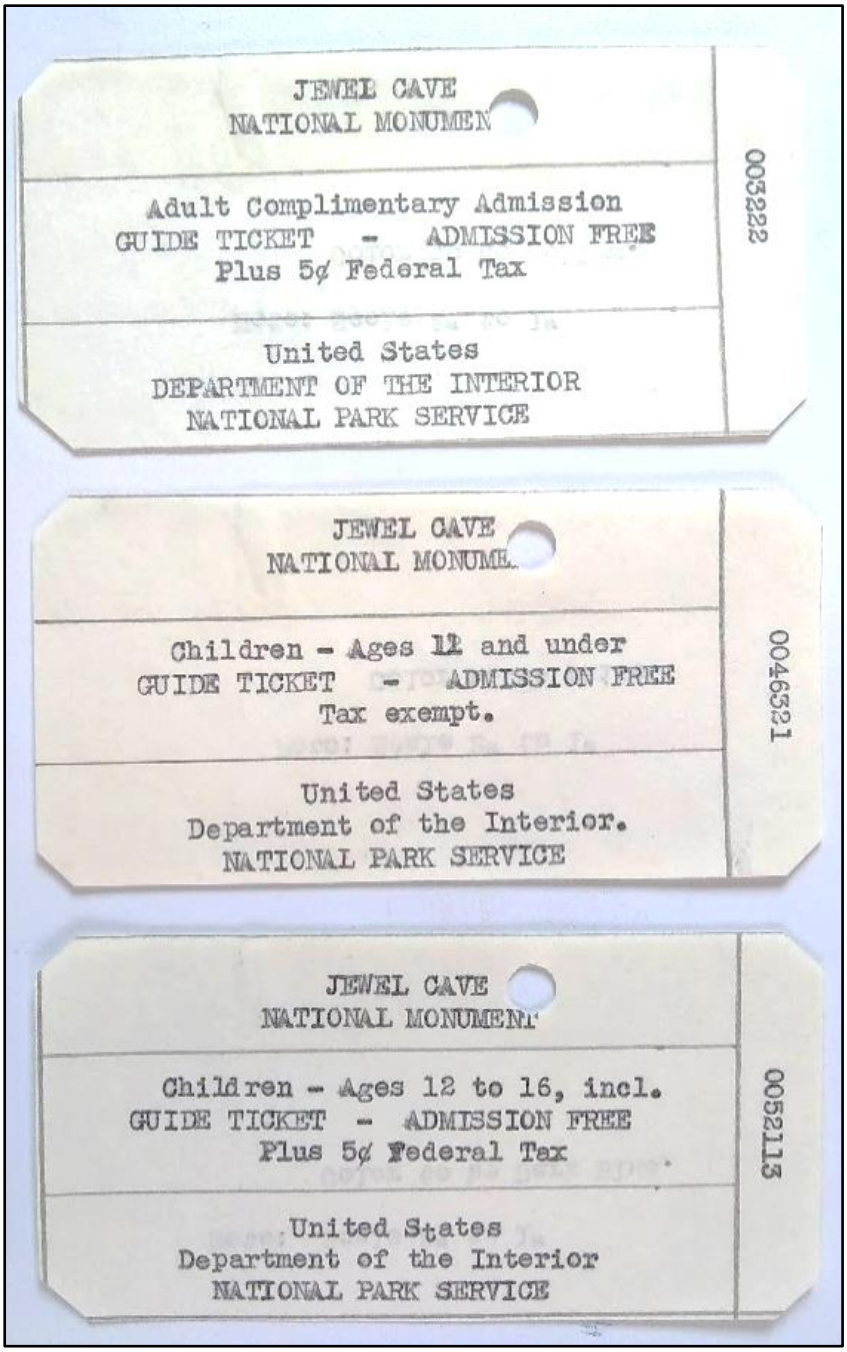


Figure 30. Jewel Cave tour tickets, 1942.

Source: NARA KC.

[144] Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946.

In 1946, Linch developed five cave tours: Hell (now known as the Dungeon Room), P.E.O. (undefined acronym), Milk River, Heaven (now Heavenly Room), and Temple Dome. He also sometimes gave the "P.E.O. Special."[145] Linch and the other seasonal ranger in 1946 gave these tours for 60 cents per person, and Linch prepared "running comments" for the tour to assist with training new guides (see Figure 31).[146] As before the war, Linch took most tours on the left-hand spur, avoiding the right-hand side, which was often wet due to seepage and had stairs in need of repair.[147] He established a small exhibit in the first passageway to the left when entering the cave, as well as one in front of the ranger station, both of which allowed those not physically able to take the tour to see cave specimens.[148] Linch promoted Jewel Cave as home to the "greatest variety of cave formations of any Black Hills Cave" and the "most outstanding collection of cave geodes reported."[149]

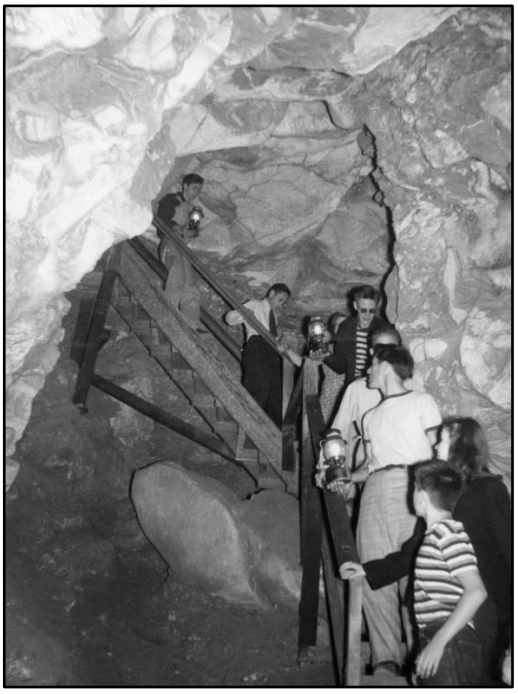


Figure 31. A tour through Jewel Cave, ca. 1950.

Source: NPS, Jewel Cave NM.

During this era, the NPS promoted Jewel Cave's appeal to people interested in "primitive cave exploration" and "primitive cavern tours."[150] Semingsen and Region Two leadership agreed that Jewel Cave's minimal development was a selling point: tour parties experienced lanterns instead of electric lights, wooden stairs instead of elevators,

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[145] Lyle K. Linch, "Jewel Cave National Monument Work Program, Summer 1946," October 21, 1946, and Lyle K. Linch, Jewel Cave Prospectus, summer 1946, both in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

[146] Linch, "Jewel Cave National Monument Work Program, Summer 1946," October 21, 1946, 2–3; Linch, Jewel Cave Prospectus, summer 1946; Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946.

[147] Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946.

[148] Linch, "Jewel Cave National Monument Work Program, Summer 1946," October 21, 1946; Lyle K. Linch, "Rough Draft: Running Comment for Jewel Cave Tour," Summer 1946, 2–3, *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

[149] Lyle K. Linch to Regional Director, memorandum, June 25, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207 Reports - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[150] NPS, "Jewel Cave National Monument," informational brochure, 1949, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC; Semingsen and Hart, 1955 Superintendents Annual Report for Jewel Cave National Monument South Dakota, July 1, 1955, 2.

and passageways often too small to walk upright in.[151] These qualities set Jewel Cave apart from other NPS-managed caves, including Wind Cave, where the CCC had installed an elevator in 1935, and Carlsbad Caverns, where an elevator had run since 1932.[152] Linch emphasized the old-fashioned nature of Jewel Cave tours, writing that they were "definitely for the young and virile—for those who love and appreciate the old Tom Sawyer thrill of flickering shadows and exploration."[153]

Linch explored new areas of the cave in partnership with Ben Burma, a geologist at the University of Nebraska. Burma joined Linch on several occasions in 1947. The two encountered an area previously unknown to them. Linch wrote,

> This latest discovery lies directly below the North-South passageway of the Milk River entrance approximately 50 feet. It is the most extensive passageway yet found on the Heaven route. Seasonal ranger Don Farrell was one of the first three persons to enter this passageway. . . . We agree that Jewel Cave has the greates[t] variety of formations of any cave in the Black Hills and that with a minimum of development it could be made one of the five most accessible and interesting caves in America.[154]

Linch tried to incorporate these new sections into the existing cave tour.[155]

Throughout the 1940s and 1950s, the entry fee remained 50 or 60 cents (the 1949 informational brochure and Linch said it was 60 cents, but in 1952 and 1955, the superintendent reported it was 50 cents).[156] Whatever the exact price, the Wind Cave superintendent thought that the fee was "too small a charge for the services rendered the public." He thought that the NPS could increase the cost to 75 cents or even one dollar without deterring visitors, and that raising the fee would put Jewel Cave more on par with prices at other caves in the Black Hills.[157]

In the 1940s and 1950s, the NPS repeatedly reported that staffing was insufficient to meet the demand for cave tours. Some people who visited the cave had a considerable wait for a tour. Those who were unwilling to wait left the monument without ever going on the tour, thus depriving the

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[151] NPS, "Jewel Cave National Monument," informational brochure, 1949.

[152] NPS, Carlsbad Caverns National Park, "Elevator Excitement," accessed December 13, 2019, https://www.nps.gov/cave/blogs/elevator-excitement.htm,

[153] Linch to Regional Director, memorandum, June 25, 1947.

[154] Lyle K. Linch to the Director, memorandum, August 1, 1947, 2, File 1706zd, Jewel Cave NM MF.

[155] Lyle Linch, "Summary of the July 1947 Monthly Narrative report for Jewel Cave National Monument," August 1, 1947, File 1706zb, Jewel Cave NM MF; Harry J. Liek, Coordinating Superintendent's Annual Report, Jewel Cave National Monument, Fiscal Year 1947, June 1, 1948, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[156] DOI, NPS, "Jewel Cave National Monument," informational pamphlet, undated [ca. 1950], Files 708a–b, Jewel Cave NM MF; Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 3; NPS, "Jewel Cave National Monument," informational brochure, 1949.

[157] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 3.

NPS of fee revenue it would have otherwise collected.[158] Visitors and local businesses complained about this issue.[159] In 1952, NPS officials reported,

> Local tourist businessmen at Custer, South Dakota, and Newcastle, Wyoming are hesitate [*sic*] to send tourist[s] to the area because of back firing complaints resulting from the publics failure to be conducted on cavern tours. This situation is an embarrassing situation to all National Park Service employees in the Black Hills that have to answer to this complaining public problem.[160]

Jewel Cave and Wind Cave managers proposed arranging a concessionaire to sell snacks and drinks at the site, to give people something to do while they waited.[161] It does not appear that such an arrangement was made.

In 1956, rangers started selling tickets outside, rather than inside the office.[162] Otherwise, the tour was largely the same. To engage people while they waited for the cave tour, Park Naturalist Wesley de Coursey developed a display of some of the common wildflowers around the cave. For those who chose not to go on a cave tour because of claustrophobia or physical issues, interpreters suggested that the NPS develop surface nature walks.[163] De Coursey planned to add a cabinet exhibiting mineral specimens just inside the cave entrance, something that Linch had reported doing but that must not have lasted, as 1956 reports do not mention an existing display.[164] Other staff began an experimental campfire program in 1956 and planned a slide program, while Ranger-in-Charge Joseph Orr developed a written version of the tour route in 1952, to update Linch's previous version. Liek mimeographed Orr's commentary to use for training new staff as tour guides.[165]

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[158] Summary of Activities at Wind Cave National Park, Fiscal Year 1940, November 15, 1940, 10; Mission 66 Prospectus for Jewel Cave National Monument, July 15, 1955, 1, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[159] Acting Regional Director James V. Lloyd to Black Hills Areas Superintendent, memorandum, July 25, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 208-01.3 Annual Report, Records of the National Park Service Region II (Midwest Region), NARA KC.

[160] "General Information," Master Plan Development Outline, Jewel Cave National Monument, South Dakota, April 1952, 3, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

[161] "General Information," Master Plan Development Outline, Jewel Cave National Monument, South Dakota, April 1952, 4; Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 2.

[162] Wayne W. Bryant, Black Hills Natural History Association, Annual Report of the Executive Secretary, November 13, 1956, 2, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

[163] Shepherd to Superintendent, Wind Cave National Park, August 31, 1956, 2.

[164] Earl M. Semingsen, and John S. Shepherd, 1957 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1957, Jewel Cave NM CF; DOI, NPS, Rock and Mineral Display and Cave Museum Room, Jewel Cave National Monument, September 7, 1956, eTIC.

[165] Earl M. Semingsen, and John S. Shepherd, 1957 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3; Black Hills Area Superintendent Harry J. Liek to Region Two Director, memorandum, November 13, 1952, Cabinet 3, Drawer 1, Folder H14 Area and Service History, Cultural Park Hist. Research Documents, Jewel Cave NM CF.

Informational Brochure

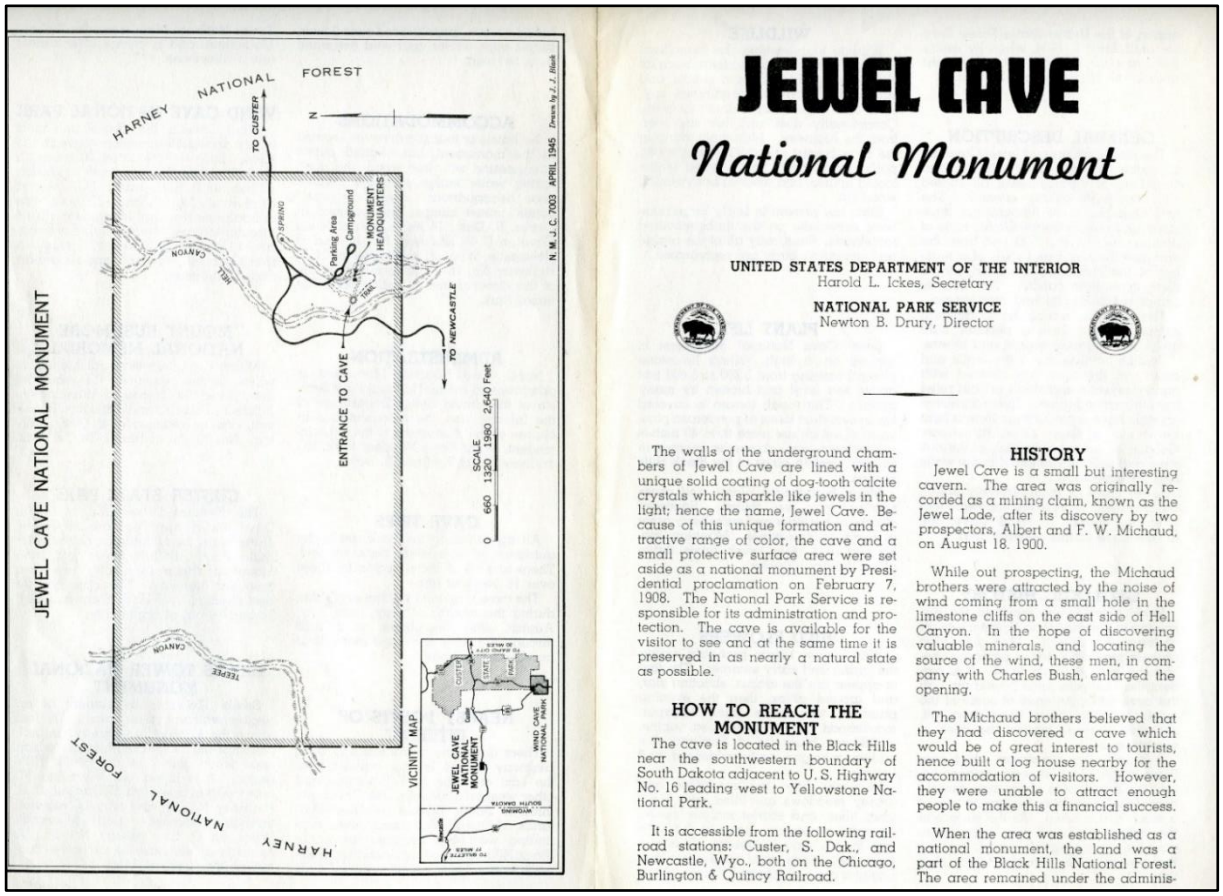


Figure 32. Jewel Cave NM informational brochure, 1947.

Source: NPS, Jewel Cave NM.

In 1947, the NPS printed an informational brochure for Jewel Cave (see Figure 32). Wind Cave and Region Two staff helped with the wording.[166] The brochure called Jewel Cave "a small but interesting cavern." It included a map of the monument and sections on geological history, history, wildlife, plant life, wildflowers, accommodations, administration, cave trips, and nearby points of interest.[167] In 1947, Jewel Cave rangers gave out approximately 2,500 of the 5,000 brochures they received at the beginning of the season.[168]

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[166] Jewel Cave National Monument, May 12, 1945, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 504 Publications, Records of the National Park Service Region II (Midwest Region), NARA KC.

[167] DOI, NPS, "Jewel Cave National Monument," informational pamphlet, undated [ca. 1945], Files 707a–b, Jewel Cave NM MF.

[168] William J. Watson to Region Two Director, October 15, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC.

In 1948, Willett Keyser of the Sundance, Wyoming, Commercial Club, complained to US Representative Frank A. Barrett (R-WY) that the Jewel Cave informational folder "advertises Highway 16 as much or more than Jewel Cave." The NPS Acting Director A. E. Demaray agreed and assured Barrett that the NPS would revise the publication.[169] A revised version, completed in 1949, added "beautiful" between the qualifiers "small" and "interesting" and reminded visitors not to take anything out of the cave.[170] The revised brochure emphasized the "primitive cave exploration" available at Jewel Cave.[171]

The brochure underwent further changes in 1952, when Semingsen requested revisions in response to frequent complaints. For instance, a man from Bismarck wrote that he had arrived at the monument in May but found the cave closed, in contradiction of the pamphlet that said it would be open from May to September.[172] Others complained that tours were not always offered on the hour, as the brochure advertised. At the suggestion of Acting Chief of Information Isabelle F. Story, the NPS used vaguer wording in the next version of the Jewel Cave brochure. It read, "The cave is open to visitors every day during the summer months, and several cave trips are made daily," to avoid setting expectations that the underfunded monument could not always meet.[173]

Cooperating Associations and Partnerships

Linch promoted partnerships with area organizations and other state and federal agencies. He spoke at the Custer Rotary Club, developed relationships with reporters at the Custer *Chronicle*, and reached out to other civic groups in Custer and Newcastle.[174] He partnered with local historian Eric Heideman to assemble some of the site's early history and continued cooperation with the Forest Service and South Dakota state parks and state forests.[175] Linch worked with the National Parks

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169 A. E. Demaray to Frank A. Barrett, September 13, 1948, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC.

170 Director to Superintendent, Wind Cave, memorandum, May 6, 1949, National Parks and Monuments Central Classified Files (1936–52); NPS, "Jewel Cave National Monument," informational brochure, 1949; and NPS Director Newton B. Drury to Superintendent, Wind Cave, May 6, 1949, all in National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC.

171 DOI, NPS, "Jewel Cave National Monument," informational pamphlet, undated [ca. 1950], Files 708a–b, Jewel Cave NM MF.

172 Acting Chief of Information Isabelle F. Story to Region Two Director, memorandum, August 20, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC.

173 Story to Region Two Director, memorandum, August 20, 1952; Acting Assistant Regional Director George P. Ingalls to the Director, memorandum, August 26, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 0-6 Printing, Records of the National Park Service Region II (Midwest Region), NARA KC.

174 Linch, "Jewel Cave National Monument Work Program, Summer 1946," October 21, 1946; Lyle K. Linch, "Foreword: Summary Accomplishments Summer of 1946," October 21, 1946, in *Jewel Cave Corporation, Historic Area Information Including Civilian Conservation Corps Documents and Jewel Cave During the 1940s*, Interpretation Division Binder, Jewel Cave NM Visitor Center, Custer, SD.

175 Ranger in Charge Lyle K. Linch to the Director, memorandum, June 1, 1947, 3–4, Files 1706p–1706q, Jewel Cave NM MF.

Association (a DC-based nonprofit), publisher of a book called *Exploring Our National Parks and Monuments*, to improve the entry on Jewel Cave when the book was updated.[176] Linch also encouraged local cavers (unsuccessfully at the time) to form a Black Hills Grotto of the National Speleological Society (NSS) and joined NSS members on tours of other caves in the Black Hills.[177]

The park naturalist at Wind Cave started the Wind Cave Library Association in 1946.[178] At the time, park cooperating associations were usually run by a park naturalist, while the park superintendent sat on the board.[179] In 1952, Mount Rushmore Park Naturalist Robert F. Upton expanded the Wind Cave Library Association into a cooperating organization that served all parks under the Black Hills Area Office and changed the name to the Black Hills Area Association (BHAA).[180] The nonprofit organization aimed to stimulate scientific research; assist in establishing "museums, observation stations, trail-side exhibits, and other interpretive and educational devices"; develop and maintain libraries; publish booklets about area parks; assist with audiovisual development; and assist with obtaining land or buildings as needed.[181] It held its first annual meeting in 1953 and spent most of its first several years discussing sales at Mount Rushmore, Wind Cave, and Devils Tower.[182]

The BHAA sold merchandise at Jewel Cave starting in 1953, but it sold the most material at Mount Rushmore, which accordingly received the "lion's share" of proceeds raised through sales.[183] None of the books listed in the BHAA inventory had anything to do with caves until 1956, when it started selling a book called *Cave Life*.[184] In part because tickets were sold outside the administrative office starting in 1956 and the books were sold inside the building, Jewel Cave sales came to just

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[176] Devereux Butcher to Lyle Linch, September 10, 1947, File 1706zk, Jewel Cave NM MF.

[177] Linch, "Jewel Cave National Monument Work Program, Summer 1946," October 21, 1946; Regional Director Lawrence C. Merriam to Wind Cave National Park Superintendent, memorandum, August 6, 1946, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 204 Inspections & Investigations, Records of the National Park Service Region II (Midwest Region), NARA KC.

[178] Black Hills Parks and Forests Association, "History of BHPFA," accessed July 2, 2019, https://blackhillsparks.org/about-us/.

[179] Ernest Ortega, interview by Jackie Gonzales, April 22, 2019, Santa Fe, NM; Al Hendricks, interview by Emily Greenwald, May 16, 2019, Ennis, MT.

[180] Liek to Region Two Director, memorandum, March 17, 1952, 4.

[181] Articles of Incorporation, Black Hills Natural History Association, March 31, 1955, amended December 6, 1956, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

[182] Executive Secretary Robert F. Upton to Howard W. Baker, December 14, 1953, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

[183] Wayne W. Bryant, Black Hills Natural History Association, Annual Report of the Executive Secretary, February 1, 1958, 3, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

[184] Bryant, Annual Report of the Executive Secretary, November 13, 1956, 3; Publications for Sale by the Black Hills Areas Association, November 20, 1953; and Executive Secretary Robert F. Upton to Association Member, November 20, 1953, both in General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

$63.45 in 1956 and $174.05 for 1957, much less than the approximately $1,000 in sales at Wind Cave and over $3,000 at Mount Rushmore.[185]

The organization changed its name again in 1956, to the Black Hills Natural History Association.[186] Headquarters shifted depending on which park naturalist ran the organization; when Robert Upton was transferred away from Mount Rushmore, Wind Cave Park Naturalist Wayne Bryant took over and moved the association's headquarters to Wind Cave with him.[187] Devils Tower and Mount Rushmore separated from the organization in 1957 and formed their own cooperating associations, leaving just Jewel Cave, Wind Cave, and Badlands in the Black Hills Natural History Association. In late 1957, Bryant left, and Wind Cave Ranger Dick Hart took over management of the association.[188]

Belowground Resource Management

Most of Jewel Cave's limited staff and financial resources in this period went to the cave tour program and security of the site. Outside researchers occasionally visited the cave.[189] Staff initiated minor resource management projects in their free time, but such activities were secondary to giving tours and managing the monument's day-to-day operations, and resource management projects were usually in service of interpretive goals.

Resource projects involved biological and geological aspects of the caves. Staff kept an eye on bats and reported in annual reports when their numbers went up or down.[190] In 1942, Wolfe compiled a list of mammals at Jewel Cave and sent 35 specimens to the University of California Museum of Vertebrate Zoology. The specimens represented six species, recorded as cave bat, Say's bat, pallid lump-nosed bat, northern chipmunk, Osgood's white-footed mouse, and fuscous bushy-tailed wood rat.[191] Walt Lineau sought input from Dr. Edward H. Stevens at the South Dakota School of Mines for a report he wrote on mineral deposits in Jewel Cave.[192] In 1956, Ranger-Naturalist de Coursey conducted a study of cave mineral fluorescence. He found colors including pale yellow, blue, and bright green in small amounts when minerals were exposed to ultraviolet light, but he determined that the limited array of colors did not warrant installing ultraviolet lights in the

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[185] Bryant, Annual Report of the Executive Secretary, November 13, 1956, 2; Bryant, Annual Report of the Executive Secretary, February 1, 1958, 2.

[186] Annual Narrative Report of the Black Hills Natural History Association, Wind Cave National Park, December 3, 1962, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural Historic Association Jan. 1953–Jan. 1963, Records of the National Park Service Region II (Midwest Region), NARA KC.

[187] Bryant, Annual Report of the Executive Secretary, November 13, 1956, 1.

[188] Bryant, Annual Report of the Executive Secretary, February 1, 1958, 1.

[189] Edward L. Tullis and John Paul Gries, "Black Hills Caves," *Black Hills Engineer* 24, no. 4 (December 1938): 233–71.

[190] Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946.

[191] Park Ranger Elwood K. Wolfe Jr. to Wind Cave Superintendent, June 30, 1942, File 1656, Jewel Cave NM MF.

[192] Walter Lienau to Earl Semingsen, undated [ca. 1956], Files 1984b–1784c, Jewel Cave NM MF.

cave. Instead, he recommended that staff leave an ultraviolet flashlight in the cave to demonstrate the phenomenon during guided tours.[193]

Aboveground Resource Management

Open forest of virgin ponderosa pine, interspersed with grassy clearings, characterized much of the surface landscape at Jewel Cave (see Figure 33). While Childs described the forest as "outstanding," it was small. Its small size and lack of lakes or large enough streams for fishing limited the recreational opportunities available to the public.[194] Rocky Mountain juniper grew on rocky slopes and birch, box elder, and aspen grew in the canyon bottoms. A large variety of shrubs and grasses covered the forest floor, and wildflowers bloomed from May through September. Childs explained that "the area, though comparatively small in size, is nevertheless an important sector of the Black Hills watershed."[195] Local wildlife was "not as important a feature of Jewel Cave National Monument as at neighboring Wind Cave National Park," but naturalists recognized that "animals do play an important role in the ecological story of the area." The most conspicuous animals were "chipmunks, red squirrels, mule deer, whitetail deer, and a few birds."[196]

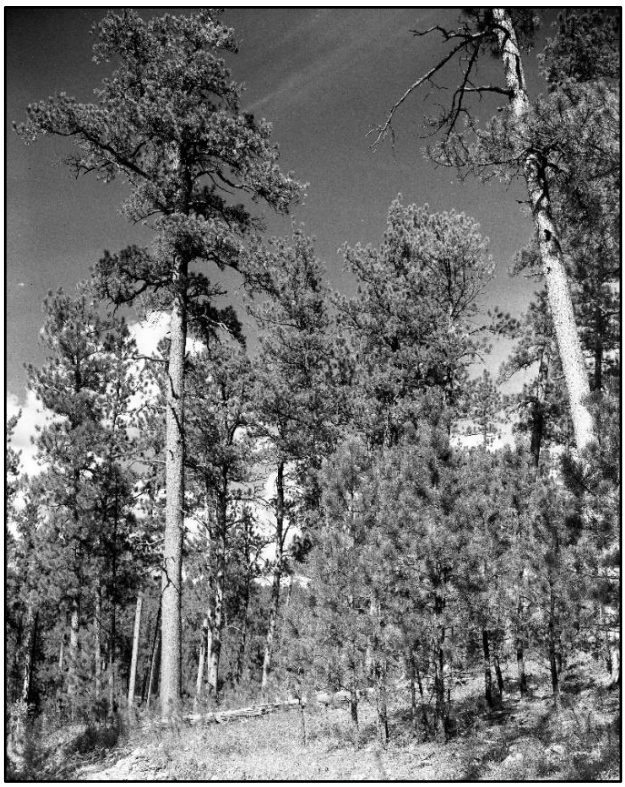


Figure 33. Ponderosa pine forests at Jewel Cave NM, ca. 1950s.

Source: NPS, Jewel Cave NM.

The extent and condition of forest cover on the monument's surface landscape required the NPS to consider forest management and fire protection. There were no records of recent fires, but fire scars on mature pines and charred logs evidenced "large and damaging fires having occurred at some earlier date." Potential threats came from lightning strike fires, which were "common to the

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[193] Ranger Naturalist DeCoursey to Park Naturalist, Wind Cave, memorandum, August 7, 1956, File 1784d, Jewel Cave NM MF.

[194] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 2.

[195] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 3.

[196] DOI, NPS, "Master Plan Development Outline Jewel Cave National Monument, South Dakota," August 1958, 5, Jewel Cave NM CF.

entire Black Hills," and from outside fires spreading into the monument.[197] Wolfe explained that the "large amount of dead standing and down trees, . . . combined with the heavy reproduction, and tall grasses, make for a rather high fire hazard throughout the monument."[198]

Infrastructure for fire protection was limited. The 3,000-gallon storage reservoir supplied water at low pressure through a one-inch pipe to the ranger station and campground, with sufficient water flow for domestic supply "but of little value for fire protection."[199] The monument lacked firefighting equipment but had an unwritten agreement for the use of Forest Service tools, which were stored about seven miles both east and west of the monument. A limited amount of fire equipment was also available at the forest supervisor's headquarters in Custer, and at Wind Cave.[200] As of 1940, the monument lacked radio or telephone service. The nearest phone was five miles away, and the year-round fire protection organization for the monument was at Wind Cave headquarters, 34 miles away by road. The need for fire protection was one rationale for a permanent ranger position at Jewel Cave.[201]

By 1942, Wolfe had arrived, and the monument received a telephone connection for the first time, but other on-site fire protection needs remained. The 1942 Master Plan recommended establishing a tool cache for six men, as well as a dedicated "patrolman-fireguard" on duty during the three-month summer fire season. "The assignment of a guard is essential," the report noted, "since the permanent ranger's time is taken up with public contact work," and Harney National Forest and Wind Cave firefighting crews were too distant to serve as lookouts.[202] Fire suppression activities that year included burning slash piles in Hell Canyon during January and February, and Wolfe attended the Yellowstone Fire School for training and participated in Harney National Forest's fire warden and cooperator training program.[203]

In 1947, Wind Cave organized a local, three-day, fire training conference for staff from Wind Cave, Jewel Cave, Mount Rushmore, and Badlands. Topics included fire danger, cooperation with other agencies, fire equipment and tool use, planning, and reporting.[204] Linch attended, but Wind Cave staff remained "responsible for initial action on any fires occurring on Jewel Cave National Monument." Wind Cave crews also had responsibility for fire protection at Fossil Cycad National

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[197] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 5.

[198] Wolfe Jr., "Jewel Cave National Monument Vegetation Cover Type Map, Narrative Description," May 12, 1942.

[199] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 4–6.

[200] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 7.

[201] "Memorandum for the Director," December 27, 1940, 4, Records of Wind Cave National Park, General File, Box 6, Folder Y2621 Forestry Reports-Annual, Records of the National Park Service Region II (Midwest Region), NARA KC.

[202] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, D-10.

[203] "Annual Forestry Report for Jewel Cave National Monument, 1942," 1, Records of Wind Cave National Park, General File, Box 6, Folder Y2621 Forestry Reports-Annual, Records of the National Park Service Region II (Midwest Region), NARA, KC.

[204] Harry J. Liek, "Memorandum for the Regional Director, Region Two," February 1, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 0-1 Mtg and Conferences, Records of the National Park Service Region II (Midwest Region), NARA KC.

Monument, but because of the distances involved, "local cooperators" at each unit took "initial action on fires starting on either of these monument areas."[205] Firefighting equipment stored at Wind Cave included a 1948 Jeep equipped with a 42-gallon tank, a 1944 Chevrolet truck with a pump for a 300-gallon tank, and a 150-gallon trailer tank. Any fire requiring further equipment would have to draw on the resources of Custer State Park or neighboring fire departments.[206]

After the 1938–1939 pine beetle infestation, the NPS checked for signs of the beetle, but incident rates were low. A 1942 annual survey found only two trees heavily infected and reported, "The general condition of the forest is good. Reproduction is heavy, soil erosion is negligible, and porcupine damage is not excessive."[207] The following year, Liek noted, "It seems certain that the Black Hills beetle infestation, that at one time threatened the entire forest stand, is under complete control and almost eradicated. Only two infested trees were found during the fiscal year."[208] By 1949, however, beetle activity had increased in the Black Hills area. NPS personnel and Forest Service control crews located all the infected trees within the monument and sprayed them with a solution of orthodichlorobenzene.[209] Acting Region Two Director Baker commended their continuing efforts and forwarded information about forest insects from the Annual Forestry Reports to the Bureau of Entomology and Plant Quarantine in Fort Collins, Colorado.[210] Baker acknowledged that "follow-up checks" would be necessary to coordinate further control treatments. He wrote, "We assume you will work closely with the Forest Service on this problem."[211]

Other than the trees felled as part of the beetle control program and perhaps some earlier lumber poaching, there had been no logging in the forest overlying Jewel Cave. This area of the

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[205] "Forest Protection Requirements Report for Wind Cave National Park, 1951," 12, Records of Wind Cave National Park, General File, Box 6, Folder Y14 Forest Fire Control, Records of the National Park Service Region II (Midwest Region), NARA KC. President Warren G. Harding established Fossil Cycad National Monument through the authority of the Antiquities Act on October 21, 1922,to protect significant exposures of fossilized specimens from a Cretaceous-era forest. Fossil Cycad NM was administered through Wind Cave National Park. Congress de-authorized the monument on September 1, 1957. Vincent Santucci and Cassi Knight, "Fossil Cycad National Monument," National Park Service, April 13, 2020.

[206] "Forest Protection Requirements Report for Wind Cave National Park, 1951," 12, Records of Wind Cave National Park, General File, Box 6, Folder Y14 Forest Fire Control, Records of the National Park Service Region II (Midwest Region), NARA KC.

[207] Elwood K. Wolfe Jr., "Memorandum for the Superintendent, Wind Cave National Park," November 13, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 0-1 Mtg and Conferences, Records of the National Park Service Region II (Midwest Region), NARA KC.

[208] Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1943, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207-01 Annual Report, Records of the National Park Service Region II (Midwest Region), NARA KC.

[209] Harry J. Liek, "Annual Forest Report, Jewel Cave National Monument, 1949," 2, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

[210] Howard W. Baker, "Memorandum for the Superintendent, Wind Cave National Park," January 6, 1949, Wind Cave National Park, General File, Box 6, Folder Y2621 Forestry Report-Annual, Records of the National Park Service Region II (Midwest Region), NARA KC.

[211] Baker, "Memorandum for the Superintendent, Wind Cave National Park," January 6, 1949.

Black Hills had no history of commercial timber harvesting.[212] In 1943, the Warren-Lamb Lumber Company asked for the forest be opened to commercial logging, but this request was refused.[213] A few trees exhibited some evidence of beetle infestation in the 1950s, but it was not regarded as abnormal activity and did not merit corrective action.[214]

A windstorm "of tornado proportions" hit the monument on November 2, 1956.[215] Regional Forester Frank Childs estimated that the storm toppled some 600 ponderosa pines.[216] A contract for salvage logging was approved in March 1957 to clean up wind-thrown trees throughout the monument.[217] The NPS sent invitations to bid on salvage logging to 30 timber companies and awarded the contract to the Mountain Sawmill Company. The contract called for Mountain Sawmill to pay the NPS in dimensional lumber from the operation.[218]

Harney National Forest issued grazing permits to livestock operators, and occasionally cattle wandered from Forest Service lands into the monument. In 1947, Region Two Director Lawrence C. Merriam commended Jewel Cave staff for "the excellent relationship that is being maintained with officials of Harney National Forest and adjacent ranchers." He noted that this kind of cooperation was valuable in the long run and especially useful for areas with limited staffing.[219] The monument encompassed only 120 acres of grassland and attracted no applications for grazing permits from local ranchers.[220] Because of this, the Forest Service used the monument as a check site in 1950 to compare with the forage on grazing allotments that were considered overgrazed.[221]

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[212] Childs, "Forest Protection Requirements Report for Jewel Cave National Monument," November 1939, 1; Wolfe Jr., "Jewel Cave National Monument Vegetation Cover Type Map, Narrative Description," May 12, 1942.

[213] Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1943.

[214] Gale H. Wilcox to Regional Director, "Memorandum: Annual Forestry Report, Jewel Cave National Monument," January 4, 1951, Records of Wind Cave National Park, General File, Box 6, Folder Y2621 Forestry Report-Annual, Records of the National Park Service Region II (Midwest Region), NARA KC.

[215] Earl M. Semingsen to Regional Director, "Memorandum: Record of Action Taken Regarding Disposition and Cleanup of Wind Thrown Trees at Jewel Cave National Monument," March 15, 1957, Records of Wind Cave National Park, General File, Box 6, Folder Y3415 Forestry Products, Records of the National Park Service Region II (Midwest Region), NARA KC.

[216] Frank W. Childs to Regional Director, "Memorandum: Inspection of Tornado Damaged Trees, Jewel Cave National Monument," Records of Wind Cave National Park, General File, Box 6, Folder Y3415 Forestry Products, Records of the National Park Service Region II (Midwest Region), NARA KC.

[217] Earl M. Semingsen to Korczk Ziolkowaski, March 20, 1957, Records of Wind Cave National Park, General File, Box 6, Folder Y3415 Forestry Products, Records of the National Park Service Region II (Midwest Region), NARA KC.

[218] Semingsen to Regional Director, "Memorandum: Record of Action Taken Regarding Disposition and Cleanup of Wind Thrown Trees at Jewel Cave National Monument," March 15, 1957; Semingsen to Ziolkowaski, March 20, 1957.

[219] Lawrence C. Merriam, "Memorandum for the Superintendent, Wind Cave National Park," February 4, 1947, Records of Wind Cave National Park, General File, Box 6, Folder Y2621 Forestry Report-Annual, Records of the National Park Service Region II (Midwest Region), NARA KC.

[220] Harry J. Liek, "Memorandum for the Director," January 20, 1943, National Parks and Monuments Central Classified Files, Wind Cave National Park, Box 130, Folder 710-05 Grazing General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[221] William J. Watson to Regional Director, "Memorandum: Annual Forestry Report, Jewel Cave National Monument, 1950" January 5, 1951, National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder

Water Rights

In the 1940s, minor issues arose with Jewel Cave's water rights deed. The rights should have carried over when the monument transferred from the Forest Service to the NPS purview, but an engineer noted in 1944 that the deed "lacks a copy of the formal declaration of intent to withdraw."[222] Wind Cave staff sent official assemblies of the deed to Washington to take care of this. The package included a drawing of the Jewel Cave Pipe Line, an undated "Notice of Appropriation of Water by the United States for Jewel Cave National Monument," a 1939 letter of authorization from a state engineer to the NPS to inspect the water system, a 1939 "Certificate of Examination of Works," and a 1939 "Certification of Construction of Works under U. S. Water Right No. 32, at Jewel Cave National Monument," by Dean W. Loucks, state engineer.[223] The NPS Washington Office resolved the issue in 1946.[224]

Planning for the Future: Develop or Deauthorize?

From 1945 into the early 1960s, NPS administrators at the regional and national levels alternated between planning for Jewel Cave's future and questioning whether the monument merited inclusion in the National Park System. Planning for the future of the monument began in 1940, when Liek submitted a "Project Construction Program" that included a visitor contact station, employee housing, a boundary fence to keep cattle out of the monument, and sewer and water connections to the new construction.[225]

First Master Plan (1942)

In 1941, the Region Two Office began drafting a full master plan for Jewel Cave—the site's first.[226] Wind Cave personnel assisted in the process and completed detailed topographical maps of Jewel Cave. Regional Geologist Carroll Wegemann prepared a preliminary interpretive statement to

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207-01.4 Superintendents Annual Reports, Records of the National Park Service Region II (Midwest Region), NARA KC.

[222] A. van V. Dunn, Hydraulic Engineer, to the Director, memorandum, March 7, 1944, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 660–05.7 Water Rights, Records of the National Park Service Region II (Midwest Region), NARA KC.

[223] A. van V. Dunn, Chief, Water Rights Division, to Region Two Director, December 6, 1945, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 660–05.7 Water Rights, Records of the National Park Service Region II (Midwest Region), NARA KC.

[224] Wind Cave Superintendent Harry J. Liek to Region Two Director, January 22, 1946; and Regional Director Lawrence C. Merriam to the Director, February 6, 1946, both in National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 660–05.7 Water Rights, Records of the National Park Service Region II (Midwest Region), NARA KC.

[225] Regional Engineer, comment, February 29, 1940, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 120 Legislation, Records of the National Park Service Region II (Midwest Region), NARA KC.

[226] Howard W. Baker to Regional Director, December 5, 1941, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 600-01 Master Plan, Records of the National Park Service Region II (Midwest Region), NARA KC.

accompany the master plan.[227] The 1942 plan for Jewel Cave was similar to Liek's: it retained the existing residence/administration building and campground, and it proposed a maintenance storage building and an employee residence.[228] The new employee house would be about 250 feet from the existing ranger station, would have running water, and be connected to the sewage system, but neither the house nor the existing administration building would be rigged with electricity.[229] Water would continue to come from the 3,000-gallon reservoir built by the CCC, and the campground would have pit latrines and additional picnic areas.[230]

The plan proposed keeping the existing CCC-built trail from the administration building to the cave entrance (gravel, surfaced with a clay binder), expanding the trail from the parking area to the administration building to 10 feet wide, and building an additional 140 feet of trail to connect the new employee residence to the existing trail.[231] Inside the cave, the 1942 plan proposed no electric lighting, but it suggested replacing wooden stairways with concrete steps and metal handrails for safety purposes.[232]



Figure 34. An existing truck trail through the monument.

Source: NPS, Jewel Cave NM.

[227] Assistant Regional Director to Superintendent, Wind Cave National Park, February 27, 1942, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 600-01 Master Plan, Records of the National Park Service Region II (Midwest Region), NARA KC; Liek, Superintendent's Annual Narrative Report, Wind Cave National Park, Fiscal Year 1942, October 31, 1942, 3.

[228] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942; DOI, NPS, Headquarters Area Plan Part of the Master Plan, Jewel Cave National Monument, January 1, 1942, eTIC.

[229] Baker to Regional Director, December 5, 1941; DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942.

[230] DOI, NPS, Headquarters Area Utilities Layout, Part of the Master Plan, Jewel Cave National Monument, January 1, 1942, eTIC; DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942.

[231] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 3003-D-1–D-2.

[232] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 2501-C.

The plan retained existing truck trails in Hell Canyon, South Hell Canyon, and from the north to the south boundaries (of the original rectangular boundary), as well as the 600-foot-long entry road, the parking lot at its terminus with 20 spots, and the 550-foot-long campground road (see Figure 34).[233] The Hell Canyon Road sustained erosion damage from floods during the planning process and needed improvements to keep it in shape.[234] The plan proposed six cattle guards, which, in addition to the boundary fencing installed by the CCC, aimed to prevent cattle from trespassing on monument grounds. The plan also provided for additional signage on Highway 16, to alert visitors that the cave was ahead. Wolfe had heard complaints that both east and westbound travelers saw the existing signs too late to make the turn into the monument.[235]

In 1943, Region Two engineers determined where the proposed roads, housing, and maintenance garage would be located, but no further action was taken, as non-military agency funding plummeted during World War II.[236] After Linch arrived in 1946, he performed several stopgap maintenance tasks that supported the master plan's goals:

- Renovated the ranger cabin, including addition of a back porch.
- Repaired signs on monument.
- Resurfaced the trail to cave with new gravel and performed other trail maintenance, including water drainage and debris clearing.
- Maintained the campground.
- Removed talus slides that had blocked the cave entrance and removed rocks in cave that posed safety hazards.
- Repaired the boundary fence.
- Removed marks and names from cave passages.
- Removed a pile of calcite crystals outside the cave entrance, to discourage visitors from removing crystals from cave.
- Repaired wooden steps and replaced three wooden stairways with rock ramps.[237]

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[233] DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 3002-D-9.

[234] Elwood K. Wolfe Jr. to Superintendent, April 19, 1942, Cabinet 2, Drawer 2, Folder Y1815 Trees and Forest, Jewel Cave NM CF.

[235] Wolfe Jr., Monthly Report for September 1941, October 1, 1941; DOI, NPS, "The Master Plan for Jewel Cave National Monument," 1942, 3002-D-11.

[236] Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1943; Sellars, *Preserving Nature in the National Parks*, 151.

[237] Linch, "Jewel Cave National Monument Work Program, Summer 1946"; Linch "Summary Accomplishments Summer of 1946," October 21, 1946; Coordinating Superintendent's Annual Narrative Report, Jewel Cave National Monument, Fiscal Year 1946; Jerome C. Miller, memorandum for file, June 4, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 240 Inspections & Investigations, Records of the National Park Service Region II (Midwest Region), NARA KC; Lyle K. Linch to the Director, memorandum, September 1, 1947, 1, File 1706zi, Jewel Cave NM MF; Lyle K. Linch to the Director, memorandum, September 30, 1947, 1, File 1706zv, Jewel Cave NM MF.

The monument still needed a few major improvements that Linch could not complete, such as installing a larger parking area, erecting better signage, and paving the entry road.[238]

Assessing Jewel Cave's Significance

Around 1946, the NPS headquarters in Chicago (where it was located during the war and immediately after) suggested that Jewel Cave be eliminated from the National Park System.[239] To make this determination, Howard Baker, at the time a Region Two landscape architect, asked Linch to write a report on the significance of Jewel Cave as compared to other caves in the Black Hills (see Figure 35).[240] Linch emphasized Jewel Cave's primitive "rugged and primitive character" and recommended retaining Jewel Cave and its "universal 'Tom Sawyer' appeal to the general public":

> In considering Mr. Baker's request for a statement regarding the significance of Jewel cave in relation to and comparison with other caves in the Black Hills to use in preparing the Region's report on abolishment of Areas, you and Mr. Baker should bear in mind that at present Jewel Cave is the dirtiest cave in the Hills (it is impossible to make a full tour of the cave without soiling good clothes); it has many crude wooden stairs that should and could be eliminated with stone-dirt ramps, much of the present trail system is somewhat hazardous; the best stalactites, exceptional occurrences of ribbon calcite, druses, alcoves, geodes, Bye-Bye Canyon, and the largest room are unavailable to the public; the cave is only meagerly explored (not to mention the nine other known caves on the Monument) and the known portions less than half mapped; the campground and parking lots are inadequate; no modern conveniences except running water and accompanying appliances are available for the protection staff; I have operated the Monument the last two years with an entirely inadequate staff and worn out equipment; the monument is without protection much of the year; it is inadequately advertised and our public folder is both inaccurate and insufficient. Worst of all, Jewel Cave's potentialities are still unappreciated by both our citizen neighbors and Park Service Officials.[241]

Linch argued that if the NPS wanted to keep the cave in the system, it should provide adequate funding to manage the cave properly. Linch quoted former Wind Cave Superintendent Stricklin, who wrote,

> The National Park Service should either fittingly develop Jewel Cave to demonstrate its rugged and primitive character in contrast to and to abet Wind Cave's modern commercialized presentation of an electric-lighted, elevator-serviced cavern, or transfer it to some other agency, or return it to private interests that will do so.[242]

Region Two Naturalist Carl Swartzlow believed that Jewel Cave should remain in the system:

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[238] Regional Director Lawrence C. Merriam to files, September 1, 1948, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 204 Inspections & Investigations, Records of the National Park Service Region II (Midwest Region), NARA KC; Lyle K. Linch to the Director, memorandum, August 1, 1947, 1, File 1706zc, Jewel Cave NM MF.

[239] Ranger in Charge Lyle K. Linch to Coordinating Superintendent Liek, September 14, 1947, File 1706zzm, Jewel Cave NM MF.

[240] Lyle K. Linch, "The Significance of Jewel Cave in Relation to Other Caves of the Black Hills," September 11, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 602 Boundaries - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[241] Linch, "The Significance of Jewel Cave in Relation to Other Caves of the Black Hills," September 11, 1947, 2.

[242] Linch, "The Significance of Jewel Cave in Relation to Other Caves of the Black Hills," September 11, 1947, 1.

> From personal observation, I rate it much superior to Oregon Caves N.M., and from the description in the files it has much more to offer than Shoshone Caverns. It would also appear that if we are to maintain areas in a nearly natural state, Jewel Cave offers accessibility and natural conditions in a high degree.[243]

Swartzlow, echoing Linch and Stricklin, argued that "one of our many cave areas should offer visitors the sense of exploration. This is possible at Jewel."[244]

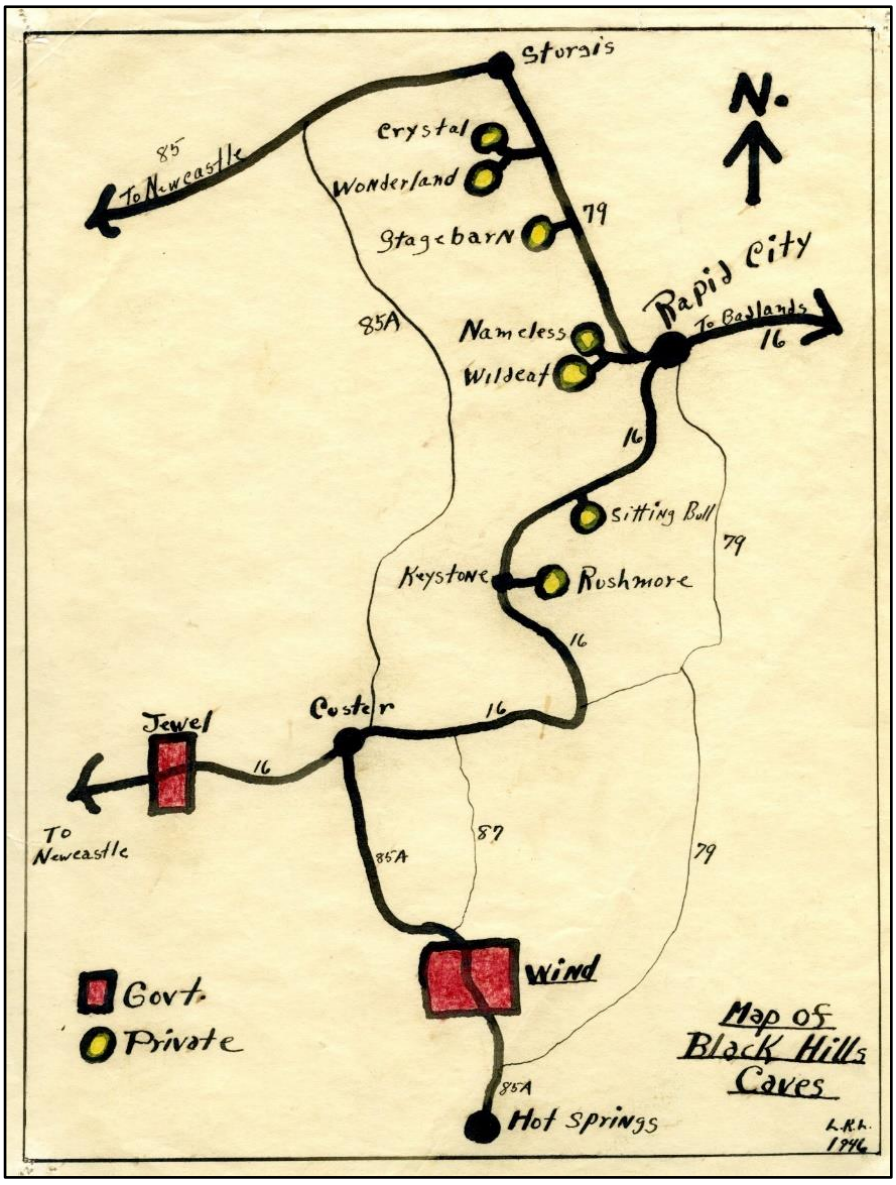


Figure 35. There were many caves in the Black Hills, as this map by Lyle Linch shows, 1946.

Source: NPS, Jewel Cave NM.

[243] Carl Swartzlow to George F. Ingalls, September 23, 1947, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 602 Boundaries - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[244] Swartzlow to Ingalls, September 23, 1947.

Coordinating Superintendent Liek disagreed that Jewel Cave had value as a primitive cave that offered visitors an exploratory experience. He argued that Jewel Cave was similar to other crystal-lined caves in the Black Hills (he called it a "representative crystal cave") and that it was actually most valuable in its potential as a "trading asset" in Forest Service negotiations:

> The monument includes 2 sections of land, of which only 160 acres are needed for the purpose of protecting the cave and the surface area surrounding the cave. The rest of the area lies out of sight of both the highway and the cave and has one of the best stands of ponderosa pine in the Black Hills. However, this stand is even-aged and mature, possibly past maturity, and in the event of a severe insect infestation it would be lost, and even now secondary insects remove a few each year. An infestation of Black Hills Beetle would call for a heavy expenditure for control and pressure from both the Forest Service and local lumbering firms to carry out such control. Inasmuch as this land and forest stand are not needed in connection with the cave, we suggest that the matter of using such land as trading stock for any future, or present, contemplated land exchanges between the Forest Service and the National Park Service be explored.[245]

Before reaching a final decision, Liek argued, the NPS would need to study further whether a "representative" cave merited protection, whether the cave should be retained, and if so, what improvements would need to be made to bring the cave up to NPS standards and how the monument could become self-sustaining through infrastructure improvements and increased staffing. "The entire problem merits study," Liek concluded. "It is believed that retention of the cave, and release or exchange of the mature timber land, is the most logical step."[246] The following year, Region Two Chief of Lands George F. Ingalls, with guidance from the NPS director's office, recommended that Swartzlow conduct further study on the speleological value of Jewel Cave "to determine whether it has sufficient scientific value to warrant its retention in the National Park System."[247] There is no evidence that Swartzlow completed this study.

Updated Master Plan (1952)

As of 1951, all of the monument's buildings, trails, and utility and water systems pre-dated full-time NPS management of the cave.[248] The campground, where people usually stayed for only one night, had piped running water, pit toilets, outdoor tables and benches, outdoor cooking facilities, six individual campsites, two acres for trailer camping, and six individual spaces for trailer camping.[249] In addition to the extant ranger cabin and the campground, the monument's facilities

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[245] Coordinating Superintendent Harry J. Liek to the Regional Director, September 25, 1947, 2, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 602 Boundaries - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[246] Liek to the Regional Director, September 25, 1947, 3.

[247] George F. Ingalls, Regional Chief of Lands, to the Regional Director, December 9, 1948, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 602 Boundaries - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

[248] Development Outline, Jewel Cave National Monument, Headquarters Area – Utilities, May 15, 1952.

[249] NPS, Facilities Available in Park Service Areas to Visitors Using Campgrounds and House Trailers, 1952 Season, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 601 Lands - General, Records of the National Park Service Region II (Midwest Region), NARA KC.

included a small storage shed and an open pit for garbage disposal.[250] The septic system and leach field still functioned near the ranger cabin.[251]

The NPS rewrote the master plan in 1952. Wind Cave Superintendent Semingsen noted that Jewel Cave had several facilities problems, foremost of which were "providing adequate administrative and protective facilities for proper housing and utility needs."[252] Semingsen identified the following as needs that drove the 1952 plan:

> 1. Provide permanent administrative and protection and housing facilities for year around operation.
>
> 2. Develop cavern trails and lighting system for safe and enjoyable public visitation.
>
> 3. Provide interpretive service and facilities portraying the cave history of the Black Hills.
>
> 4. Provide concession snack bar and campground supply services for the one stop visitor and the overnight visitor.
>
> 5. Provide a fire break and protection system in and around the area to assure 100% protection of the virgin ponderosa pine timber stands.[253]

The plan proposed an incinerator (to replace the open garbage pit), a fire cache building, a power plant building, and snow removal equipment. The existing CCC-built ranger quarters and office would be dedicated only to administration, with new buildings available for housing. Roads would be chipped and sealed, and six miles of three-strand barbed wire fencing would replace the existing, often-compromised boundary fencing.[254]

The 1952 plan acknowledged the poor condition of the cave trail system but proposed no changes:

> The trail system for the most part is of bad gradient. Numerous narrow passageways and low ceilings are encountered. Some of the stairways, most of which are of wood, are very steep and many of the units are none too rigid in their construction. However it is generally agreed that the cave should be allowed to remain "in the rough." Therefore no improvement is contemplated at this time.[255]

One of the most novel ideas to emerge from the 1952 planning process was the possibility of a second entrance to the cave. At the request of Assistant Director James V. Lloyd, Orr developed two ideas: excavate under the parking lot, where there was a room along the tour route, or, extend a

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[250] Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952.

[251] Chief Engineer to Region Two Director, July 6, 1951, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 207-22 Rehabilitation, Records of the National Park Service Region II (Midwest Region), NARA KC.

[252] "General Information," Master Plan Development Outline, Jewel Cave National Monument, South Dakota, April 1952, 4.

[253] Master Plan Development Outline, Jewel Cave National Monument, South Dakota, April 1952, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

[254] Master Plan Development Outline, Jewel Cave National Monument, South Dakota; Monument Operation Prospectus, April 1952, 2–4; DOI, NPS, Reconstruction of Entrance & Service Roads, Headquarters Area, Jewel Cave National Monument, June 1952, eTIC.

[255] Development Outline, Jewel Cave National Monument, Headquarters Area – Utilities, May 15, 1952.

passage 65 feet from the bottom of an 80-foot stairway "and re-enter the existing passageway near the chamber called 'Blue Heaven.'" (The name Blue Heaven is no longer used: the open lead in Blue Heaven goes to what is known today as "Deep Canyon." See Figure 36).[256]

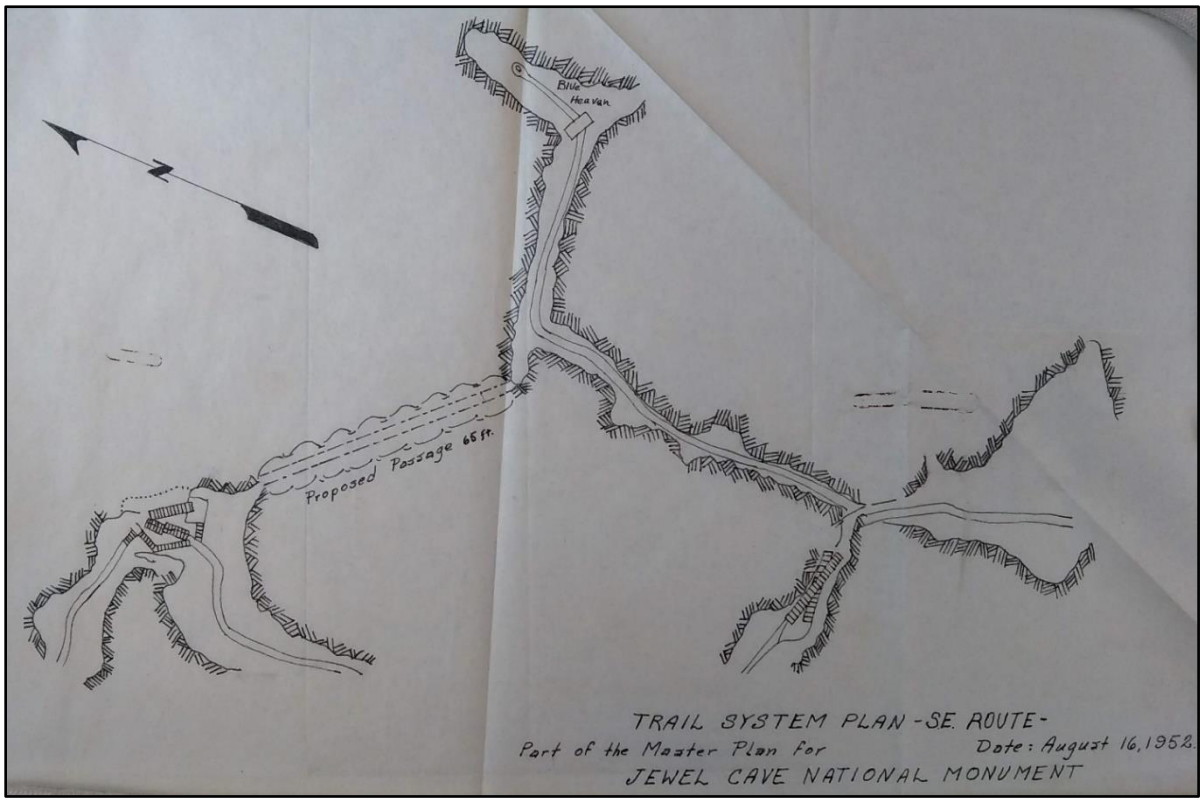


Figure 36. The NPS proposed blasting a new passageway to connect two existing passageways within the cave to create a loop tour, 1952.

Source: NARA KC.

A minor flurry of construction in 1953 followed the planning process. Maintenance crews installed four cattleguards on the Hell Canyon road and truck trail at monument boundaries to keep out cattle. They reconstructed and surfaced the entrance road off Highway 16 and added a spur to the proposed new residence area. At the ranger cabin, they added storm shutters, painted interior rooms, and tiled the floor in the public office portion. Crews stained the equipment shed, painted campground tables, erected an entrance control gate, and constructed and installed new campground signs. And, for the first time, the NPS installed a radio and telephone system at the monument, comprising a power house building, radio poles and antenna, three telephones in the cave, and one telephone in the ranger cabin. Water system improvements were delayed due to a suspected crack

[256] Jewel Cave Ranger-in-Charge Joseph L. Orr to Region Two Director, memorandum, August 16, 1952, National Parks and Monuments Central Classified Files (1936–52), Box 192, Folder 600-01 Master Plan, Records of the National Park Service Region II (Midwest Region), NARA KC.

and subsequent moss growth that created a blockage in the main water line.[257] Routine maintenance in subsequent years consisted of regular trail and road maintenance, replacement of wooden stairways in the cave, and the addition of a rock retaining wall on the trail to the cave entrance (see Figure 37).[258]

Wind Cave maintenance crews performed most of the non-routine maintenance, and Wind Cave superintendents complained that this arrangement was expensive and time-consuming, because "[a]ll equipment, labor and supervision must travel 76 miles round trip."[259] Appropriations for Jewel Cave maintenance often did not cover these travel costs and the time of Wind Cave maintenance staff, so Wind Cave's budget often supplemented the tiny Jewel Cave appropriations.[260]



Figure 37. Trail to the cave entrance, 1958.

Source: NPS, Jewel Cave NM.

In 1954–1955, the NPS finally addressed the problem of inadequate housing at Jewel Cave, when the US Bureau of Reclamation (BOR) donated a trailer house for seasonal ranger quarters, and Wind Cave moved a building to the area. Both were hooked up to the sewer, water, and electric systems.[261] The BOR trailer was a "Transa-House," built by the Kit Manufacturing Company. Transa-Houses, which the federal government used for rural housing for brief period in the 1950s, had a trailer-like center and panels on either side to open up into rooms, so the entire house when opened resembled an "H."[262]

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[257] Liek, Superintendents Annual Report for Jewel Cave National Monument South Dakota, 1953, 5.

[258] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 2; Semingsen and Hart, 1955 Superintendents Annual Report for Jewel Cave National Monument South Dakota, July 1, 1955, 3; Earl M. Semingsen, and Richard T. Hart, 1956 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1956, Jewel Cave NM CF; Earl M. Semingsen, and John S. Shepherd, 1957 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1957, Jewel Cave NM CF.

[259] Liek, Semingsen, and Hart, 1954 Superintendents Annual Report for Jewel Cave National Monument South Dakota, May 25, 1954, 3.

[260] Semingsen and Hart, 1955 Superintendents Annual Report for Jewel Cave National Monument South Dakota, July 1, 1955, 2.

[261] Semingsen and Hart, 1955 Superintendents Annual Report for Jewel Cave National Monument South Dakota, July 1, 1955, 3; Superintendent Earl M. Semingsen to Region Two Director, memorandum, June 22, 1954, General Files, Box F-7, Folder F7423 Book #1. Sept 1952 – Jan. 1962. WICA, Records of the National Park Service Region II (Midwest Region), , NARA KC.

[262] Richa Wilson, "Cozy Cabins and A Hyperbolic Paraboloid" (Ogden, UT: US Forest Service, 2015), 55; S. Alan Higgins, "Modern Residential Architecture in South Dakota, 1950–1975: A Thematic Context Study" (Pierre: South Dakota State Historical Society, 2017), 115.

Mission 66 Prospectus (1955)

In July 1955, Wind Cave staff completed a prospectus for Jewel Cave, as part of the NPS's national Mission 66 Program to revitalize park infrastructure.[263] All parks completed these prospectuses, which detailed development plans for the park over a 10-year period, and then the NPS Washington Office prioritized the order in which parks received funding.[264] The Mission 66 Prospectus for Jewel Cave proposed the following:

- Buildings (for visitor use and housing)
    - Build two quadplex seasonal quarters along new residence road.
    - "Obliterate" the existing CCC-built headquarters building.
    - Build near the cave entrance a combination administration, visitor center, and elevator building, to be open year-round, to "become the heart center of the area."
    - Construct adjacent to the new visitor center a day-use ranger office and ticket building.
    - Construct a ranger office and quarters at Jasper Cave.
    - Buildings all "to be constructed of reinforced concrete with natural stone masonry facing."
- Cave Management
    - Reconstruct cave trails: "replace all wood constructed stairways with concrete stairways having safety hand rails and other protection features," "lower all trail treads along the trail routes, at points where inadequate head room exists, to at least a minimum of 7 ft. from trail tread to the cavern ceiling," and "oil surface all cave trails."
    - Initiate cave research project to "survey, map and determine the extent of the Jewel Cave – Jasper Cave system in their relation to the Black Hills geological structure."
    - "Clean out trails at Jasper Cave sufficient for passage of a 200# man leaving this cave to be 'the primitive cave' of the National Park System for scientific research, exploration, etc."
- Surface Resource Management
    - Lay a self-guided nature trail through the forest, with the plan to later make it a "one-way vehicular nature drive."
    - Install "adequate trail-side interpretive exhibits along the Jewel Cave trail system."
    - Expand existing campground and build modern restrooms.

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[263] Acting Regional Director E. J. Castro to Wind Cave National Park Superintendent, memorandum, May 23, 1956, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC; Earl M. Semingsen to NPS Director, memorandum, July 15, 1955, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[264] NPS, Advance Copy – Summary of Mission 66 Objectives and Program for Jewel Cave National Monument, June 15, 1956, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

    - Add cattle guards on highways.
    - Create a 16-foot boundary fire break.
    - Reconstruct boundary fence with woven wire.
- Roads, Parking, and Utilities
    - Construct bypass highway ("top priority"—"required to divert and eliminate all commercial highway travel through the Monument") and a "clover leaf" approach.
    - Construct 200-car parking area.
    - Construct a road to Jasper Cave.
    - Construct a utility area and residence road near monument's south boundary, away from public access points, to include a fire cache building, maintenance shop, car storage area, incinerator, and sewer and water access.
    - Construct new signage for roads and trails.
    - Extend to cave power line and telephone line (including "mine-type" telephones in the cave).
    - Drill water well with electric pumping station near Jewel Cave entrance and drill a water well near Jasper Cave.
    - Extend water line to campground and new buildings.
    - Install electric lights in Jewel Cave, install telephone in cave and all buildings.
- Staffing requirements
    - Ranger in Charge or Superintendent (GS-9, year-round).
    - Supervisory Park Ranger (GS-7, year-round).
    - Maintenance man (GS-6, six months at Jewel Cave, six months at Wind Cave).
    - Seasonal Park Naturalist (GS-6, five months, supervised by Wind Cave park naturalist).
    - Seasonal Park Naturalist (GS-5, five months).
    - Seasonal Park Ranger (GS-5, five months).
    - Five Seasonal park rangers (GS-4, five months).
    - Watchman-janitor (GS-5, year-round).
    - Laborers (two positions, ungraded, six months).
    - Wind Cave Fire Chief to assist with forestry and fire control.[265]

The Region Two Office and the NPS Washington Office responded to the Jewel Cave Mission 66 Prospectus. Assistant Region Two Director John S. McLaughlin opposed elevator service at Jewel Cave, enlargement of Jewel Cave passageways, and opening Jasper Cave to the public:

[265] Mission 66 Prospectus for Jewel Cave National Monument, July 15, 1955, 1–5.

> While Jewel Cave is unique, its charm is derived from the intimacy of its passages and rooms. It is a small cave and to place an elevator and full height passages in it would alter it entirely. It should remain as a primitive cave and while we agree improvement is necessary on the trails, we do not think elevator service is necessary, indeed, it would be contrary to the primitive aspect we should endeavor to continue at the Monument. We suggest that Jasper Cave be kept as a research cavern and that it be closed to the general public.[266]

The Washington Office agreed that Jasper Cave should not be opened but rather be used as a research area.[267] The regional director also opposed the bypass highway, cloverleaf, improvement of the existing trail structures, the fire break, the road to Jasper Cave, expansion of the campground, and plumbing at the campground.[268]

E. T. Scoyen, Associate Director of the NPS, agreed that expanding passageways in Jewel Cave to allow for seven-foot clearances "cannot be justified" and no elevator should be built:

> You need a new but modest visitor center-administration building. Please plan to have your orientation, information, interpretation and administration center in this one building. . . .
>
> We do not concur in provision of elevators or of Jewel Cave lights at this time. It is our belief that one of the charms of Jewel Cave is the experience of visiting a cave without all of the "modern" improvements.[269]

A majority of Region Two and Washington Office officials agreed that the Mission 66 Prospectus was overkill. "As a whole," Acting Region Two Director E. J. Castro wrote, "the Jewel Cave estimates seem unrealistic and excessively high in light of the proposed staff and probable visitation."[270] Robert G. Hall, acting chief of the Western Office of Design and Construction (WODC), agreed, and he opposed "Mr. Semingsen's general approach to the development of Jewel Cave." Instead, he wrote, "We believe this cave should remain primitive and shown in much the same manner as at present in order to be of highest value to park visitors."[271]

In light of these sentiments, Wind Cave Park Naturalist Wayne Bryant edited the "statement of significance" in Jewel Cave's Mission 66 Prospectus. He explained,

> I find myself at a loss at describing any real national significance. True, it may have some crystalline calcite lining the passages, but so do many of the commercial caves of the Black Hill region. Furthermore, a memorandum by Volney Lewis dated July 25, 1935 regarding the geological features of the cave states that much of the calcite incrustation has been removed by souvenir collectors. . . .
>
> I had heard several people express great disappointment in Jewel Cave, including certain National Park Service officials, none of whom believe it to be of national significance. Should not the Area

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[266] John S. McLaughlin to Wind Cave National Park Superintendent, memorandum, July 26, 1955.

[267] Associate Director E. T. Scoyen, NPS, Wind Cave National Park Superintendent, March 5, 1956, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[268] McLaughlin to Wind Cave National Park Superintendent, memorandum, July 26, 1955; Castro to Wind Cave National Park Superintendent, memorandum, May 23, 1956, 2–3.

[269] Scoyen, NPS, Wind Cave National Park Superintendent, March 5, 1956.

[270] Castro to Wind Cave National Park Superintendent, memorandum, May 23, 1956, 2.

[271] Acting Chief, WODC, Robert G. Hall, to NPS Director, memorandum, August 20, 1955, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

> Investigations Branch of the Service look into this matter before large sums of money are spent through MISSION 66 for developing the area? Isn't there a danger of degrading our national monument standards? Is it not possible that this monument was set aside before more outstanding caves, in our system today, were discovered or at least well known, or before our qualification standards were set high enough?[272]

Bryant admitted these were "strong statements to make in view of the fact that I have not taken a trip through the cave yet myself." He recommended the cave be made a state park, where it could still be useful in "taking off some of the pressure on Wind Cave."[273] Region Two Chief of Interpretation H. Raymond Gregg replied to Bryant that his "perceptive thoughts on this matter are by no means out of order or without sympathy on the part of many people who have studied such matters," but he asked Bryant to refrain from "any rationalizing or justification of national significance."[274]

Revised Master Plan and Prospectus (1957–1958)

Little discussion of declassifying the monument followed Gregg's response to Bryant. It appears that by this point, the Region Two Office had determined that Jewel Cave should remain within a national monument, but that development of the site should be minimal. Instead of delisting Jewel Cave, the acting regional director suggested its master plan be "restudied with a view to the possibility of certain changes in the location and scope of development."[275] To that end, in October 1957, a landscape architect from the WODC met with Semingsen and a Forest Service official at Jewel Cave to discuss a revised master plan for the headquarters.[276] They considered the idea of

> placing most of the Monument's development down in Hell Canyon with the possibility in mind of an eventual rerouting of Highway 16 to run outside of the Monument down Lithograph Canyon and make possible an approach to the development from the lower level and through a new entrance from the relocated highway. A visitor center and parking area placed in the canyon would mean walking part way up the side of the canyon instead of coming down from above as they do now. Development possibility in the canyon, to include a residential area and campground, seem limited from the standpoint of space between canyon walls and the need to stay above the possible range of those up where the views are better, the grounds dry more rapidly, and the sunlight is longer. Mr. Axline has already investigated in some detail the problem of bringing an access road from the present entrance

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[272] Park Naturalist Bryant to Regional Chief of Interpretation Gregg, memorandum, March 29, 1956, 1–2, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[273] Bryant to Regional Chief of Interpretation Gregg, memorandum, March 29, 1956, 1.

[274] Regional Chief of Interpretation H. Raymond Gregg to Superintendent, Wind Cave National Monument (Attn: Naturalist Bryant), memorandum, April 10, 1956, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[275] Acting Regional Director M. H. Harvey to Wind Cave National Park Superintendent, memorandum, July 25, 1958, 1–2, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[276] Robert G. Hall to Superintendent, Wind Cave National Park, memorandum, May 27, 1958, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC; Region Two Director Howard W. Baker to Chief, WODC, memorandum, December 7, 1957, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

> down to a canyon development. Much of it would involve rock excavation and its estimated cost is $100,000.[277]

Region Two Landscape Architect Weldon Gratten thought that development down in Hell Canyon

> should work out all right on the ground but it tends to crowd development in a rather limited area above the cave and does not provide for needed campground expansion. Nor does it eliminate the problem of a rather poor existing entrance intersection.[278]

Planners ultimately opposed development at the floor of Hell Canyon because "development possibilities were too limited from the standpoint of space requirements between the canyon walls and the added hazards from flash floods in the canyon bottom."[279] The South Dakota State Highway Department told the NPS that it was not planning to relocate the portion of Highway 16 that passed through the monument, but it might consider doing so if the NPS thought such a rerouting would be "desirable." Ultimately, Gratten concluded, "It seems more likely that the State would prefer to stay with the existing road and some day raise its standards by simply easing curvature by cutting further into the side banks."[280]

Semingsen approved the draft master plan in December 1957 with headquarters development in the same area as the park's existing buildings.[281] During the review, the question arose of whether Jewel Cave should continue to provide camping facilities.[282] Those at the October meeting had concluded that Jewel Cave should retain a campground, since nearby Forest Service options were not expansive and new developments by the Forest Service would not be "designed to the standards usually found in areas of the National Park System."[283] However, Region Two Director Howard Baker argued against a campground.[284] The WODC completed drawings in May 1958, one with camping and one without, keeping the entrance and development in the existing footprint.[285] The

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[277] Regional Landscape Architect Weldon W. Gratton to Regional Chief of Operations, memorandum, November 13, 1957, 2, Records of Wind Cave National Park, General File, Box 1, Folder A9815 Conservation-Mission 66-JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

[278] Gratton to Regional Chief of Operations, memorandum, November 13, 1957, 2.

[279] Earl M. Semingsen and Walter Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 2, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1958, Jewel Cave NM CF.

[280] Gratton to Regional Chief of Operations, memorandum, November 13, 1957, 2.

[281] Wind Cave National Park Superintendent Early M. Semingsen to Chief, WODC, memorandum, December 6, 1957, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC; Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 2.

[282] Hall to Superintendent, Wind Cave National Park, memorandum, May 27, 1958.

[283] Quotes from Gratton to Regional Chief of Operations, memorandum, November 13, 1957, 1. See also Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 2.

[284] Acting Regional Director, Region Two, M. H. Harvey to Wind Cave National Park Superintendent, memorandum, May 22, 1958, Records of Wind Cave National Park, General File, Box 1, Folder D18 Plan. Prog. & Master Plan - JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

[285] Hall to Superintendent, Wind Cave National Park, memorandum, May 27, 1958.

NPS ultimately opted to wait until the Forest Service released its forthcoming "Operation Outdoors" plan, before deciding on whether to include a campground.[286]

Semingsen submitted a revised Mission 66 Prospectus to the Washington Office on October 1, 1958, to reflect the revisions to the monument's master plan. He again recommended not developing Jasper Cave and keeping the Jewel Cave tour primitive:

> Jewel Cave is the only cave in the National Park Service which is not lighted by electricity. Here the guided tour is led by a Park Ranger with gasoline lanterns along rather primitive trails and provides the visitor with a more primitive cave experience which has the flavor of adventure. Such an experience to most of the visitors makes up for the lack of large spectacular formations in the cave. However, this kind of tour and the narrowness of the passages can permit a limited number of visitors, ten to fifteen, per ranger guide, so the park ranger staffing cannot be judged by the number of visitors per guide as in other caves. Two similar cave tour routes are available for guiding up to four cave trips at one time.[287]

The revised prospectus echoed earlier requests for a new visitor center, more staff, a self-guided surface trail, cattle guards, fencing, a new water well, and additional employee housing.[288]

Acting NPS Director E. T. Scoyen, the Region Two director, and the WODC chief approved the revised Jewel Cave Mission 66 Prospectus in February 1959.[289] The final prospectus planned $65,000 for the visitor center/administration building and 5.5 full-time equivalent (FTE) staff (one permanent management and protection, one permanent maintenance and rehabilitation, three seasonal management and protection, and 0.5 seasonal maintenance and rehabilitation) at a total cost of $309,604.[290]

Wind Cave staff also completed a museum prospectus, which set a goal for Jewel Cave interpretation to "emphasize formation of the cave and its decorative formations, with some treatment of the significance of the virgin pine forest."[291] A proposed visitor center, incorporating a small museum, would serve the following functions:

> (1) interpret area story by exhibits and possible audio-visual program; (2) provide information service and sales publications to area visitors; (3) serve as operating headquarters for cave guide personnel; (4) serve as waiting room and gathering place for cave tour visitors; (5) provide necessary administrative office space.[292]

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[286] NPS, Jewel Cave National Monument Mission 66 Prospectus (revised), October 1, 1958, 6, 8, General Files 1952–1960, Box A-33, Folder A98 Mission 66, Records of the National Park Service Region II (Midwest Region), NARA KC.

[287] NPS, Jewel Cave National Monument Mission 66 Prospectus (revised), October 1, 1958, 6.

[288] NPS, Jewel Cave National Monument Mission 66 Prospectus (revised), October 1, 1958, 6.

[289] Acting NPS Director E. T. Scoyen to Region Two Director, memorandum, February 4, 1959; and NPS, Notice of Approval: Jewel Cave National Monument Prospectus, February 4, 1959, Records of Wind Cave National Park, General File, Box 1, Folder A9815 Conservation-Mission 66-JECA, Records of the National Park Service Region II (Midwest Region), NARA KC.

[290] NPS, Notice of Approval: Jewel Cave National Monument Prospectus, February 4, 1959.

[291] Edwin C. Alberta and Wayne W. Bryant, "Museum Prospectus," 6, Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

[292] Alberta and Bryant, "Museum Prospectus," 13.

The museum would be a space for protecting objects, such as calcite crystal specimens or any archeological material that turned up over time, and making them available "for reference by traveling scientists, research workers, and Service personnel." The proposed exhibits included local geology of the Limestone Plateau, forestry values of the surface land, history of the cave's discovery, display and explanation of crystal formation, description of the guided tours, and promotion of other attractions in the greater Black Hills area.[293] The Region Two Office approved the museum prospectus, and by July 1959, Semingsen, Keith E. Miller, and Hart had formed a group to begin planning specific exhibits.[294]

With approved plans, it appeared that the NPS might finally begin construction on Jewel Cave. Other parks had already received infusions of Mission 66 funding, with new visitor centers and other facilities to show for it. Regional Director Baker visited Jewel Cave on June 26, 1959, and reported favorably on his visit and cave tour:

> This was the first time I had been in Jewel Cave for a good many years and I was glad to have the opportunity to refresh my memory of its fine qualities. It is certainly a trip requiring much more exertion and stamina on the part of the visitor than at Wind Cave. I do think we have to watch the steps, stairs, and structures very, very carefully so that there will be no opportunity for failure which would cause accidents. I have the feeling that someday we should take steps to lower some of the floors and make it easier for the average person to walk along a trail. At least I believe most people would get more out of the trip if they didn't have to be continuously watching so they wouldn't bump their heads.[295]

In addition to still backing a plan to enlarge cave passageways, Baker suggested retaining the campground and declared his hope of realizing the Mission 66 developments at Jewel Cave.[296] To move forward, Jewel Cave needed an updated master plan (which the WODC was already working on), in addition to the approved Mission 66 Prospectus. Baker was optimistic about the schedule and commented, "Generally we feel we have more or less agreed on a plan and on that basis have programmed the construction of facilities in the 1962 and 1963 fiscal years."[297] Semingsen wrote in

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[293] Alberta and Bryant, "Museum Prospectus," 14.

[294] Earl M. Semingsen to Regional Director, "Memorandum: Exhibit Planning, Jewel Cave National Monument," July 15, 1959, General Files, Box D96, Folder D6215 Book #1. June 1953 – Dec. 1959. WICA., Records of the National Park Service Region II (Midwest Region), NARA KC; Earl M. Semingsen to Ranger-in-Charge, Jewel Cave National Monument, "Memorandum: Jewel Cave National Monument Interpretation Studies and Research Projects," June 29, 1959, Cabinet 3, Drawer 1, Folder H14 Area and Service History Cultural Park Hist. Research Documents, Jewel Cave NM CF.

[295] Regional Director Howard W. Baker to Superintendent, Wind Cave National Park, memorandum, June 26, 1959, 1, General Files 1952–1963, Box N-10, Folder Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[296] Baker to Superintendent, Wind Cave National Park, memorandum, June 26, 1959, 2.

[297] Regional Director Howard W. Baker to Jess H. Lombard, December 23, 1959, 5, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

late 1959, "Jewel Cave is presently programmed for heavy construction in about two or three packages in the next two or three years and should end up as a completed area prior to 1966."[298]

During the ongoing planning process, Jewel Cave and Wind Cave maintenance crews improved existing cave trails. In 1957, maintenance crews laid an asphalt tread and made other improvements on the "Heavenly" cave route, which Semingsen described:

> A crew of three men worked on cave trails from the last week in July until the first of September laying an asphalt tread on the cave trail within the cave for about four hundred feet of the distance which is taken by the regular cave tours. The remainder of the distance on the "heavenly" route was improved by using natural materials which could be found handy in the cave to improve the tread on the trail. Steep inclines were improved by constructing wooden stairways in several places. This improvement work makes the trail much easier and safer for the visitors and it is possible for the ranger guides to get farther into the cave with the average group of visitors and show them more of the cave.[299]

Maintenance employee Clarence Kelsey also worked on the Dungeon Route, where he reconstructed a flight of stairs and added new handrails.[300]

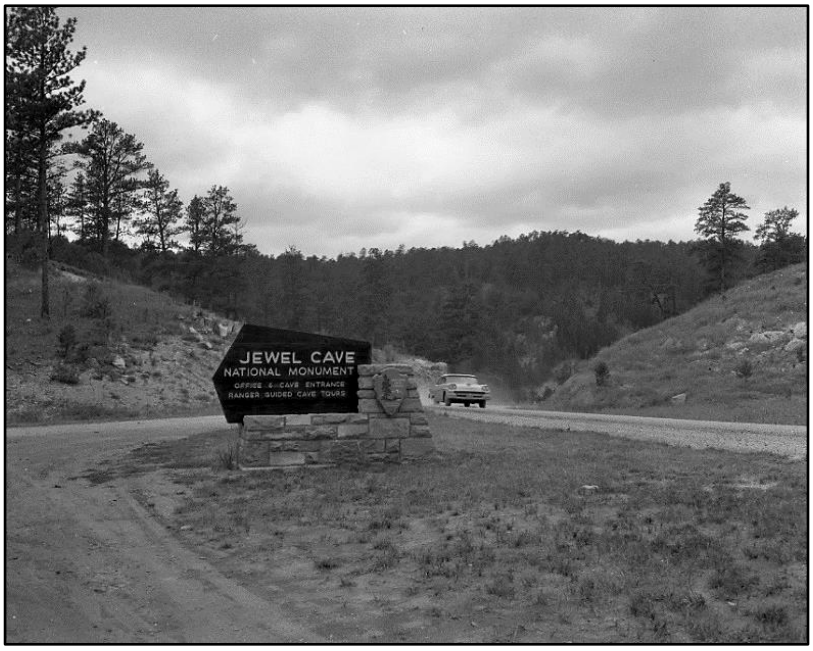


Figure 38. New entrance sign for Jewel Cave NM, ca. 1958.

Source: NPS, Jewel Cave NM.

[298] Earl M. Semingsen to Superintendent, Dinosaur National Monument, memorandum, November 19, 1959, 4, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[299] JECA Annual Report 1957–1958, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1957, Jewel Cave NM CF.

[300] JECA Annual Report 1957–1958; Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 4–5. Note that this is one of the earliest mentions of the "Dungeon Room," which was previously referred to as "Hell." The term "Dungeon Room" became standardized, as did other names given to cave rooms in the late 1950s, likely because of the continuity of exploration and management from the late 1950s on. Mike Wiles, comments on draft administrative history, April 7, 2020.

As plans for the monument progressed, the sign shop at Mount Rushmore created 26 new signs for Jewel Cave (see Figure 38).[301] Wind Cave crews erected the signs in 1957 and 1958.[302] One of them was a "routed wood sign" installed near the cave entrance. The new sign "briefly summarize[d] important features of the cave story." The NPS placed a similar sign near the parking area that introduced the public to Jewel Cave and Jasper Cave (see Figure 39).[303] Both of these signs called Jewel Cave a "small cave." No one could have anticipated that within the year, three rock climbers would prove that description wrong and change everything.

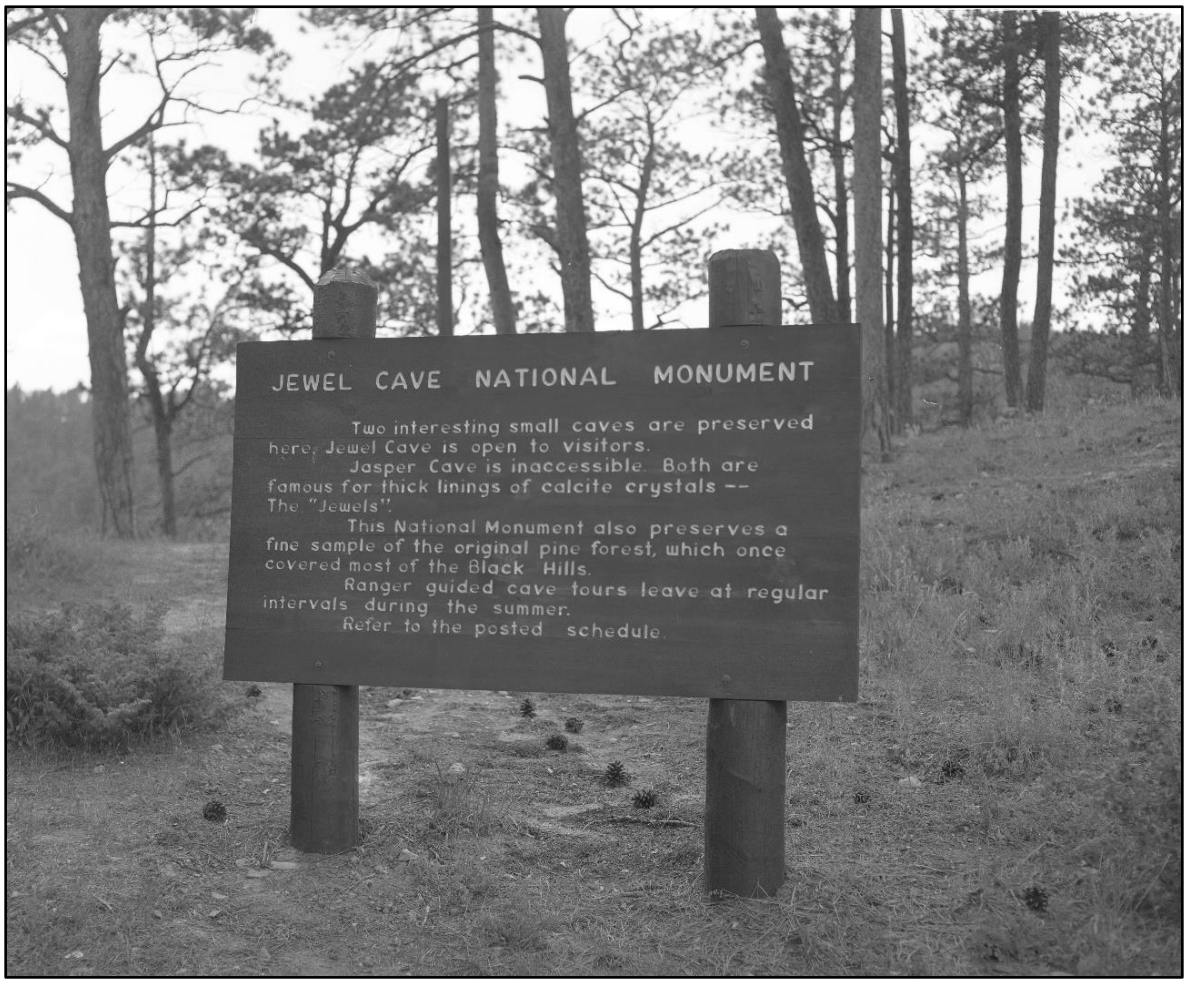


Figure 39. A new sign at Jewel Cave erected in 1958 called Jewel Cave and Jasper Cave "small caves." This sign was near the park entrance and was in addition to the sign in front of the cave entrance that also called Jewel Cave a "small cave." Richard Hart, 1958.

Source: NPS, Jewel Cave NM.

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[301] Byrum C. Waller, Chief, Maintenance, Jewel Cave Sign Construction Narrative Report, June 1958, Cabinet 2, Drawer 3, Folder 523.2–Signs Construction JECA '58, Jewel Cave NM CF.

[302] JECA Annual Report 1957–1958; Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 5.

[303] Master Plan Development Outline, Jewel Cave National monument, South Dakota: Interpretation, August 1958, 20, Cabinet 3, Drawer 3, Folder D18 Master Plan, Jewel Cave NM CF.

Conclusion

After the NPS took over full management of Jewel Cave in 1939, it emphasized the "primitive" nature of its cave tours, as compared to Wind Cave and others with electric lighting, elevators, and other modern infrastructure. The NPS wrestled with whether to keep Jewel Cave in the National Park System, wondering whether it held enough significance to warrant inclusion. By the time the NPS began Mission 66 planning, delisting appears to have been taken off the table. But the debate continued over whether to maintain Jewel Cave as a "primitive" cave or to implement its Mission 66 Prospectus, which called for significant new infrastructure, including installing an elevator.

Chapter 4: Investment in Visitor Services and Cave Exploration (ca. 1957–1972)

Jewel Cave National Monument (Jewel Cave) underwent a massive transformation between 1959 and 1972. Seasonal staff, followed by Herb Conn, Jan Conn, and other individuals unaffiliated with the National Park Service (NPS), discovered and mapped new cave passageways. Their explorations proved that Jewel Cave was not a "small cave," but that it contained at least tens of miles of passageways, if not more. Visitation skyrocketed as news of the discoveries spread. The resulting publicity shifted NPS attitudes toward Jewel Cave. Within a few years, NPS administrators went from debating whether Jewel Cave should be eliminated from the National Park System to planning a new cave entrance and other high-impact developments. To facilitate the development, the NPS exchanged land with the Forest Service through an act of Congress. By 1972, Jewel Cave had new boundaries, two new cave entrances, a new visitor center, and many leads (unexplored passages) for further cave exploration.

Management and Staffing

Jewel Cave seasonal staff grew in the late 1950s. In 1957, there were four GS-4 seasonal park rangers, as well as a seasonal full-time maintenance person—the first time the monument had a dedicated maintenance employee.[1] The following year, Walt Lienau (a former seasonal ranger) became the ranger-in-charge, and the NPS hired six seasonal rangers (GS-4), one seasonal naturalist (GS-4), a fire control aid, and an ungraded maintenance employee (see Figure 40). Lienau reported to Wind Cave Superintendent Earl M. Semingsen, while the maintenance employee reported to the Wind Cave



Figure 40. Seasonal staff at Jewel Cave, ca. 1959/1960.

Source: NPS, Jewel Cave NM.

[1] Earl M. Semingsen and John S. Shepherd, 1957 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 1, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1957, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF); Earl M. Semingsen and Walter Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota,

maintenance supervisor.[2] Wind Cave Administrative Assistant J. W. Warner managed Jewel Cave personnel issues, procurement, property management, billing, and files.[3]

In 1958 and 1959, Region Two Director Howard W. Baker and Semingsen planned long-term staffing changes for Jewel Cave. Baker asked Semingsen to include a superintendent position (GS-9) for Jewel Cave in the 1961 budget.[4] Baker explained how Semingsen's role functioned and how the new position would change that:

> For all intents and purposes, Mr. Semingsen functions as Coordinating Superintendent of Jewel Cave. He looks after all area activities, including management, protection, interpretation, and maintenance. Under delegation from me, he is responsible for the control of the area's funds; for the preparation of its budgets; for processing its personnel actions; for procuring its supplies and materials; for answering correspondence relating to the area, etc.
>
> Mr. Semingsen's position description contains this statement: "By delegation of authority and responsibility from the Regional Director, the Superintendent is assigned full responsibility and control of Jewel Cave National Monument." This part of his position description, as well as another part relating to Jewel Cave, will need amending if you approve this recommendation. . . . [to] establish . . . a Superintendent's position for Jewel Cave in fiscal 1961. This being so, the arrangement recommended herein will hold only until such time as we fill the position.[5]

Director Conrad Wirth opposed "creating any more coordinating superintendencies than is absolutely necessary," but he did not object to changing Semingsen's title to "Superintendent of Wind Cave and Jewel Cave." The title change took effect in April 1959.[6]

In June 1959, Baker secured funding for a permanent, non-furloughed ranger position at Jewel Cave—not a full superintendent, but a ranger who was permanent and year-round. Baker explained his plan for the position to Semingsen:

> I would like to fill this position as soon as we can. It should be filled by an experienced National Park Service man, preferably someone who has had an opportunity to go through the Yosemite Ranger

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4, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1958, Jewel Cave NM CF.

[2] Semingsen and Shepherd, 1957 Superintendents Annual Report for Jewel Cave National Monument, 1; Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument, 4.

[3] NPS, Wind Cave, Position Description for "Administrative Assistant (J. W. Warner)," July 17, 1958, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), National Archives and Records Administration, Kansas City, MO (hereafter NARA KC).

[4] "Notes on Discussions Mr. Baker had with Mr. Semingsen at Rapid City on October 24," November 4, 1958, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[5] Regional Director Howard W. Baker to the Director, memorandum, November 10, 1958, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[6] Acting Associate Director Hillary A. Tolson to Region Two Director, memorandum, December 11, 1958; Acting Regional Director M. H. Harvey to Superintendent, Wind Cave National Park, memorandum, April 1, 1959; and Regional Director Howard W. Baker to Superintendent, Wind Cave National Park, memorandum, December 23, 1958, all in General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

> School. The man should be stationed at Jewel Cave and in the winter time he can be used at Wind Cave, or perhaps we would need to borrow him from time to time for special type of assignment.
>
> However, generally he would be under your direction. I want him to report directly to you as Superintendent of Wind Cave National Park and Jewel Cave National Monument, for he should be responsible for all activities at Jewel Cave.[7]

In July, Baker and Semingsen hired Keith E. Miller from Glacier National Park into the new, full-time ranger-in-charge position (see Figure 41).[8] Miller managed day-to-day operations, reports, and public relations in Custer and Newcastle, while the Wind Cave administrative officer and superintendent continued to manage the rest.[9] Under Miller were the assistant ranger-in-charge (Lienau), four seasonal rangers, a park naturalist, a fire control aid, and a laborer.[10]



Figure 41. Park Ranger Keith Miller stands next to a patrol car, ca. 1950s.

Source: NPS, Harpers Ferry Center.

Later that year, Semingsen left Wind Cave for another assignment, and Jess H. Lombard replaced him. Lombard's title remained "Superintendent of Wind Cave National Park and Jewel Cave National Monument."[11] In his introductory letter to Lombard, Baker pushed back the goal for

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[7] Regional Director Howard W. Baker to Superintendent, Wind Cave National Park, memorandum, June 26, 1959, 2, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[8] Keith E. Miller, 1960 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 2, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1961, Jewel Cave NM CF.

[9] Earl M. Semingsen to Superintendent, Dinosaur National Monument, memorandum, November 19, 1959, 4, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[10] Earl M. Semingsen to All Employees, Wind Cave National Park, Jewel Cave National Monument, memorandum, July 20, 1959, 4, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[11] Regional Director Howard W. Baker to Jess H. Lombard, December 23, 1959, 1, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

a separate Jewel Cave superintendent to 1962.[12] Baker explained his vision the Jewel Cave ranger-in-charge position:

> We have a Park Ranger assigned to Jewel Cave to be stationed at the area during the summer when the Monument is open. The remainder of the year he can be moved to Wind Cave to assist with such work as you consider desirable. He should be kept generally informed on what is happening at Jewel Cave and be your principal representative for that area. However, while he is at Wind Cave he can be assigned to the ranger staff and can report to the Chief Ranger except when handling Jewel Cave matters. Furthermore, we consider this man as available for special assignments in case we need assistance at other places in the Region during the winter season.[13]

Miller remained the ranger-in-charge at Jewel Cave through 1961. He went on several cave exploration trips with the Conns during his tenure.[14]

When Miller left in 1962, Homer A. (Pete) Robinson served as ranger-in-charge for less than a year. After Robinson departed, Lombard and the Region Two Office reallocated funds to change the position from a GS-7 to a GS-9 and retitled it "Management Assistant." Wallace (Wally) Elms became the first to fill the new position on May 5, 1963 (see Figure 42).[15] Lombard clarified that while he (Lombard) was superintendent of Jewel Cave, Elms was "in direct charge of the Monument."[16] The management assistant remained the only permanent position at Jewel Cave, but the non-permanent maintenance man lived at Jewel Cave in the winter starting in 1964.[17]



Figure 42. Wally Elms, the first person to hold the title "management assistant" at Jewel Cave. Pictured here at Wind Cave, ca. 1963.

Source: NPS, Jewel Cave NM.

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[12] Baker to Lombard, December 23, 1959, 5.

[13] Baker to Lombard, December 23, 1959, 1.

[14] Jess H. Lombard to Director, memorandum, July 7, 1960, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1960, Jewel Cave NM CF; Wind Cave National Park Superintendent to Regional Director, undated [ca. 1961], Cabinet 3, Drawer 1, Folder H14 Area and Service History, Cultural, Park Hist. Research Documents, Jewel Cave NM CF; Herb and Jan Conn, Jewel Cave Exploration Cave Trip Log, Special Use Permit JECA-1-60, Sept. 26, 1959 to March 31, 1960, File 3449zp, Jewel Cave National Monument Museum Files, Custer, SD (hereafter Jewel Cave NM MF); Herb and Jan Conn, Jewel Cave Exploration, Special Use Permit JECA-1-60, Descriptive Report, 1, File 3449zj, Jewel Cave NM MF.

[15] Jess H. Lombard, 1963 Superintendent's Annual Report for Jewel Cave National Monument, 2, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF.

[16] Jess H. Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 2, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF.

[17] Jess H. Lombard and James B. Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 2, 6, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF.

In February 1965, Lombard hired James B. Thompson to replace Elms as management assistant (still GS-9). Under Thompson were eight seasonal rangers, two laborers, one maintenance worker, and one ranger-naturalist.[18] Thompson prepared the Jewel Cave budget and had relative autonomy while at Jewel Cave, but anything that needed to go to the Region Two Office had to pass through Lombard.[19] Thompson left in summer 1966, and Donald F. Gillespie, a ranger at Wind Cave replaced him, first in a temporary capacity and then permanently, but at a lower grade level (GS-7).[20]

In 1967, the permanent staff expanded to include a management assistant and maintenance employee, and the seasonal staff increased to ten rangers, three laborers, and a clerk-stenographer.[21] The naturalist position was "dropped for administrative reasons."[22] In 1968, a woman joined the seasonal staff for the first time, working in the ticket booth.[23] In 1969, the staff consisted of one management assistant (GS-9), three supervisory seasonal park rangers (GS-5), seven general seasonal park rangers (GS-4), three seasonal maintenance employees (ungraded), four seasonal laborers, and one maintenance foreman (no grade listed).[24] Seasonal staff in 1970 included several Newcastle High School teachers on their summer break, along with a teacher from Minnesota.[25] Dave Todd took over as management assistant in March 1969 and remained in that position through the opening of the new visitor center in 1972.[26]

Effects of Exploration on NPS Planning and Management

As of 1959, the NPS Washington Office had approved Wind Cave Superintendent Semingsen's Mission 66 Prospectus for Jewel Cave, and the Western Office of Design and Construction (WODC) was working on a master plan to accompany it.[27] While the NPS considered where to develop additional visitor services at Jewel Cave, the seasonal staff spent their non-working hours

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[18] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 2.

[19] James B. Thompson, interview by Jackie Gonzales, April 18, 2019, Estes Park, Colorado.

[20] Warren D. Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 2, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF; Thompson, interview.

[21] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 2.

[22] Donald F. Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967, 2, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[23] The report did not include the woman's name. Donald F. Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 2, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[24] "Organization Chart of Wind Cave National Park," April 4, 1969, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

[25] Alex Mitich, "Cave Questions – Little Jewels," *Bits and Pieces* 7, no. 2 (March–April 1971): 21–22, in Cabinet 3, Drawer 1, Folder H14 Area and Service History, Cultural, Park Hist. Research Documents, Jewel Cave NM CF.

[26] Dave Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 4, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF; Robert A. Martin to David Todd, Park Manager, Jewel Cave NM, March 4, 1970, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF; Dave Todd, Annual Budget Request, for Informational Printing (Free and Sales), Jewel Cave National Monument, February 17, 1972, Cabinet 1, Drawer 2, Folder 6.A.2 Annual Budget Requests Printing 10-81, Jewel Cave NM CF.

[27] Baker to Lombard, December 23, 1959, 5.

exploring the cave, and they invited friends to join them. These individuals, and others unaffiliated with the NPS, made discoveries that dramatically changed the understanding of Jewel Cave's size and importance, which in turn shifted NPS development plans for the monument.

Exploration in the Late 1950s

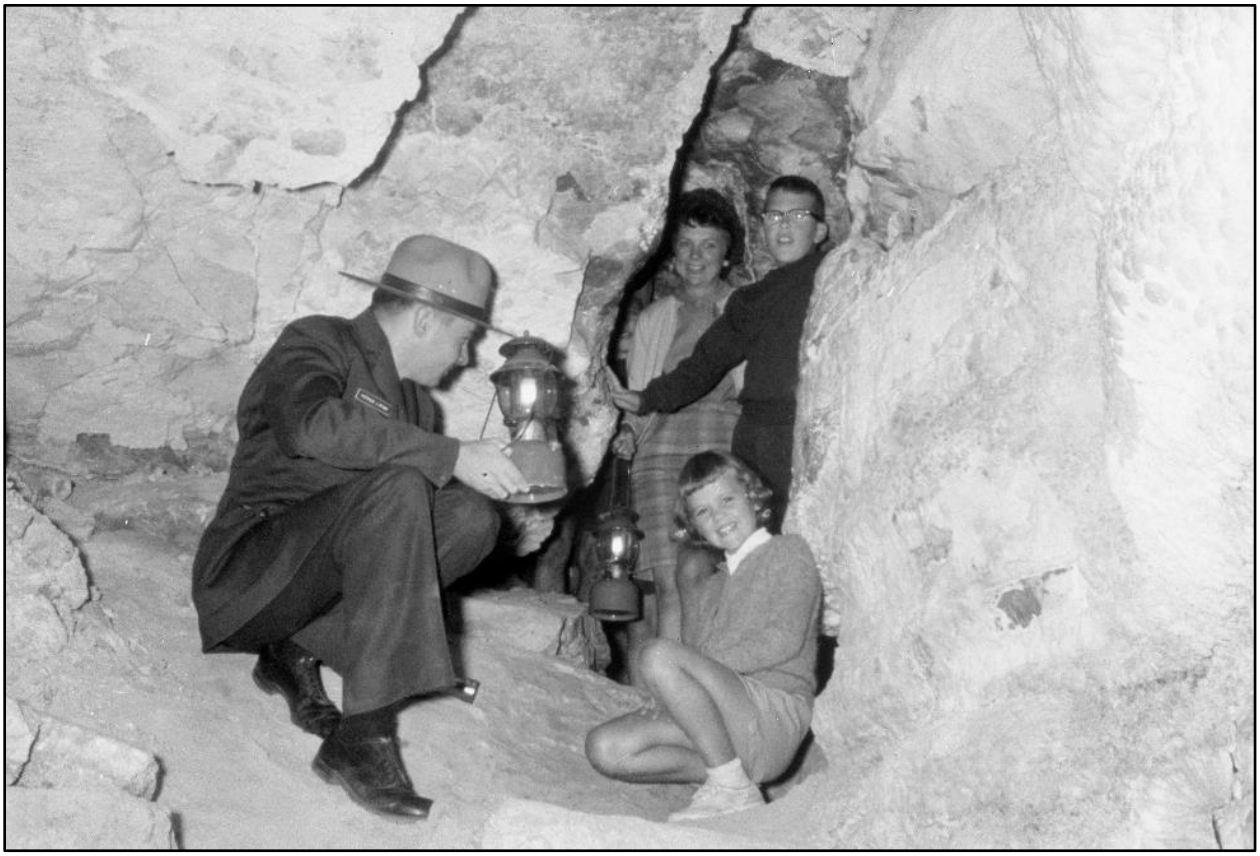


Figure 43. Park Ranger P. J. Ryan leading a cave tour, 1961.

Source: NPS, Jewel Cave NM.

Seasonal rangers Patrick J. ("P. J.") Ryan, Clarence Kinzer, and Jimmie D. Hylton explored the cave during their free time in summer 1957 (see Figure 43). One day, as the story goes, Ryan was smoking a cigarette near Milk River, when he noticed the smoke drifting through the broken-down calcite piled nearby. Ryan, Kinzer, and Hylton cleared away some of the rubble, crossed a deep crevice beyond Milk River, and found passages that had not been previously known.[28] Ryan and Kinzer wrote up a description of the passages they had found. Wind Cave Park Naturalist Richard Hart later tried but failed to retrace their steps using the writeup.[29] In late August, Ryan and Kinzer

[28] Jewel Cave NM Management Assistant Wallace B. Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 1–2, Files 1661a–1661b, Jewel Cave NM MF; Dwight Deal, interview by Jackie Gonzales, June 30, 2019, Custer, SD.

[29] Park Naturalist Richard T. Hart, "JECA Research—Seasonal park rangers," undated [1957], File 3449zza, Jewel Cave NM MF.

wrote additional descriptions of their findings for Semingsen, which included a room that was one hundred feet from floor to ceiling. They began to speculate about what these discoveries could mean for the future of Jewel Cave:

> There is the possibility that Jewel Cave could be built up to where it could have a tour equal to that of Wind Cave, however, the expense of such a project would be terrific. For that reason the wisdom of attempting to improve that particular area at the present is questionable as we had some difficulty in reaching some of the remote areas discussed.[30]

Ryan was well-connected in caving circles and offered to promote Jewel Cave during an upcoming talk for a National Speleological Society (NSS) grotto in New Jersey.[31]

The next June, Delmer Brown, a student in geological engineering at the South Dakota School of Mines, requested a permit to survey Jewel Cave as part of his undergraduate work. Semingsen approved the permit, which was the first granted at Jewel Cave for surveying. Semingsen set the following conditions:

> In order for Mr. Brown to have access to the cave, we may designate him as a collaborator, without compensation, of the National Park Service. As a requirement of this collaboratorship, he is to furnish two copies of his manuscript and map to the Superintendent, Wind Cave. The Black Hills Natural History Association is to render some financial assistance in getting the manuscript typed. . . .
>
> Mr. Brown understands that he is under no circumstances to work alone in the cave and any assistance used by him must be cleared with the Superintendent, Wind Cave National Park, and the Officer-in-Charge, Walter Lienau, at Jewel Cave National Monument.[32]

The Region Two Office granted Semingsen permission to use some of the $500 that had been budgeted for natural history research at Wind Cave toward Brown's survey.[33]

Brown explored and surveyed Jewel Cave during 1958 and 1959. Brown received help from his advisor, Stan Arlton (who later studied the relationship between Jewel Cave's airflow and volume), and seasonal rangers, who made transit-tape surveys of the rooms beyond Milk River. Wind Cave Park Ranger Bill Eibert participated in the exploring, report writing, and mapping, work he performed outside of his normal duties.[34] John Hannan and Gerald Wergadal of Jewel Cave assisted

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[30] Patrick J. Ryan and Clarence M. Kinzer to Wind Cave National Park Superintendent, August 26, 1957, File 3449zzc, Jewel Cave NM MF.

[31] Patrick J. Ryan to Richard B. Hart, April 10, 1958, File 3449zzb, Jewel Cave NM MF.

[32] Wind Cave Superintendent Earl M. Semingsen to Edward L. Tullis, South Dakota School of Mines and Technology, June 24, 1958, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[33] Chief, Division of Interpretation, Ronald F. Lee, to Region Two Director, memorandum, September 24, 1958, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[34] Park Naturalist Richard B. Hart to Wind Cave Superintendent Earl M. Semingsen, June 24, 1958, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC; Earl M. Semingsen and Walter Lienau, 1959 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1959, Jewel Cave NM CF; G. William Eibert, "Jewel Cave Exploration (Beyond 'Badger-Hole' Traverse)," August 25, 1959, Files 1695a–1695h, Jewel Cave NM MF; Wind Cave Superintendent Earl M. Semingsen to Region Two Director, memorandum, August 17, 1959, File 3449zw, Jewel Cave NM MF; Elms to Wind Cave Superintendent, memorandum, February 4, 1965, Files 1661a–1661b, Jewel Cave NM MF.

Eibert with mapping.[35] (Eibert's map lacked inclination measurements and was revised later.[36]) The group tied the new surveys to the earlier Civilian Conservation Corps surveys and one from 1938 that Hart believed was completed by Frank Neighbor, an undergraduate student at South Dakota School of Mines and Technology.[37] They explored some of the areas that Lyle Linch had been through, but Brown had difficulty telling which chamber was which based on Linch's notes (this may have had something to do with Linch's exaggerated reports).[38]

Brown submitted his thesis, "A Study of the Geology and a Description of a Portion of Jewel Cave," on September 16, 1959. John Doerr, acting chief of interpretation at the NPS Washington Office, called Brown's thesis "an unusually good contribution to cavern geology." Doerr showed it to US Geological Survey (USGS) Geologist William Davies, editor of the *NSS News*, and Davies asked permission to publish Brown's thesis in a future issue. Doerr commended Semingsen for "having created a work situation so favorable to this type of research."[39] Geological Engineering Professor John Paul Gries of the South Dakota School of Mines praised the effort: "This mapping project, and the exploratory work which preceded it, has greatly increased our knowledge of the size of the Cave; certainly it can no longer be considered one of the small caves of the Hills."[40]

Word of Jewel Cave began to spread within the caving community. Geology students from the University of Wyoming and the South Dakota School of Mines joined Brown, Eibert, and others during the 1959 season, including Jim Thompson, who later would become the management assistant at Jewel Cave, and Dwight Deal, a student at the University of Wyoming and member of the NSS.[41] Ryan had first introduced Deal to the cave.

Deal knew Herb and Jan Conn, whom he had met when they visited South Dakota to rock climb in the Black Hills (see Figure 44). Herb Conn was from Geneva, New York, and Jan Conn was from Maryland. Herb had a degree in electrical engineering from the University of Colorado, and Jan was a composer and musician. Both were skilled climbers. Although they had been in a cave a few times before, including Schoolhouse Cave in West Virginia, the Conns' real interest and claim to fame had always been their surface climbing. In particular, they were known for many first ascents and their limited use of technical equipment. While most climbers were content to rappel back to the ground after completing a climb, the Conns almost always climbed back down, which

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[35] "Jewel Cave National Monument: Operation and Maintenance," undated [ca. 1961], File 1679c, Jewel Cave NM MF.

[36] Michael Wiles and Rene Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 4, Jewel Cave National Monument Digital Files (hereafter Jewel Cave NM DF).

[37] Hart to Semingsen, June 24, 1958; Mike Wiles, comments on draft administrative history, April 7, 2020.

[38] Delmer L. Brown to Keith E. Miller, August 19, 1959, 2–3, File 3449zv, Jewel Cave NM MF.

[39] Acting Chief, Division of Interpretation, John E. Doerr, to Region Two Director, memorandum, October 15, 1959, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[40] John Paul Gries to Earl Semingsen, August 8, 1959, File 1693, Jewel Cave NM MF.

[41] Thompson, interview; Deal interview; Supervisory Park Ranger Keith E. Miller to Wind Cave National Park Superintendent, memorandum, June 5, 1960, 1, File 1785f, Jewel Cave NM MF.

they considered the true test of their skills. When Deal asked the Conns if they would be interested in climbing underground in Jewel Cave, they said yes.[42]



Figure 44. Herb and Jan Conn, ca. 1959.

Source: NPS.

Wind Cave Superintendent Jess Lombard issued Deal a special use permit for exploration and surveying of Jewel Cave, to build on Brown and Eibert's surveys.[43] Lombard discussed with the NPS Washington Office whether a permit or "use of Gratuitous Service (non-appointive)" was a better way to manage the exploration. The assistant director recommended using a permit for research purposes (since "the work is actually research and could be applied under that category") and suggested that the NPS add a section on surveying and mapping caves to its new handbook "on without compensation employment."[44] Miller did not know the insurance requirements for caving, so he advised consulting with the NSS if the NPS needed to figure out how to procure insurance for cave exploration.[45]

On caving trips under his permit, Deal was often accompanied by Herb Conn, Jan Conn, and Wind Cave Ranger Dave Schnute. Miller praised their qualifications for this work:

> Mr. Deal has done extensive spelunking in caves throughout the country. Mr. & Mrs. Conn are well known for their rock climbing ability. Dave Schnute has been spelunking for several years. Both Deal and Conn have engineering backgrounds and this has enabled them to do an excellent mapping job to-date.[46]

Deal taught Herb Conn how to survey, and Herb joined Deal on every one of the trips from September 26, 1959, to March 1960. Jan joined all but one (see Figure 45). The Conns even went

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[42] Dwight Deal, "Jewel Cave Exploration late 1800s through 1962," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019; Don Hipschman, "South Dakota Couple Discovers… A New World Underground," [Magazine title unknown], March 22, 1964, clipping, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC; Lorraine Collings, "The Conns of Jewel Cave," *Empire Magazine* (March 18, 1973): 26; Jan Conn, "Jewel Cave Exploration from 1959–1979," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019; Dwight Deal, "Foreword," in Herb and Jan Conn, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota* (St. Louis: Cave Books, 1977), 12–13; Deal, interview.

[43] Miller to Wind Cave Superintendent, memorandum, June 5, 1960, 1, File 1785f, Jewel Cave NM MF; and Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 2, File 1661b, Jewel Cave NM MF.

[44] Miller to Wind Cave Superintendent, memorandum, June 5, 1960, 2, File 1785g, Jewel Cave NM MF.

[45] Miller to Wind Cave Superintendent, memorandum, June 5, 1960, 2, File 1785g, Jewel Cave NM MF.

[46] Miller to Wind Cave Superintendent, memorandum, June 5, 1960, 1, File 1785f, Jewel Cave NM MF.

without Deal on several trips.[47] In some passages, they found evidence that they were not the first ones there. Lombard sent one such find, a Sears Roebuck catalog, to Sears and asked if they might be able to tell from the plow advertised on the page what year the catalog was from. Sears guessed 1908, indicating the Michauds likely had been in some of these passages 50 years before.[48]



Figure 45. Jan Conn, Herb Conn, Dave Schnute, and Dwight Deal, 1959.

Source: NPS, Jewel Cave NM.

Mineral Withdrawal

Surveys of Jewel Cave, first by Brown and Eibert and then by Deal and the Conns, presented a management problem: the newly discovered portions of the cave were under Forest Service land, which, unlike the national monument land, was open to mining claims. On October 14, 1959, Semingsen asked the Region Two Director about

> "freezing" the land area along the east monument boundary and subsequently acquiring sufficient land by exchange or otherwise from the United States Forest Service. . . . It is quite apparent that the Jewel Cave cavern system is of greater extent and significance than heretofore realized and we are anxious to protect the entire system from encroachments of any kind from adjoining United States Forest Service lands.[49]

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[47] Herb and Jan Conn, Jewel Cave Exploration Cave Trip Log, Special Use Permit JECA-1-60, Sept. 26, 1959 to March 31, 1960, File 3449zp, Jewel Cave NM MF; Deal, interview; Jan Conn, "Jewel Cave Exploration from 1959–1979," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019.

[48] G. D. Downey to Jess H. Lombard, April 11, 1960, File 3449zo, Jewel Cave NM MF.

[49] Earl M. Semingsen to Region Two Director, memorandum, October 14, 1959, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

Semingsen recommended that the NPS authorize additional research to determine the extent of the cave outside of monument boundaries.[50]

Semingsen and Region Two Office staff worked with Black Hills National Forest officials in Custer, who then cooperated with the Bureau of Land Management (BLM) to withdraw Forest Service lands above the known cave from mineral entry.[51] The agencies agreed on terms needed to begin a withdrawal on January 4, 1960.[52] The following year, the NPS made a formal application to withdraw 1,119.84 acres east of the Jewel Cave National Monument boundary from mineral exploitation for the purpose of "protection of extensive caverns and underground passages originating within Jewel Cave National Monument."[53]

The NPS and Forest Service approved the final mineral withdrawal in 1961. After the approval, NPS Director Conrad Wirth, Region Two Director Baker, and other regional staff inspected the monument. They discussed the need for "studies relating to a reevaluation of the significance of Jewel Cave and future Service actions in regard to that area."[54] The new cave discoveries, the mineral withdrawal, and the visit from Director Wirth confirmed that Jewel Cave was finally safe from losing its national monument status.

Search for New Tour Routes

After the mineral withdrawal, Wind Cave superintendents and the Region Two Office supported continued exploration for the express purpose of locating potential tour routes. Ryan and Kinzer had already recommended against a tour in the area that they had explored beyond Milk River because of the "rough, low, and narrow" nature of the passageways.[55] In June 1960, Regional Chief of Interpretation M. E. Beatty met Lombard, Miller, and the Conns to plan future exploration efforts. They agreed that the best place to explore would be

> in the Monument area westward from the large room known as "Penn Station." It was suggested that an effort be made to find a connection with one of the passages used on conducted trips to permit making a loop trip, thus increasing the daily visitor use of the cave.[56]

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[50] Semingsen to Region Two Director, memorandum, August 17, 1959.

[51] Miller to Wind Cave National Park Superintendent, memorandum, June 5, 1960, 1, File 1785f, Jewel Cave NM MF; Miller, 1960 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 4.

[52] Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 2, File 1661b, Jewel Cave NM MF.

[53] Edgar I. Rowland, State Director, BLM, Notice of Proposed Withdrawal and Reservation of Lands, May 9, 1961, File 3397c, Jewel Cave NM MF.

[54] 1961 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 1, Jewel Cave NM CF; Regional Director to Director, memorandum, no date, 1, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

[55] Clarence M. Kinzer and Pat Ryan to Wind Cave National Park Superintendent, August 24, 1957, File 3449zzd, Jewel Cave NM MF.

[56] Regional Chief of Interpretation M. E. Beatty to Region Two Director, memorandum, June 28, 1960, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

Beatty wanted "to retain the visitor station . . . near the entrance to Jewel Cave." He questioned whether other passageways contained more than the dogtooth spar formations, which, he felt,

> frankly do not live up to their name due to the heavy brown-stained coating and also fail to live up to the expectations of visitors as the cave name indicates. The principal attraction appears to be the primitive nature of the cave—wooden stairs and Coleman lanterns. If these were changed to concrete steps and electric lighting, I am of the opinion the cave would lose much of its interest for visitors.[57]

Beatty thus continued the argument from the previous decade that Jewel Cave was most valuable to the NPS as a primitive cave experience.



Figure 46. Jan Conn (*far left*) and Herb Conn (*fourth from left standing*) with cavers, including Jewel Cave Management Assistant Wally Elms (*second from right*) and his wife (*far right*). Photo taken by Seasonal Ranger Mike Kaback, 1963.

Source: NPS, Jewel Cave NM.

In 1960, the Region Two Office paid the Conns $500 to survey Jasper Cave with an eye toward possible loop tour routes that the NPS could develop there (see Figures 46 and 47).[58] The Conns noted that, "At the back of the entrance room a twisting hole leads down 40' and is equipped with three old wooden ladders." Further in the cave, the Conns found additional evidence of earlier cavers, including "several bottles containing water, a few candles," a tobacco can, and buttons. At a "crystal lined passage too tight to squeeze through" with strong air movement (at survey point B11), the Conns noted, "there were signs here that previous explorers had attempted to enlarge the

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[57] Beatty to Region Two Director, memorandum, June 28, 1960.

[58] Beatty to Region Two Director, memorandum, June 28, 1960; Regional Chief of Interpretation M. E. Beatty to Superintendent, Wind Cave National Park, memorandum, July 7, 1960, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC; Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 3, File 1661c, Jewel Cave NM MF.

passage with crowbars."[59] Herb reported that, despite the strong winds emanating from Jasper Cave, accessible passages were minimal:

> In addition to our own visits to Jasper Cave, groups of rangers have been in several times during the past summer on their days off, hunting for further leads. While it is never possible to say that an important lead might not have been missed, we feel reasonably certain that practically all of the accessible portion of the cave has been found and is shown on the map.[60]

Regional Director Baker concluded that Jasper Cave "was proven to be of such limited extent and so devoid of significant features as to eliminate it from future consideration in planning."[61]



Figure 47. Herb Conn surveying Jewel Cave, pictured here in a photo by the South Dakota Highway Department, ca. 1963.

Source: NPS, Jewel Cave NM.

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[59] Herb Conn, "Jasper Cave Exploration, Jewel Cave National Monument, Special Use Permit JECA-1-60," October 26, 1960, 1–3, Cabinet 3, Drawer 2, Folder N3023 Jasper Cave, Jewel Cave NM CF.

[60] H. Conn, "Jasper Cave Exploration, Jewel Cave National Monument, Special Use Permit JECA-1-60," October 26, 1960, 3.

[61] Regional Director to Director, memorandum, no date, 1.

With Jasper Cave off the table, the Conns continued to explore the many leads they found in Jewel Cave. The NPS issued the Conns an annual permit for surveying and mapping for the purpose of identifying a new tour route. The Region Two Office funded the Conns' surveying with lump sum payments and occasionally made additional research dollars available for the purpose of analyzing potential tour routes (about $500 a year for the first few years of the 1960s).[62] As a requirement of their annual permits, Herb and Jan prepared a narrative report, survey data, and maps, in order to explain the three-dimensional aspects of the cave and to enable later cavers to follow their routes.[63] During 40 trips in 1960, they mapped 3.5 miles, much of the time working with Miller, Schnute, and other cavers and friends (see Figure 48).[64] All of the new cave they found was beyond Milk River, extending east and northeast.[65]



Figure 48. Jan Conn with Myrna Sheie, Karen Dilts, and Lynn Svatos, photo by Larry Dilts, ca. 1975.

Source: NPS, Jewel Cave NM.

In February 1961, Region Two Director Baker concluded that the Conns' findings for potential new tour routes were insufficient to warrant further exploration. Baker wrote to Lombard,

> . . . nothing has been found thus far in the way of cave formations and decorations to warrant additional development. It also appears there are no natural passages connecting the two presently developed routes which would have permitted a circle trip and an increase in the number of people who could be taken through the cave at one time.
>
> Although we share your hope that additional exploration work can be financed next year, it would be unrealistic for us to anticipate any further continuation of this work from National Park Service funds. We hope you will convey to the Conns our sincere appreciation of the careful work performed under what must have been very difficult conditions. We greatly appreciate their cooperation and feel that

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[62] Jewel Cave NM Management Assistant Wallace B. Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 3, File 1661c, Jewel Cave NM MF; 1961 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 4; Beatty to Superintendent, Wind Cave National Park, memorandum, July 7, 1960; and Wind Cave Superintendent Jess H. Lombard to Region Two Director, November 6, 1961, both in General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[63] Herb and Jan Conn, Jewel Cave Exploration, Special Use Permit JECA-1-60, Descriptive Report, 1, File 3449zj, Jewel Cave NM MF.

[64] Herb and Jan Conn, Jewel Cave Exploration, Special Use Permit JECA-1-60, Cave Trip Log, 16–22, File 3449zj, Jewel Cave NM MF; Herb and Jan Conn, Jewel Cave Exploration Cave Trip Log, Special Use Permit JECA-1-60, April 1, 1960 to June 30, 1960, File 3449zm, Jewel Cave NM MF.

[65] H. and J. Conn, Jewel Cave Exploration, Special Use Permit JECA-1-60, Descriptive Report, 2.

> their contribution to the project was very superior to the amount of money we were able to make available.[66]

Despite Baker's opposition, Lombard issued the Conns a permit for August to December 1961.[67] During these several months, the Conns found 2.5 more miles of cave, including what they called the "Frosty Grotto," which they described as "possibly the most scenic discovery in the cave." It was a passage 40 feet high and five feet wide, with walls "coated with white aragonite coral formation and some frostwork" and a floor "piled deep with crystalline fragments or 'snow.'" This discovery, as well as a breakthrough to a "bewildering maze of passageways" that included "Eerie Boulevard," made a round-trip tour a legitimate possibility.[68] In the wake of the Conns' discoveries, Lombard convinced Region Two officials to provide $500 from the region's Natural History Research budget for their exploration work.[69]

After these finds, Miller emphasized the need for continued exploration of the cave:

> The more times I enter the new sections of Jewel Cave, the greater becomes my appreciation of what the cave has to offer. It is difficult to visualize the actual beauty, since it is not apparent in the sections through which we now take cave tours. . . . Eventually it will be necessary to open other portions of the cave to the public. Not solely because of the pressure of a heavy park visitation, but also to show off some of the beauty of Jewel Cave.
>
> I feel that the survey and mapping of Jewel Cave should continue. Primarily because the more we know the easier will be the administrative decisions concerning it. Secondly, there is a possibility that another entrance may be found. Third, again for administrative reasons, we should know how far out of the Monument it runs and what protection is needed. Fourth, it is just good common sense to want to know just where and how far the cave runs. . . .
>
> I have felt somewhat like an uncle to a questionable Park Service stepchild, whose being has sometimes caused concern, but who in my mind deserves the status given to a child who has proven he is a legitimate offspring of Park Service criteria.[70]

Region Two officials had begun to consider constructing a second entrance to the cave by tunnel, but Miller did not think this was a good idea. Rather, Miller argued, "the present tour routes can handle the present visitation," and he echoed the regional office's perspective from before the Conn's 1961 discoveries that the tours offered visitors a "primitive cave" experience while still showcasing the cave's eponymous crystals.[71]

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[66] Regional Director Howard W. Baker to Wind Cave Superintendent, memorandum, February 6, 1961, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[67] NPS, Special Use Permit JECA 1-61, expires December 31, 1961, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[68] Herb and Jan Conn, General Report, Special Use Permit JECA-1-61, File 3449zi, Jewel Cave NM MF.

[69] Lombard to Region Two Director, November 6, 1961.

[70] Keith E. Miller to Wind Cave National Park Superintendent, January 26, 1962, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

[71] Miller to Wind Cave National Park Superintendent, January 26, 1962.

In spite of Miller's opposition to development, Lombard asked the Conns as part of their 1962 explorations to investigate potential locations for a tunnel into the cave. They identified two possible locations: either a 150-foot tunnel connecting to the Haunted Loft or a 200-foot tunnel connecting to the Cracker Barrel area. In either case, the entrance would be in Hell Canyon, "on the south facing slope below the existing campground." Echoing earlier NPS preferences for drip formations over calcite crystals, Lombard noted that a tunnel "would open up sections of the cave where the display of mineral decoration far exceeds those presently seen on the developed tours now used," and he added that further exploration might reveal even better locations for a tunnel.[72]

Assistant Region Two Director George E. Baggley, however, opposed the construction of a tunnel into Jewel Cave. He wrote,

> We see no reason, however, for giving immediate attention to new tunnels or addition to existing cave tours since the existing tours appear adequate for several years into the future.
>
> If additional explorations suggest that a loop trip can be developed with exit through another tunnel, our enthusiasm for additional entrances would be much higher. Perhaps this objective can be included in any additional cave exploration work which the Conns—or your own staff—may pursue.[73]

As of 1962, the NPS had no plans to create new entrances to Jewel Cave because of the opposition of the Region Two Office.

1962 Formation Discoveries

While the NPS debated what to do about Jewel Cave, the Conns continued to find new rooms and formations inside the cave (see Figures 49 and 50). In June 1962, Lombard argued that recently discovered geological features, such as the frosted grotto, indicated that "there is [a] significant difference in geological features of this portion of Jewel Cave compared to the previously surveyed portions."[74] That same day, Beatty, now the Region Two chief of natural history, acknowledged for the first time that the Conns' recent discoveries might merit development:

> An extremely large room, believed to be only 40 feet from the surface, could easily be reached by a small vertical drill hole, which would permit the Conns to close their traverse and accurately locate the new find in relation to the existing dirt road down Lithograph Canyon. This find is under land controlled by the U.S. Forest Service which has been withdrawn from mineral exploration and development. Mr. Lombard believes that it would be possible to effect an exchange of lands with the Forest Service as some of our land has exceptionally good timber stands.[75]

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[72] Wind Cave Acting Superintendent Robert J. Murphy to Region Two Director, memorandum, April 25, 1962, General Files 1952–1963, File 3449zg, Jewel Cave NM MF.

[73] Region Two Assistant Director George E. Baggley to Wind Cave Superintendent, memorandum, May 17, 1962, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[74] Jess H. Lombard to Region Two Director, memorandum, June 20, 1962, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[75] Regional Chief, Division of Natural History, M. E. Beatty, to Assistant Region Two Director, memorandum, June 20, 1962, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

This was the first time anyone in the NPS suggested drilling a vertical hole into a passage. The proposed land exchange with the Forest Service was not a new idea, however; Semingsen had first proposed such a swap in 1959.



Figure 49. The Conns and other cavers discovered new formations in Jewel Cave. Here, Jan Conn is holding frostwork. Photo by Dave Schnute, 1962.

Source: NPS, Jewel Cave NM.

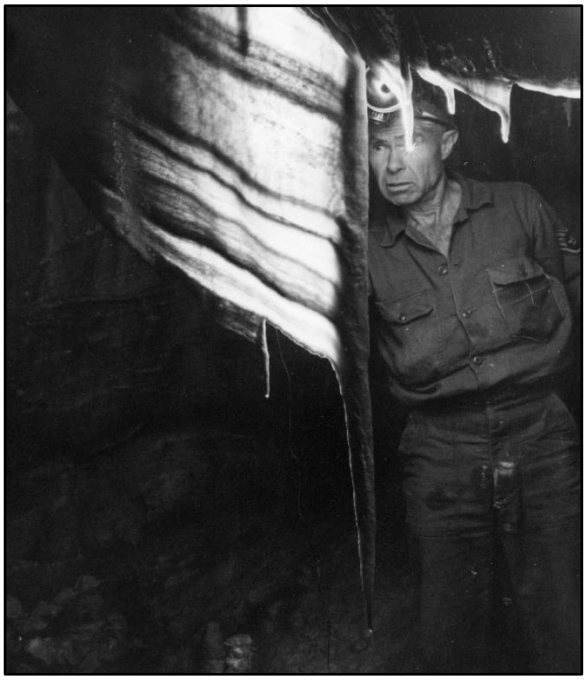


Figure 50. Herb Conn examines cave "bacon," in photo by South Dakota Highway Department, ca. 1963.

Source: NPS, Jewel Cave NM.

In 1962, the Conns—and other cavers who were friends of theirs—went on over 50 trips and surveyed over three miles of passageways, bringing the total mileage of known cave passageways to 10.[76] Members of the NSS, who were in Custer for the second-ever NSS convention, joined the Conns for some recreational expeditions in Jewel and Wind Cave.[77]

Among the discoveries in 1962 were wet rooms near Lithograph Canyon that included stalactites and flowstone, something that the NPS and Forest Service had previously assumed the cave lacked. Through the "Long-Winded Passage," the Conns found many new passageways to the southeast and wind indicating many more passageways beyond. They also encountered formations they thought were unique to Jewel Cave. Herb Conn explained,

> One, named "scintillites" by Dwight Deal and Will White, consists of red helictites of silica covered with a sparkling layer of tiny quartz crystals. The other forms in silvery balloons or bubbles of a magnesium mineral, hydromagnesite.[78]

Deal believed that the newly discovered formations proved Jewel Cave's value and merited development:

> I now think, for the first time, that there is defin[i]tely something worth developing for the public in the new sections of Jewel. The dripstone formations are as extensive and at least as scenic as any observed in any developed cave in the Black Hills. I feel that the displays in Jewel Cave are actually much more scenic than those in the other caves of the region. . . . The calcite crystals, however, are the final touch that make these rooms such exceptional sights. The combination of fairly sizeable cave passages, the coating of large calcite crystals, and the delicate dripstone formations result in both the scenic and scientifically most interesting cave passages in the United States. The caves in the Black Hills are already the most geologic[al]ly complex caves known in the country, and poss[i]bly in the world. Combine this with a scenic group of cave passages and the result is a cave which would be most ideally suited for the interpretive program of the National Park Service. I therefore encourage those considering the development of these new sections of Jewel Cave.[79]

Other experts lauded Jewel Cave's unique geology, including John A. Stellmack and Alan D. Howard, a ranger-naturalist at Wind Cave who had bachelor's degree in geology from Yale and master's in geology from Harvard.[80] Stellmack argued that the deposits of "stalactites, stalagmites, columns, flowstone, draperies and . . . many unusual helictites" on top of the dogtooth spar made it unique among Black Hills caves.[81] In an August 1962 report, Howard highlighted the unique formations in Jewel Cave, including dripstone, "large passageways and immense rooms [that] exceed

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[76] Herb and Jan Conn, Jewel Cave Exploration Trip Log, Special Use Permit JECA-1-62, Jan. 1, 1962 to Sept. 15, 1962, 3–9, File 3449zd, Jewel Cave NM MF; No author, "Jewel Cave Surveys," undated [ca. 1962], Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

[77] Dwight Deal, "Jewel Cave Exploration late 1800s through 1962," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019.

[78] Herb and Jan Conn, Jewel Cave Exploration Summary Report, Special Use Permit JECA-1-62, Jan. 1, 1962 to Sept. 15, 1962, 1, File 3449zd, Jewel Cave NM MF.

[79] Dwight E. Deal to Jess H. Lombard, June 27, 1962, Files 1786c–1786d, Jewel Cave NM MF.

[80] Acting Superintendent Robert J. Murphy to Midwest Region Director, memorandum, September 20, 1962, 1, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[81] John A. Stellmack, Editor, *NSS News*, to Jess Lombard, September 10, 1962, File 1786j, Jewel Cave NM MF.

in size most of those in Wind Cave," pools, calcite coating, flowstone, "sandstone intrusions," manganese deposits, popcorn, "balloonites," "scintillites" (chert dissolved to form thin stringers like "a bowlful of spaghetti which has a red color and a drusy quartz coating which gives a dazzling sparkle to the formation"), stream gravels, and old water levels with corresponding horizontal bands of colors.[82] Howard continued,

> I believe that development of the cave should follow a rather complete exploration of the cave in the area under consideration for development. Only then can the best routing for proposed trails be determined. . . . As an example of what happens when inadequate exploration and mapping precede trail development, I point to the almost complete absence of flowstone along the trails in Wind Cave, although there are many areas near the entrance and Garden of Eden which contain flowstone deposits. . . . The selection of route should be considered in conjunction with the selection of an entrance site. The best cave routes have little or no retracing of steps on the tour. People expect to be immediately hit with the best that the cave has to offer, so a route that begins in an area of flowstone, and similarly ends with a flowstone display would be the ideal.[83]

Howard recommended still making the cave trails "as primitive as possible," with minimal grading, minimal electric lighting, and stairways of wood and iron rather than concrete.[84] "Another possibility," Howard offered, "is to make the first area opened a primitive or 'rough' development, and then if demand and load are sufficient, later add a separate loop which would be more highly developed, giving the visitor the choice of a hard or easy tour."[85]



Figure 51. Discoveries made by the Conns and their caving partners included massive rooms, such as "King Kong's Cage," pictured here with Jan Conn in the foreground and two other cavers in the background (*their headlamps are visible as white dots to the right of Jan's knee*). Photo by Dave Schnute, 1962.

Source: NPS, Jewel Cave NM.

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[82] Alan D. Howard, "Personal Observations and Opinions Regarding the Proposed Commercial Development of New Parts of Jewel Cave," August 5, 1962, 1–2, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

[83] Howard, "Personal Observations and Opinions Regarding the Proposed Commercial Development of New Parts of Jewel Cave," August 5, 1962, 3.

[84] Howard, "Personal Observations and Opinions Regarding the Proposed Commercial Development of New Parts of Jewel Cave," August 5, 1962, 3–4.

[85] Howard, "Personal Observations and Opinions Regarding the Proposed Commercial Development of New Parts of Jewel Cave," August 5, 1962, 4.

Howard and two other rangers prepared colored slides of these new discoveries, showcasing images of "the new south 'wet' section of Jewel Cave," scintillites, and hydromagnesite bubbles, as well as more common geologic formations including manganese deposits, flowstones, cave pearls, chert layers, polished peppers, red cave earth, soda straws, boxwork, aragonite, water pools, rimstone, and geodes (see Figures 51 and 52).[86]

Around the time that Howard was preparing these slides in 1962, the NPS changed the names of its regional offices. The Region Two Office in Omaha became the Midwest Regional Office. It continued to supervise South Dakota's parks, including Jewel Cave.[87] Once the slides were ready, Lombard submitted them, along with maps, photographs, and mineral samples, to the Midwest Regional Office to make the case for opening newly discovered portions of the cave to the public.[88]



Figure 52. Soda straws in Jewel Cave, ca. 1963.

Source: NPS, Jewel Cave NM.

New Development Plans

After seeing slides of the newly discovered formations, the Midwest Regional Office determined that the NPS should develop the section of Jewel Cave near Lithograph Canyon. Midwest Regional Director Howard Baker concluded, "In view of the extent and variety of the discoveries noted in the above, there seems to be no doubt as to the national significance of the caverns connecting with Jewel Cave."[89] Access to the new sections of the cave, he suggested, "could be developed through either a 110 foot sloping tunnel from Lithograph Canyon or a 200 foot vertical elevator shaft north of the Canyon."[90] The regional office proposed constructing an elevator building, a utility area, a new parking lot, new utilities, staff housing, and a day use picnic area on the surface, but no camping.[91] After construction was completed, regional officials planned to "obliterate and restore [the] existing headquarters site."[92]

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[86] Murphy to Midwest Region Director, memorandum, September 20, 1962, 2–3.

[87] Ron Cockrell, *Amidst Ancient Monument: The Administrative History of Mound City Group National Monument/Hopewell Culture National Historical Park Ohio* (Omaha: Division of Cultural Resources, Midwest Support Office, NPS, DOI, 1999), 343; Howard Baker, "The Early Days," *Courier* 34, no. 3 (March 1989): 20.

[88] Murphy to Midwest Region Director, memorandum, September 20, 1962, 2–3.

[89] Regional Director to Director, memorandum, undated [ca. 1962], 2.

[90] Regional Director to Director, memorandum, undated [ca. 1962], 2.

[91] Regional Director to Director, memorandum, undated [ca. 1962].

[92] No author, "Jewel Cave Development," undated, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

The area recommended for development was within the Black Hills National Forest, which meant no progress could be made until the NPS came to an agreement with the Forest Service. Baker explained his proposal:

> A boundary revision shall be obtained which will exclude roughly seven-eighths of the present Monument area, while adding an approximately equal acreage to the east and south. A land exchange with the Black Hills National Forest is inherent to this proposal.[93]

Lombard drew a proposed boundary and a development scheme for the new visitor center. The new boundary would return lands to the west of the known cave, where no cave passageways had ever been found, to the Forest Service; exclude Highway 16 but allow for easy location of an access road from the highway to the proposed visitor center; include the historic entrance; and provide room for the visitor center, parking, housing, elevator, and utilities. The new boundary would also exclude the Jasper Cave entrance from Jewel Cave National Monument.[94]

NPS Assistant Director A. Clark Stratton approved Lombard's proposed boundary in 1963 and approved "in principle . . . relocation of Monument headquarters, and opening to the public of newly explored sections of the cave."[95] Stratton suggested that an executive order might be the best way to accomplish the boundary revision, although he thought that permission to drill test holes for an elevator shaft could be achieved through a memorandum of understanding with the Forest Service.[96]

While the NPS discussed development, the Conns continued exploration under their special use permit.[97] They reported to Lombard that they had discovered yet another unique formation, which they called "logomites" (see Figure 53). The Conns wrote,

> The most fascinating discovery is that of the large hollow stalagmites which are described in the mimeographed pages attached. Not only are they hollow, a feature defying explanation, but they are composed of a coarse calcite "popcorn" unlike the compact banded material of normal stalagmites. "Popcorn" is generally a secondary deposit growing on the wall, and in this case—to all appearances—it has been deposited upon a vertical tube of empty air! . . . Information on the hollow stalagmites has been presented to a number of geologists and authorities on cave formations, but no one has yet produced a reasonable explanation of these unusual towers. We believe they are another formation unique in Jewel Cave. Not only are they spectacular and intriguing to contemplate, but they may lead to new concepts of the cave's history and of cave processes in general.[98]

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[93] Regional Director to Director, memorandum, undated [ca. 1962].

[94] Jess H. Lombard, Superintendent, Wind Cave, to Midwest Regional Director, June 25, 1963, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF.

[95] A. Clark Stratton, Director, NPS, to Midwest Regional Director, November 6, 1963, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF; Wallace B. Elms, Annual Report of Information and Interpretive Services—NPS (CN)-1, 1963, 1, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[96] Stratton to Midwest Regional Director, November 6, 1963.

[97] Elms, Annual Report of Information and Interpretive Services—NPS (CN)-1, 1963, 3; NPS, Special Use Permit JECA-1-63, expires December 31, 1963, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[98] Herb and Jan Conn, Jewel Cave Exploration Summary Report, Special Use Permits JECA-1-62, JECA-1-63, Sept. 16, 1962 to March 31, 1963, 1–2, File 3449zb, Jewel Cave NM MF.

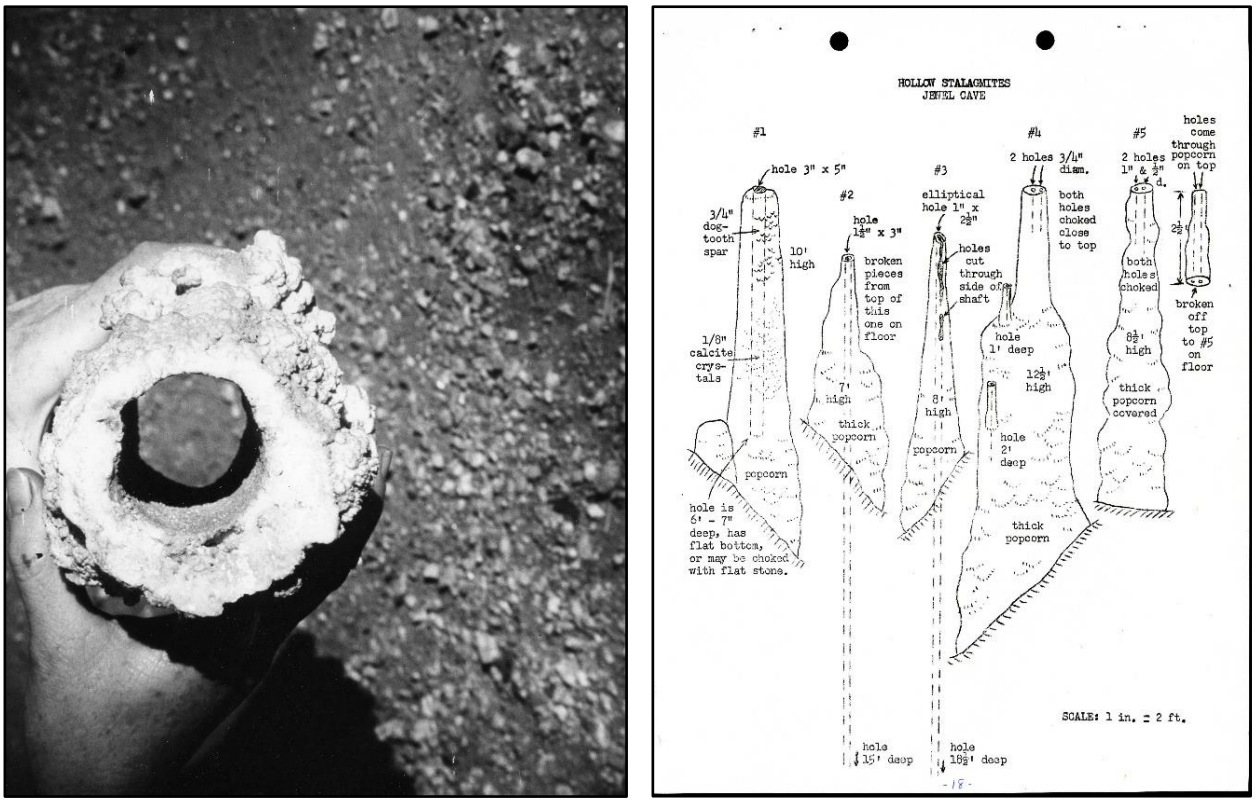


Figure 53. Herb and Jan Conn discovered hollow stalagmites in the cave, which they called "logomites." At left is a photograph of one, ca. 1963, and on the right is Herb Conn's drawing of them.

Source: NPS, Jewel Cave NM.

Despite these additional discoveries, midway through 1963, Lombard and the Midwest Regional Office closed all access to remote areas of the cave, citing safety concerns. The only exception was permission for the Conns to continue surveying already-known areas. Lombard explained that safety was more of a concern due to the extent of new discoveries: unexplored cave passageways were now so far from the cave entrance that it would be difficult to rescue injured cavers.[99] For the rest of 1963 and all of 1964 and 1965, the NPS did not permit further exploration in Jewel Cave. The only sanctioned trips into the cave during were "for the purpose of marking the principal cave routes with flagging tape, for photographing, and for other specifically authorized purposes."[100]

[99] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 8; Regional Director to Director, memorandum, no date, 3; Elms to Wind Cave Superintendent, memorandum, February 4, 1965, 4, File 1661d, Jewel Cave NM MF.

[100] Herb and Jan Conn, Jewel Cave Exploration Summary Report, Special Use Permits JECA-1-63, JECA-1-65, April 1, 1963 to Dec. 31, 1963, 1, File 3449g, Jewel Cave NM MF.

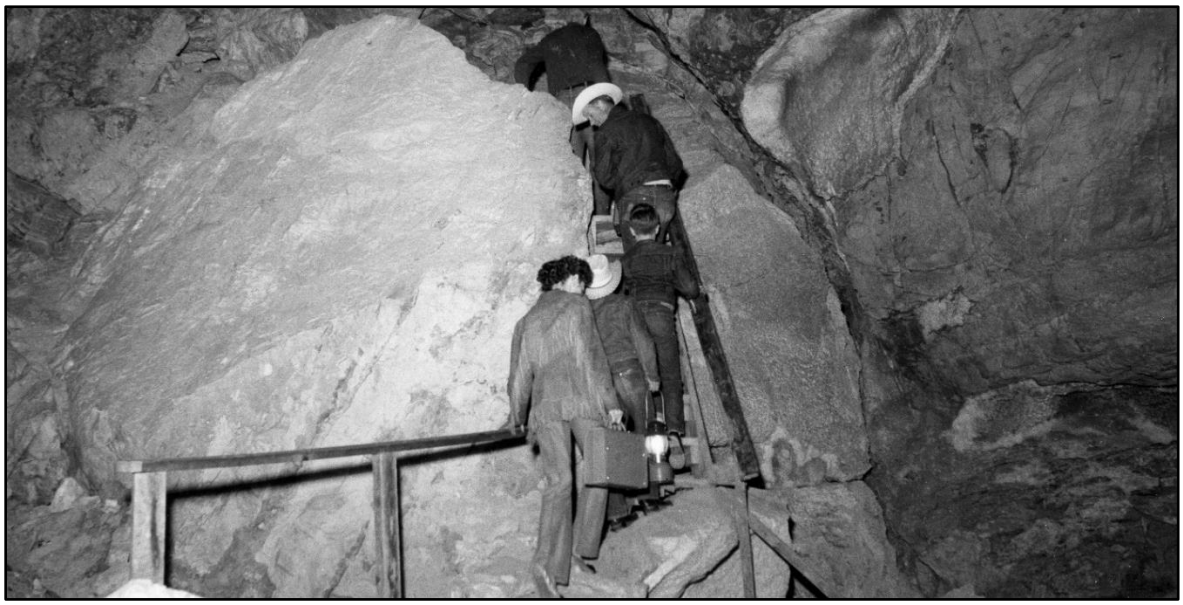


Figure 54. A cave tour in 1964. This image ran in Don Hipschman's article on Jewel Cave and the Conns in *South Dakota Highway Magazine* in March 1964.

Source: NPS, Jewel Cave NM.

In January 1964, the Conns used their limited access of the cave to take some photographs for Don Hipschman, director of the Division of Publicity of the South Dakota Department of Highways (see Figure 54).[101] The Conns noted, "[Hipschman] wanted some shots of our activities—the surveying, the nailing up of the marking tape, etc.—to go with the article he has written."[102]

Hipschman's article ran in *South Dakota Highway Magazine* in March 1964. Edwin Alberts, chief of the Midwest Division of Natural History, reviewed the article before Hipschman published it and recommended that "[t]he size of Jewel Cave should be played down" so that readers did not assume that the cave had large chambers like Carlsbad Caverns.[103] However, Hipschman still discussed the extent of the cave, and the Conns' recent discoveries:

> The Conns' explorations, which began in 1959, have found four formations which are unique in the United States, and which may be unique in the world. In addition they have mapped 13½ miles of new passages and have uncovered leads to others that will total hundreds of miles underground and may well be the largest cave on earth.[104]

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[101] US Travel Service, "Second Semi-Annual Report of the Secretary of Commerce on the United States Travel Service," April 1962–September 1962, 32.

[102] Herb and Jan Conn to Wally Elms, January 23, 1964, File 1775f, Jewel Cave NM MF.

[103] Edwin C. Alberts to Assistant to the Regional Director, memorandum, December 11, 1963, 1, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[104] Don Hipschman, "South Dakota Couple Discovers . . . A New World Underground," *South Dakota Highway Magazine*, March 22, 1964, clipping, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

Hipschman's article included a photo of the hollow stalagmite the Conns had discovered, and he mentioned the NPS decision to halt exploration of the cave.[105]

Hipschman's article brought national publicity to Jewel Cave, which resulted in increased visitation and greater interest from the South Dakota congressional delegation.[106] Lombard expressed frustration to Acting Midwest Regional Director George Baggley that the Conns had talked to the press without going through him, especially because Hipschman had cast the NPS as an obstacle to the Conns' continued exploration:

> The Conns have demonstrated a complete disregard for provisions of the Special Use Permit JECA_1-63, Condition No. 24, concerning publicity. We never have been given prior opportunity to edit the publicity they "leaked" to various sources. Herb and Jan Conn have indicated a strong possessiveness about Jewel Cave and a tendency to exclude the National Park Service. We believe they should be gradually phased out or else brought into line to do useful, specific, cave-survey jobs with adequate compensation. We do not believe that even with the new access tunnel that they should be allowed to explore, without limitation, all passages regardless of where they lead. We could have problems with the U.S. Forest Service, for one thing, if their explorations penetrated deep under the Forest lands and they got stuck or injured.
>
> The Conns resist strongly and resent all efforts at control, but control of the cave exploration is what we must have. We note some of the Conn's publicity invites other spelunkers to share the exploration of Jewel Cave. We are going to point out to them that they have absolutely no authority to issue any such invitations or to make any statement about policies at Jewel Cave.[107]

Unlike Lombard, Baggley recognized that the publicity the Conns generated through the article had triggered a surge of national support for Jewel Cave, which he surmised could be useful to the NPS.[108] Baggley encouraged Lombard to work with the Conns and the press as important allies in the development of Jewel Cave:

> We can understand the interest the Conns have in the cave. The recent publicity which they have received tends to increase this interest. They have really made genuine contributions to our program. Under the circumstances, the "possessiveness" which you mention with respect to cave exploration is quite understandable. To a limited degree at least, it is an asset to our program. They are the prime authorities on the subject at the moment and it is our obligation to use their energy and "know how" to advance our own program. Unless their attitude should become one of complete intransigence, we should not suggest that we do not consider them wholeheartedly as members of our team. . . .
>
> We have no doubt that much of our "image" in South Dakota will depend on how successfully we handle this sudden burgeoning of interest in Jewel Cave after so many years of almost complete neglect of its potential.[109]

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[105] Hipschman, "South Dakota Couple Discovers . . . A New World Underground."

[106] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 1.

[107] Superintendent Jess H. Lombard to Midwest Regional Director, memorandum, April 7, 1964, 1–2, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[108] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 7.

[109] Acting Regional Director George F. Baggley to Wind Cave Superintendent, memorandum, June 10, 1964, 1–2, File 3449p, Jewel Cave NM MF.

After hearing of the Jewel Cave discoveries, US Senators George McGovern (D-SD) and Karl E. Mundt (R-SD) began corresponding directly with the NPS officials in the Midwest Regional Office and the Conns as they considered introducing legislation for a land exchange between the NPS and the Forest Service.[110] McGovern advocated strongly and vocally for Jewel Cave, calling South Dakota's cave systems "the world's largest and most awe-inspiring caverns." He drew attention to the size of Jewel Cave's unique speleogical formations to justify protecting the cave and authorizing funds for development.[111] Mundt requested specimens of the recently discovered formations from Jewel Cave for his office, so that he could show colleagues and visitors why Jewel Cave was so unique.[112] To fulfill Mundt's request, Lombard sent to NPS Director George Hartzog "ten specimens from the proposed tour route": hollow stalagmite, scintillites, calcite crystals, dripstone, flowstone rings, bacon rind, "chiclet" (or "cave pearl"), and popcorn. Lombard assured Hartzog that "[a]ll specimens removed from the cave were found lying loose upon the floor. NONE were broken from walls or ceiling."[113]

McGovern introduced a bill on April 17, 1964, to effect a land exchange between the Forest Service and the NPS.[114] McGovern's bill provided for the NPS to reclassify Jewel Cave as a national park, but NPS leadership opposed a redesignation.[115] The NPS assistant director explained why:

> Generally, national parks are spacious land areas essentially of primitive or wilderness character which contain scenery and natural wonders outstanding in quality, whereas national monuments are significant landmarks, structures, objects or areas of scientific or prehistoric interest. Accordingly, the designation of this area—comprising about 1,280 acres—would be most appropriate as a national monument to denote the types of values known to be represented here. Due to its remoteness and the difficult access to the newly discovered portion of the cave, we are unable to fully appraise the values associated with this section until an entrance tunnel is developed. We therefore, recommend the enactment of the enclosed substitute bill which would retain National Monument designation for Jewel Cave.

The assistant director agreed with the land exchange provision in McGovern's bill.[116]

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[110] George F. Baggley, notes from long distance telephone call with Assistant Director Baker, April 21, 1964, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[111] 110 Cong. Rec. 5076 (March 12, 1964).

[112] Robert H. Rose, Research Geologist, Natural History Studies, to Wind Cave Superintendent, memorandum, February 24, 1964, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[113] Superintendent Jess H. Lombard to NPS Director, March 4, 1964, Files 1784g–1784i, Jewel Cave NM MF.

[114] 110 Cong. Rec. 8236 (April 17, 1964).

[115] Max N. Edwards, Assistant to the Secretary of the Interior and Legislative Counsel, to Hon. Kermit Gordon, Director, Bureau of the Budget, April 13, 1964, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF; 26 Fed. Reg. 4074 (May 11, 1961).

[116] Assistant Director, NPS, to Legislative Counsel, Office of the Solicitor, undated [April 1964?], Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF.

Determining the Cave's Surface Footprint

Engineers and designers could not make plans for new visitor facilities until they knew exactly where the newly discovered underground rooms were located in relation to the surface.[117] Lombard had asked many experts for assistance, including the USGS Branch of Crustal Studies, but no one knew exactly how to correlate underground and aboveground surveys.[118] Herb Conn reached out to James C. Maxwell of the University of Missouri School of Mines about electromagnetic cave surveying equipment, and Maxwell suggested using radiolocation.[119] Maxwell did not own such equipment himself, so he referred the NPS to Earl C. Biffle of Fenton, Missouri, who had developed equipment with Father Paul Wightman of St. Henry's Seminary in Belleville, Illinois.[120]

Elms invited Father Wightman and Biffle to Jewel Cave to operate the radiolocation equipment that they had used at other caves. Herb Conn drew a diagram of where they should radiolocate based on the estimated location of the large underground passage that they called the "Target Room" (see Figure 55).[121] On March 31, 1964, Wightman and Biffle started the radiolocating process, with Biffle, the Conns, and Park Ranger J. F. Devenport underground, and Wightman, Elms, Lombard, and Midwest Regional Electrical Engineer John Eubank aboveground (see Figure 56). Elms described how the process worked:

> A two-kilocycle transmitter feeding a 19-inch loop—laid exactly horizontal—was placed in the caves at the desired locations; and a receiver operated with a loop on the surface picked up the signal and determined the location by rotating the loop through a null position (position of no reception). A depth triangulation was made by the same method.[122]

Within four hours, they located the spot to drill a test hole and marked it aboveground for the driller. The NPS paid Wightman and Biffle for their travel and fees associated with the survey. Lombard, Elms, and Eubank were pleased with the survey results and recommended proceeding with drilling the test hole into the Target Room.[123] The WODC recommended a magnetic

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[117] Regional Director to Director, memorandum, no date, 4.

[118] Luther T. Peterson Jr., Acting Regional Chief of Operations and Maintenance, to Acting Regional Engineer, Topographic Division, Geological Survey, Denver, Colorado, memorandum, March 9, 1964; Acting Regional Engineer Thomas V. Cummins to Luther T. Peterson Jr., NPS, Omaha, memorandum, March 5, 1964; and L. C. Pakiser, Chief, Branch of Crustal Studies, to Superintendent Jess H. Lombard, March 31, 1964, all in General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[119] H. and J. Conn to Elms, January 23, 1964, File 1775f, Jewel Cave NM MF; James C. Maxwell to Wallace B. Elms, March 4, 1964, File 3449x, Jewel Cave NM MF; James C. Maxwell to Jess Lombard, March 5, 1964, File 3449w, Jewel Cave NM MF.

[120] Jess H. Lombard to Chief, WODC, March 12, 1964, memorandum, File 1785k, Jewel Cave NM MF; James C. Maxwell to Jess Lombard, March 5, 1964, File 3449w, Jewel Cave NM MF.

[121] Paul Wightman, interview by Jackie Gonzales, June 30, 2019, Custer, SD; Management Assistant Wallace B. Elms to Wind Cave Superintendent, memorandum, April 6, 1964, 1–2, Files 1785o–1785p, Jewel Cave NM MF; Herb Conn, Drawing of Target Room and Drill Point, March 13, 1964, File 1659, Jewel Cave NM MF.

[122] Elms to Wind Cave Superintendent, memorandum, April 6, 1964, 1–2, Files 1785o–1785p, Jewel Cave NM MF.

[123] Elms to Wind Cave Superintendent, memorandum, April 6, 1964, 2, File 1785p, Jewel Cave NM MF; Jess H. Lombard to Midwest Regional Director, memorandum, April 3, 1964; and Superintendent Jess H. Lombard to Herb and

directional survey to calculate depth, which Schlumberger Well Surveying Corporation of Newcastle completed after the radiolocation survey.[124]

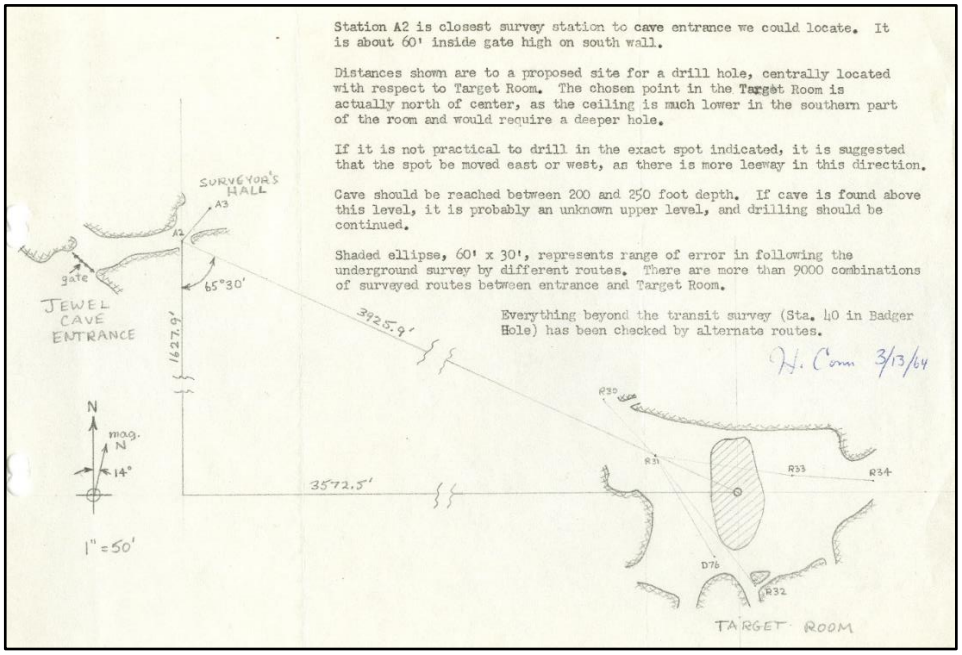


Figure 55. Herb Conn's drawing of where to drill a hole to hit the Target Room, 1964.

Source: NPS, Jewel Cave NM.

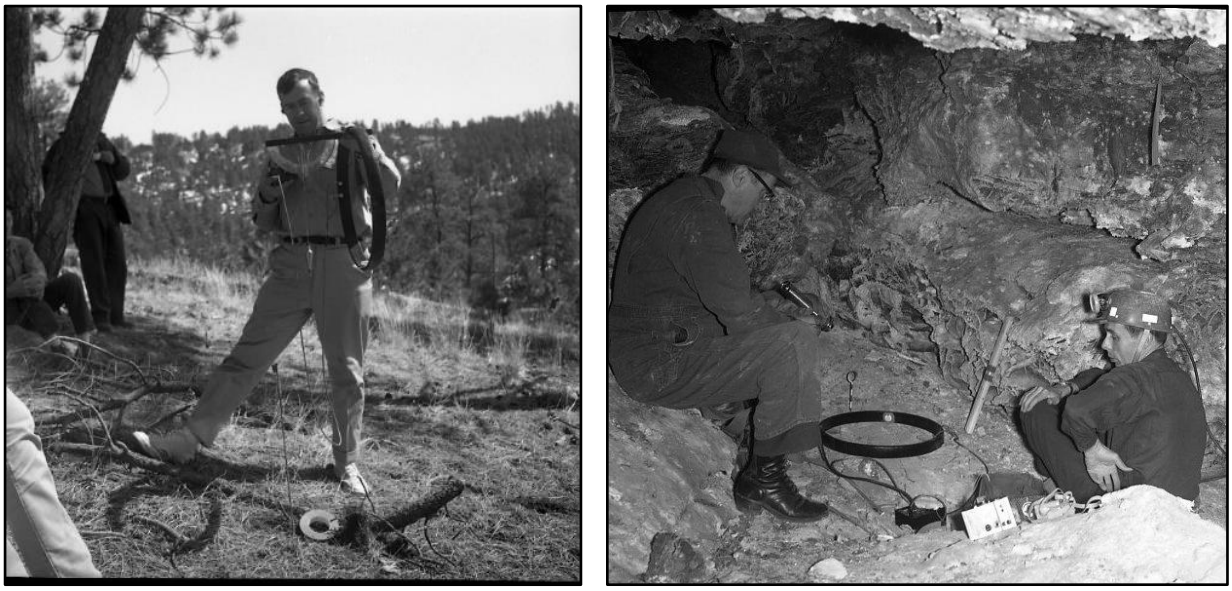


Figure 56. Radiolocating the underground cave from the aboveground surface. Father Paul Wightman uses the equipment aboveground, while others wait belowground, 1964.

Source: NPS, Jewel Cave NM.

Jan Conn, April 7, 1964, both in General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[124] Jewel Cave NM Management Assistant Wallace B. Elms to Superintendent, Wind Cave and Jewel Cave, memorandum, June 29, 1964, File 3449n, Jewel Cave NM MF.

Herb Conn proposed to do barometric studies before a test hole was drilled into the Target Room, in case the hole changed the cave's "breathing." Based on his observations and Stan Arlton's earlier research, Conn believed it would be possible to calculate the volume of the cave by measuring the barometric pressure and the velocity, duration, and direction of the air flow within the cave. To complete this, he secured permission from Senator McGovern to borrow a barograph from the Forest Service in Washington.[125] They went to McGovern because Lombard had hesitated to offer assistance: he agreed that air flow studies were important but thought that NPS employees, not the Conns, should perform the work.[126] Lombard was particularly concerned of the intent behind the measurement efforts:

> While we agree with the Conns on the desirability of gathering this information when there is only the one known opening into Jewel Cave, we do not believe they should be allowed to "interpret" the results just to substantiate exaggerated claims concerning the size of Jewel Cave.[127]

Dr. Wilfred D. Logan, Midwest Regional Chief of Archeological Research (and later the first chief of the Midwest Archeological Center [MWAC] in Lincoln, Nebraska) told Acting Midwest Regional Director Baggley that he did not think calculating the cubic feet volume of the cave would be very useful, since it would not necessarily help with interpretation (he called it "obscure knowledge"). But Logan acknowledged,

> On the other hand—Senator McGovern has introduced a $133,000 clause into the Interior Department's appropriation bill for F.Y. 1965 providing for Visitor Center and related development at Jewel Cave connected with the discovery of the new sections of the Cave. Jess [Lombard] can hardly lock the Cave up and keep the Conns out in view of their connection with Senator McGovern.[128]

Baggley agreed that the barometric wind study was "of minimal importance" and not "worthy of Service funding."[129] In spite of Baggley and Lombard's resistance—and likely as a result of the Conns' connection with Senator McGovern—Herb Conn completed his proposed preliminary study of Jewel Cave airflow and air pressure before the test hole was drilled.[130] NPS Acting Resource Studies Advisor Merrill J. Mattes was pleased with Herb's study and considered his findings valuable contributions to the NPS as it developed management policies for the cave.[131]

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[125] H. and J. Conn to Elms, January 23, 1964, File 1775f, Jewel Cave NM MF; Herb Conn to Jess H. Lombard, April 2, 1964, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[126] Lombard to H. and J. Conn, April 7, 1964.

[127] Lombard to Midwest Regional Director, memorandum, April 7, 1964, 1–2.

[128] Wil Logan to Merrill J. Mattes, May 22, 1964, Box N-10, File N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[129] Acting Regional Director George F. Baggley to Wind Cave Superintendent, memorandum, June 10, 1964, 1, File 3449p, Jewel Cave NM MF.

[130] Herb Conn, "Preliminary Report: Wind and Air Measurements, Entrance to Jewel Cave," June 24, 1964, File 1668, Jewel Cave NM MF.

[131] Acting Resource Studies Advisor Merrill J. Mattes to Wind Cave Superintendent, memorandum, December 3, 1965, File 3449i, Jewel Cave NM MF.

Next, the WODC prepared specifications for a contractor to drill a 200-foot, three-inch-diameter hole into the Target Room. The contract was open-ended so the contractor could drill additional holes if the first did not work.[132] The NPS contracted with Clark Drilling Company of Custer to do the work.[133] Herb and Jan Conn went into the cave after the hole was drilled in June 1964, and Elms lowered a light into it to confirm that the survey hole had indeed penetrated the Target Room.[134] The test hole survey was only seven feet and six inches off from the point radiolocated by Wightman and Biffle (see Figure 57).[135]



Figure 57. The test hole into the Target Room, 1964.

Source; NPS, Jewel Cave NM.

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[132] Jess H. Lombard to Chief, WODC, memorandum, February 7, 1964, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC; Jess H. Lombard to Chief, WODC, March 24, 1964, memorandum, File 1785n, Jewel Cave NM MF.

[133] Jewel Cave NM Management Assistant Wallace B. Elms to Superintendent, Wind Cave and Jewel Cave, memorandum, June 29, 1964, File 3449n, Jewel Cave NM MF.

[134] "Electronic Survey of Jewel Cave Successful," press release, June 17, 1964, 2, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

[135] Jewel Cave NM Management Assistant Wallace B. Elms to Rev. Paul Wightman, July 1, 1965, File 3449k, Jewel Cave NM MF; G. F. B. to Mr. Baggley, memorandum of long-distance telephone call, June 17, 1964, General Files 1952–1963, Box N-10, Folder N3023 Book #1 JECA June 1958–June 1964, Records of the National Park Service Region II (Midwest Region), NARA KC.

Land Exchange with the Forest Service

To proceed with development above the Target Room, which was under Forest Service land, the Midwest Regional Office cooperated with the Forest Service "for joint on-the-ground study of the Jewel Cave area with the objective of recommending boundary changes necessary to provide adequate service areas for Jewel Cave." The NPS also worked with the Forest Service to protect underground natural resources outside of the monument boundary.[136] Forest Service and NPS officials met in Custer in June 1964 to discuss the possible land exchange and the legislation McGovern had introduced earlier that spring to change the boundary.[137] They agreed that the best outcome would be to shift the boundaries of Jewel Cave east and south, while retaining approximately the same total acreage (around 1,280 acres). Part of the new western boundary would be the centerline of Highway 16, where it squiggled from north to south.[138]

Officials from both agencies agreed that it would be helpful to include a provision—either in the legislation or in a cooperative agreement—that extended NPS jurisdiction to any naturally connecting underground portions of Jewel Cave that lay under Forest Service land.[139] NPS Director George B. Hartzog Jr. agreed that this arrangement would be useful and confirmed that McGovern's bill would allow for the NPS to be given administrative jurisdiction over the subsurface features through agreements between the Forest Service and the NPS, if published in the *Federal Register*.[140]

To justify the boundary exchange, the NPS prepared preliminary plans for the development that would occur on the surface above the Target Room. In September 1964, John A. Ronscavage of the WODC completed a General Development Narrative to guide development at the area of the park above the Target Room.[141] Ronscavage explained,

> The portion of the existing Monument encompassing present Headquarters and the existing entrance to the cave will be retained as a control and access point to the new underground system, but will not be used by the visitor once the new entrance and facilities are developed. It may prove useful as an emergency exit in the new scheme.[142]

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[136] Baggley, notes from long distance telephone call with Baker, April 21, 1964.

[137] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 7.

[138] Park Planner David L. Hieb to Regional Director, NPS, June 3, 1964, 1–3, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF; David L. Hieb, Acting Regional Chief, National Park System Studies, NPS, to Ted Schlapfer, Supervisor, Black Hills National Forest, June 9, 1964, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF.

[139] Hieb to Regional Director, NPS, June 3, 1964, 3.

[140] Jackson E. Price, Director, NPS, to Midwest Regional Director, July 6, 1964, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF. The language in McGovern's draft was not included in the final bill.

[141] John A. Ronscavage, WODC, Jewel Cave National Monument General Development Plan, drawing, September 1964, File 1735, Jewel Cave NM MF. Mike Wiles later noted, "This would not even remotely be feasible, which shows they did not understand the realities of the situation." Wiles, comments on draft, April 7, 2020.

[142] NPS, John A. Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. Nm-JC-3113-H General Development, February 1964, revised October 1964, 2, Cabinet 3, Drawer 3, Folder D18 JECA Master Plan, Jewel Cave NM CF.

The General Development Narrative called for completing the land exchange with the Forest Service to acquire the land above the Target Room, building a visitor center above the room, excavating an elevator shaft into the Target Room, developing a tour in the cave from the elevator, installing electric lights on the new tour, and retaining the old ranger cabin at the cave entrance.[143] The following year, Ronscavage prepared a master plan for Jewel Cave development, which the NPS director and the Midwest regional director approved in 1965 (see Figure 58).[144]

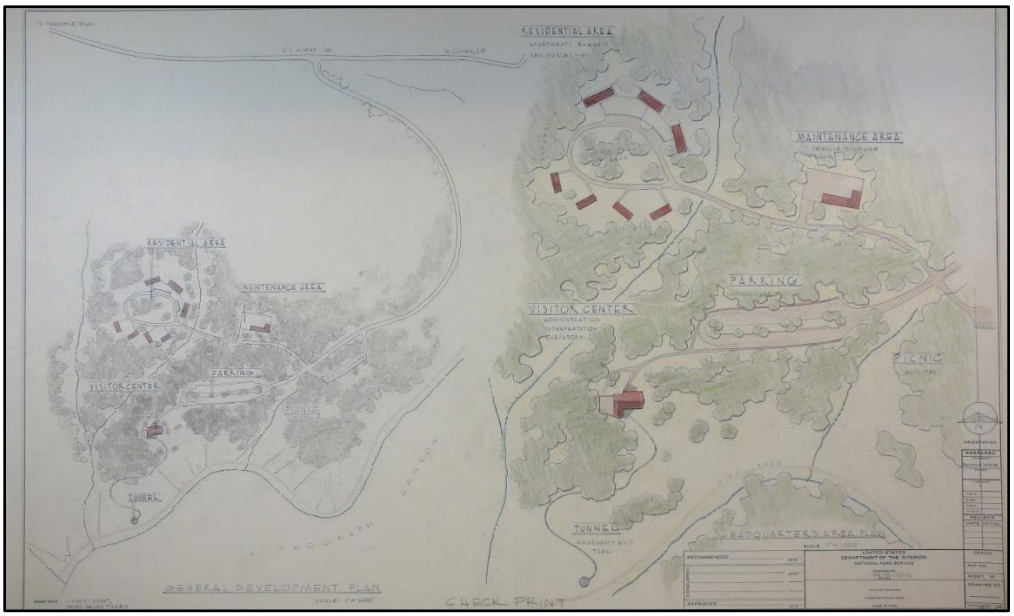


Figure 58. John A. Ronscavage of the NPS Western Office of Design and Construction completed this color conceptual drawing, the first to show a proposed visitor center above the Target Room, in September 1964.

Source: NPS.

NPS officials were eager to break ground on the Jewel Cave visitor center. They signed a memorandum of understanding (MOU) with the Forest Service to move forward while Congress worked on legislation formalizing the exchange. The MOU stipulated that the NPS could withdraw lands around Jewel Cave National Monument from mineral entry. Within the proposed boundaries, the MOU allowed the NPS to close and rehabilitate the Hell Canyon road, assume fire protection responsibilities, and survey and mark the new boundary lines. The Forest Service would be allowed to develop Prairie Dog and Chokecherry Springs to provide water for livestock on ranches within

[143] Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. Nm-JC-3113-H General Development, February 1964, revised October 1964, 2–4.

[144] Wallace B. Elms, Annual Report of Information and Interpretive Services—NPS (CN)-1, 1964, 2, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF; Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 7.

the previous monument boundaries.[145] The MOU was designed to be temporary and would terminate when Congress authorized the boundary changes. The agencies agreed to cooperate to secure passage of the legislation.[146]

South Dakota's congressional delegation remained interested in Jewel Cave. In November 1964, assistants to Senator Mundt and US Representative Ellis Y. Berry (R-SD2) visited Jewel Cave.[147] Early in 1965, McGovern introduced an updated bill in the Senate to change the Jewel Cave National Monument boundaries (S. 2812), and Representative Berry introduced a companion bill in the House of Representatives (H. R. 9417).[148] The bills passed out of committee in September 1965—McGovern's chairmanship of the Committee on Interior and Insular Affairs facilitated quick action on the Senate side.[149] The Senate committee's report explained that the boundary exchange would allow the NPS

> to permit the new area [at Jewel Cave] to be opened up and made accessible to visitors as a part of the national monument. At the same time, the relinquishment to Forest Service control of approximately the same acreage now within the national monument will relieve the National Park Service of responsibility for administering land which is of no great importance for its purposes.
>
> The long-range development plans of the National Park Service for the revised Jewel Cave National Monument include providing a ¾-mile access road and parking area, elevators, an emergency exit tunnel, underground lighting, a visitors' center, employees quarters, and related facilities. The total cost of these installations is estimated at about $1,646,000.[150]

The committee speculated, based on NPS planning reports, that a new visitor center and related facilities would boost visitation from 55,000 to 220,000 annually. In a speech on the Senate floor, McGovern referenced Herb and Jan Conn's contributions. He remarked, "I am convinced, Mr. President, that Jewel Cave is one day going to be one of the great national park units—an underground wonderland rivaling Yellowstone and the new Canyonlands National Park in Utah."[151]

President Lyndon B. Johnson signed the act to revise the boundary of Jewel Cave National Monument on October 9, 1965 (see Appendix A). The final legislation cited the need to protect "significant caverns and other geological features beneath lands within the Black Hills National Forest adjacent to the national monument" and returned to the Black Hills National Forest equal acreage from the previous boundaries of the national monument.[152] The new boundaries

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[145] W. L. Lloyd, Forester, memorandum, March 18, 1965; and Memorandum of Understanding Between the United States Forest Department of Agriculture and the National Park Service Department of Interior, February 9, 1965, 1–4, both in *Historical Documents of Jewel Cave National Monument* binder, File Duplicates, Jewel Cave NM CF.

[146] Memorandum of Understanding Between the United States Forest Department of Agriculture and the National Park Service Department of Interior, February 9, 1965, 5.

[147] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 1.

[148] 111 Cong. Rec. 24885–24886 (September 23, 1965); 110 Cong. Rec. 5076 (March 12, 1964); H. Rept. 981, 89th Cong, 1st Sess., September 13, 1965.

[149] 111 Cong. Rec. 24723 (September 22, 1965); Select Legislative Summary for Jewel Cave National Monument, Undated [ca. 1990?], 2, Jewel Cave NM CF.

[150] 111 Cong. Rec. 24886 (September 23, 1965).

[151] 111 Cong. Rec. 24886 (September 23, 1965).

[152] Act of October 9, 1965, 79 Stat. 971 (P.L. 89-250).

corresponded with what was then the known area of Jewel Cave and excluded Jasper Cave. Since there had never been any real programming at Jasper Cave, NPS staff did not change park operations beyond removing the sign at the entrance referring to both Jewel Cave and Jasper Cave.[153] The MOU between the Forest Service and the NPS terminated in spring 1966, since it was superfluous after Congress enacted the boundary change.[154]

Monument Operations

Research

Outside of surveying and exploring, research at Jewel Cave in the late 1950s centered on the cave's bat populations.[155] James Stokes of Wind Cave wrote "Behavior and Habits of Bats as observed in Jewel Cave National Monument" in 1959, based on his observations from that summer. Stokes found that some bats had a parasitic winged insect infestation and recommended further study on the matter.[156] Stokes began a bat banding program later that year, which he continued into 1961, with bands and data cards provided by the US Fish and Wildlife Service.[157] Stokes estimated populations during the



Figure 59. Banding bats at Jewel Cave, 1962.

Source: Jewel Cave NM

[153] James B. Thompson, Annual Report of Information and Interpretive Services—NPS(CN)-1, Jewel Cave, 1965, 1, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[154] Warren D. Hotchkiss, Superintendent, Wind Cave National Park, to Midwest Regional Director, April 19, 1966, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF.

[155] NPS, "Priority List—Research Program," January 1, 1958, and NPS, "Priority List—Research Program," January 1, 1959, both in Records of Wind Cave National Park General File, Box 5, Folder N2621 Annual Research Reports, Records of the NPS Region II (Midwest Region), NARA KC.

[156] Stokes' brief report is available in Jewel Cave Central Files. James T. Stokes, "Behavior and Habits of Bats as observed in Jewel Cave National Monument," undated [Sept. 1959?], Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

[157] Reports on the number of bats banded by Stokes are available in annual ranger-in-charge reports from 1960 and 1961. Miller, 1960 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 4; Lombard, 1962 Superintendent's Annual Report, 10A8 for Jewel Cave National Monument, 3.

Acting Director of Bird and Mammal Laboratories, USFWS Branch of Wildlife Research Richard H. Manville to Acting Superintendent of Wind Cave and Jewel Cave J. Wesley Warner, December 9, 1959, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

winter hibernation at 3,500 to 4,000 bats (see Figure 59).[158] Lombard discontinued the bat banding program in 1962, "since a survey disclosed over 65% of the banded individuals suffered from flesh damage due to the use of an improper sized band supplied by the Fish and Wildlife Service."[159] Lombard asked for larger bands to address the problem.[160]

In 1965, at the request of Wind Cave Park Naturalist John Tyers, assistant professor of Zoology at the University of Kansas, Knox Jones, brought students to Jewel Cave to band bats and to study swarming patterns (see Figures 60 and 61).[161] Larry Brown and Jerry Kocer, researchers from the University of Wyoming, classified the bats in 1965 after Thompson sent them specimens.[162] There was a brief hiatus in bat research until 1970, when Robert Martin of the South Dakota School of Mines Department of Biology assisted Jewel Cave in bat studies and banding.[163]



Figure 60. Bats at Jewel Cave. Photo by Richard Hart, 1958.

Source: NPS, Jewel Cave NM.



Figure 61. A bat in Jewel Cave, with a hand for scale. Photo by Richard Hart, 1959.

Source: NPS, Jewel Cave NM.

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158 Acting Superintendent of Wind Cave and Jewel Cave J. Wesley Warner to John Aldrick, US Bureau of Sport Fisheries Department of Bird & Mammals Distribution, December 2, 1959, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

159 Lombard, 1963 Superintendent's Annual Report for Jewel Cave National Monument, 6.

160 Superintendent Jess H. Lombard to Bureau of Sport Fisheries and Wildlife Department of Birds and Mammals Distribution, memorandum, September 17, 1963, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

161 John A. Tyers, Chief Park Naturalist, Wind Cave, to J. Knox Jones Jr., Assistant Professor, Zoology, University of Kansas, May 28, 1965, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF; Thompson, interview.

162 Larry N. Brown, Assistant Professor and Curator of Mammals, to Jim Thompson, Management Assistant, Jewel Cave NM, November 19, 1965, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

163 Robert A. Martin to David Todd, Manager, Jewel Cave NM, July 20, 1970, Cabinet 3, Drawer 4, Folder N1427 Bats Jewel Cave Pre-1980, Jewel Cave NM CF.

Brochure

The NPS revised the Jewel Cave brochure in 1966 to reflect the larger size of the known cave, newly discovered features, and the 1965 boundary change.[164] Over the next few years, only minor changes were made to the brochure, with the idea that it would be thoroughly revamped when the new visitor center opened.[165] When the visitor center opened in summer 1972, the overhauled brochure included a new map and significant textual revisions.[166] Unlike previous brochures, it did not call Jewel Cave "small." Instead, large text read, "In the lovely hill country of western South Dakota, in a fragrant green setting of ponderosa pine, is a glittering underground world—Jewel Cave." The brochure provided the information about the history of the park, climate, terrain, flora, fauna, cave genesis, cave formations (boxwork, globulites, frostwork, helictites, gypsum flowers, hydromagnesite bubbles), and the breathing of the cave.[167]

Natural History Association

The Black Hills Natural History Association (BHNHA) continued to sell books and other merchandise at Jewel Cave, Wind Cave, Mount Rushmore, Badlands, and Devils Tower. As of 1958, Wind Cave Park Naturalist Richard Hart was the executive secretary. Sales at Jewel Cave were low due to inadequate display space: just $49.50 in 1959. Devils Tower and Mount Rushmore withdrew to form their own associations in 1958, and Badlands followed in 1959, leaving just Jewel Cave and Wind Cave in the BHNHA.[168]

Regional Chief of Interpretation M. E. Beatty wanted the BHNHA to focus on books:

> Jewel Cave should be given attention as an outlet for pertinent material; most visitors would find their stay at this area enriched by availability of interpretive literature. Souvenir sales should not be engaged in, but good quality post cards or color slides might be considered. Soft drinks would not be

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[164] James B. Thompson, Annual Report of Information and Interpretive Services—NPS(CN)-1, Jewel Cave, 1965, 1, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[165] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967.

[166] Dave Todd, Annual Budget Request, for Informational Printing (Free and Sales), Jewel Cave National Monument, February 24, 1971, Cabinet 1, Drawer 2, Folder 6.A.2 Annual Budget Requests Printing 10-81, Jewel Cave NM CF; Dave Todd, Annual Budget Request, for Informational Printing (Free and Sales), Jewel Cave National Monument, February 17, 1972, Cabinet 1, Drawer 2, Folder 6.A.2 Annual Budget Requests Printing 10-81, Jewel Cave NM CF.

[167] Jewel Cave National Monument, informational brochure (US GPO, 1972), Files 712a–712e, Jewel Cave NM MF.

[168] Richard T. Hart, Black Hills Natural History Association, Annual Report of the Executive Secretary, December 31, 1958, 1; and Hart, Black Hills Natural History Association, Annual Report of the Executive Secretary, December 31, 1959, both in General Files 1952–1963, Box A44, Folder A42 Black Hills Natural History Association, Records of the National Park Service Region II (Midwest Region), NARA KC; Semingsen and Lienau, 1959 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 3; Semingsen to All Employees, Wind Cave National Park, Jewel Cave National Monument, memorandum, July 20, 1959, 2.

> objectionable if the vending machine can be kept somewhat inconspicuous. This, of course, is for the Superintendent to decide.[169]

The BHNHA did not expand its book offerings, but it did begin selling soft drinks at Jewel Cave in 1960, per Beatty's recommendation. Proceeds from sales went to aid the parks, but Jewel Cave received little because of its still minimal sales. Hart recommended electing a non-NPS resident of Custer to the BHNHA board to "give Jewel Cave more representation on the Board."[170]

In 1962, the organization proposed changing its name to the Wind Cave Natural History Association.[171] The change occurred sometime between then and 1965. At Jewel Cave, the association continued to sell items at the ticket booth, which it wanted to expand to provide more display space.[172] The new content included *The Geology of Jewel Cave*, a booklet written by Management Assistant Jim Thompson and published by the Wind Cave Natural History Association.[173] The association sold it at the Jewel Cave ticket booth starting in 1965 (see Figure 62). Copies sold well enough that the association reprinted it in 1967, with a few revisions to reflect changes in the known extent of the cave.[174] Thanks largely to the booklet (315 copies sold in 1968 alone), Wind Cave Natural History Association annual revenues for Jewel Cave increased, reaching $2,213.20 in 1968.[175]



Figure 62. The ticket booth outside of the ranger station, erected in 1963, with Wind Cave Natural History Association publications displayed for sale on the right-hand side, ca. 1965.

Source: NPS, Jewel Cave NM.

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[169] Regional Office Comments on Annual Report, April 19, 1960, General Files 1952–1963, Box A44, Folder A42 Black Hills Natural History Association, Records of the National Park Service Region II (Midwest Region), NARA KC.

[170] Richard T. Hart, Annual narrative report of the Black Hills Natural History Association, December 31, 1960, 1–2, Box A44, Folder A42 Black Hills Natural History Association, Records of the National Park Service Region II (Midwest Region), NARA KC.

[171] Annual Narrative Report of the Black Hills Natural History Association, Wind Cave National Park, December 3, 1962, Box A44, Folder A42 Black Hills Natural History Association, Records of the National Park Service Region II (Midwest Region), NARA KC.

[172] Donald F. Gillespie, Annual Report of Information and Interpretive Services—NPS(CN)-2, Jewel Cave, 1966, 1, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[173] James B. Thompson, *The Geology of Jewel Cave* (Wind Cave Natural History Association, 1965), Files 714a–n, Jewel Cave NM MF.

[174] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 4; Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967, 2.

[175] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 1.

Aboveground Natural Resources

Jewel Cave staff continued to develop their understanding of the monument's aboveground natural resources, although accomplishments in this area drew less attention than the breakthroughs belowground. Research project proposals submitted by NPS staff in 1959 included a study of the monument's surface geological features, a botanical survey, and a survey of the local fauna. The proposals suggested partnering with a cooperating school or other federal bureaus for the latter two projects. However, all of the aboveground projects ranked below the need to further survey and map the cave and to study the cave "breathing" phenomenon.[176]

Superintendent Warren D. Hotchkiss, responding to a request from the regional director, prepared a land inventory for Jewel Cave in 1968. The regional director used the data to support funding requests for soil and moisture conservation. Hotchkiss reported that the monument contained 1,273.51 acres of land, 575 of which were classified as grazed and 1,110 as cut-over land. Soil and moisture conservation work had previously been completed on 7.5 acres, and a project was in progress on 3.5 acres of land.[177] Other conservation work included adding topsoil to areas around the Ranger Station trampled by people visiting the park.[178]

Due to the small size of the monument and the fact that it was predominately covered in forest, livestock grazing was not an important management issue. The annual forestry report for 1963 noted that the lack of livestock or a large, stable deer population meant that "no grazing or browsing problems occur."[179] However, boundary changes in 1965 incorporated unfenced lands into the monument, increasing the likelihood of trespass by cattle grazing on the adjoining Harney National Forest. The following year, the acting superintendent reported that "[r]ecent boundary changes have permitted cattle unrestricted access to the monument" and "encroachment by cattle took place regularly."[180] Two miles of temporary fence built in 1967 kept cattle away from the headquarters area. But a proper boundary fencing program was needed.[181]

Insect pests at Jewel Cave and Wind Cave included the Black Hills pine beetle and the tent caterpillar. Acting Regional Chief Ernest Field suggested the use of DDT for control of the tent caterpillar, recommending a "25% emulsified concentrate mixed with water at the rate of two quarts

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[176] US Department of Interior, National Park Service, "Priority List—Research Program, Jewel Cave National Monument," January 1, 1959, Records of Wind Cave National Park General File, Box 5, Folder N2621 Annual Research Reports, Records of the NPS Region II, NARA KC.

[177] Warren B. Hotchkiss, Superintendent, Wind Cave, to Regional Director, Midwest Region, "Memorandum: Soil and Moisture Conservation Needs Inventory, Jewel Cave," October 14, 1968, Cabinet 2, Drawer 4, Folder D54, Jewel Cave NM CF.

[178] Hotchkiss, Wind Cave Annual Narrative Report, 1967, 7.

[179] Superintendent, Wind Cave to Midwest Regional Director, "Memorandum: Annual Forestry Report NPS(CR)-1, 1963, Jewel Cave," January 21, 1964, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

[180] Acting Wind Cave Superintendent Donald F. Gillespie to Midwest Regional Director, "Memorandum: Annual Forestry Report NPS(OR)-1, 1966, Jewel Cave," February 7, 1967, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

[181] Wind Cave Superintendent Warren D. Hotchkiss to Midwest Regional Director, "Memorandum: Annual Forestry Report NPS(OR)-1, 1967, Jewel Cave," February 8, 1968, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

of concentrate to make 100 gallons of mix."[182] In 1959, $1,000 was allocated to Wind Cave and $150 to Jewel Cave for insect control, mostly directed at the pine beetle. Field said that he would visit the monument in the spring to help survey for infested trees.[183]

After conducting the annual beetle survey in 1958, the regional forester and the supervisory park ranger reported that "woodpeckers had eliminated the insect from almost every infested tree thus keeping the disease endemic."[184] Again in 1959, control of the beetles was "being accomplished by woodpeckers." The superintendent reported that a "careful survey was made on two different occasions this year of the infested trees and all were found to be cleaned up by birds."[185] For the next few years, woodpeckers apparently continued to keep the insects in check. Then, in 1963, a partial survey by the Forest Service showed "insect infested trees of epidemic proportions." The superintendent planned another survey and a goal of one hundred percent treatment of all infected trees. This entailed felling the infected trees and treating them with ethylene dibromide (EDB).[186]

The 1965 survey "turned up only two new infested trees," which suggested that beetles had returned to an endemic level. However, tent caterpillars damaged vegetation at the monument's headquarters and in the canyons that year. They were controlled by burning the vegetation.[187] That same year, the superintendent sent out a memo prohibiting the use of DDT at Wind Cave and Jewel Cave for spraying tent caterpillars, calling for the disposal of any remaining stocks "just as soon as possible."[188]

Jewel Cave cooperated with other federal and state agencies to meet its fire management needs. As of January 1, 1960, both Wind Cave and Jewel Cave were part of the Black Hills Cooperative Fire Control Agreement.[189] The agreement established procedures and cost-sharing policies for cooperative fire-fighting on lands administered by the South Dakota Department of Game, Fish and Parks and several federal agencies (the NPS, Forest Service, and BLM). Initial action in fire suppression would be taken by whichever agency's personnel could first arrive on the scene,

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[182] Ernest K. Field to Superintendent, Wind Cave National Park, "Memorandum: Tent Caterpillar Control," July 28, 1959, Records of Wind Cave National Park General File, Box 6, Folder Y22 Forest Pests & Control, Records of the NPS Region II (Midwest Region), NARA KC.

[183] Ernest K. Field to Assistant Regional Director, "Orientation of Incoming Superintendent, Wind Cave," November 23, 1959, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

[184] Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 4.

[185] Semingsen and Lienau, 1959 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 4; Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 4.

[186] Elms to Midwest Regional Director, "Memorandum: Annual Forestry Report, Jewel Cave, NPS(CR)-1, 1963," January 21, 1964, 2.

[187] Acting Wind Cave Superintendent John A. Tyers to Midwest Regional Director, "Annual Forestry Report, NPS(OR)-1, 1965, Jewel Cave," February 14, 1966, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

[188] Warren D. Hotchkiss, to Wind Cave personnel and Jewel Cave Management Assistant, "Memorandum: Use of DDT Prohibited," March 25, 1966, 2, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

[189] Howard W. Baker, Regional Director to Jess H. Lombard, December 23, 1959, 5, General Files 1952–1963, Box A52, Folder A6435 WICA May 1956 to 1961, Records of the National Park Service Region II (Midwest Region), NARA KC.

"irrespective of administrative boundaries." However, the agency responsible for the area in question should "relieve the cooperating agency as promptly as reasonably possible, including the release of manpower and equipment." The specific "Protection Boundaries" assigned to each agency would be agreed upon at an annual fire planning conference and designated on a map as part of the agency's fire plan.[190]

Fire protection duties became more formalized at Jewel Cave in 1958 with the creation of a fire control aid position (GS-4). This seasonal employee was responsible for "clearing fire trails, maintaining a fire weather station and patrolling the area regularly to eliminate man-caused forest fire and secure early detection on lightning-caused forest fires." The fire control aid maintained radio contact with Wind Cave and the Forest Service using the Black Hills radio network. In 1958, there were no fires on the monument, and in 1959, crews responded to two fires on adjacent lands.[191] In what must have been a frightful few minutes in 1960, a small fire started near the entrance to Jewel Cave when a gas can ignited and rolled down the grassy slope. Luckily, the fire control aid and maintenance man were present, and "the fire was controlled in approximately eight minutes."[192] Lightning caused a fire in June 1961, but a Forest Service aircraft spotted it and a ground crew extinguished it, containing the fire to a single tree.[193]

Superintendent Lombard reported that there were insufficient funds in the forestry and fire control budget to employ a fire control aid in 1962, despite "many long periods of extremely high fire hazard in the vicinity."[194] Annual reports from 1963 to 1966 make no mention of fire control activities. In 1967, Management Assistant Donald Gillespie participated in a two-day Forest Service fire simulator training program in Hill City, South Dakota. While there were no fires at the monument that year, NPS personnel helped suppress some lightning-strike fires on Forest Service land, as part of the cooperative agreement with Black Hills National Forest.[195] Beyond the specialized training available through the Forest Service, monument staff received "back up sessions on pumper operation and safe use of hand tools" and familiarized themselves with the fire attack plan.[196]

A 1972 MOU among the Black Hills National Forest, Devils Tower National Monument, Mount Rushmore National Memorial, Jewel Cave, and Wind Cave supplemented the earlier

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[190] "Cooperative Forest Fire Protection Agreement Between State of South Dakota Department of Game, Fish and Parks and National Park Service and United States Forest Service and Department of Interior Bureau of Land Management," 3, 7, Cabinet 2, Drawer 2, Folder Y1417 Wildland Fire Presuppression, Jewel Cave NM CF.

[191] Semingsen and Lienau, 1958 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 2, 4; Semingsen and Lienau, 1959 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 4.

[192] Miller, 1960 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 2.

[193] Jess H. Lombard, "Memorandum: 1961 Supplement to Superintendent's Annual Report (Period June 1 to June 30) for Jewel Cave," July 6, 1961, 4, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1961, Jewel Cave NM CF.

[194] Jess H. Lombard, 1962 Superintendent's Annual Report, 10A8 for Jewel Cave National Monument, 2, files provided by Katie Atkins, Folder A2621 Narrative Reports: Annual, Superintendent's Annual 1962, Jewel Cave NM CF.

[195] Hotchkiss, Wind Cave Annual Narrative Report, 1967, 7.

[196] Warren D. Hotchkiss to Regional Director, "Memorandum: Annual Forestry Report—NPS(OR)-1, Jewel Cave," January 30, 1969, Cabinet 2, Drawer 2, Folder Y26 Reports, Jewel Cave NM CF.

cooperative fire control agreement. The MOU established specific dispatching procedures and areas of responsibility for Forest Service fire crews and a contract helicopter, including "all fires within the boundaries of Jewel Cave National Monument and Mount Rushmore National Memorial." Meanwhile, Wind Cave and Jewel Cave personnel were required to respond to fires reported on national forest land within one mile of their boundaries.[197]

Law Enforcement and Safety

Law enforcement issues at the monument were minor, mostly amounting to fence-cutting and cattle trespass or small acts of vandalism. Vandalism most often occurred in the winter, when there were no staff at the monument.[198] In 1960, two steel bars were pulled out of the Jasper Cave gate during the winter off-season, and someone cut the boundary fencing open in the autumn. Ranger-in-Charge Keith Miller reported that "year around protection will be available with the construction of two new residences during fiscal year 1962," which would "eliminate many of the violations that occur."[199] Still, over the next year, the boundary fence was cut in several places, and Jasper Cave was broken into again.[200] The first successful law enforcement action on the monument occurred in 1965 when "a Custer, South Dakota resident was fined $25 for cutting and removing wood from the monument."[201]

Construction of the New Visitor Center and Associated Development

Development plans for the new visitor center and new cave tour were based on the General Development Narrative and Master Plan that Ronscavage and the WODC completed in late 1964 and early 1965 (see Figure 63).[202] Wind Cave hosted a pre-construction conference in August 1965, to kick off the process. Attendees included Lombard, Wind Cave Administrative Assistant Carl Glass, Wind Cave Maintenance Supervisor Harold J. Chittum, Jewel Cave Management Assistant Jim Thompson, WODC Project Supervisor Hal Look, WODC Landscape Architect Vernon M. Anderson, and representatives from contractors Summit Construction Company and Howe Investments and Northwestern Engineering Company (HINEC), both of Rapid City.[203]

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[197] "Memorandum of Understanding Between the Black Hills National Forest and Devils Tower National Monument, Mount Rushmore National Memorial, Jewel Cave National Monument, and Wind Cave National Park," Cabinet 2, Drawer 2, Folder Y1417 Wildland Fire Presuppression, Jewel Cave NM CF.

[198] Semingsen and Lienau, 1959 Superintendents Annual Report for Jewel Cave National Monument South Dakota, 5.

[199] Miller, 1960 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 5.

[200] Lombard, 1962 Superintendent's Annual Report, 10A8 for Jewel Cave National Monument, 2.

[201] Warren D. Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 3, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF.

[202] Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. Nm-JC-3113-H General Development, February 1964, revised October 1964, 2.

[203] Jean Donnell, Minutes of Pre-Construction Conference, August 5, 1965, 1, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-0232-1041, Jewel Cave NM CF.

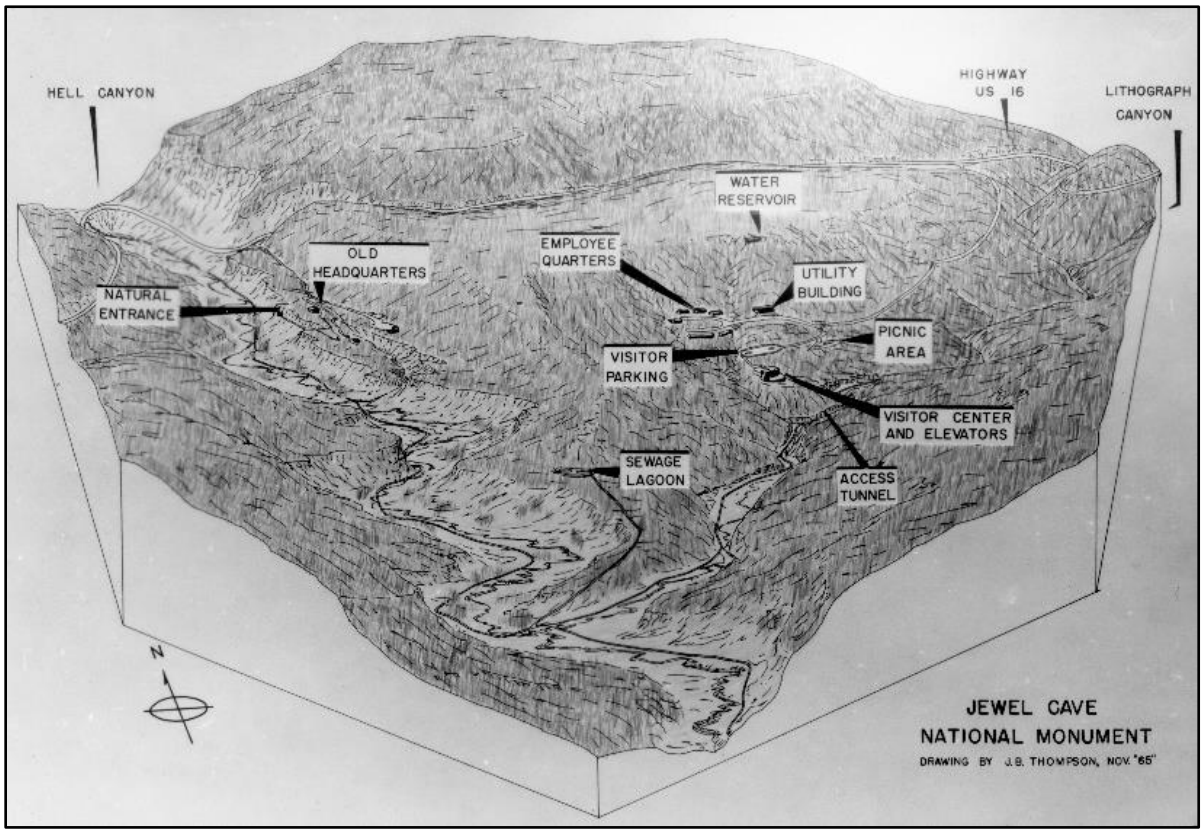


Figure 63. A schematic drawing of Jewel Cave as it would look after development, if one were south of the monument and looking north into Hell and Lithograph Canyons. Drawn by James B. Thompson, November 1965.

Source: NPS, Jewel Cave NM.

Jewel Cave management assistants and Wind Cave superintendents kept local partners informed and involved during the construction process. In January 1966, Thompson and Warren D. Hotchkiss, the superintendent at Wind Cave who followed Lombard, together with the Forest Service and state highway commissioner, held a "round-robin discussion of development plans in the Custer area" at the request of the Custer Chamber of Commerce and the Highway 16 Association.[204] The Custer and Newcastle Chambers of Commerce agreed to erect roadside signs directing visitors to Jewel Cave.[205] Management Assistant Donald Gillespie (who followed Thompson) gave talks at the Rapid City Rotary Club, Hot Springs Gem and Mineral Society, the Custer Chamber of Commerce, the Custer 4-H clubs, the Custer Sportsmen Association, and other local groups to keep them informed of developments going on at Jewel Cave.[206] Gillespie also kept local landowners apprised of development "in an effort to ward off any misunderstandings

[204] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 1.

[205] Gillespie, Annual Report of Information and Interpretive Services—NPS(CN)-2, Jewel Cave, 1966, 1.

[206] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 2; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 1.

concerning cattle grazing and possible trespass." He noted that the program had been successful and "cooperation has been very good."[207]

Groundwork: Roads and Utilities

One of the first changes to the new site was laying new roads and leveling land (see Figure 64). Brady Engineering Company of Spearfish, South Dakota, completed a topographical survey of the 40-acre development area and the planned access road from Highway 16, in order to ascertain the extent of leveling required before construction.[208] In August 1965, Summit Construction Company began construction of "roads, parking areas, [and] residential and utility roads" for the new area.[209] The WODC prepared all plans and specifications for the projects. Roads were constructed with "4" of base course and 2" of plant mix surfacing" and then sealed, chipped, and curbed with concrete (except for the entrance road and shoulders of the utility and residential roads).[210] Following construction, the NPS added topsoil to and reseeded the disturbed areas.[211] A year later, Summit Construction returned and built a retaining wall to mitigate slumping "on the newly completed Monument roadway between the office and residence area."[212] The NPS coordinated with the South Dakota Department of Highways to add



Figure 64. Grading for the entrance road to the new development area. Photo by John Tyers, 1965.

Source: NPS, Jewel Cave NM.

[207] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 1.

[208] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 7; WODC, Roads & Parking, Headquarters, Jewel Cave Nat'l Mon., S.D., January 1965, File 1740, Jewel Cave NM MF.

[209] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 5.

[210] Jewel Cave, Completion Report Narrative, Access Road: Headquarters Area, December 1, 1966, 1, 3, Jewel Cave NM CF; Jewel Cave, Completion Report Narrative, Residential and Utility Roads: Headquarters Area, December 16, 1966, 3, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-0232-1043, Jewel Cave NM CF.

[211] Harvey B. Reynolds, Assistant to the Regional Director, Development, to Regional Director, memorandum, December 8, 1966, 2, General Files 1952–1963, Box D135, Folder Book #10 July 1964–Jan 1967 WICA closed, Records of the National Park Service Region II (Midwest Region), NARA KC.

[212] Donald F. Gillepsie to Owen Emme, July 24, 1967, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-0232-1043, Jewel Cave NM CF.

new entry signs along Highway 16, but the NPS planned to replace signs internal to the monument after construction was completed.[213]

As part of the extension of utilities to the new area, the NPS issued the Black Hills Electric Cooperative, Inc., a permit to relocate existing electrical lines

> with future underground primary voltage service to a pad-mounted or vault-type transformer for the Visitor Center, elevators, cave trails and aerial distribution to the Residential and Maintenance areas. A portion of the existing line is proposed to be retained to serve the picnic area comfort station with a short section of underground line at the parking area.[214]

For electrical service to the elevators, the Rural Electrification Administration agreed to provide a "three-phase, 7200/12500 volt wye power service… at no cost of extension to the Government."[215] The NPS prepared special use permits for Bison State Telephone Company to realign its line and to Northwestern Bell Telephone Company, which had a toll telephone line running through a portion of the monument that had previously been Forest Service land (see Figure 65).[216] The new permits to these companies lasted until the mid- to late 1970s. After their expiration, renewal of these permits languished for 40 years, although the park still allowed the companies to maintain their lines.[217]



Figure 65. Power line construction near the location of the new visitor center, 1967.

Source: NPS, Jewel Cave NM.

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[213] Gillespie, Annual Report of Information and Interpretive Services—NPS(CN)-2, Jewel Cave, 1966, 1.

[214] NPS, John A. Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. NM-JC-3116 General Utilities, February 1965, 2.

[215] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 6; Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. NM-JC-3116 General Utilities, February 1965, 2.

[216] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 4.

[217] "JECA," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677zzi, Jewel Cave NM MF.

HINEC completed the new water system in 1966. It consisted of a new pump in the existing well and another in a pump house to push water to a 100,000-gallon reservoir, from which the water flowed by gravity through a distribution system to the new headquarters area (see Figure 66). HINEC experienced difficulty with digging trenches and with "cracking of the reservoir roof and water penetration of the reservoir walls," but it was able to repair the roof and walls and complete the job.[218]



Figure 66. Excavation for the 100,000-gallon reservoir at Jewel Cave National Monument, 1965.

Source: NPS, Jewel Cave NM.

Ronscavage planned for primary sewage treatment through the "extended aeration process," secondary treatment by a small sewage lagoon, and then disposal via dry wash. He acknowledged the difficulties of sewage treatment in the hilly area:

> The extreme limitations of the site make it impossible to construct sewage lagoons large enough for primary treatment. Also it is necessary to prevent untreated wastes from entering the cave system. The proposed comfort station will have a septic tank and leach field disposal system.[219]

Thompson assisted with siting the sewage disposal system and minimizing its effect on the cave resource, such as "not putting the septic system on top of the cave" (although this happened anyways: passages beneath the sewer lagoons were discovered in 1969).[220] In late 1966, HINEC completed the new sewer system, which consisted of lines (six-inch vitrified clay pipe and six-inch cast iron pipe), trenches in which the lines were placed, a sealed lagoon "composed of two cells with a total surface area of approximately one acre," and a four-strand covered wire fence around the lagoon. HINEC encountered minor difficulties grading the lagoon and digging trenches in rocky areas, but it overcame these problems by drilling and blasting ahead of the backhoe to fracture rocks (see Figure 67).[221]

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[218] Jewel Cave, Completion Report Narrative, Water System: Headquarters Area, December 23, 1966, 3, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-0232-1041, Jewel Cave NM CF.

[219] Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. NM-JC-3116 General Utilities, February 1965, 2–3.

[220] Thompson, interview; Wiles, comments on draft, April 7, 2020.

[221] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 5; Jewel Cave, Completion Report Narrative, Sewer System: Headquarters Area, December 27, 1966, 1–3, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-0232-1041, Jewel Cave NM CF.



Figure 67. The graded future site of the sewage lagoon, 1965.

Source: NPS, Jewel Cave NM.

Cave Tour and Elevator Shaft

Herb and Jan Conn worked on the cave tour route that would lie underneath the new surface developments. In February 1965, Thompson, Look, and Herb Conn went into the cave "to study the proposed new tour route trail location." Thompson and Look agreed on the Conns' proposed loop, with two amendments:

> 1. The western entrance into the Chinese Torture Chamber [later called simply the "Torture Room"] was unsatisfactory due to safety and terrain reasons and an alternative was selected which makes entrance into this chamber further to the east.
> 2. The route from Rum Runners Road to the Formation Room, as mapped by the Conns, was found to be less scenic than a higher level route through the Mezzanine. Since two steep stairways would be required (one up and one down) however, both routes should be built so that a choice may be made on the basis of the makeup for the tour group. Mr. Look will at least survey the two possibilities.
>
> No satisfactory alternative to the route north of Spooky Hollow was found. This will require enlarging the passage for about 15 linear feet.[222]

Thompson noted that the tour route included many impressive formations, but it lacked examples of scintillites and logomites (the hollow stalagmites Hipschman had written about). Thompson recommended that the NPS display these features to the public in the future, while being especially careful about exposing fragile hydromagnesite bubbles to the public. Thompson asked designers and surveyors to keep in mind "the tour management trap that can result from a single loop tour," in case they could think of a way to create additional interconnections.[223]

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[222] Management Assistant James B. Thompson to Acting Superintendent, Wind Cave, memorandum, February 6, 1965, 1, Cabinet 2, Drawer 4, Folder D52 Contracts, Jewel Cave NM CF. The Chinese Torture Chamber later became the "Torture Room," and Rum Runners Road became "Rum Runner's Lane" (a reference to Prohibition, because it connected a wet area of the cave with a dry one). The passage to be enlarged was the "low spot" of the route and was one of only two places excavated during construction. Wiles, comments on draft, April 7, 2020.

[223] Thompson to Acting Superintendent, Wind Cave, memorandum, February 6, 1965, 1–2.

With these suggestions, the Conns and Thompson ironed out the details of the route, and the Conns finished marking it with plastic surveyor tape by the end of 1965 (see Figure 68).[224] Gillespie worked with interpreters to determine what information guides should provide on a cave tour. Chuck McCurdy (likely a seasonal ranger at Jewel Cave) suggested that the new tour carry over many of the topics covered in the old tour: origins of the cave, cave cycles, speleothems, the cave environment, history of Jewel Cave exploration, and an introduction to limestone, cave hydrology, and cave breathing.[225] As for tour group size, Gillespie noted, "It is difficult to say what the maximum size of tours will be. We would hope to contain them to 100 or fewer but during peak use it may well go over that figure."[226]

With the route of the cave tour settled, the next step was to dig the elevator shaft, around which the visitor center would be built. The WODC hired Edward H. Oshier, a mining engineer at the South Dakota School of Mines, to complete a geology study that would determine where to locate the elevator shaft. Thompson, who had a degree in geology, helped Oshier with survey work.[227] Rock data from the test hole drilling log informed Oshier's study.[228]



Figure 68. Cavers in the Formation Room, which Herb and Jan Conn included in their proposed tour route. Photo by Alan Howard, September 1962.

Source: NPS, Jewel Cave NM.

In February 1965, Thompson called siting the elevator and access tunnel an "important problem which is holding up development." Oshier had originally proposed driving an eight-by-ten-foot tunnel from Lithograph Canyon to a point south of the Target Room, to allow vehicle access to the cave and to intersect with the elevator shaft. Other proposals were to either use the same elevator shaft site and build a four-by-eight-foot walk-in tunnel from Lithograph Canyon (with no vehicular access), which would require steps, or to build an elevator shaft north of the Target Room that did

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[224] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 8; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 8.

[225] Charles H. McCurdy to George Robinson and Don Gillespie, memorandum, August 4, 1967, 1–2, Cabinet 2, Drawer 4, Folder 1965–81 SEND TO NARA 2011, Jewel Cave NM CF.

[226] Management Assistant Donald F. Gillespie to Wind Cave Superintendent, memorandum, April 2, 1968, 1, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[227] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 7; Thompson, interview.

[228] Driller's Log of Well, April 24, 1964, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-7:971-3, Jewel Cave NM CF.

not intersect with the tunnel, allowing for either type of tunnel since it would be structurally independent of the shaft.[229] All proposals provided for elevator landings at two levels. Thompson explained his thinking:

> The more northerly elevator provides a slightly more desirable tour circulation pattern and better position for future tour expansion. On the surface it would be closer to the parking lot. The southern location could be connected directly with the access tunnel and might present some less risk to damaging the cave. On the surface it has a more esthetically pleasing location.
>
> The larger longer tunnel would be more expensive but might decrease maintenance and construction costs because of vehicle access. The smaller tunnel would be much cheaper and would not risk changing air circulation patterns. . . . The importance of reaching a decision in this matter cannot be overemphasized. No further development can be undertaken until this problem is resolved. . . . The shaft must be excavated before the building is constructed. These development items are coming up in the 67 F.Y. program. Funding for the shaft and tunnel are available from F.Y. 65 and 66.[230]

Thompson supported a shaft north of the Target Room, because he thought drilling too close to or directly into the large room would cause structural problems.[231]

Oshier raised concerns about the accuracy of the existing surveys. He recommended, before proceeding with any drilling or underground development, that the Conns conduct additional Brunton surveys to check the accuracy of their previous surveys, and that they place permanent survey stations in the cave.[232] Oshier then recommended

> sinking a small 5'x8' vertical shaft from the surface of Lithograph Canyon to connect with the cave opening at approximately Station ST-12. . . . The sole purpose of this shaft is to provide an entrance to the cave in the area of the development so that additional transit and level surveys may be made and that additional much needed exploration of the cave in the area to be developed can be performed expeditiously. Without these additional underground surveys and careful examination of vital areas of the Cave the driving of the adit and the elevator shaft work cannot be performed without undue risk involving critical areas of the Cave which should be preserved in their natural state.[233]

Oshier suggested contracting with local miners to drill the small shaft and then placing a ladder in it and a small shack above it. Only after this small shaft and further surveys had been completed, Oshier advised, should the adit and elevator shaft be constructed.[234] He included specifications for the adit in his report and echoed Thompson's concerns about the stability of the Target Room:

> It is my considered opinion that the placing of this shaft and adit in any area in close proximity to the Target Room could lead to disastrous consequences. It is my opinion that the Target Room is the result of the collapse of the limestone beds in an area criss-crossed by joints and possibly a major

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[229] James B. Thompson to Wind Cave Acting Superintendent, February 5, 1965, 2, Cabinet 2, Drawer 4, Folder D52 Contracts, Jewel Cave NM CF.

[230] Thompson to Wind Cave Acting Superintendent, February 5, 1965, 3.

[231] Thompson, interview.

[232] Edwin H. Oshier, "Report on Proposed Underground Development of Jewel Cave National Monument," June 17, 1965, 3, Cabinet 2, Drawer 4, Folder D52 Contracts, Jewel Cave NM CF.

[233] Oshier, "Report on Proposed Underground Development of Jewel Cave National Monument," June 17, 1965, 2.

[234] The "adit" was the horizontal access tunnel—"adit" is a mining term meaning a horizontal passage through rock. Oshier, "Report on Proposed Underground Development of Jewel Cave National Monument," June 17, 1965, 2–6.

> fault. Any attempt to work through this area either in raising or sinking the shaft or in driving the service adit could lead to grave difficulties and without doubt would materially increase the cost of the work. . . . [I]f we keep the proposed adit and shaft work a reasonable distance from all known passageways of the Cave we will have no difficulties. We must, however, have the needed survey information before we can make our final plans.[235]

Oshier recommended that "only experienced mining companies be requested to bid on this project." The WODC drew up the specifications for drilling the test hole(s), access tunnel, and elevator shaft.[236] In December 1965, the NPS approved the final drawing for the elevator shaft, which would include space for two elevators.[237]

Frontier Constructors, Inc., won the contract to drill an elevator shaft wide enough for two elevators (see Figures 69, 70, 71, and 72).[238] After drilling the first test core, Frontier consulted with Oshier, and the NPS determined the shaft hole should be moved 20 to 25 feet to the east. The change necessitated a longer shaft, because the relocated point was uphill from the original. It also required redesigning the visitor use tunnels belowground. In October 1966, Frontier proceeded with excavation of the shaft until drillers hit fractured rock: they had expected to hit only solid limestone and then mount the elevator rails directly in the limestone walls, but they encountered hardly any solid limestone.[239] After hitting the fractured rock, Frontier stopped excavation and explained, "it was unsafe to proceed with the work until the concrete lining could be installed to hold the rock in place. The material is badly fractured and is bedded at about 45°."[240]



Figure 69. Earth-moving in preparation for construction of the elevator shaft, 1966.

Source: NPS, Jewel Cave NM.

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[235] Oshier, "Report on Proposed Underground Development of Jewel Cave National Monument," June 17, 1965, 7.

[236] Oshier, "Report on Proposed Underground Development of Jewel Cave National Monument," June 17, 1965, 7; WODC, NPS, Specifications for Construction of Shaft, Tunnels, and Subsurface Exploration, Jewel Cave National Monument, South Dakota, Project No. JC-S49, May 25, 1966, Cabinet 2, Drawer 4, Folder D 22 Contract No. 14-10-7:971-3, Jewel Cave NM CF.

[237] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 6; Ronscavage, Master Plan: Jewel Cave National Monument, General Development Narrative To Accompany Drawing No. NM-JC-3116 General Utilities, February 1965, 2.

[238] Allen D. Huber, Acting Chief of Contract Administration and Construction, to Frontier Constructors, Inc., September 28, 1966, Cabinet 2, Drawer 3, Folder Elevator Shaft-JECA Frontier Constructors, Jewel Cave NM CF.

[239] Wiles, comments on draft, April 7, 2020.

[240] P. E. Smith, Chief of Contract Administration and Construction, DCSSC, to Assistant Director, Design and Construction, memorandum, November 3, 1966, 2–3, Cabinet 2, Drawer 3, Folder Elevator Shaft-JECA Frontier Constructors, Jewel Cave NM CF.

Oshier reexamined the cores to figure out how much lining would be needed and determined there was a "possibility of structural collapse of a fault located to the north of the proposed shaft. Therefore, it is not considered practical to move the shaft location to the north." However, the NPS did not want to move the shaft south because visitors would have to walk farther from the already-completed parking area. Because so much work had already been done at the present location, the NPS decided to keep the shaft there, despite additional costs that might result from the fractured rock.[241]



Figure 70. Elevator shaft excavation and the partially graded visitor center site, July 18, 1967.

Source: NPS, Jewel Cave NM.



Figure 71. Excavation of the elevator shaft. Photo by Don Gillespie, 1966.

Source: NPS, Jewel Cave NM.



Figure 72. Inside the elevator shaft during construction, 1967.

Source: NPS, Jewel Cave NM.

[241] Smith to Assistant Director, Design and Construction, memorandum, November 3, 1966, 2–3.

Because of the added costs, the NPS asked Congress for an additional $300,000 in March 1967 to complete the shaft and elevator. The "badly fractured rock," Assistant Secretary of the Interior Stanley A. Cair explained, "will require complete concrete lining for the entire length of the [310-foot] shaft" (see Figure 73). Because this would delay construction, the NPS reprogrammed money designated for housing at Jewel Cave to the elevator shaft, as no new housing would be needed until the visitor center was completed.[242] In May, the additional funding came through.

The final shaft was lined entirely with concrete. Crews excavated a little at a time, stopped at regular intervals to install rebar and a temporary inner lining for each newly excavated section of shaft. They poured concrete and then removed the inner lining after the concrete had set. After finishing this process for one section of shaft, crews then excavated below the poured concrete and repeated the process, which meant the newest concrete butted up against the base of the previously poured concrete. This was difficult to do, and often left gaps through which water could leak. In places where crews hit cave passages before the Target Room, they built an outer wall with heavy timbers to contain the poured concrete.[243]

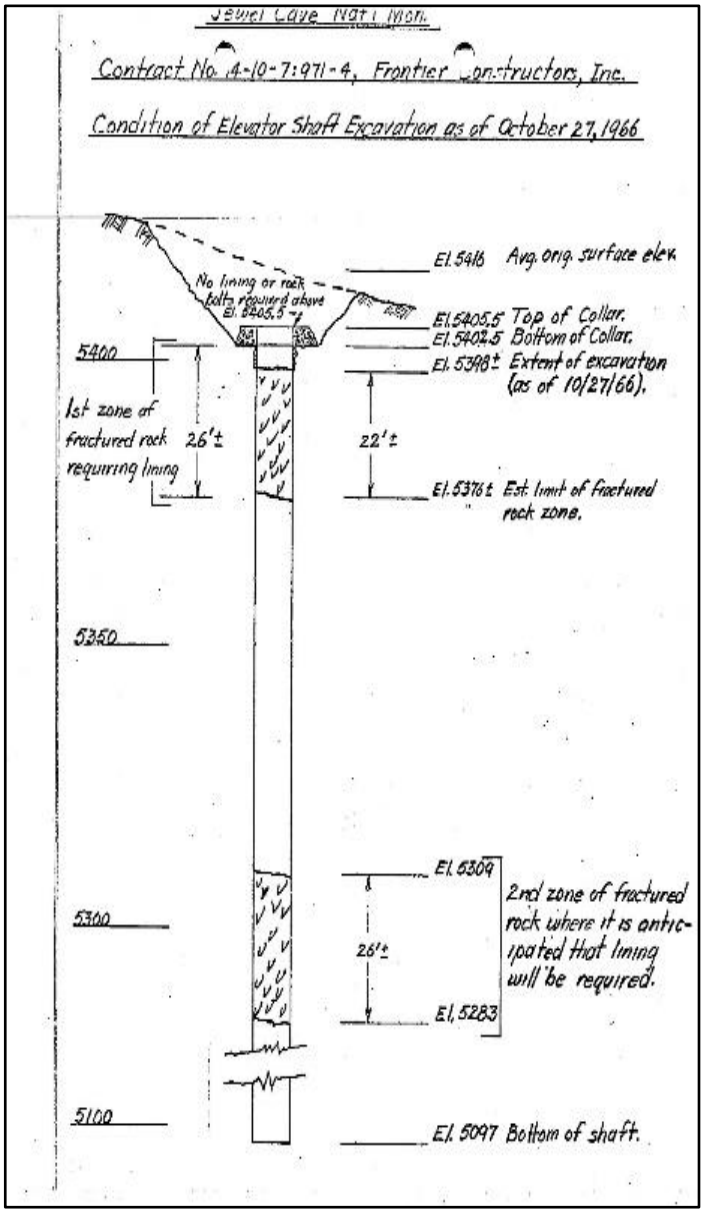


Figure 73. When excavating the elevator shaft, Frontier hit fractured rock that required lining of the shaft in those zones, 1966.

Source: NPS, Jewel Cave NM.

[242] Stanley A. Cair to Rep. Julia B. Hansen Chair, Subcommittee on Interior and Related Agencies Appropriations, March 16, 1967, Cabinet 2, Drawer 3, Folder Elevator Shaft-JECA Frontier Constructors, Jewel Cave NM CF.

[243] These wooden timbers were never removed and have deteriorated in subsequent years. Wiles, comments on draft, April 7, 2020; Acting Chief of Contract Administration and Construction, and Contracting Officer, Walter Lord to Frontier Constructors, Inc., May 11, 1967, Cabinet 2, Drawer 3, Folder Elevator Shaft-JECA Frontier Constructors, Jewel Cave NM CF.

Geological issues continued to plague Frontier. In September 1967, drillers ran into a cavity "just below the level of the upper landing and Target Room connection. It leads down at a 45 degree angle northeast past the north wall of the shaft, where it looks down into deep fissures on both north and east sides." It turned out that these were known cave passages, surveyed by Centennial Development Co. in September 1966 as part of the additional surveys Oshier had recommended, but Frontier had not realized where they were located in relation to the shaft. Frontier noted, "A large quantity of rock from the shaft has fallen through the new hole and has completed blocked the cave passage for 20 feet" between two Centennial stations, and it would require cleanup (see Figure 74).[244]

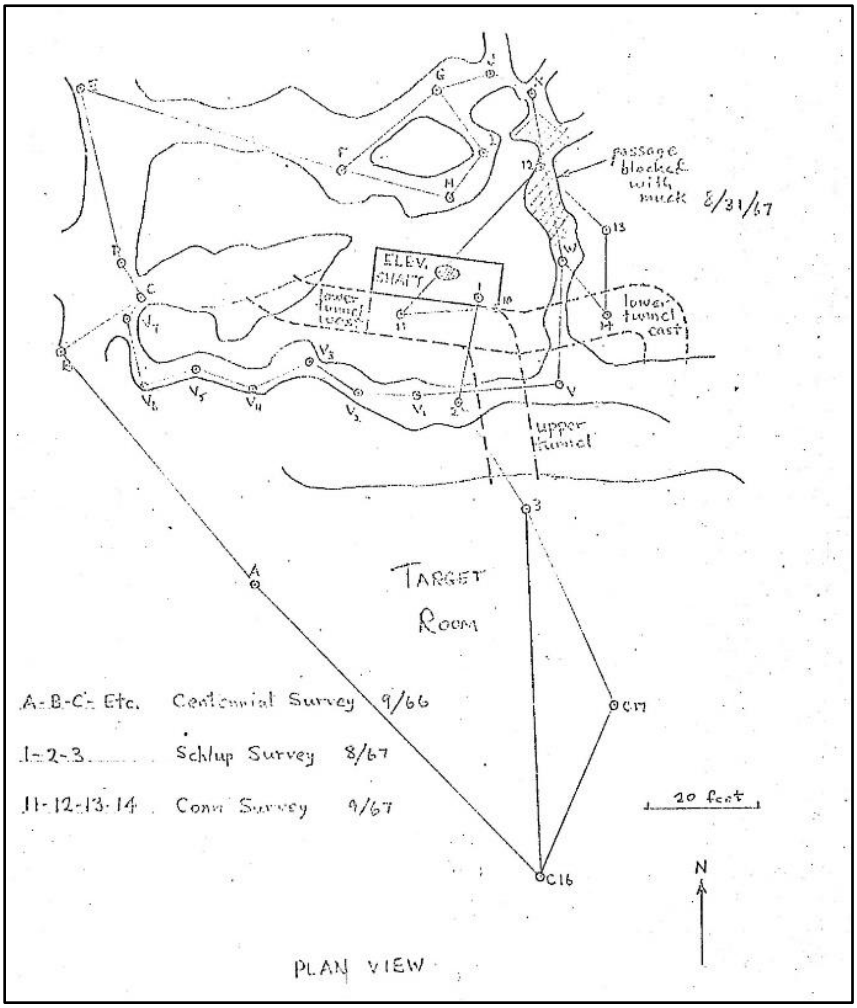


Figure 74. When drilling the elevator shaft, rock and muck fell into the cave and blocked a passageway. Drawn here by Herb Conn, August 31, 1967.

Source: NPS, Jewel Cave NM.

[244] Herb Conn, "Report of Investigation of Elevator Shaft Area in Jewel Cave Sept. 1, 1967," September 2, 1967, Cabinet 2, Drawer 3, Folder Elevator Shaft-JECA Frontier Constructors, Jewel Cave NM CF.

By July 1968, Frontier had completed the 389-linear-foot access tunnel (coated in gunite), one concrete portal, 480 square feet of approach road, and 96 square feet of storage area.[245] Spoil from the shaft was used as fill for the parking at the proposed picnic area.[246] In July 1969, Frontier completed the concrete-lined elevator shaft and emergency exit. Its contract did not include the addition of elevator machinery (see Figure 75).[247]

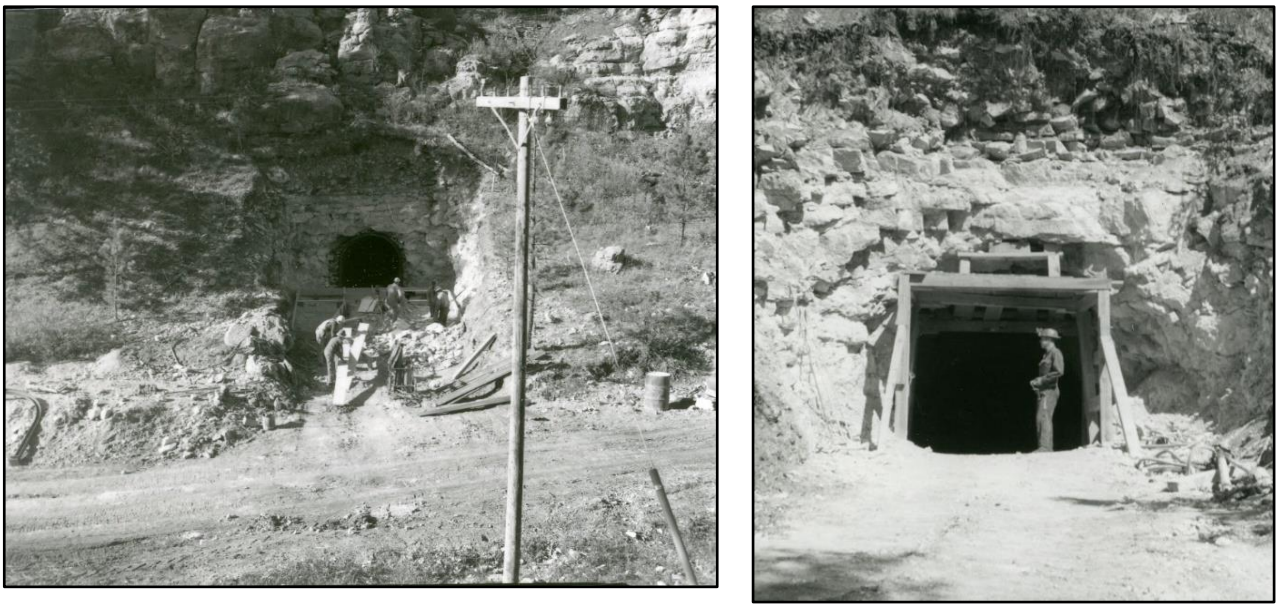


Figure 75. Construction of the access tunnel, pictured here at its entrance in Lithograph Canyon, ca. 1967.
Source: NPS, Jewel Cave NM.

While drillers excavated the elevator shaft from above, the NPS began trail construction inside the cave. Minor construction and cave lighting planning began in 1966 but then stalled due to funding shortages caused by the elevator shaft drilling issues.[248] Herb Conn, a trained electrical engineer, advised Gillespie on the lighting system (see Figure 76). The NPS completed drawings in February 1967, revised them, and ordered 2,000 feet of cable to wire the cave with electricity.[249]

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[245] Completion Narrative Report, Work Order No. 146-225107, Construct Access Tunnel, Headquarters Area, 9, 26, Cabinet 2, Drawer 3, Folder Shaft, Tunnels, & Subsurface Exploration, Jewel Cave NM CF; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 9.

[246] Carl W. Alleman to Midwest Regional Director, memorandum, March 13, 1967, Cabinet 2, Drawer 3, Folder D3215 Campgrounds, Picnic Areas, Jewel Cave NM CF.

[247] Mining Engineer George R. Kyler to Western District Manager, memorandum, July 24, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[248] Completion Report Narrative, Day Labor Project, Work Order No. 146-211705, PCP-U-14, Construct Cave Lighting System for Jewel Cave, Headquarters Area, January 7, 1975, 1, Cabinet 2, Drawer 3, Folder Construct Cave Lighting System-JECA, Jewel Cave NM CF.

[249] Management Assistant Donald F. Gillespie to Wind Cave Superintendent, memorandum, January 13, 1967, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF; Completion Report Narrative, Day Labor Project, Work Order No. 146-211705, PCP-U-14, Construct Cave Lighting System for Jewel Cave, Headquarters Area, January 7, 1975, 1–2.



Figure 76. Installing wiring along the new cave tour route.

Source: NPS, Jewel Cave NM.

The NPS hired a crew of six to prepare the cave trail.[250] They moved "blocks weighing five tons and more . . . to provide a walking surface." Maintenance crews installed a shop in the access tunnel to provide easy access for trail and lighting development. By mid-summer, about two-thirds of the trail had been "roughed in" and was ready for a "base coarse application," and temporary lighting was installed on the route.[251] Later that summer, the NPS purchased aluminum stair treads and other materials needed for the trail, as determined by WODC engineers. Crews graded and leveled the tour assembly area in the Target Room, moving "large amounts of breakdown . . . to provide a large relatively flat area." They also constructed a wooden emergency stairway on the back route of the Target Room, for maintenance purposes only.[252]

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[250] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 1; "Item 6," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677i, Jewel Cave NM MF.

[251] Completion Report Narrative, Day Labor Project, Work Order No. 146-211705, PCP-U-14, Construct Cave Lighting System for Jewel Cave, Headquarters Area, January 7, 1975, 1; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 9.

[252] Completion Report Narrative, Day Labor Project, Work Order No. 146-211705, PCP-U-14, Construct Cave Lighting System for Jewel Cave, Headquarters Area, January 7, 1975, 2–3.

In early 1968, crews completed the trail surface and installed transformers to power the lights along the tour route (see Figures 77 and 78).[253] By late 1969, the aluminum stairways and the wiring for the cave lighting system were almost finished.[254] Herb Conn sent recommendations for setting up lighting to best showcase the cave's unique features to Keith Fellbaum (an engineer at Mount Rushmore who had assisted with the cave trail and lighting design), along with minor changes needed to complete the lighting system.[255] In November 1969, the cave telephone was installed, which included buried cable and "5 moisture-proof telephone boxes."[256]

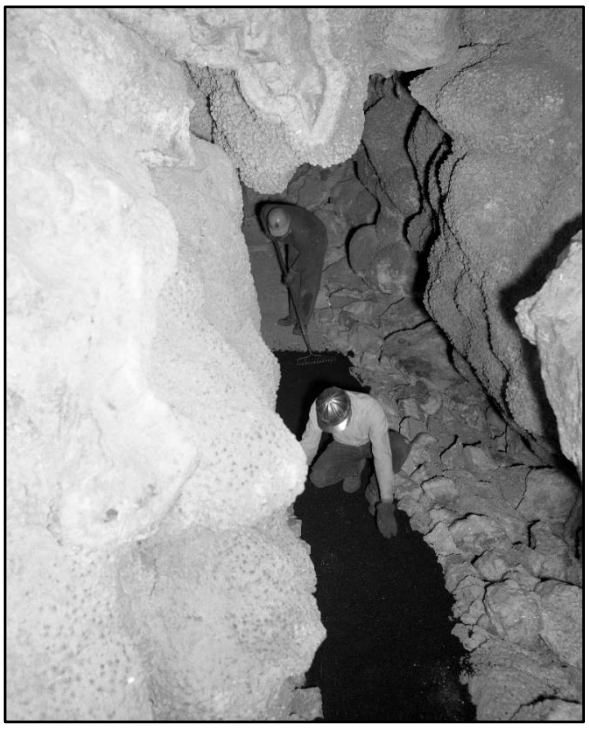


Figure 77. Laying asphalt for the new cave tour trail, ca. 1968.

Source: NPS, Jewel Cave NM.

Maintenance crews noticed some rockfall when they paved the trail in summer 1969. It may have occurred before then, but rockfall on top of rubble was not easy to notice. The rockfall slowed after the early summer wet season, but it did not stop entirely.[257] In July, mining engineers from the Bureau of Mines and the WODC inspected the cave trail developments. They found the stairway and lighting systems safe, but they noted that the roof of the Target Room was slacking—hence the rockfall—and was not safe for visitors. Mining Engineer George R. Kyler of the Bureau of Mines recommended Aero Spray 52 Binder, made by American Cyanamid Company, to seal the rock and prevent slacking.[258] The US Army Corps of Engineers suggested using shotcrete instead of Aero Spray 52, because Aero Spray 52 "has no structural strength and probably would not work on a ceiling application."[259]

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[253] Completion Report Narrative, Day Labor Project, Work Order No. 146-211705, PCP-U-14, Construct Cave Lighting System for Jewel Cave, Headquarters Area, January 7, 1975, 3.

[254] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 1.

[255] Herb Conn to Keith Fellbaum, February 21, 1970, File 6347a, Jewel Cave NM MF.

[256] Jewel Cave NM, Work Order No. 146-211708, January 7, 1975, Cabinet 2, Drawer 3, Folder Work Order 146-211708 – Cave Telephone, Jewel Cave NM CF.

[257] Mount Rushmore NM Engineer Keith Fellbaum to Jim Dunning, Midwest Region, memorandum, December 31, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[258] Mining Engineer George R. Kyler to Western District Manager, memorandum, July 24, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[259] Midwest Region Civil Engineer George F. Lucko to Mount Rushmore NM Engineer Keith Fellbaum, memorandum, October 3, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

The NPS asked Oshier to examine the rockfall and suggest another possible solution. Oshier thought that the rockfall might be "the result of humidity changes in the room and the scaling of a rather talcy area of the ceiling which exists immediately above the assembly area." The humidity changes had occurred as a result of air entering the cave from the elevator shaft, which introduced a freeze/thaw cycle to this part of the cave for the first time, thus destabilizing the ceiling of the Target Room. Oshier recommended barring down (scaling) the talcy area and several large chunks near elevator shaft entrance, which was common practice in mines. After the scaling, he said, the NPS should monitor humidity and temperature, and if the rockfall continued, then the NPS could install bolted-down cyclone wire fencing.[260]



Figure 78. Herb Conn and maintenance workers installing aluminum stair treads along the new cave tour route. Photo by Don Gillespie, 1968.

Source: NPS, Jewel Cave NM.

Jewel Cave and Wind Cave managers considered, in lieu of the expensive task of stabilizing the ceiling, rerouting the existing trail and possibly eliminating the Target Room entirely from the tour route.[261] Fellbaum asked Fred Kaas to study alternative tour routes.[262] Kaas advised that, even if the rockfall continued indefinitely, the tour route could remain the same with a few changes:

> The original concept of interpretation may be retained by the installation of a new platform, stair and short trail connection, all outside the hazardous area, but still utilizing the existing shaft and entrance to the Target Room.

Kaas thought that the platform provided a valuable congregating area and "increases the initial visual impact as well as offering a wider field of view."[263]

In 1970, the rockfall continued, so the WODC decided to reroute the cave trail slightly to avoid hazardous areas and to construct a "shelter for the upper elevator lobby portal," which the WODC

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[260] Consulting Engineer Edwin H. Oshier to Keith Fellbaum, December 22, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[261] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 1.

[262] Mount Rushmore NM Engineer Keith Fellbaum to Jim Dunning, Midwest Region, memorandum, December 31, 1969, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[263] Fred Kaas, Wind Cave, to Jim Dunning, Chief Park Support, January 7, 1970, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

designed. Instead of using a recently leveled area as a gathering spot, planners determined that a platform in the Target Room would be a safer location (see Figure 79). Planners also ordered the construction of a wooden roof structure in the Target Room, at the point of entry from the elevator lobby, to deflect any ongoing rockfall. The WODC deemed these measures to be sufficient to make the Target Room safe for tour groups, even if occasional rockfall continued.[264]



Figure 79. A 1968 photo of the Target Room, with caption on back reading: "View of Target Rm. showing first 3 stairs locations - prior to construction of 2 & 3." The upper landing in the photo is still used to access the elevator portal, but no stairs were ever built between the upper and lower landing. Instead, after issues with rockfall from the Target Room ceiling, the lower landing was camouflaged with large rock and abandoned. If the photo were taken in 2020, the Target Room platform would fill the lower third of the image.

Source: NPS, Jewel Cave NM.

Interpretation During Development

Visitation increased as news of Jewel Cave's size spread. By April 1969, Jewel Cave ranked as the third-largest cave in the country, with 30 miles of mapped passages.[265] In 1968, 35,049 people went on guided cave tours, nearly tripling the 1960 count of 11,262. The NPS anticipated an additional increase when the new visitor center opened.[266] As in previous years, managers complained that they could not accommodate everyone who wanted to go on a cave tour, due to limited space in the cave and insufficient staffing.[267] In 1964, Thompson noted,

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[264] Dave Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 1, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[265] Management Inspection Data – Jewel Cave National Monument, April 15, 1969, 1, File 1677b, Jewel Cave NM MF.

[266] 1961 Ranger-in-Charge's Annual Report for Jewel Cave National Monument, 4; "Item 8," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677zzg, Jewel Cave NM MF.

[267] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 3.

> In the past three years the visitor cave tour use has approximately doubled. Due to the confined nature of the developed portion of Jewel Cave, the tour situation has become extremely difficult from the standpoint of accommodation of the visitors, interpretation of the cave features, and safety.[268]

Thompson observed that the increase "has pushed Jewel Cave very close to the saturation point, due to the small capacity of the developed portion of the cave. Splitting of tours has provided some relief on the very large groups, but sufficient personnel are not available for consistently doing this."[269] The new tour route was badly needed.

In 1966, with visitation increasing, the NPS awarded the A. C. Nelson Company a contract for construction of four mobile buildings: a temporary office and public contact station, a comfort station (toilets) trailer, and two mobile quarters for use during construction.[270] The trailers were initially supposed to be at the west end of the new parking area, but due to complications with installing water and sewer lines, the contractors moved them "to the proposed maintenance area" on the eastern side of the new parking area.[271]

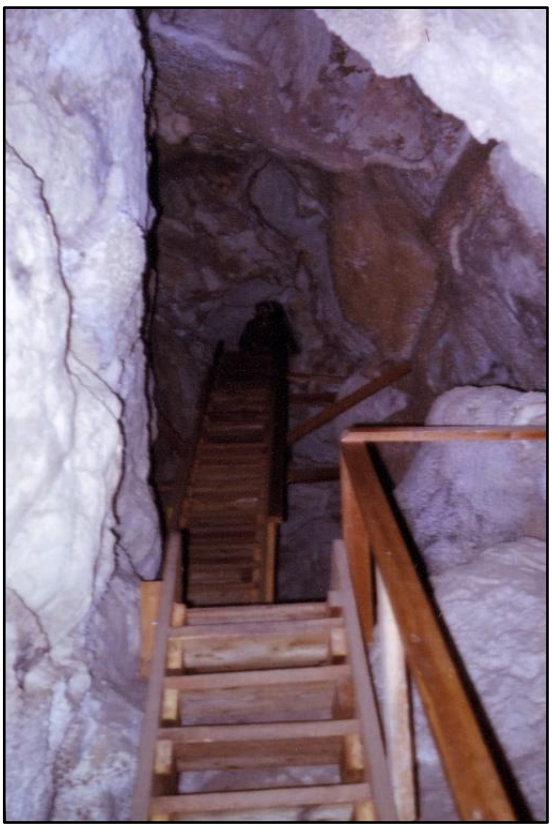


Figure 80. Tours continued from the Hell Canyon entrance to the cave during development of the new area. Pictured here, staircases on the old tour route, 1963.

Source: NPS, Jewel Cave NM.

Jewel Cave staff continued to offer cave tours through what managers began to call "the historic portion of the cave" (see Figure 80) during construction of the new headquarters.[272] They installed botanical signs for the cave entrance trail and gave tours to growing numbers of cave visitors. The remodeled ticket booth, first erected in 1963, had been expanded by 1969 into a "small structure that houses a combination ticket booth, information counter, concession stand, ranger station, etc., etc. . . . on the eastern rim of Hell Canyon."[273] In addition to selling tickets, rangers displayed and sold Wind Cave Natural History

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[268] Lombard and Thompson, 1965 Superintendent's Annual Report for Jewel Cave National Monument, 5.

[269] Jess H. Lombard and James B. Thompson, Supplement to the 1965 Annual Report for Jewel Cave National Monument, 1, files provided by Katie Atkins, Folder A26, Jewel Cave NM CF.

[270] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1966, 5, 8; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 8; DOI, NPS, Fact Sheet for Completion report: Jewel Cave National Monument, Offices Public Contact Station, and Two Mobile Quarters, November 10, 1966, Jewel Cave NM CF.

[271] Lombard and Thompson, Supplement to the 1965 Annual Report for Jewel Cave National Monument, 2.

[272] Gillespie, Annual Report of Information and Interpretive Services—NPS(CN)-2, Jewel Cave, 1966, 2.

[273] Lombard, 1964 Superintendent's Annual Report for Jewel Cave National Monument, 6; Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 3; Elms, Annual Report of Information and

Association publications at the booth (see Figure 81).[274] Some rangers roved in the parking area, a practice Gillespie called "very fruitful," because it gave visitors "the opportunity for some individual attention in addition to helpful advice concerning clothing, pets, cameras, etc."[275] A loudspeaker, microphone, amplifier, and taped message announcing the tour were the only audiovisual materials at the site.[276]

Interpretive staff assessed existing signage around the monument. New signs would be installed at the new visitor center, but the NPS also removed "two signs that read 'Collection of Rock and Plant Specimens Prohibited'" to comply with Director Hartzog's wishes to remove the word "prohibited" from NPS signage.[277] Staff assessed potential sites for a surface foot trail to connect the historic area in Hell Canyon with the new visitor center.[278] As of 1970, the trail had not yet been completed.[279] Other interpretive planning remained on hold while monument staff waited for the Washington Office, Harpers Ferry Center (HFC), and regional staff to finish plans for the visitor center.[280]



Figure 81. This ticket booth by the CCC ranger cabin was installed in 1963. The soda machine and the water fountain in the foreground, in front of the cabin, were also installed in the 1960s.

Source: NPS, Jewel Cave NM.

In 1969, the NPS contemplated keeping the historic area closed for the summer season, due to budget and construction issues, but "last minute budgetary adjustments" allowed it to open.[281] It

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Interpretive Services—NPS(CN)-1, 1963, 1; Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967; Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 2.

[274] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967, 1, 3.

[275] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967, 3.

[276] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 5.

[277] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 2.

[278] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 2.

[279] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 3.

[280] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 1.

[281] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 1.

opened again for three months in 1970, and interpreters tried to tie in "environmental awareness and education" to existing cave tours. That summer, Management Assistant Dave Todd instituted a 35-person maximum on cave tours. He found that smaller groups provided

> better protection of both visitors and resources, an environmentally oriented interpretive "story," and a more leisurely, enjoyable tour for everyone. There were virtually no complaints from visitors in regard to the imposed limit on cave tours. On the contrary, we received many compliments for the unhurried, personalized park experience people enjoyed at Jewel Cave.[282]

In addition to the size limit, the NPS increased the tour fee from 50 cents to $1 per person—a change long recommended by Wind Cave superintendents. By and large, visitors did not complain about the fee increase.[283] Todd considered offering "environmentally oriented 'cave crawls' for spelunkers" in both the old and new sections of the developed cave. Todd initially planned the cave crawls for groups of about 12 with 2 ranger guides.[284]

Museum Exhibits and the New Visitor Center

As of 1960, the monument had two interpretive exhibits: one of cave formation specimens and another of fresh-cut wildflowers, insects, butterflies, and moths.[285] A lack of administrative space resulted in the removal of the cave formation specimens to Wind Cave, where they were stored until the new visitor center was built.[286] In July 1966, Jewel Cave, Wind Cave, and Midwest Regional Office staff drafted an updated interpretive prospectus to reflect the new development.[287] Changes included adding bats to the museum exhibit, adding examples of delicate speleogical formations to the mineral exhibit, and developing a third exhibit to "deal with the cave exploration story, telling of the equipment, lighting, etc., with consideration given to utilizing the actual lighting equipment to softly illuminate the exhibit room." They proposed activities for people waiting for tours, including a film, wayside exhibits, a patio at the visitor center, and some sort of food service.[288] The Midwest regional director approved the amended interpretive prospectus later in 1966, having stricken a suggestion from Thompson to blast a small hole along the nature trail as a demonstration of cave "breathing." Hotchkiss opposed the idea, saying that it "smacks somewhat of gimmickery."[289]

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[282] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 4.

[283] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 1, 4.

[284] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 6.

[285] Richard T. Hart, Annual Report of Information and Interpretive Services—10A2, 1, 1960, Cabinet 1, Drawer 2, Folder 6.A.1 Annual Interpretive Reports 1960–1979, Jewel Cave NM CF.

[286] Elms, Annual Report of Information and Interpretive Services—NPS (CN)-1, 1963, 1.

[287] Acting Regional Director George Baggley to Wind Cave Superintendent, memorandum, March 22, 1966, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF.

[288] David D. Thompson Jr., MWR Chief of Interpretation and Visitor Services, to Associate Regional Director, memorandum, July 13, 1966, 1–2, Cabinet 1, Drawer 3, K1817 Interp Prospectus, Jewel Cave NM CF.

[289] Management Assistant James B. Thompson to Wind Cave Superintendent, August 4, 1966; Wind Cave Superintendent Warren Hotchkiss to Midwest Regional Director, memorandum, August 9, 1966; Acting Regional Director George E. Baggley to Wind Cave Superintendent, memorandum, August 19, 1966, all in Cabinet 1, Drawer 3, K1817 Interp Prospectus, Jewel Cave NM CF.

Museum planning had been delayed for several years during the drawn-out elevator shaft digging process. In 1967, the NPS museum planning team picked up the exhibit planning process.[290] Monument staff collected material for the future museum. The collection already included mineral specimens and bats, and staff now added caving equipment from Jan and Herb Conn that included patched pants, a leather seat guard, hard hats, a carbide lamp, a compass, Herb's device to measure cave wind and barometric pressure changes, a caving notebook, worn shoes, and more, for an exhibit on exploration. The Conns' pieces were significant because they were "the actual items used in exploring the cave."[291] In June 1970, Todd loaded "all but the most fragile and delicate of Jewel cave's museum specimens" into a van at Wind Cave, where they had been stored, and sent them all to the HFC in West Virginia for the exhibit planners to use.[292]

The NPS held a meeting to review the Jewel Cave exhibit plans with regional interpretive staff, HFC staff, and Keith Trexler and Dave McLean of the Washington Office's Division of Museums. They determined the exhibits would be installed in lobby area, since the size of the visitor center had been reduced due to cost considerations and "the Exhibit Room originally included in the plan has now been eliminated." They acknowledged that having ticket sales and exhibits in the same room and could cause congestion issues. To remedy this, the exhibit planning team suggested moving ticket sales from the lobby to "a structure adjacent to the visitor center building, for use during peak periods of visitation." All present agreed the ticket booth should be "a permanent facility included as an integral part of the building design."[293]

Housing and Maintenance Buildings

Jewel Cave had a longstanding problem of inadequate staff housing. In 1961, Wind Cave Superintendent Lombard noted an "acute and urgent need" for two more housing trailers at Jewel Cave.[294] Staff lived in temporary housing built in the 1940s, in the Transa-Hut erected in the 1950s, and in the Civilian Conservation Corps (CCC)-built ranger cabin (see Figures 82 and 83).[295] The NPS added three trailers at Jewel Cave in 1964, after which the management assistant and maintenance person lived at Jewel Cave year-round, but housing remained inadequate, especially for those with

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[290] Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1967, 2.

[291] Lester F. McClanahan to Superintendent, Wind Cave, December 11, 1969; and "Jewel Cave Exhibits," both in Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

[292] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 3.

[293] Acting Midwest Regional Director to Chief, Design and Construction, SSC, memorandum, undated [Sept. 1967? 68?], 1, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF; Gillespie, Annual Report of Information and Interpretive Services—NPS(OI)-2, Jewel Cave National Monument, 1968, 1; "Item 6," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677i, Jewel Cave NM MF.

[294] Superintendent Jess E. Lombard to Region Two Director, memorandum, September 5, 1961, General Files 1952–1963, Box F-7, Folder F7423 Book #1. Sept 1952–Jan 1962. WICA., Records of the National Park Service Region II (Midwest Region), NARA KC.

[295] Thompson, interview.

families.[296] NPS management inspections in 1969 noted that the lack of permanent and seasonal housing at Jewel Cave "will result in serious recruitment and area protection problems especially when visitor services are expanded" when the visitor center opened.[297] New housing was not included in the visitor center development because of budget cuts, despite the NPS calling it "an important part of the management scheme" at Jewel Cave.[298]



Figure 82. Housing at Jewel Cave near the Hell Canyon entrance, 1967.

Source: NPS, Jewel Cave NM.



Figure 83. Transa-Hut at Jewel Cave, 1963.

Source: NPS, Jewel Cave NM.

[296] Statement for Management, Jewel Cave National Monument, March 1987, 17, Cabinet 1, Drawer 2, Folder D18 Statements for Management, Jewel Cave NM CF; Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 2; Thompson, interview.

[297] "Item 4," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677g, Jewel Cave NM MF.

[298] "Item 6," in Management Inspection Data – Jewel Cave National Monument, April 15, 1969, File 1677i, Jewel Cave NM MF.

New maintenance buildings went up conjunction with the visitor center development. In 1965, a metal wash house and a metal storage building were constructed (see Figure 84).[299] The maintenance shop and storage area became "badly overcrowded" with the maintenance needs from the new development.[300] In 1969, Strahan Construction Company built a new Shop and Utility building, which a Hot Springs contractor finished in 1971.[301]



Figure 84. Maintenance shed in Lithograph Canyon, ca. 1966.

Source: NPS, Jewel Cave NM.

Visitor Center Construction and Opening

In October 1970, the NPS awarded the contract for the construction of the "long awaited new visitor center" to the Corner Construction Company of Rapid City. The contract for $553,480 included building a visitor center with piers, completion of one elevator, site work, and installing underground power to the building.[302] Corner Construction began work in November 1970 and completed the bulk of construction on the visitor center building during 1971 (see Figures 84, 85, and 86).[303] The new building was designed in the Mission 66/Parkscape Development style that the

[299] Statement for Management, Jewel Cave National Monument, March 1987, 17.

[300] Hotchkiss, Jewel Cave National Monument Annual Narrative Report, 1967, 6.

[301] This building was the maintenance building as of 2020. Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1969, 1; Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 1; Statement for Management, Jewel Cave National Monument, March 1987, 17.

[302] Midwest Staff Meeting Minutes, October 20, 1970, Cabinet 2, Drawer 3, Folder D22 Construction, Jewel Cave NM CF.

[303] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 1.

NPS used across the country during the 1960s and 1970s.[304] The main entry door was directly ahead when approached from the parking lot stairway, and there was no dedicated space for the bookstore, although there were some display shelves to the right of the entryway.[305] A delay occurred in 1971, when a cement truck driver backed into the restroom area, and the contractor had to complete necessary repairs (see Figure 87). Despite this setback, by the end of the 1971, the bulk of the main visitor center building had been erected.[306]

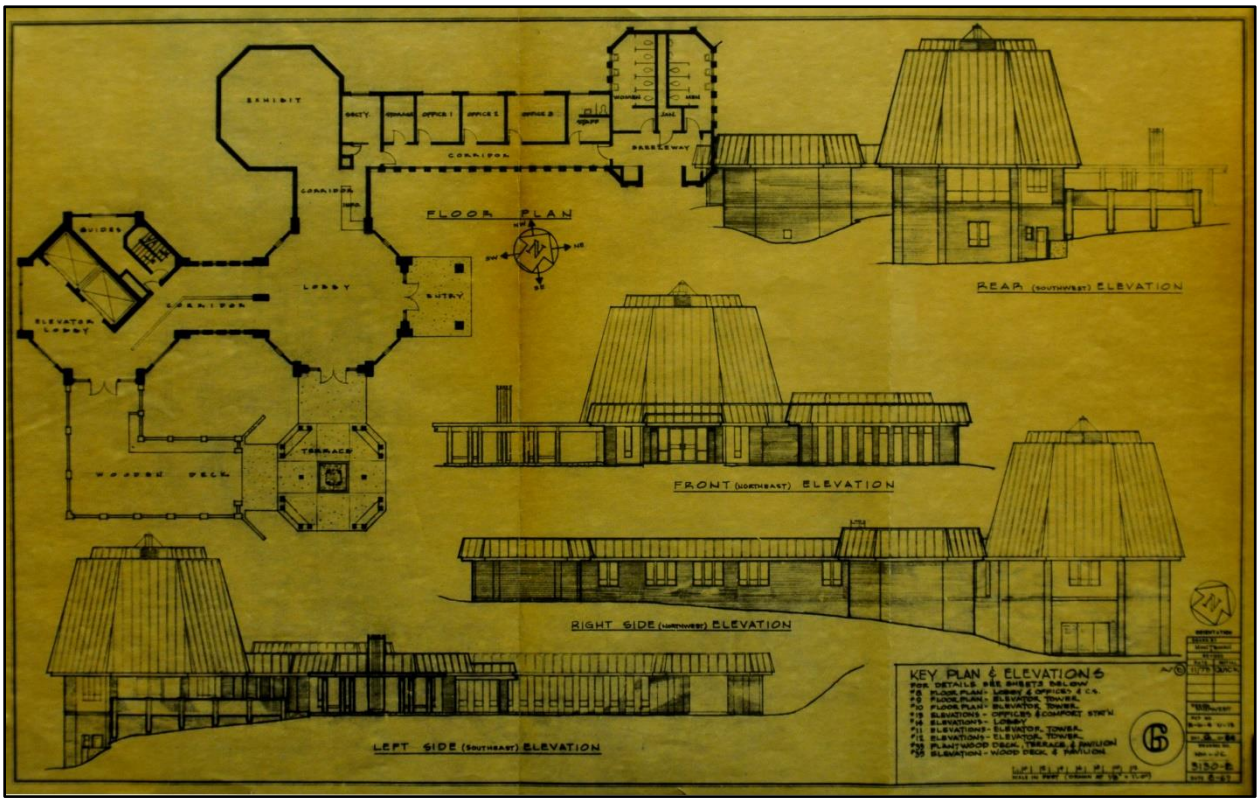


Figure 85. Drawings for the Jewel Cave Visitor Center, 1969.

Source: NPS, Jewel Cave NM.

[304] Sarah Allaback, *Mission 66 Visitor Centers: The History of a Building Type* (Washington, DC: Government Printing Office, 2000), https://www.nps.gov/parkhistory/online_books/allaback/vciii.htm.

[305] Al Hendricks, interview with Emily Greenwald, May 16, 2019, Ennis, MT; Wiles, comments on draft, April 7, 2020.

[306] Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study* (Omaha: NPS Midwest Regional Office, 2006), 225.

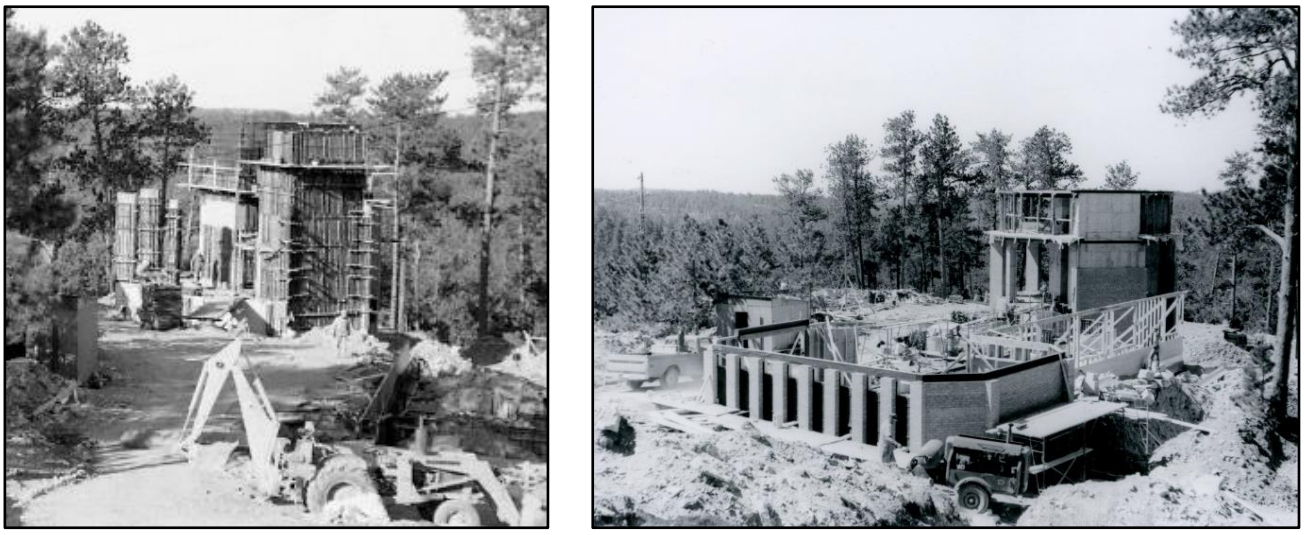


Figure 86. As shown here, the elevator was built first and then the visitor center was built around it, ca. 1970–1971.

Source: NPS, Jewel Cave NM.



Figure 87. Visitor center construction was delayed briefly when a cement truck backed into the restroom building in 1971.

Source: NPS, Jewel Cave NM.

Although contractors had dug a shaft large enough for two elevators, only one elevator was installed due to funding constraints. Todd explained that the single elevator might limit visitation to the cave:

> Since installation of only one of two elevators has been authorized, visitor services may have to be curtailed during periods of heavy travel. The interpretive potential of the cave will be realized only with the addition of the second elevator. [307]

[307] Todd, Information and Interpretive Services, NPS(I)-2, Jewel Cave National Monument, 1970, 2.

Nevertheless, the NPS deemed one elevator sufficient for the time being. Contractors spent the first several months of 1972 installing windows, doors, and utilities, and completing the walkways and benches around the visitor center.[308]

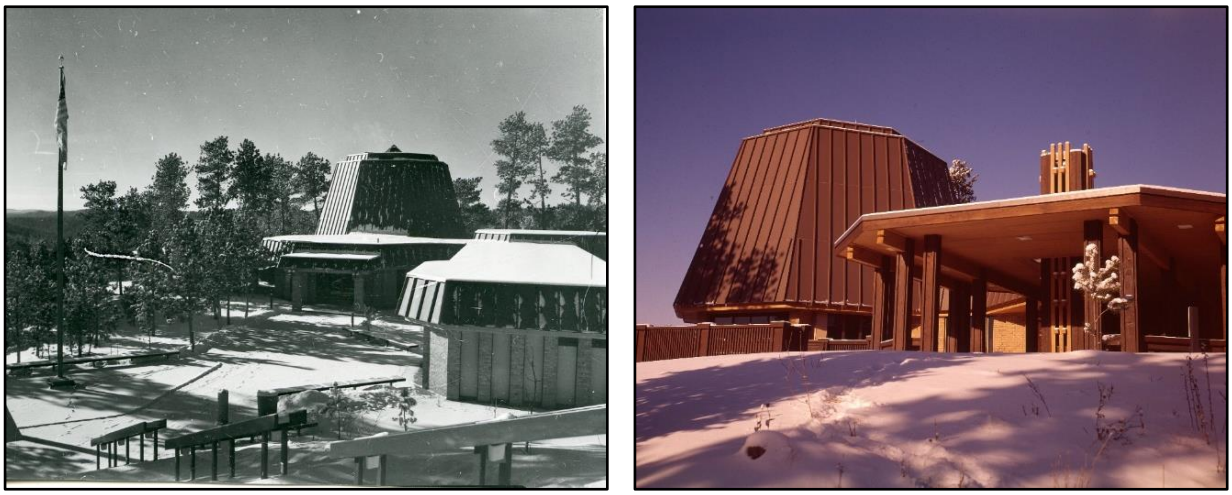


Figure 88. The Jewel Cave visitor center, built in the Mission 66/Parkscape style, opened to the public in 1972.

Source: NPS, Jewel Cave NM.

The new Jewel Cave visitor center was officially dedicated on May 28, 1972 (see Figure 88). The NPS held a special event and ribbon-cutting to celebrate the opening of the new center. Dignitaries attended and spoke at the events, including US Representative James Abourezk (D-SD) and former US Representative Ellis Y. Berry (R-SD) (see Figure 89). NPS regional and national officials attended, as did Herb and Jan Conn. Tours began after the official opening, and the contractor continued to complete minor repairs and alterations into 1973.[309]



Figure 89. US Representative James Abourezk (D-SD) (*center, with hands on scissors*) and former US Representative Ellis Y. Berry (R-SD) (*left, with hand on scissors*) cutting the ribbon to open the Jewel Cave visitor center, 1972.

Source: NPS, Jewel Cave NM.

[308] Evans-Hatch and Evans-Hatch, *Place of Passages*, 226.

[309] Evans-Hatch and Evans-Hatch, *Place of Passages*, 226; Lorraine Collings, "The Conns of Jewel Cave," *Empire Magazine* (March 18, 1973): 26, in Conn File Interpretation Division Binder, Jewel Cave NM Visitor Center; Hendricks, interview.

Conclusion

Jewel Cave—both the cave and the NPS monument dedicated to protecting it—underwent a complete transformation between 1959 and 1972. In 1959, the NPS considered Jewel Cave a "small cave," as the sign out front proclaimed. A representative crystal cave of the Black Hills, yes, but perhaps not a cave of such great extent or such unique features to meet the high standards required for inclusion in the National Park System. Herb and Jan Conn started exploring the cave in September 1959 (see Figure 90). Within six years, their exploration proved the cave was at least 10 miles long, and Herb's barometric wind study suggested that it extended much farther The Conns' discoveries upended NPS plans for Jewel Cave, shifting them from offering "primitive," Tom Sawyer-esque cave tours to building a full Mission 66 visitor center and elevator and tunnel access into the cave. The opening of the visitor center in 1972 ushered in a new era for Jewel Cave National Monument, during which the NPS agreed on the cave's important value to the nation and the need to protect and preserve it.



Figure 90. Herb and Jan Conn, pictured here in 1967 just inside the cave's historic entrance in Hell Canyon, explored over 10 miles of Jewel Cave in the 1960s. Their discoveries convinced the NPS to develop a new cave entrance and visitor center, rather than delist the national monument.

Source: NPS, Jewel Cave NM.

Chapter 5: Managing a Larger Cave (1972–1989)

After the new visitor center opened in 1972, the monument's focus shifted from the Michauds' cave entrance—now called the "historic entrance"—to the recently developed area. Staff began leading cave tours that began from the elevator, went through the Target Room, and then along the tour route that the Conns had laid out. Staff still gave tours at the historic entrance, in order to offer the primitive cave experience that the National Park Service (NPS) had seen as central to Jewel Cave's appeal. Over the next two decades, visitation increased, as did the number of interpretive staff. Jewel Cave's lead role changed from management assistant to unit manager, but the position remained under the supervision of the Wind Cave superintendent.

The Conns and their caving partners nearly doubled the known extent of the cave, from 41 surveyed miles in 1972 to 81 in 1989.[1] With greater understanding of the tremendous belowground resource, the NPS hired the first dedicated cave specialist for Jewel Cave.

General Administration

Staffing and Budgets

Jewel Cave had its own line item in the regional budget starting in the 1970s, but Wind Cave administrative staff continued to manage Jewel Cave's budget and finances. The arrangement benefited Jewel Cave. If Wind Cave had surplus funds and Jewel Cave had outstanding needs, Wind Cave sometimes moved its funds to Jewel Cave projects.[2] For instance, when Jewel Cave experienced a budget shortfall in 1983, Wind Cave reallocated $20,900 of its own funds to maintain minimum operations at Jewel Cave.[3] .

Dave Todd continued to hold the management assistant position in 1972, and he oversaw Jewel Cave's day-to-day operations. Todd reported to Lester McClanahan, superintendent of Wind Cave and Jewel Cave, who had final responsibility for management decisions.[4] At some point between

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[1] Herb and Jan Conn, Jewel Cave Exploration, Special Use Permit 2-146-9, Summary Report, Jan. 1, 1972 to Dec. 31, 1972, File 3449b, Jewel Cave National Monument Museum Files, Custer, SD (hereafter Jewel Cave NM MF); "Extend mapped Jewel Cave caverns past 75 mile mark," *Custer Chronicle*, July 14, 1987, Cabinet 1, Drawer 3, K1817 Interpretive Planning Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF); Superintendent's Annual Report, Jewel Cave National Monument, 1989, 6, files provided by Katie Atkins, Folder 1990 Superintendent's Report, Jewel Cave NM CF.

[2] Dennis Ditmanson, interview by Jackie Gonzales, April 19, 2019, Santa Fe, NM.

[3] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 1, files provided by Katie Atkins, Folder 1983 Superintendent's Report, Jewel Cave NM CF.

[4] Dave Todd, Annual Budget Request, for Informational Printing (Free and Sales), Jewel Cave National Monument, February 17, 1972, Cabinet 1, Drawer 2, Folder 6.A.2 Annual Budget Requests Printing 10-81, Jewel Cave NM CF.

1972 and 1974, Steve Hurd took over from Todd as management assistant, still under McClanahan (see Figure 91).[5] A full-time maintenance employee and a GS-7 ranger who led the interpretive, resource management, and protection efforts (Larry Dilts) worked alongside Hurd.[6]

The NPS restructured its regions in 1974 and established two new regional offices, one of which was the Rocky Mountain Regional Office in Denver, Colorado. This regional alignment lasted for the next 21 years.[7] As part of the restructuring, the NPS transferred South Dakota's parks from the Midwest Region to the Rocky Mountain Region.[8] The change in oversight affected Jewel Cave primarily in the pool of parks it was now competing with: while the Midwest Region contained parks mostly of similar size and complexity, the Rocky Mountain Region managed several large, complex parks with high visibility (such as Rocky Mountain National Park and Yellowstone National Park).[9]

In 1976, Al Hendricks took over as management assistant at Jewel Cave, his first management role. Hendricks had the same permanent staff as Hurd, as well as a seasonal staff of over a dozen interpretive rangers and a secretary.[10] The seasonal secretary performed everyday clerical work, but personnel and



Figure 91. Steve Hurd became management assistant around 1973.

Source: NPS, Jewel Cave NM.

[5] Management Assistant Stephen M. Hurd to Bruce Hopkins, March 11, 1974, Cabinet 1, Drawer 3, Folder K38 NPS Publications; Jewel Cave NM; Management Assistant Stephen M. Hurd to Wind Cave National Park Superintendent, memorandum, October 10, 1975, Cabinet 1, Drawer 3, Folder K187 Interp Prospectus, Jewel Cave NM CF.

[6] Larry Dilts, interview by Jackie Gonzales, April 17, 2019, Colby, KS. Note to reader: there are no superintendent's annual reports for the 1970s, and we therefore have an incomplete picture of staffing levels during this period. This is common to all parks for this period: Director George B. Hartzog Jr. (1964–1972), a former superintendent at Jefferson National Expansion Memorial (now Gateway Arch National Park) saw the superintendent's annual report as an onerous task, and as director, instead called for briefing papers or summaries. The superintendent's annual report practice was re-instated following Hartzog's dismissal by President Nixon.

[7] United States, Congress, Senate, Committee on Appropriations, Department of the Interior and Related Agencies Appropriations for Fiscal Year 1975, hearings (Washington, DC: US Government Printing Office, 1974), 876.

[8] U.S. Congress, House, Department of the Interior and Related Agencies: Appropriations for 1975, Hearings, 94th Cong. (Washington, DC: GPO, 1975), 131; James B. Thompson, interview by Jackie Gonzales, April 18, 2019, Estes Park, CO.

[9] Ron Cockrell, Midwest Regional Historian, NPS, to Emily Greenwald, April 7, 2020.

[10] Al Hendricks, interview by Emily Greenwald, May 16, 2019, Ennis, MT.

budget files were all handled by the Wind Cave administrative officer, and the files resided at Wind Cave.[11] Staff meetings were held at Wind Cave, and even the Jewel Cave mail arrived at Wind Cave.[12]

As the manager of a small unit, Hendricks' duties ran the gamut, especially in the slow winter season. An entry in his daily log on February 8, 1979, provides a snapshot of his activities:

> Went to town for mail. Shovelled [*sic*] V.C. sidewalk. Bob took pictures of V.C. roof paint situation and I proposed memo and sent photos to Noby Ikeda at RMRO [Rocky Mountain Regional Office]. Received call from Naomi Hunt of the N.P.S. Courier. She requested pictures of Herb and Jan Conn to accompany the press release. I found four black & white negatives, prepared a memo and mailed them out by certified mail. Answered one info. request.[13]

Hendricks familiarized himself with maintenance operations with the help of seasonal maintenance worker Don Lytle, who had previously worked at Wind Cave and remained at Jewel Cave for many years.[14] Dilts left in 1977, and Bob Appling replaced him as interpretive and resource management lead.[15] In 1981, Hendricks left Jewel Cave for Lehman Caves, and Dennis Ditmanson became the management assistant (GS-9) (see Figure 92).[16]

McClanahan closely oversaw the Jewel Cave management assistant. He required the management assistant to obtain permission for anything other than routine daily operations, and only McClanahan communicated directly with the Rocky Mountain Regional Office. He thus continued the practice of centralizing Jewel Cave management at Wind Cave, but he did not visit Jewel Cave often.[17] McClanahan made it clear that the Jewel Cave management assistant was his subordinate. Hendricks recalled how this sometimes caused issues for the management assistant, but Ditmanson remembered McClanahan as "uniformly supportive."[18] In 1983, McClanahan and Ditmanson partnered to host a Rocky Mountain Regional Superintendent's Conference in Custer and gave the superintendents a tour of Jewel Cave.[19]

As it had been for Hendricks, Jewel Cave was Ditmanson's first management role. He recalled how the collaborative relationship among Wind Cave, Mount Rushmore National Memorial, and Badlands National Monument benefitted Jewel Cave, as well as the other units:

> I think we were able to maybe heighten the perception of the park a little bit. Even though we were—of that group, of Badlands and Mount Rushmore and Wind Cave and Jewel Cave—we were, by far,

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[11] Al Hendricks, daily note log, August 31, 1977, from Hendricks' personal files; Hendricks, interview.

[12] Al Hendricks, daily note log, February 17, 1979, from Hendricks' personal files; Al Hendricks, daily note log, February 21, 1979, from Hendricks' personal files.

[13] Al Hendricks, daily note log, February 8, 1979, from Hendricks' personal files.

[14] Jewel Cave National Monument Objectives, 1979 FY, 2, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF.

[15] Hendricks, interview; Dilts, interview.

[16] Ditmanson, interview; Superintendent's Annual Report, Jewel Cave National Monument, 1986, 1, files provided by Katie Atkins, Folder 1986 Superintendent's Report, Jewel Cave NM CF.

[17] Hendricks, interview.

[18] Ditmanson, interview.

[19] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 13.

> the junior partner. But we met regularly, informally, a lot, with the other four parks, we would get together for various things. And I think we were able to put Jewel Cave maybe on a little higher level as a true partner in that grouping. It taught me the value of cooperation. You know, we didn't have things like a front-end loader, big, heavy equipment at Jewel. But if we needed it, we could get it from Wind Cave, primarily. But sometimes even a place like Mount Rushmore would have something that we could borrow. We would go to both Wind Cave and Badlands and assist with things like the bison roundups, which was a real great experience for me personally and for the staff that was able to do that. If there was a project at any of those parks that needed a lot of manpower for a short period of time, often maintenance crew, primarily, would go to that area and help. Not for months at a time, but for a day or two.[20]

McClanahan retired in 1983, and Jim Randall became superintendent of Wind Cave and Jewel Cave.[21] Randall held the position until 1985, when Ernest Ortega replaced him. The relationship between the two units changed when Ortega became superintendent. Ortega later recalled that he wanted the two units to have a "symbiotic kind of relationship, whereas they would not be subservient to Wind Cave, but rather . . . Wind Cave staff, primarily me, would be available to provide assistance and support."[22] Ortega noted that the relationship between the two parks was already a good one, but he wanted to emphasize Jewel Cave's autonomy. He retitled Ditmanson's position "unit manager," and he wanted Ditmanson to function as a de facto superintendent.[23] Ortega's prior experiences influenced his perspectives on the relationship between Wind Cave and Jewel Cave. Early in his career, he had managed El Morro National Monument under the purview of the Navajo Lands Group superintendent, and he was therefore sensitive to the challenges Jewel Cave managers faced in having to report to a different unit's superintendent.[24]

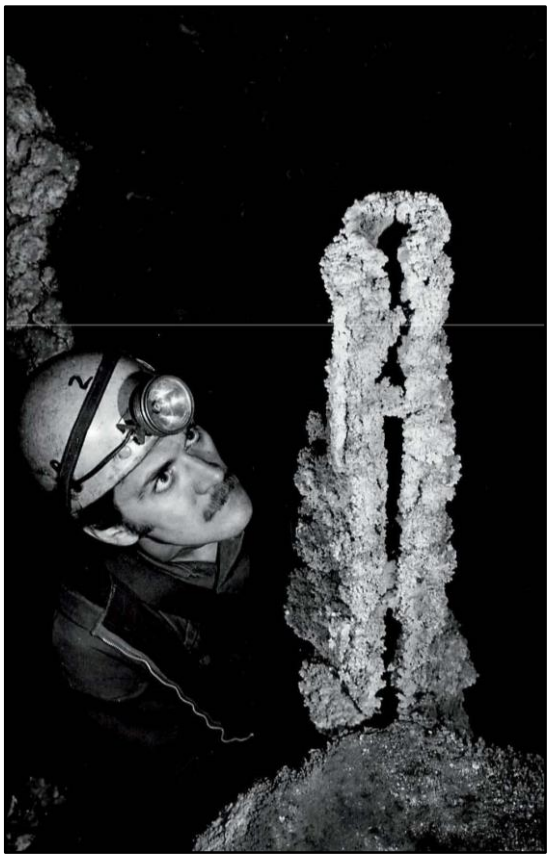


Figure 92. Dennis Ditmanson in the cave, examining a hollow stalagmite. Photo by Art Palmer, ca. 1984.

Source: NPS, Jewel Cave NM.

At one point, Ortega suggested creating a full superintendent position for Jewel Cave, but Harold Dance in the Rocky Mountain Regional Office

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[20] Ditmanson, interview.

[21] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 1.

[22] Ernest Ortega, interview by Jackie Gonzales, June 28, 2019, Custer, SD.

[23] Ortega, interview; Ditmanson, interview.

[24] Ortega, interview.

responded that he would have to lower Ortega's pay grade to make the change, so it never happened. Ortega was, however, able to raise the Jewel Cave unit manager's pay grade, and by the time Ditmanson left in December 1986, he was a GS-11.[25] Steve Holder then replaced Ditmanson, transferring in from Golden Gate National Recreation Area, where he had been the Marin Headlands District Ranger.[26]

Staff numbers grew under Ditmanson and Holder in the 1980s. In 1983, Jewel Cave had three permanent staff: the management assistant (Ditmanson), maintenance lead (Steve Riley), and chief of interpretation, resource management, and visitor protection (Herschel Schulz) (see Figure 93). In addition, it employed twenty seasonal staff (sixteen interpretation, one resource management, and three maintenance). In July 1983, the Rocky Mountain Regional Office conducted a position classification review at Wind Cave and Jewel Cave.[27] Perhaps as a result of that analysis, Jewel and Wind Cave staff developed a position description for a clerk-typist position at Jewel Cave, which Joanne Bornong filled in 1986 when funding came through (there had been a seasonal clerk-typist in the 1970s and early 1980s, but this was the first permanent clerical position).[28] Bornong cooperated with Jean Donnell, the administrative officer at Wind Cave, who had been at Wind Cave for decades and ran a smooth operation.[29] In 1988, the clerk-typist position was reclassified as park ranger-administration position

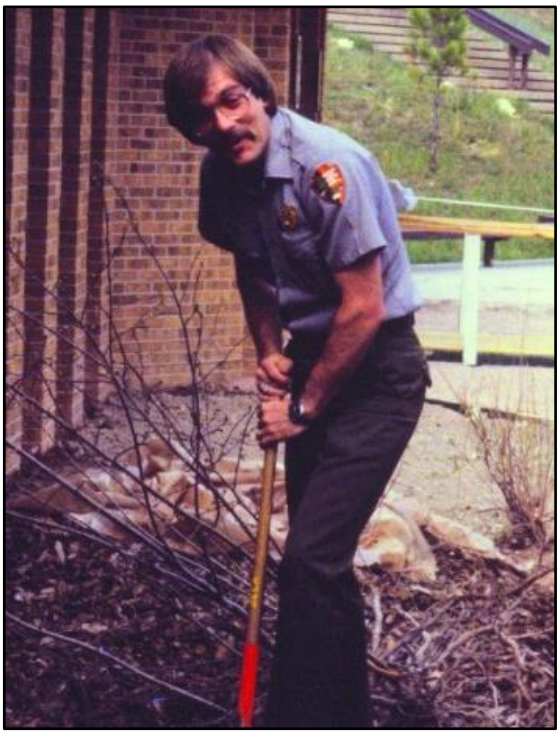


Figure 93. Herschel Schulz was chief ranger of interpretation, protection, and visitor protection for part of the 1980s.

Source: Jewel Cave NM.

[25] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 3, files provided by Katie Atkins, Folder 1986 Superintendent's Report, Jewel Cave NM CF; Ditmanson, interview.

[26] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 1, files provided by Katie Atkins, Folder 1987 Superintendent's Report, Jewel Cave NM CF.

[27] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 2.

[28] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 1, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 3.

[29] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 14, files provided by Katie Atkins, Folder 1990 Superintendent's Report, Jewel Cave NM CF; Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Management Goals for FY1986, 1, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF; Marty Ott, interview by Jackie Gonzales, April 24, 2019, Kanab, UT.

(GS-4). Later that year, Bornong transferred away, and Margaret Schwartz replaced her.[30]

In 1986, Wind Cave and Jewel Cave updated all park ranger series position descriptions to reflect new, service-wide GS-0025 classification standards.[31] This was the beginning of a service-wide effort to separate generalist ranger positions into specialized positions (i.e., interpretation, natural resource management, or cultural resource management).[32] Jewel Cave seasonal staff positions were retitled to fit the new categories.[33] Other staff changes in the mid-1980s included Larry Dilts returning as chief of maintenance (see Figure 94), and, when Chief of Interpretation and Resource Management Herschel Schulz left in 1986, Brian Adams replaced him (GS-7/9).[34] Staff changes in 1988 and 1989 included converting long-time seasonal maintenance employee Don Lytle to a permanent/subject-to-furlough employee, converting a park ranger/administration position (GS-4) to full-time, changing a park ranger (resource management) (GS-3) to a forestry technician (GS-4), and creating a supervisory park ranger to manage seasonal interpretive employees (GS-6/7).[35]

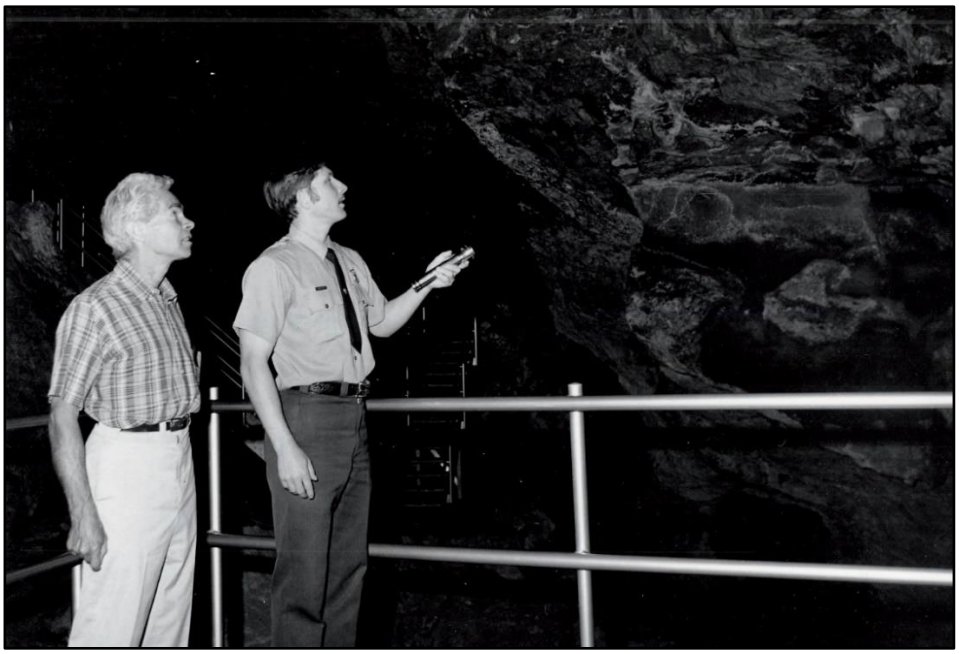


Figure 94. Larry Dilts was the chief ranger at Jewel Cave, left for several years, and then returned as maintenance lead. Pictured here with Herb Conn in a state of South Dakota photograph, 1975.

Source: NPS, Jewel Cave NM.

[30] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 1, files provided by Katie Atkins, Folder 1988 Superintendent's Report, Jewel Cave NM CF.

[31] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 3.

[32] Paul Menard, interview by Jackie Gonzales, April 9, 2019, Sequim, WA.

[33] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 4.

[34] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1984, 1, files provided by Katie Atkins, Folder 1984 Superintendent's Report, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 2, files provided by Katie Atkins, Folder 1984 Superintendent's Report, Jewel Cave NM CF; Ditmanson, interview; Dilts, interview; Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Management Goals for FY1986, 3.

[35] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 1; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 1.

By the end of 1989, Jewel Cave had six permanent staff, twenty seasonal or temporary staff, one Student Conservation Association (SCA) intern, four other interns, and three regular volunteers.[36] That November, Holder transferred to a park in Alaska, and Brian Adams became acting unit manager in his place for a brief period.[37] After Holder left, Wind Cave leadership reviewed the position "and identified it as a potential trainee position under the GS-0025/301 series [miscellaneous administration and program] for recruitment in December," thus opening the door to establishing a separate superintendency for Jewel Cave.[38]

Volunteers In Parks

Starting in the late 1970s, Jewel Cave and Wind Cave managers began developing a Volunteers In Parks (VIP) program, following 1969 legislation authorizing the secretary of the Interior to establish such a program service-wide.[39] Hendricks was required to write regular VIP reports, and he used funding from new the VIP program for certain expenses related to the Conns' surveying work (which was still done under a special use permit), such as carbide for lamps, a replacement compass, and tape.[40] In the early 1980s, Jewel Cave and Wind Cave managers tracked the monetary equivalent of work conducted through the VIP program (estimated in terms of what the work would have cost, had it been done by paid staff), counting it as donated income to the parks.[41] In 1984, park managers drafted a VIP Operation Plan.[42] As a result of efforts to expand the program, VIP hours for Jewel Cave reached 2,500 in 1985 and 5,403 in 1986 (the 1986 hours had an estimated value of $40,000).[43] Much of this increase came from cave exploration activities that were now counted as VIP hours.[44] VIP participation remained high through the end of the decade, with volunteers posting 5,000 hours in 1987 and a little over 6,000 hours per year in 1988 and 1989.[45]

General Management Planning

Jewel Cave received virtually no funding for parkwide planning in the 1970s. Hendricks, Ditmanson, McClanahan, and Ortega repeatedly requested funding for a general management plan

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[36] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 2.

[37] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 1.

[38] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 3.

[39] Act of July 29, 1970, 84 Stat. 472 (P. L. 91-357).

[40] Al Hendricks, daily note log, February 7, 1979, from Hendricks' personal files; Mike Wiles, comments on draft administrative history, April 7, 2020.

[41] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 1.

[42] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 1.

[43] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 1, files provided by Katie Atkins, Folder 1984 Superintendent's Report, Jewel Cave NM CF; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 4.

[44] Wiles, comments on draft, April 7, 2020.

[45] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 1; Superintendent's Annual Report, Jewel Cave National Monument, 1988, 2; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 2.

(GMP), since the most recent plan on file was the Master Plan started in 1962, which predated the new visitor center.[46] A GMP, managers argued, was "needed to reflect development requirements, visitor uses, cave and surface resource considerations and external influences."[47] The most recent interpretive prospectus was also outdated: it had been written in 1966 and became obsolete after the construction of the new visitor center.[48]

In 1987, Jewel Cave managers wrote a Statement for Management in which they reiterated the need for a new GMP and interpretive prospectus:

> The principal issue facing Jewel Cave is the lack of a current General Management Plan and Interpretive Prospectus. Since the existing plans are obsolete, they are of no use in directing management action, but more importantly, the absence of up-to-date plans virtually assures that no development action will occur at this location. A number of projects have been identified via the 10-238 process, including a second elevator, expansion of the Visitor Center, surface trails, a picnic area with comfort station, etc., but none has received a servicewide priority listing. All possible means of completing these crucial plans should be investigated.[49]

In 1988, staff worked on preliminary planning tasks for a GMP and interpretive prospectus, but still no funding was forthcoming.[50] The next year, however, the Rocky Mountain Regional Office provided funds for GMPs and development concept plans for both Wind Cave and Jewel Cave. Work began on them in September.[51]

Cooperating Association

A Wind Cave naturalist continued to run the Wind Cave Natural History Association (WCNHA) in the 1970s and 1980s, as was common in the NPS at the time, and the Wind Cave superintendent retained a seat on the board.[52] Jane Farrell served as president of the board for much of the 1980s.[53] The association operated the bookstore at the new Jewel Cave visitor center.[54] Jewel Cave managers

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[46] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1985, 1, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF; Outline of Planning Requirements, Jewel Cave National Monument, June 2, 1989, 1–2, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 9.

[47] Outline of Planning Requirements, Jewel Cave National Monument, May 15, 1986, 1, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[48] Statement for Management, Jewel Cave National Monument, March 1987, 21, Cabinet 1, Drawer 2, Folder D18 Statements for Management, Jewel Cave NM CF.

[49] Statement for Management, Jewel Cave National Monument, March 1987, 21.

[50] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 8, files provided by Katie Atkins, Folder 1988 Superintendent's Report, Jewel Cave NM CF.

[51] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 14.

[52] NPS, Statement for Management, Wind Cave National Park, amended June 1980, SFM-6, Cabinet 1, Drawer 2, Folder D18 Statements for Management, Jewel Cave NM CF; Hendricks, interview; Ortega, interview.

[53] Ernest W. Ortega to Jane Farrell, President, Board of Directors, Wind Cave/Jewel Cave Natural History Association, February 23, 1987, Cabinet 3, Drawer 4, Folder N1427 Bats (Mora), Jewel Cave NM CF.

[54] Steve Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975, SFM-4, Cabinet 1, Drawer 2, Folder D18 Statements for Management, Jewel Cave NM CF.

participated in hiring sales clerks for the bookstore, who were generally on duty every day the visitor center was open to the public.[55]

Proceeds from the bookstores helped to fund interpretation at the two parks. In 1983, WCNHA sales amounted to $24,000, of which Jewel Cave received $800 for interpretive programming and $1,500 for cave-related research. In 1984, of $45,616 in gross sales, net sales amounted to $3,727, of which $2,132 went to Jewel Cave for interpretation.[56] Starting in 1985, sales supported two SCA positions at Jewel Cave.[57] People could become members of the WCNHA at rates of $1 per year or $3 for a lifetime.[58]

The WCNHA published books on Jewel and Wind Caves to sell in their bookstores. In 1977, the WCNHA republished Jim Thompson's booklet, *The Geology of Jewel Cave*, after Jewel Cave staff updated and partially rewrote the text to reflect recent discoveries of cave passages.[59] In the early 1980s, geologists Art and Peg Palmer received financial support from the association to write a new booklet on the geology of Jewel Cave (they had recently completed one on the geology of Wind Cave).[60] The Palmers partnered with Jay Arnold, editor of the *NSS News*, to complete *Jewel Cave: A Gift from the Past* in 1984.[61] Ditmanson commented that the Palmers' booklet "will serve as our prime informational piece dealing with the cave resource and it provides a perfect complement to Herb and Jan Conn's earlier work on the exploration effort."[62] It was one of the bookstore's top-selling items in 1984, along with Jewel Cave postcards and the Jewel Cave map.[63]

The WCNHA became the Wind Cave/Jewel Cave Natural History Association in 1984, a name change that Hendricks had requested several years prior because the association operated at both parks.[64] In 1987, Ortega believed the association had gone too far in its own direction was not necessarily providing the best possible financial support for the parks, and so he dissolved it. In its place, Ortega established the Black Hills Parks and Forests Association (BHPFA), led by Wind Cave

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[55] Al Hendricks, daily note log, May 26, 1979, from Hendricks' personal files; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 15.

[56] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 5, 14; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1984, 5.

[57] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 4.

[58] Wiles, comments on draft, April 7, 2020.

[59] Status Report on Goals – 7/1/76–9/30/77, Jewel Cave National Monument, October 1, 1977, 1, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF.

[60] Art Palmer to Norm Salisbury, October 28, 1981, and Art Palmer to Dennis Ditmanson, December 14, 1981, Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF.

[61] Jay Arnold to Art Palmer, August 3, 1982, Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF; Arthur N. Palmer, *Jewel Cave: A Gift from the Past* (Hot Springs, SD: Wind Cave/Jewel Cave Natural History Association, 1984); Art Palmer to Christina, Dennis, and Georgene, January 7, 1984, and Art & Peg Palmer to Dennis, Herschel, and families, January 15, 1983, Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF.

[62] Dennis L. Ditmanson to [unnamed], May 24, 1984, Cabinet 1, Drawer 3, Folder K42 Publications/Other, Jewel Cave NM CF.

[63] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1984, 6.

[64] Hendricks, interview.

Naturalist Bill Swift.[65] The new association opened sales outlets at non-NPS sites in the area, including Bear Butte State Park, Custer State Park, and Nebraska National Forests and Grasslands. In 1989, the BHPFA returned a total of $12,073 to Wind Cave and Jewel Cave.[66]

Community Partnerships

The Jewel Cave management assistant/unit manager and the Wind Cave superintendent were active in community organizations near the caves. As in the early days of the monument, civic groups in Custer, South Dakota, and Newcastle, Wyoming, promoted Jewel Cave. Both Custer and Newcastle, Ditmanson wrote, were "supportive of the monument and several Custer businesses have provided financial support for various special projects."[67] Jewel Cave managers were active in both the Custer and Newcastle Chambers of Commerce (membership paid for by the cooperating association), the Custer Rotary Club, and the Custer Community Hospital.[68] Schulz was on the board of the Environmental Education Association of South Dakota, and both Schulz and Ditmanson participated in the Black Hills Sport and Travel show and the Black Hills, Badlands, and Lakes Association Information Exchange.[69]

Private and other governmental organizations in neighboring communities donated money to Jewel Cave, such as Custer Bank (which paid for membership in Black Hills, Badlands and Lakes Association), Westworld Hospital Management, Custer Community Hospital ($2,000 for the park internship program), Black Hills National Forest, and Jewel Cave Employee's Recreation Association. In 1986, the Lutheran Brotherhood donated plumbing fixtures and furniture for the park's new pole barn.[70]

In 1983, Jewel Cave celebrated its 75th anniversary in cooperation with community organizations. The NPS invited local media to participate. The *Rapid City Journal* did a full-page article on the historic tour, and the WCNHA published a historic newspaper to mark the occasion. On August 24 and 25, the monument hosted a birthday party and other celebrations, attended by 200 people.[71] Organizations that had played a role in the monument's history, such as the Custer Chamber of Commerce and the Newcastle Lions Club, were invited to attend, speak, and provide recollections.[72]

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[65] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 5.

[66] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 7.

[67] Statement for Management, Jewel Cave National Monument, March 1987, 11.

[68] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 16.

[69] In addition to the BHPFA, there was a separate organization called the Black Hills, Badlands and Lakes Association that served as an umbrella tourism promotion organization for the area. Superintendent's Annual Report, Jewel Cave National Monument, 1984, 8; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 15; Hendricks, interview; Ditmanson, interview; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 19.

[70] Superintendent's Annual Report, Jewel Cave National Monument, 1986, 2.

[71] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 19.

[72] James A. Randall, Rocky Mountain Regional Director, to Wind Cave-Jewel Cave Superintendent, memorandum, July 8, 1983, Cabinet 3, Drawer 3, Folder A8215 Special Events, Dedications, etc., Jewel Cave NM CF; NPS,

NPS managers, at Jewel Cave, Wind Cave, and the Rocky Mountain Regional Office, maintained close communication with the media, elected officials, and the local tourism industry to increase partnerships and visitation.[73] In 1984, local news network KEVN produced a short program on the Spelunking Tour, which was widely seen in the area.[74] The NPS regularly sent out press releases regarding tours, staffing, special programming, improvements to cave trails and facilities, and visitation numbers.[75] The *Rapid City Journal* and the *Custer Chronicle* were especially supportive and frequently ran stories about Jewel Cave.[76]

Jewel Cave staff collaborated with managers of other caves and with the National Speleological Society (NSS) to share strategies for protecting and exploring caves. The Paha Sapa Grotto, the local NSS chapter that had been founded by South Dakota School of Mines and Technology students in 1966, was a particularly active partner at Jewel Cave.[77] Employees from other NPS cave parks interacted with Jewel Cave staff, such as when Oregon Caves employees Tom Aley and Dick Fay visited Jewel Cave "to gather information and ideas in preparation for a major revision of the lighting system at Oregon Caves."[78] Jewel Cave staff later visited Oregon Caves to assist them with development of a cave inventory system.[79] Jewel Cave employees attempted to partner with privately managed caves in the Black Hills, but with mixed results. Two private cave operators had their staff participate in Jewel Cave's seasonal orientation program in 1987, and another based its seasonal orientation packet on Jewel Cave's.[80]

"Anniversary Publication Underway for Jewel Cave National Monument," press release, April 15, 1983, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF.

[73] Al Hendricks, daily note log, April 6, 1979, from Hendricks' personal files; Dennis L. Ditmanson to Eileen Daily, Tour Development Coordinator, South Dakota Tourism, September 4, 1985, Cabinet 1, Drawer 2, Folder 6.A.1 Correspondence, Jewel Cave NM CF; Ortega, interview; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 17.

[74] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 2, 8.

[75] NPS, "Anniversary Publication Underway for Jewel Cave National Monument," press release, April 15, 1983; NPS, "Visitation up at Jewel Cave National Monument," press release, January 4, 1985; NPS, "Trail Rehabilitation Underway at Jewel Cave National Monument," press release, March 8, 1985; NPS, press release, May 25, 1987, 2, all in Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning Jewel Cave NM CF.

[76] Mike Wiles, interview by Jackie Gonzales, June 26 and 27, 2019, Custer, SD; Randall to Wind Cave-Jewel Cave Superintendent, memorandum, July 8, 1983; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 9; "Extend mapped Jewel Cave caverns past 75 mile mark," *Custer Chronicle*, July 14, 1987, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF.

[77] Paha Sapa Grotto, "About Us," accessed December 13, 2019, https://www.pahasapagrotto.org/about-us.html.

[78] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 9.

[79] Wiles, comments on draft, April 7, 2020.

[80] Statement for Management, Jewel Cave National Monument, March 1987, 23.

Natural Resources

Ortega and other park managers stressed that developing knowledge of the cave through exploration was a key part of managing cave resources appropriately.[81] As the known resource grew, management grew in turn. For the first time, the NPS looked beyond studying only what was needed for interpretation of Jewel Cave. It funded and partnered to fund studies of the cave's geology, biology, and more. At the same time, the NPS faced the challenge of protecting fragile cave resources that were affected by heavy visitation.

Cave Exploration and Mapping

In the 1970s, Herb and Jan Conn discovered roughly 30 miles of new passageways in Jewel Cave while surveying under special use permits, renewed annually.[82] They often brought along friends and other cavers, who were covered under the Conns' permit as long as the Conns accompanied them and there were no more than eight people.[83] Most cavers they brought belonged to the Paha Sapa Grotto, the local chapter of the NSS. The Conns marked selected cave routes with surveyors' flagging tape, purchased by the NPS, and wrote route descriptions so that Jewel Cave staff or other cavers could follow their routes.[84]

In 1977, the Conns hit a point west of Hell Canyon where they believed additional cave lay beyond, based on strong airflow. They were fairly certain they had found the far side of a connecting passage that was too small for people, but based on their survey data, they were unable to determine how long the non-connection was. They hoped that, if it was a direct and not-too-distant connection, they could widen the narrow passage with dynamite, removing just a few inches from each side. They contacted Father Paul Wightman, the Catholic priest who had assisted with radiolocation of the Target Room back in 1964, and wrote, "[we] might just take you up on your offer to help with some radio location work." They explained to Father Wightman,

> . . . we think that there's a good chance of finding much more cave. There are many breezy leads heading into the hill to the west [of Hell Canyon], which could be as permeated with cave as the hill on the east side of the canyon.
>
> The National Park Service holds out some hope that they will give us permission to blast, if we can make a good case for the closeness of the connection and the feasibility of opening it. We have a caver friend in Custer who is in the business of excavating and using explosives, and he has volunteered his services.[85]

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[81] Ortega, interview.

[82] Herb and Jan Conn, Jewel Cave Exploration, Special Use Permit 2-146-9, Summary Report, Jan. 1, 1972 to Dec. 31, 1972, File 3449b, Jewel Cave NM MF; Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975; Jewel Cave Exploration, Special Use Permit SP 1569-0-0022, Summary Report, Dec. 1, 1980 to Nov. 30, 1981, File 3447, Jewel Cave NM MF; Ditmanson, interview; Ortega, interview.

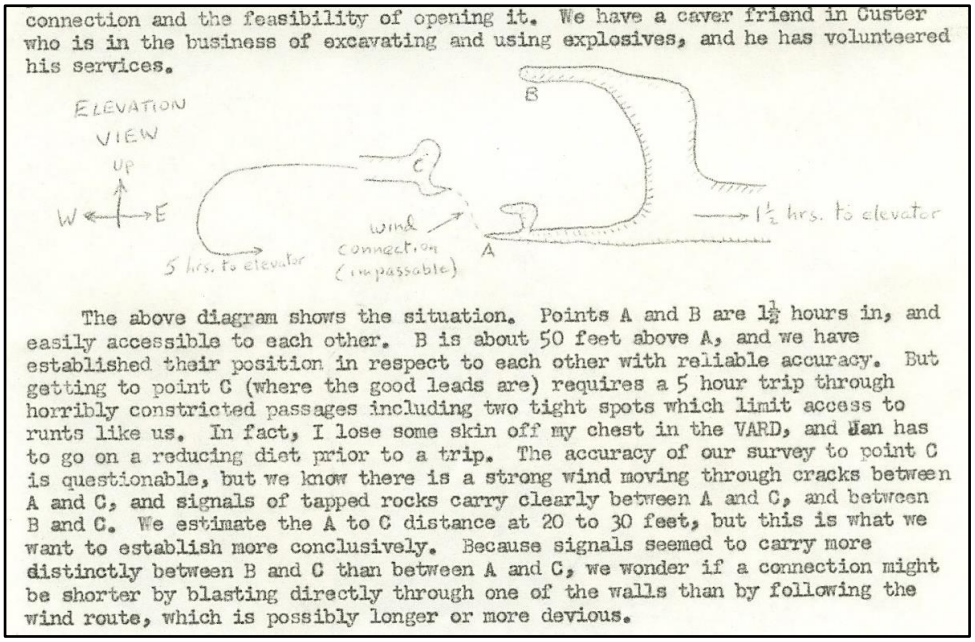
[83] Hendricks, interview; DOI, NPS, Jewel Cave NM, Special Use Permit 1569-17, January 1, 1977, Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

[84] Hendricks, interview.

[85] Herb and Jan Conn to Father Paul Wightman, July 29, 1977, 1, File 1657a, Jewel Cave NM MF.

Wightman arrived at Jewel Cave later that year and conducted the radiolocation work.[86]

The Conns called the potential new connection the "Very Important Shortcut," or VISC (see Figure 95). The NPS did not uniformly support the VISC: McClanahan questioned the wisdom of blasting rock within the cave for the purposes of exploration. The Conns received approval for it directly from the Rocky Mountain Regional Office.[87] The Conns raised funds to create the VISC from private donors, most of whom were part of the local caving community and park staff.[88] Drilling began on August 27, 1979, with the Conns supervising inside the cave while Hendricks oversaw operations aboveground.[89] The first driller did not get the direction quite right, but a second remedied the initial mistake and completed the VISC in early 1980.[90] The VISC opened the door to many new discoveries west of Hell Canyon.[91]


connection and the feasibility of opening it. We have a caver friend in Custer who is in the business of excavating and using explosives, and he has volunteered his services.

The above diagram shows the situation. Points A and B are 1½ hours in, and easily accessible to each other. B is about 50 feet above A, and we have established their position in respect to each other with reliable accuracy. But getting to point C (where the good leads are) requires a 5 hour trip through horribly constricted passages including two tight spots which limit access to runts like us. In fact, I lose some skin off my chest in the VARD, and Dan has to go on a reducing diet prior to a trip. The accuracy of our survey to point C is questionable, but we know there is a strong wind moving through cracks between A and C, and signals of tapped rocks carry clearly between A and C, and between B and C. We estimate the A to C distance at 20 to 30 feet, but this is what we want to establish more conclusively. Because signals seemed to carry more distinctly between B and C than between A and C, we wonder if a connection might be shorter by blasting directly through one of the walls than by following the wind route, which is possibly longer or more devious.

Figure 95. Herb Conn drew and explained the "Very Important Shortcut" (VISC) in a letter to Father Paul Wightman, 1977.

Source: NPS, Jewel Cave NM.

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[86] Al Hendricks, daily note log, September 27, 1977, from Hendricks' personal files.

[87] Wiles, interview.

[88] Jan Conn, "Informal Panel Session," talk, Jewel Cave 200-mile Reunion, June 30, 2019, Custer, SD.

[89] Al Hendricks, daily note log, September 3, 1979, from Hendricks' personal files; Al Hendricks, daily note log, September 10, 1979, from Hendricks' personal files.

[90] Al Hendricks, daily note log, December 16, 1979, from Hendricks' personal files; Al Hendricks, daily note log, January 10, 1980, from Hendricks' personal files; Mike Wiles, "Jewel Cave Exploration from 1979 to 2005," talk, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD; J. Conn, "Informal Panel Session."

[91] Mike Wiles, Ken Allgier, and Steve Baldwin, Jewel Cave Exploration, Summary Report, Jan. 1 to Dec. 31, 1988, Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

The Conns cultivated Ken Allgier and Mike Wiles as protégés who could take over when Herb and Jan were no longer able to cave.[92] In 1983, Schulz and Ditmanson modified the Conns' special use permit to identify "specifically designated trainees (Paul Wieland and Mike Wiles) who will be under direction of permittees." Wieland and Wiles were required to follow the same regulations regarding surveying, mapping, safety, reporting, and publicity as the Conns.[93] After the permit was issued, the Conns wrote to McClanahan,

> We've suggested to Herschel (and he agreed to discuss it by phone with Dennis) that Ken Allgier should be included as a trainee on the Permit, either instead of or in addition to Paul Wieland, Ken now has almost as much experience as Mike Wiles in Jewel Cave (61 trips in the last three years, compared to Mike's 77 and Paul's 29). He is the regular compass reader for the mapping crew, and he is competent, dedicated, and devoted to conservation and safety. At this point he is more familiar with the new areas of the cave than we are, or anyone but Mike.
>
> Ken expects to remain in the Black Hills for the foreseeable future. On the other hand, Mike is now working in Pierre with limited opportunities of weekend trips to the Hills, and future jobs may take him farther away. Paul is in Brookings, still much interested in the cave but unable to get here often. His future plans may or may not bring him back to the area.
>
> We feel it is important to the continuity of the cave work for Ken to become a recognized trainee. We're hopeful that you and Dennis will agree, so that this change can become effective for the current year.[94]

After receiving this letter, McClanahan and Ditmanson added Allgier to the permit. The following year, McClanahan completed the transfer from the Conns to the next generation of cavers when he issued Wiles and Allgier a two-year special use permit for "exploration, orientation, survey, and mapping of Jewel Cave."[95] Jan Conn later explained how they picked Wiles: "We found Mike Wiles, we figured, this guy's is as nutty as we are! He'll keep it going."[96]

In conjunction with the handover, Wiles revamped the trip report template "to clarify issues that had been annoyances in the past."[97] Schulz approved the new format, which included the date and time of entry and exit, changes since the last trip, date of last time the cavers were in the area, and number of cavers in the group. To standardize cavers' descriptions, Wiles wrote a glossary of speleothems, skills, hazards, types of rock, and levels of the cave.[98]

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[92] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 16.

[93] DOI, NPS, Jewel Cave NM, Special Use Permit SP1569-3-0001, January 1, 1983, Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

[94] Herb and Jan Conn to Lester F. McClanahan, February 22, 1983, Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

[95] Lester F. McClanahan to Herb and Jan Conn, February 28, 1983, and DOI, NPS, Jewel Cave NM, Special Use Permit SP1569-4-0001, November 10, 1984, both in Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

[96] Jan Conn, "Jewel Cave Exploration from 1959–1979," talk, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD.

[97] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 4.

[98] Jewel Cave NM, Cave Trip Report, undated [c.1984], and Jewel Cave NM, Cave Inventory Guidelines [c.1984], Cabinet 3, Drawer 4, Folder L3012 (special use permits) Exploration Survey & mapping, Jewel Cave NM CF.

Safety protocols increased in the 1980s. For the first time, the NPS placed first aid kits within the cave, since most exploration at that point took cavers so far in that they faced several hours of difficult caving to reach an exit.[99] Wiles attended a National Cave Rescue Commission seminar at Wind Cave in 1984, the same year that seasonal Ranger Dan Snyder drafted (but did not finalize) a Cave Rescue and Emergency Operations Plan.[100] In October 1985, Wiles and Allgier oriented members of the Pennington County Search and Rescue Team to Jewel Cave, and they conducted a mock rescue in December.[101]

Jewel Cave managers treated caving as a volunteer activity, even if those doing the caving were NPS employees. Wiles was a seasonal employee, as were other cavers, but they were required to do their exploratory caving outside of work hours. These volunteers—the Conns and then Wiles—essentially became the NPS-approved custodians of the deep cave. All exploration went through them, and the integrity of the exploration program at the cave depended on their actions. At Wind Cave, by contrast, there were no NPS-designated primary explorers. Because of that, Wind Cave had some issues with rogue cavers who entered without permission. This did not happen at Jewel Cave, where the Conns and then Wiles acted as gatekeepers of the cave.[102]

When Wiles and Allgier took over the permit, they sought advice and counsel from the Conns, which provided continuity in exploration efforts.[103] As had been the case for the Conns, the permit required Wiles or Allgier to be present on any cave trip, and they were responsible for ensuring the safety of other cavers and keeping cave resources safe. Ditmanson later remarked,

> [Mike Wiles is] the key. If Herb and Jan were the instigators of the real cave work at Jewel Cave, Mike is the logical successor to that. He's carrying on that tradition and ought to be recognized for that. . . . Managers come and go. I mean, we're there for a while and we kind of blow through and do whatever we do and then we go away. And people like Mike are the real heroes of the Park Service.[104]

In 1987, Wiles, Art and Peg Palmer, and Steve Baldwin surveyed the 75th mile of Jewel Cave. To congratulate the explorers on the achievement, Herb and Jan Conn entered the cave while Wiles, the Palmers and Baldwin were still inside and left congratulatory cards, cans of soda, a bag of M&Ms, and a tin full of fresh grapes. Wiles later recounted, "We discovered these while leaving the cave and were thrilled by these thoughtful and unexpected surprises."[105] There were no other external celebrations, but the *Custer Chronicle* reported on the achievement.[106] Since the new sections of the cave were increasingly far from access points (even with the help of the VISC), Wiles, Allgier, and

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[99] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 5.

[100] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 5; Research Projects at Jewel Cave National Monument by Seasonal Staff, Status Report, 1984, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects; Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 1.

[101] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 7.

[102] Ortega, interview; Ditmanson, interview.

[103] Statement for Management, Jewel Cave National Monument, March 1987, 7.

[104] Ditmanson, interview.

[105] Wiles, comments on draft, April 7, 2020.

[106] "Extend mapped Jewel Cave caverns past 75 mile mark," *Custer Chronicle*, July 14, 1987, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning Jewel Cave NM CF; Wiles, "Jewel Cave Exploration from 1979 to 2005."

Baldwin regularly embarked on 12- to 17-hour exploration trips in the cave.[107] These long trips led to another major breakthrough in 1989, beyond what they called the "Victory After Continuous Contortions" (VACC), which pointed to huge passageways to the west.[108]

Mapping changed dramatically in the late 1980s as a result of computer technology. A caver at Wind Cave, Jim Nepstad, pioneered computer mapping on his own time using a program called SMAPS, which showed cavers at both caves the possibilities computer mapping might hold. Meanwhile, AutoDesk, Inc., of Sausalito, California, donated an AutoCAD computer program to Jewel Cave for resource management projects. Jewel Cave eventually followed Wind Cave's lead and used SMAPS instead of AutoCAD. Ortega saw the benefit of digital mapping systems used by Nepstad and others and fought for better computer systems at both parks in order to improve mapping capabilities.[109]

At the request of Wiles, Herb Conn painstakingly entered all of the survey data he and Jan had collected since 1959 into the new SMAPS system. The Conns' handwritten notes and maps proved to be remarkably accurate: Wiles later noted that in the years since Herb entered this data, resource management staff have only found two minor errors in his work.[110] The new mapping system prompted some changes in trip reporting, as Wiles, Allgier, and Baldwin noted,

> The computer allows a single data correction to cause the coordinates of each successive station to be adjusted. Because this would quickly make earlier data listings obsolete, survey data and coordinate listings will no longer be included in the annual report. The data entered on the Sperry computer at Jewel Cave National Monument is the most complete, and should be considered the final authority.[111]

Cave mapping had begun the long road toward going digital.

Cave Resource Management

The NPS conducted a broad study of cave radiation and safety procedures in 1974, after research at Carlsbad Caverns indicated that radiation levels might be unsafe for employees who worked in caves long-term. The study encompassed Carlsbad Caverns, Mammoth Caves, Cumberland Gap Caves, Lehman Caves, Oregon Caves, Round Spring Cave in Ozark National Scenic Riverways, Crystal Cave in Sequoia National Park, Timpanogos Cave, Jewel Cave, and Wind Cave. For the study, the NPS collaborated with the Environmental Protection Agency (EPA), the Mine Safety and Health Administration (MSHA) within the Department of Labor, the National Institute for Occupational Safety and Health (NIOSH), and the Occupational Safety and Health Administration (OSHA). In 1980, the NPS completed a Cave Radiation Safety and Occupational

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[107] Wiles, Allgier, and Baldwin, Jewel Cave Exploration, Summary Report, Jan. 1 to Dec. 31, 1988.

[108] Wiles, "Jewel Cave Exploration from 1979 to 2005."

[109] Ortega, interview; Wiles, comments on draft, April 7, 2020.

[110] Wiles, interview; Wiles, comments on draft, April 7, 2020; Superintendent's Annual Report, Jewel Cave National Monument, 1987, 2.

[111] Mike Wiles, Ken Allgier, and Steve Baldwin, Jewel Cave Exploration, Summary Report, Jan. 1 to Dec. 31, 1989, Cabinet 3, Drawer 2, File N3023 Speleology, Jewel Cave NM CF.

Health Guideline, the first NPS-wide document addressing cave safety.[112] Protocols in the new guide included:

- Prohibition of smoking underground.
- Regular Kusnetz method tests to measure alpha radiation.
- Regular sampling requirements.
- Prohibition of ventilating buildings with cave air.
- Prohibition on using alpha radiation in cavers to justify cave closures.
- Mandate for "positive management actions" to reduce human exposure to alpha radiation.
- Mandate for environmental monitoring of newly opened areas of cave to the public, or changes in processes that could affect radiation exposure of staff or the public.
- Requirement to explain danger to employees.
- Provision of medical surveillance to employees with high radiation levels.
- Limitation of 700 hours of underground work per year for employees at caves where "radiation measurements suggest a potential radiation health hazard."[113]

The guide set healthy radiation levels for employees and mandated that the NPS make available medical surveillance if any employee's alpha radiation levels went above a certain level.[114]

At Jewel Cave, NPS staff completed a Natural and Cultural Resource Management Plan (RMP) in 1983.[115] It set the following priorities:

1. Conserve flora, fauna, and ecological processes.
2. Identify and preserve cultural resources.
3. Maintain the majority of the cave undeveloped and for research and exploration.
4. Minimize human impacts on cave resources.
5. Interpret cave features in the developed sections of the cave.
6. Coordinate with other agencies, especially the Forest Service and local government.[116]

The plan stressed that "the cave remains the focus of attention at the Monument" and that the NPS should prioritize projects relating to the cave resource over other resource management initiatives.[117]

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[112] NPS, Cave Radiation Safety and Occupational Health Management Guideline, May 19, 1980, 11, Cabinet 3, Drawer 1, File 1980 Cave Safety, Jewel Cave NM CF.

[113] NPS, Cave Radiation Safety and Occupational Health Management Guideline, May 19, 1980, Chapters 2–3.

[114] NPS, Cave Radiation Safety and Occupational Health Management Guideline, May 19, 1980, Chapter 4, 1.

[115] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 16.

[116] Finding of No Significant Impact for Proposed Actions Concerning Natural and Cultural Resources Management at Jewel Cave National Monument, August 26, 1983, 2, Cabinet 3, Drawer 4, Folder N16 Management of Natural Resources and Area, Jewel Cave NM CF.

[117] Finding of No Significant Impact for Proposed Actions Concerning Natural and Cultural Resources Management at Jewel Cave National Monument, August 26, 1983, 4.

It recommended further studies on hydrology, visitor impact on cave resources, flora, and fauna—especially bats—to update prior research.[118]

The 1983 RMP triggered efforts to collect baseline scientific data both above- and belowground.[119] A later report said that the most "salient point" to emerge from the RMP was that Jewel Cave had "an almost universal lack of baseline information upon which to make management or planning decisions."[120] In 1984, the research biologist at Wind Cave set up monitoring systems inside and outside the cave. The following year, Ronald Kirbo, the cave management specialist at Carlsbad Caverns National Park—the first in the nation hired in that series—visited Wind Cave and Jewel Cave to assist with inventorying existing cave resources.[121]

In 1985, Ditmanson hired Mike Wiles and Jim Basinger into a shared cave management position: each was dedicated half-time to cave management and half-time to interpretation (see Figure 96). This was the first time any staff positions at Jewel Cave specialized in management of cave resources.[122] Also in 1985, Jim Nepstad (previously of Mammoth Cave National Park) became the first cave specialist at Wind Cave. In 1989, Wind Cave secured funding to promote him to a full-time cave specialist, the first full-time cave management position at either Wind Cave or Jewel Cave. Nepstad's full-time position was modeled after a similar position at Carlsbad Caverns National Park.[123]



Figure 96. Mike Wiles, the first staff person whose position was dedicated to managing cave resources, paints an updated cave map to replace an old one (on the wall behind him). Wiles completed the work on his own time, with $1,000 of support from the NHA. It took 234 hours to complete. ca. 1984.

Source: NPS, Jewel Cave NM.

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[118] Finding of No Significant Impact for Proposed Actions Concerning Natural and Cultural Resources Management at Jewel Cave National Monument, August 26, 1983, 5–6.

[119] Finding of No Significant Impact for Proposed Actions Concerning Natural and Cultural Resources Management at Jewel Cave National Monument, August 26, 1983, 5–6.

[120] Statement for Management, Jewel Cave National Monument, March 1987, 9.

[121] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 5; Wiles, comments on draft, April 7, 2020.

[122] Wiles, interview; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 6–7; Wiles, comments on draft, April 7, 2020.

[123] Wiles, interview; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 6–7; Wiles, comments on draft, April 7, 2020; NPS, "Cave and Karst Resources Management Plan, Wind Cave National Park," 2007, 74–75; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 3, 6.

Wiles and Basinger performed resource management tasks like addressing problems caused by visitor traffic. They set up equipment along the Scenic Tour route to collect baseline microclimate data, reexamined earlier algae eradication techniques, prepared a plan to update the cave lighting system to address algae problems, correlated cave survey data, and tracked down past studies of the cave.[124] They also investigated ways to remove lint from the cave, which had built up over the years from visitors' clothing. At first, they used a dry, 1.5-inch nylon paint brush to remove the lint, then wetted down the surfaces of the walls and ceiling of the Formation Room with water, creating a runoff to rinse the remaining lint. They recommended regularly spraying formations along the scenic tour, using a vacuum for lint on rough surfaces, and carefully dusting lint off delicate speleothems only every 20 years to avoid damage to cave resources. The rest of the cave, they determined, should be cleaned at a rate of about 20 percent annually, equivalent to a complete cleaning every five years. To cut down on future lint accumulation, they recommended installing collection tarps under all platforms and stairways.[125]

In 1986, Ditmanson and Ortega requested funding for a cave management plan.[126] Wind Cave staff had begun assisting Jewel Cave with a preliminary plan, but the monument needed a full plan in order to "identify and direct future research needs."[127] In 1987, the Rocky Mountain regional chief scientist called cave management "our primary resource management need" at Jewel Cave and identified $150,000 in "unmet funding need" in this area.[128] A 1988 Natural Resource Program Review for Jewel Cave pointed again to baseline data as one of the most crucial cave resources management needs. It added that the lack of baseline data could lead to the "loss of fragile and irreplaceable cave resources" and could have harmful consequences for the cave's bat population.[129]

The NPS partnered with outside organizations to manage cave resources, like the NSS and the Northwest Cave Research Institute (NCRI). Wiles had heard of NCRI and began coordinating with the institute after attending one of its field camps at Bighorn Cave in Wyoming,[130] In 1988, Jewel Cave partnered with NCRI to "organize a volunteer field conservation camp for Jewel Cave."[131] The agreement between Jewel Cave and NCRI provided for four years of cooperation. In July 1988,

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[124] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 6–7; Summary of Research Activities, Jewel Cave National Monument, 1987, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1986, 4; Superintendent's Annual Report, Jewel Cave National Monument, 1987, 4; Wiles, comments on draft, April 7, 2020.

[125] "Removing Lint from Speleothems," undated, 2, Cabinet 3, Drawer 2, Folder N3023 LINT, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 4, 6; Mike Wiles, "Microclimate Monitoring of the Scenic Tour Area at Jewel Cave," undated [1987?], Cabinet 3, Drawer 2, Folder N3023 Microclimate Study of Jewel Cave (Wiles), Jewel Cave NM CF; Ditmanson, interview; Wiles, interview.

[126] Outline of Planning Requirements, Jewel Cave National Monument, May 15, 1986, 1.

[127] Statement for Management, Jewel Cave National Monument, March 1987, 23.

[128] Jewel Cave NM Unit Manager to Regional Chief Scientist, December 18, 1987, Cabinet 3, Drawer 4, Folder NN2215 Area Research Plans, Jewel Cave NM CF.

[129] Natural Resources Program Review, Jewel Cave NM, 1988, Cabinet 3, Drawer 4, Folder NN2215 Area Research Plans, Jewel Cave NM CF.

[130] Wiles, comments on draft, April 7, 2020.

[131] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 5.

NCRI brought a group of 40 volunteer cavers to Jewel Cave for a week-long conservation work camp, during which participants reflagged five miles of cave trails, radiolocated 10 locations in the cave, and installed photopoints for a cave resources photo-monitoring program along the Scenic Tour route.[132] NCRI produced a report from this work titled "Cave Resources Inventorying and Radio Location Survey."[133] The following year, NCRI sponsored 35 volunteers who provided 1,400 hours of service. Similar to the previous year's crew, they conducted a cave inventory along eight miles of cave trails, reflagged some of the travel routes, radiolocated 14 locations in the cave, and continued the resource photo-monitoring program along the Scenic Tour route.[134]

Outside Studies of Jewel Cave

Research at Jewel Cave expanded in the 1970s. In 1975, Management Assistant Steve Hurd commented, "Use of subterranean resources as a laboratory for scientific and educational purposes" was becoming increasingly popular as a result of the new visitor center development. Hurd and later managers partnered with academics and outside institutions to issue special permits for research within the cave.[135]

Some of the research focused on bats. In 1972, Martin and Hawks (first names not available) studied bat hibernation in Jewel Cave and other caves in the area. They found that Jewel Cave was the only one of over 100 caves in the Black Hills with relatively large numbers of five chiropteran species.[136] Ken McCarty conducted research on Jewel Cave's bats in the late 1970s.[137] Dave Mora, a former seasonal interpretive ranger, wrote the next major bat study in 1987, titled, "Hibernating Bat Population Census." Mora's study received funding from Bowling Green University and the Wind Cave/Jewel Cave Natural History Association.[138] Two years later, John Anderson, a graduate student at Fort Hays State University under Dr. Jerry Choate, began a multiyear study of Jewel Cave bats, funded in part by the BHPFA and Fort Hays State University.[139]

During the 1980s, several outside researchers conducted geological studies. In 1983, Derek Ford of McMaster University partnered with Art and Peg Palmer to write a "Preliminary Report Upon McMaster University Geochemical and Isotopic Studies in Wind and Jewel Cave."[140] The Palmers

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[132] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 2, 6.

[133] Summary of Research Activities, Jewel Cave National Monument, 1988, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects.

[134] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 2, 6.

[135] Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975.

[136] Dave Mora, "Bats of Jewel Cave," 2, Cabinet 3, Drawer 4, Folder N1427 Bats (Mora), Jewel Cave NM CF.

[137] Wiles, comments on draft, April 7, 2020.

[138] Summary of Research Activities, Jewel Cave National Monument, 1987; Research Project Description, "The Bats of Jewel Cave," February 1987, and Ernest W. Ortega to Jane Farrell, February 23, 1987, both in Cabinet 3, Drawer 4, Folder N1427 Bats (Mora), Jewel Cave NM CF.

[139] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 7.

[140] Derek C. Ford to Dennis Ditmanson, May 24, 1983, Cabinet 3, Drawer 2, Folder N3023 Thermal Genesis of Black Hills Caves (Ford), Jewel Cave NM CF; Art & Peg Palmer to Jewel Cave staff, June 10, 1988; and Arthur N. and

continued their geological research after completing *Jewel Cave: A Gift from the Past*. In the late 1980s, they conducted research to "clarify the stratigraphy (sequence of rock layers) in the upper levels of the cave."[141] They communicated regularly with Jewel Cave staff and helped to organize trips to Jewel Cave for the 1988 NSS convention in Custer.[142] Around the same time, Rick Olson, a former seasonal interpreter at Jewel Cave, started a separate study titled "Microscopic Analysis of Hydromagnesite Balloons" (see Figure 97).[143]

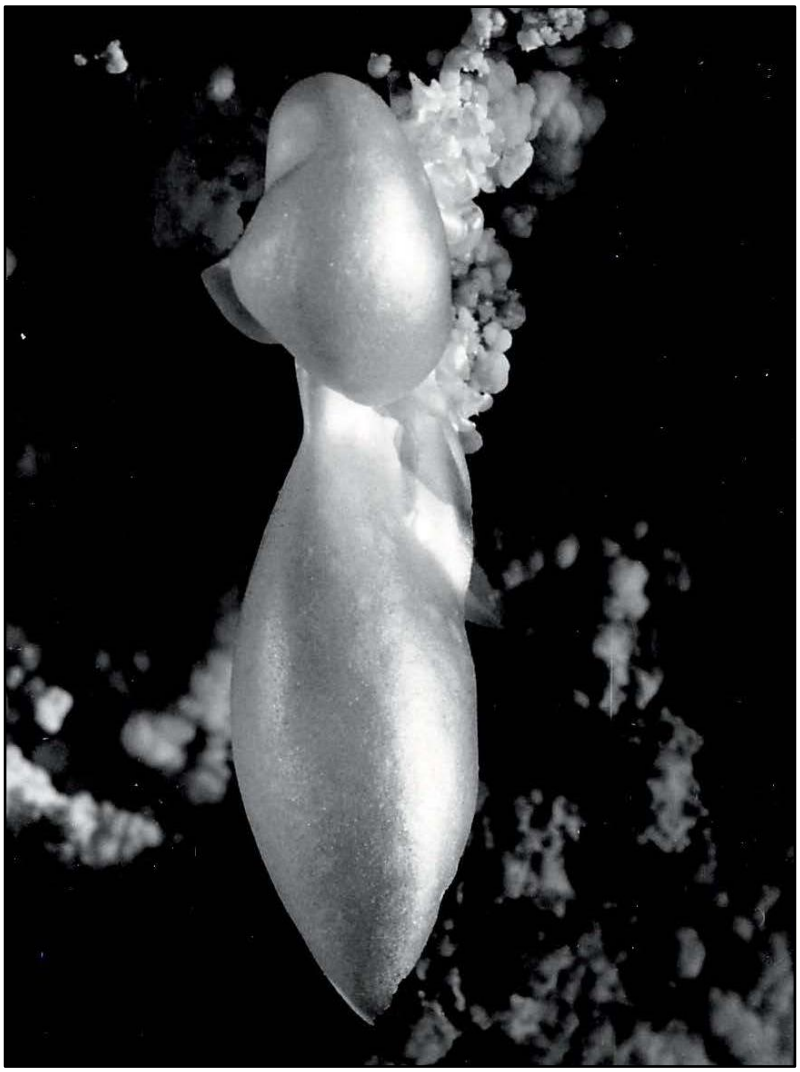


Figure 97. A photograph of hydromagnesite balloons by Art Palmer, ca. 1984.

Source: NPS, Jewel Cave NM.

Margaret V. Palmer to Dennis Ditmanson, January 7, 1985, both in Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 4.

[141] Art & Peg Palmer to Steve Holder, Brian Adams, August 10, 1989, Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF.

[142] A. & P. Palmer to Jewel Cave staff, June 10, 1988.

[143] Summary of Research Activities, Jewel Cave National Monument, 1988.

Starting in 1984, Jewel Cave managers applied to the NPS Research Center at the University of Wyoming to fund studies at Jewel Cave.[144] Wind Cave or Jewel Cave staff attended research center meetings to keep the center apprised of ongoing research and to discuss new funding needs, such as a vegetation survey in 1985.[145] The center funded a study to identify "man-caused introductions of water and pollutants into both Wind Cave and Jewel Cave," which was completed by Dr. Calvin Alexander, Marsha Davis (a graduate student and a seasonal employee at Jewel Cave), and Scott Alexander (no relation to Calvin).[146] The study's goals were

> 1) to evaluate the water distribution within these two park areas;
>
> 2) to determine the effects of human impact upon the natural hydrologic system;
>
> 3) to document any detrimental effects to the water quality;
>
> 4) to document any instances in which the cave environment is adversely affected by the quality or quantity of the water present; and
>
> 5) to provide options to present water use practices, if necessary.[147]

Their study dispelled the long-held notion that an area known as the New Wet Room was receiving water from the parking lot. Davis, Alexander, and Alexander instead proved that the parking lot drainages directed water in a different direction, with some entering the cave at locations on and near the Spelunking Tour route. They concluded that the monument's sewer system, parking lots, and fuel storage tanks, as well as Highway 16, were all "potential sources of contamination to the Cave." The sewage lagoon was already contaminating the cave and was in danger of contaminating the monument's water supply wells.[148] The hydrology study strongly influenced cave resource management in the 1980s and for decades to come. (See the Maintenance section below for cave managers' responses to these findings.)

Interagency Cave Resource Protection

NPS managers at Jewel Cave and Wind Cave coordinated with the Forest Service, the Bureau of Land Management (BLM), and other federal agencies for effective cave resource management. In 1987, the NPS signed a service-wide memorandum of understanding (MOU) with the BLM for

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[144] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 4.

[145] Steve Holder to Ken Diem, August 25, 1988, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF; Summary of U.W.-N.P.S. Research Center 1985 Research Projects, 1985, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

[146] E. Calvin Alexander and Marsha Davis, "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2," August 1987, Cabinet 3, Drawer 2, Folder N3023 Hydrology Study 2nd Year Final Report, Jewel Cave NM CF; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 13; Superintendent's Annual Report, Jewel Cave National Monument, 1988, 6; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 6.

[147] Alexander and Davis, "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2," August 1987, 1.

[148] E. Calvin Alexander and Marsha Davis, "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2," August 1987, 13, National Park Service Electronic Technical Center (hereafter eTIC); Alexander and Davis, "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2," August 1987, 4–5; Wiles, comments on draft, April 7, 2020.

planning and program coordination. The MOU was not specific to caves, but it laid the groundwork for cooperative management of mineral and other underground resources.[149]

In 1985, US Senator Bill Bradley (D-NJ) introduced a bill (S. 1453) that would establish a Sioux National Park in the Black Hills. The new park would be administered by the Sioux Nation, which the legislation defined as "Lakota, Dakota, and Nakota bands who were members of the alliance referred to as the Seven Council Fires." That definition encompassed eight federally recognized tribes: the Cheyenne River Sioux, Crow Creek Sioux, Lower Brule Sioux, Oglala Sioux, Rosebud Sioux, Standing Rock Sioux, Santee Sioux of Nebraska, and the Sioux Tribe of the Fort Peck Reservation. The legislation required the federal government to convey to the "Sioux Nation" all federal lands within the Great Sioux Reservation, as defined by the treaty of April 29, 1868. The land area included Jewel Cave National Monument.[150] Jewel Cave managers had no comment on the proposal as of March 1987. Congress did not pass the bill to establish the park.[151]

In 1988, US Representative Rick Boucher (D-VA) and Senator Tom Daschle (D-SD) introduced bills for a Federal Cave Resource Protection Act. Boucher's bill was cosponsored by 29 other members of the House, and Daschle's bill was cosponsored by 7 other Senators. The impetus for the legislation was a Congressional Research Service (CRS) report that had found that "existing land management laws are broad enough to permit management of cave resources, but they do not expressly address that goal or compel that result."[152] US Representative Bruce Vento (D-MN), a cosponsor, explained the need for this legislation on the floor of the House:

> there are approximately 40,000 known caves in the United States. A significant number of these caves are located on Federal lands, including over 4,200 caves on BLM and Forest Service lands alone. . . . Existing general land management laws provide little consideration to Federal cave resources specifically. As such, many caves, while still in relative obscurity, are open to indiscriminate use that has raised concerns with those interested in the scientific, educational, and recreational resources that caves have to offer.

Vento noted that the bill would require federal agencies to consider caves during environmental review and other land management processes. Other legislators emphasized that it would not add costs for agencies, since it would simply require federal agencies to take caves into consideration during already-occurring planning processes. Vento clarified that the bill was "by no means intended to stifle use of caves but its purpose is rather to prevent indiscriminate use of caves that could inflict permanent damage on the natural resources contained within."[153]

US Representative Manuel Lujan Jr. (R-NM), another cosponsor, highlighted the archeological importance of caves, since many caves in New Mexico contained Indigenous ruins or artifacts. Lujan

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[149] Memorandum of Understanding Between BLM and NPS for Planning and Program Coordination, January 29, 1987, Cabinet 1, Drawer 2, Folder A54 Inspections, Surveys, Appraisal, Jewel Cave NM CF.

[150] 131 Cong. Rec. 19333–19336 (July 17, 1985).

[151] Statement for Management, Jewel Cave National Monument, March 1987, 25.

[152] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., pp. 49–50 (June 16, 1988) (statement of US Senator Tom Daschle).

[153] 134 Cong. Rec. H1187 (daily ed. March 28, 1988).

applauded the civil and criminal penalties in the bill that would to enable federal land managers to punish those who damaged cave resources. The bill, Lujan reminded Congress, would allow "controlled exploration" in some cases, and in other cases, it would allow "the Secretaries of Agriculture and Interior to keep in confidence the location of caves if they can not be adequately protected. The Secretaries are also provided with a process to exempt caves from this act, after public comment."[154]

The Reagan administration initially opposed the Federal Cave Resource Protection Act, concerned that it would add more rounds to the planning process.[155] The Forest Service was skeptical, worried that cave protection would outrank other uses for the land. Forest Service Associate Chief George M. Leonard argued,

> . . . not every void, cavity or recess on the Federal lands is worthy of protection. Many are truly insignificant. And even where a cave may possess some value, there is a need to provide some way for weighing that value against the value of other potential uses.

Leonard opposed the bill until it allowed more discretion for department heads to "make judgments as to significance or to balance the value of the cave resource against other multiple use values of the area."[156] The Forest Service also requested clearer provisions for criminal penalties and clearer explanation of how the act would relate to federal mining laws. Leonard asked, "What are the rights and duties of the United States when a cave is discovered in the course of lawful mineral activities?"[157] While voicing his opposition to the bill, Leonard also admitted that the Forest Service had "not made substantial progress in dealing with cave resources" and that a "negligible amount" of the Forest Service budget went to cave management.[158]

US Senator Tom Daschle (D-SD) testified in support of protecting caves, especially those in South Dakota. He brought John Scheltens, a caver, to the congressional hearings.[159] Scheltens had taken Daschle caving at Wind Cave, which helped to open Daschle's eyes to the importance of protecting caves. Daschle explained,

> When I was first approached on this issue, I must confess I was unsure about the need for protective legislation. However, after going on my maiden spelunking expedition with my close friend John Scheltens, who is here today testifying on behalf of the National Speleological Society, and reading

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[154] 134 Cong. Rec. H1187 (daily ed. March 28, 1988).

[155] 134 Cong. Rec. H1187 (daily ed. March 28, 1988).

[156] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., pp. 36–37 (June 16, 1988) (statement of George M. Leonard, Associate Chief, US Forest Service).

[157] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., p. 41 (June 16, 1988) (statement of George M. Leonard, Associate Chief, US Forest Service).

[158] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., p. 44 (June 16, 1988) (statement of George M. Leonard, Associate Chief, US Forest Service).

[159] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., p. 49 (June 16, 1988) (statement of US Senator Tom Daschle).

> more about the subject, I became convinced that caves are indeed a national resource that we must act to preserve.
>
> And yet, in spite of the significance of America's caves, they're being incredibly abused today. There are hundreds of documented examples of malicious destruction. Some have been turned into toxic waste dumps, others into shooting ranges, and in hundreds of cases, graffiti have permanently destroyed the aesthetic and natural beauty of many of these sites which are obviously millions of years old. In Carlsbad Caverns, it is estimated that more than 10,000 formations have already been broken.
>
> Thus far, efforts to protect these caves have been inconsistent and completely inadequate. For caves that are integrally included in some Federal land management plans, they're not even mentioned in others. And the reason is simple. There is no specificity with regard to the importance of cave resources or their management in Federal law today.

Daschle said the bill was "overdue" and "a modest step," but one that the NSS and conservation organizations supported.[160] He also emphasized the need for a confidentiality provision in the bill:

> Currently, cave enthusiasts have more extensive knowledge about the location and nature of caves on federal land than many federal land managers. The caving community, however, is reluctant to reveal cave sites, fearing that such disclosure will result in abuse of caves. My bill encourages caving organizations to share these site locations with federal officials with the understanding that only governors or scientists with special needs will be told of their existence.
>
> This provision is key. We cannot expect federal land planners to protect a resource they do not know is in existence. Cooperation and interaction between the speleological community and the government will help ensure that land managers understand the nature and extent of their sub-surface resources and make wise land use decisions based on that knowledge.
>
> There is precedent for this kind of withholding provision. The Archaeological Resources Protection Act of 1979 (ARPA) has worked well to protect archaeological resources by allowing the withholding of information in certain circumstances.[161]

Jer Thornton of the American Cave Conservation Association also stressed the need for a confidentiality provision. Thornton said, "Cavers know where the resource is but often won't tell a federal agency for fear of vandalism."[162]

On November 18, 1988, Congress passed the Federal Cave Resource Protection Act (FCRPA). In its final form, the FCRPA provided statutory protections for caves that had previously been nonexistent. It defined caves, distinguished between significant and non-significant caves, set civil and criminal penalties for violation of the act (fines from which would go to protect cave resources), and protected information about cave locations. It did not alter existing mineral rights or laws. The act required the secretary of the Interior to issue regulations within nine months of the act's passage,

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[160] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., pp. 49–50 (June 16, 1988) (statement of US Senator Tom Daschle).

[161] *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., p. 53 (June 16, 1988) (statement of US Senator Tom Daschle).

[162] Betsy Marston, "Caves: Hidden, but Vulnerable," *High Country News*, December 21, 1987, in *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong., p. 58 (June 16, 1988).

establishing criteria to determine the significance of cave resources. After that, the act directed the secretary of the Interior to (1) identify an initial list (that would be updated periodically) of significant cave resources on Department of the Interior (DOI) lands "after consultation with appropriate private sector interests, including cavers," (2) regulate and/or restrict the use of caves deemed significant under the established criteria, (3) enter into "volunteer management agreements with persons of the scientific and recreational caving community," and (4) appoint appropriate advisory committees.[163] (See Appendix C for full text of the FCRPA). Agencies took different approaches: the NPS decided to declare all caves as significant, while the Forest Service adopted a nominating process for determining which caves would be considered significant.[164]

Following the passage of the FCRPA, the Forest Service signed a service-wide MOU with the NSS. The MOU declared that, since "increased cooperation will promote better management of non-renewable cave resources and that our joint efforts will have long term benefits for the American public," specific national forests could make agreements with NSS grottos to protect and manage cave resources.[165] The Forest Service had not hired staff specializing in cave resources at that point, so the agreement with the NSS provided a convenient way to access cave experts and comply with new FCRPA regulations. NSS members would, among other things, develop cave management plans, inventory cave locations and resources, install and maintain cave gates and signs, monitor visitor use and compliance with regulations, conduct informational and educational programs, provide surveying and cartographic assistance, provide administrative support for cave resource programs, conduct cave cleanup, research cave resources, and develop cave search and rescue plans.[166]

At Jewel Cave, cave resource protection became more challenging because new discoveries were located primarily under Forest Service land. As of 1988, 12 percent of the known cave was outside of the surface boundary of the monument, and just one year later, that figure jumped to 17 percent.[167] NPS managers discussed "a possible resource protection zone consistent with known cave resources." The zone could be expanded to the east and southeast as cavers discovered more passageways. Acting Unit Manager Brian Adams reported in 1987 that a plan "to seek additional land for the Monument" was under debate and would be addressed as part of the monument's upcoming GMP process. NPS managers were not concerned about selective logging and grazing, but they worried about the effects that mining operations and watershed alterations on Forest Service lands could have on the cave.[168] In 1988, the monument's Natural Resources Program

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[163] Act of November 18, 1988, 102 Stat. 4546 (P. L. 100-691).

[164] Wiles, comments on draft, April 7, 2020.

[165] Memorandum of Understanding between the U.S. Department of Agriculture – Forest Service and the National Speleological Society, September 30, 1988, 1, Cabinet 1, Drawer 2, Folder A54 Inspections, Surveys, Appraisal, Jewel Cave NM CF.

[166] Memorandum of Understanding between the U.S. Department of Agriculture – Forest Service and the National Speleological Society, September 30, 1988, 1–2.

[167] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 6; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 6.

[168] Brian Adams to Terry Kilpatrick, February 3, 1987, Cabinet 3, Drawer 4, Folder L1425 Holdings other than Federal, Jewel Cave NM CF.

Review identified as a top resource management issue the need to prevent loss of cave resources due to mining, especially because newly discovered cave passages were almost entirely under Forest Service lands.[169]

To ensure that cave resources would be protected, the NPS began working with the Forest Service and the BLM on a Mineral Entry Withdrawal and Mineral Assessment Report in 1988. They proposed to withdraw approximately 5,000 acres from mining entry, similar to the withdrawal completed in 1961.[170] The BLM participated because it managed mineral rights on federal lands, while the Forest Service owned the land. Wiles worked with Rusty Dersch, the head geologist in the Forest Service's Denver office, to determine the extent of the withdrawal.[171] The following year, the Forest Service contracted out a mineral report and a legal survey of the monument. Holder noted that "this will be the first legal survey of the Monument and we look forward to completion of this project."[172]

The Forest Service and BLM finalized the mineral withdrawal in 1990. The agreement withdrew 2,387.22 acres on Forest Service land from mineral entry for 20 years, with an option for the secretary of the Interior to extend the period of withdrawal.[173] Although temporary, it ensured the protection of Jewel Cave in the immediate future and continued a strong tradition of interagency cooperation in cave management. District Ranger Frank Cross praised the partnership, declaring that "Jewel Cave and the United States Forest Service – BHNF have a great relationship."[174]

Surface Resource Management

The NPS coordinated with the Forest Service and local government to protect surface resources at Jewel Cave. Most of the NPS surface resource management consisted of weed control, monitoring for grazing trespass, and preliminary surface resource studies. The 1976 Statement for Management and the 1983 RMP set the following objectives regarding surface resources: "To conserve and perpetuate all native flora, fauna and ecological processes in as near a pristine condition as possible" and to foster native plants and animals "through appropriate programs for controlling exotics."[175] As was the case with underground resources, the monument had little baseline information regarding surface natural resources. Ditmanson commented that "informed management is impossible without such data," and he suggested developing a comprehensive plant

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[169] Wiles, "Jewel Cave Exploration from 1979 to 2005"; Natural Resources Program Review, Jewel Cave NM, 1988, Cabinet 3, Drawer 4, Folder NN2215 Area Research Plans, Jewel Cave NM CF.

[170] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 6.

[171] Summary of Research Activities, Jewel Cave National Monument, 1988; Wiles, interview.

[172] Steve Holder, Memorandum: Status of Withdrawing Lands from Mineral Location Around Jewel Cave National Monument," January 3, 1989, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF; Charles J. Hendricks, Director, Watershed, Soils, and Minerals Area Management, to Steve Holder, October 30, 1989, Cabinet 3, Drawer 2, Folder A94 – Dept. of Agri. – Forest Service, Jewel Cave NM CF.

[173] 55 Fed. Reg. 20766 (May 18, 1990).

[174] Frank J. Cross to Black Hills National Forest Supervisor, March 29, 1989, Cabinet 3, Drawer 4, Folder L1417 Boundary Adjustments, Jewel Cave NM CF.

[175] Statement for Management, Jewel Cave National Monument, March 1987, 5.

inventory and compiling other wildlife resource information.[176] Jewel Cave staff eventually completed a vegetation inventory, bird list, and reptile study.[177]

Weed control in the 1970s focused on the eradication of Canada thistle under a cooperative program with the state of South Dakota. In 1973, two rangers surveyed 90 grids at the monument and identified and treated just 12 dense patches of thistle (noxious weeds were relatively scarce at Jewel Cave prior to the Jasper Fire in 2000). They applied Banvel chemical spray and cut flowering plants, mostly found on disturbed land. Because the thistle was widespread throughout the Black Hills, managers expected it to return to the monument. "For this reason," they decided, "it is advisable that a yearly survey of the monument be taken to determine and stop regeneration of this weed."[178] The treatment program continued for the next few years with success, and by 1975, crews had nearly eradicated the heaviest concentration of thistle along Highway 16 in Hell Canyon. They found no new concentrations along the road the following year.[179] Park Ranger Larry Dilts reported that the Banvel treatments had been effective and "very few plants were found this year."[180] The thistle eventually returned, however. The 1983 RMP recommended ongoing thistle eradication, along with upgrading the herbarium, monitoring beetles, conducting a vegetation baseline study and a soil survey, and preparing a vertebrate inventory.[181]

No grazing permits were issued on monument lands, but cattle continued to trespass from neighboring allotments, constituting "the single most unnatural influence imposed on the monument which is otherwise managed as a natural area." Transient cattle—as many as 45 in one day—consumed water and forage that wildlife depended upon and introduced noxious weeds.[182] A lack of fencing contributed to the problem: at the time, the monument had about six miles of border and only about one-and-a-half miles of fencing.[183] Rocky Mountain Acting Associate Regional Director James A. Randall pointed out that it was the cattle owner's responsibility to keep livestock off monument land and preferred that the Forest Service provide funding for fencing.[184] The

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[176] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 4, 16, Cabinet 3, Drawer 4, Folder N16 Management of Natural Resources and Area, Jewel Cave NM CF.

[177] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 3.

[178] "Canadian Thistle Project, 1973," 1973, Cabinet 3, Drawer 2, Folder N50 Pest and Weed Control, Jewel Cave NM CF.

[179] Larry D. Dilts, Memorandum: Canadian Thistle Eradication, August 22, 1975, Cabinet 3, Drawer 2, Folder N50 Pest and Weed Control, Jewel Cave NM CF.

[180] Dilts, Memorandum: Canadian Thistle, June 30, 1976.

[181] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 8–10, 16.

[182] Management Assistant, Jewel Cave National Monument to Superintendent, Wind Cave National Monument, Memorandum: Cattle Trespass, November 22, 1976, 2, Cabinet 3, Drawer 4, Folder L24 Encroachments, Jewel Cave NM CF; Stephen M. Hurd, Memorandum: Cattle Trespass in Jewel Cave National Monument, December 5, 1974, Cabinet 3, Drawer 4, Folder L24 Encroachments, Jewel Cave NM CF.

[183] Management Assistant, Jewel Cave National Monument to Superintendent, Wind Cave National Monument, Memorandum: Cattle Trespass, November 22, 1976, 2.

[184] Randall to Superintendent, Wind Cave National Park, Memorandum: Boundary Fencing, Cabinet 3, Drawer 4, Folder L3019 Land Use (special) Grazing, Jewel Cave NM CF.

agencies cooperated to add some fencing on the south side of Highway 16, but it deteriorated within a decade.[185]

Another issue related to cattle arose in 1989, stemming from the terms of the 1965 land exchange between the Forest Service and the NPS. A Forest Service cattle watering station, known as Prairie Dog Spring, had become part of the monument through the exchange. The Forest Service continued to use the spring, as the exchange legislation had provided, by pumping water onto adjacent Forest Service land for livestock. By 1989, the equipment was in a poor state of repair and the surrounding land was overgrazed. Fred L. Way, wildlife biologist with the Black Hills National Forest's Elk Mountain Ranger District, recommended dismantling the existing structure and converting the spring into a water source for wildlife, as well as a source of water and insects for bats to feed on. The NPS could develop educational or interpretive signage for the area.[186]

Fire Management

The possibility of fire within monument boundaries had increased as a result of the 1965 land exchange. The land added to the monument had previously been managed by the Forest Service for commercial timber production. After the exchange, the "explosion of young ponderosa pine" (known as dog hair growth), a pattern of trees dying along the Highway 16 corridor, and a 75-year program of complete fire suppression resulted in an area of high fire risk. On average, the Black Hills area experienced 138 fires a year, burning some 780 acres.[187]

Managers recognized that the history of total fire suppression posed problems for fire management and created conditions that could lead to a "catastrophic fire." They reported that "past suppression action has caused an explosion of hazardous fuel, which will require continual suppression action." Jewel Cave completed hazardous fuel reduction activities, like mechanical thinning and slash pile burning, in cooperation with the Forest Service and Wind Cave.[188] The 1983 RMP specified that "all wildfires within the Monument are suppressed due to the extensive, high-value developments located here, its small size and its proximity to neighboring commercial timber." However, the plan also recommended prescribed fire in the monument as an alternative to mechanical trimming and slash burning.[189]

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[185] Dennis L. Ditmanson to Associate Regional Director, memorandum, December 18, 1986, Cabinet 3, Drawer 4, Folder L24 Encroachments, Jewel Cave NM CF.

[186] Fred L. Way, Wildlife Biologist, Elk Mountain Ranger District, Black Hills National Forest, "Inspection of Prairie Dog Spring with Jewel Cave Personnel," Cabinet 3, Drawer 4, Folder L3019 Land Use (special) Grazing, Jewel Cave NM CF.

[187] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 16, 23.

[188] Herschel E. Schultz and James R. Ellenwood III, "Fire Management Plan, Jewel Cave National Monument, 1986," [pdf 30–31], Cabinet 2, Drawer 2, Folder Y14 Wildland Fire Mgt, Wildland Fire Plan, Jewel Cave NM CF; Marvin J. Liewer to Albert Hendricks, June 5, 1980, and Lee R. Sutton to Al Hendricks, July 3, 1980, both in Cabinet 1, Drawer 4, Folder Y1419 Wildland Fire Suppression, Jewel Cave NM CF.

[189] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 23–24.

In 1986, the NPS produced a Fire Management Plan for the monument that further promoted the concept of prescribed burns. The plan described the role of fire in the past as producing nutrients, thinning young seedlings, and opening up parts of the forest for new growth. It noted that fire was "not the destructive agent it once was thought to be" but was, "in fact, an important factor in maintaining this forest ecosystem." The plan called for a "long range program to restore the role of fire on the Monument."[190] Managers hoped that continued mechanical thinning would eventually make the area suitable for management through prescribed burning, and they recommended that Wind Cave and Forest Service personnel assist with prescribed burn events, including interagency cooperative burns in areas near the monument boundaries.[191]

The NPS conducted the first-ever prescribed burn at Jewel Cave in October 1986. It was carried out "in cooperation with the Black Hills Interagency Fire Group," with some 45 personnel from several state and federal agencies participating. As part of a training course called "Prescribed Fire for Practitioners," three days of classroom instruction preceded the "field exercise" on Thursday October 30, when fire was applied to a "44-acre area of open-grown ponderosa pine/meadow." The monument remained open during the exercise, with a park ranger on hand "to interpret the park's prescribed fire program and to answer visitor questions."[192]

In 1989, Jewel Cave, Wind Cave, Devils Tower, Mount Rushmore, and the Black Hills National Forest signed a five-year MOU outlining procedures for each agency in responding to wildfires in the area. The agency detecting the fire would promptly notify the other agency's dispatch center to facilitate quick deployment of fire crews. Each agency had specific response responsibilities, depending on the fire's location and Burning Index. For a Burning Index of moderate and above, NPS crews from Wind Cave and Jewel Cave were required to respond to all reported fires on Forest Service land within three miles of park boundaries and, if requested, would respond forest-wide.[193] Another agreement that year between Jewel Cave and the Black Hills National Forest required staff from each agency to cooperate in developing action plans. They agreed to meet at least annually to consult on "vegetation/timber management programs that may impact each agency's resources and resolve concerns early in the planning process."[194]

Cultural Resources

The primary cultural resource management activity in this period related to the Civilian Conservation Corps (CCC) ranger cabin. In 1981, as a result of a field survey of the cabin, Rocky

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[190] Schultz and Ellenwood III, "Fire Management Plan, Jewel Cave National Monument, 1986," [pdf 6].

[191] Schultz and Ellenwood III, "Fire Management Plan, Jewel Cave National Monument, 1986," [pdf 30–31].

[192] Dennis L. Ditmanson, "News Release: Jewel Cave Announces Fall Prescribed Burn," October 21, 1986, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning Jewel Cave NM CF.

[193] Memorandum of Understanding between The Black Hills National Forest and Devils Tower National Monument, Mount Rushmore National Memorial, Jewel Cave National Monument, and Wind Cave National Park, 1989, Cabinet 1, Drawer 2, Folder A54 Inspections, Surveys, Appraisal, Jewel Cave NM CF.

[194] Interagency Agreement Between National Park Service, Jewel Cave National Monument and United States Forest Service, Black Hills National Forest, 1989, Cabinet 2, Drawer 2, Folder Y1421 Wildland Fire Prescribed Fire, Jewel Cave NM CF.

Mountain Regional Director (and former Jewel Cave Management Assistant) Jim Thompson concluded that it was eligible for nomination to the National Register of Historic Places. He instructed the regional office to submit a nomination. Maintenance crews reroofed the building and removed a "a nonconforming, modern addition."[195] They also took steps to improve the appearance of the area and "to restore an exterior 'historic scene'" by removing chain link fencing, dilapidated housing, overhead wiring, and asphalt trail surfaces, and regrading and reseeding areas after the removals.[196]

The 1983 RMP laid out a broader cultural resource management program for the monument. It provided an overview of the monument's cultural resources and ideas for preservation and interpretation:

> Cultural resources at Jewel Cave National Monument are limited to certain developments at the historic entrance to the cave which were constructed by members of the Civilian Conservation Corps in the early 1930's. These developments included the ranger cabin which also functioned as an administrative center, the trail to the entrance and the entrance itself. . . .
>
> Long range plans are to restore the historic scene so that visitors to this part of the Monument will have an experience reminiscent of that which could have been received in the early years of the National Park Service operation at Jewel Cave.[197]

However, the NPS lacked data about the "historic scene" that could guide restoration of the area. The RMP therefore identified preparation of a Historic Resource Study (HRS) as the monument's top cultural resource management priority. Information from an HRS would inform restoration of historic structures and interpretation at the monument.[198] The RMP recommended further study of the historic CCC cabin to identify needs beyond the minor historic preservation work that had just been completed.[199] It also recommended identifying and interviewing former CCC members who had worked at the Jewel Cave camp, a project of some urgency since that group was aging.[200] In 1987, the revised Statement for Management again listed as one of the monument's many objectives the need "to research the cultural history of the monument and provide for the preservation of such

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[195] Harrison Goodall, Field Survey, April 29, 1980, File 3390c, Jewel Cave NM MF; DOI, NPS, RMR, As Maintained Roads and Trails within Jewel Cave National Monument, May 30, 1975, eTIC; Rocky Mountain Regional Director James B. Thompson to SD State Historic Preservation Officer Junius Fishburne, February 4, 1981, File 3393e, Jewel Cave NM MF.

[196] Additions to Assessment of Effect Form, undated [May 1984], File 3387h, Jewel Cave NM MF; Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 15–16; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 7.

[197] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 32.

[198] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 32.

[199] Rocky Mountain Regional Office Historic Preservation Team, Historic Administration Building Pres., Jewel Cave National Monument, blueprint, approved April 27, 1982, eTIC.

[200] Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument, May 5, 1983, 34.

resources as may be deemed significant." It reiterated the need to document the role of the CCC at Jewel Cave and to preserve the historic ranger cabin.[201]

Archeological Investigations

There were almost no archeological investigations at the site in the 1980s. One exception came in 1984, when the NPS proposed several "dugouts" on Forest Service land adjacent to the monument in order to collect soil for the monument's sewage system. After the soil was removed, the dugouts would be used by the Forest Service for watering livestock and wildlife. Because the project involved ground disturbance, it required an archeological survey to comply with Section 106 of the 1966 National Historic Preservation Act (P.L. 96-515).[202] Forest Service archeologists completed the archeological survey and made recommendations for mitigation, which the NPS would need to complete since it was an NPS project.[203]

Administrative History

As Jewel Cave's staff grew, managers considered how to use the monument's history to inform management. In 1984, Ditmanson requested funding for an administrative history of the monument, since "much of the early history of the Monument has already been lost."[204] He noted, "As the status of Jewel Cave continues to grow with the ever-increasing mileage, knowledge of how the area was set aside and how it developed will become more important." Many with knowledge of the early history of the monument were elderly, and while some had been interviewed as part of a 75th anniversary celebration in 1984, others had not.[205]

In 1986, Ditmanson applied to the NPS Research Center at the University of Wyoming for funding to "compile an oral history of the exploration of Jewel Cave" to supplement Herb and Jan Conn's recently published book, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota*.[206] Ditmanson wrote,

> Herb and Jan Conn, the primary explorers of Jewel Cave, have written of their experiences in The Jewel Cave Adventure. The book, however, does not deal with the subject of how National Park Service officials perceived or dealt with the tremendous discoveries the Conn's were making. The book also stops its narrative in the late 1970's and does not cover how the other individuals involved

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[201] Statement for Management, Jewel Cave National Monument, March 1987, 10–11, 26.

[202] An Act of October 15, 1966, 80 Stat. 915 (P.L. 96-515).

[203] Lance W. Rom, "A Level III Cultural Resource Inventory of the Jewel Cave Dugouts," June 1984, Cabinet 3, Drawer 1, Folder Archeo Resource for Pole Barn, Jewel Cave NM CF.

[204] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 2; DOI, NPS, Development/Study Package Proposal, Research & Prepare an Administrative History, March 30, 1984, Cabinet 2, Drawer 3, Folder D2215 #118 Admin. History, Jewel Cave NM CF.

[205] NPS, "Anniversary Publication Underway for Jewel Cave National Monument," press release, April 15, 1983; DOI, NPS, Development/Study Package Proposal, Research & Prepare an Administrative History, March 30, 1984.

[206] Herb and Jan Conn, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota* (St. Louis: Cave Books, 1977), 21–64.

> in the exploration felt about the significance of what they were finding. This study should produce both taped and transcribed data for future inclusion in a larger administrative history of the Monument.[207]

The center, however, funded scientific research topics, not historical ones, so it did not support the oral history project.[208] Jewel Cave unit managers submitted additional requests to the Rocky Mountain Regional Office for an administrative history through 1989, but none were fulfilled.[209] This was perhaps indicative of a disparity that existed between parks in the Rocky Mountain Region, where several large, complex parks (Yellowstone National Park, for example) intensified competition for funding within the region, sometimes to the detriment of smaller park units. This disparity did not exist within the Midwest Region, where most parks were smaller and thus operated on a more level playing field.[210]

Museum Collection

In 1986, Jewel Cave staff updated and reorganized the interpretive goals for the museum collection under three broad themes:

1. The Geology of Jewel Cave – the formation of the cave; scientific significance of various cave formations; uniqueness of Jewel Cave.
2. The Story of Man and Human Events Connected to Jewel Cave – discovery, early attempts at mining and tourism, exploration, surveying and mapping, National Monument status, NPS activities, development, the future.
3. The Natural History of the Surface Area of Jewel Cave National Monument – wildlife, Ponderosa Pine forest, fire ecology, plants.[211]

Items in the collection could be used for exhibits and interpretive programs, and they could be made available for researchers to study.[212]

In 1989, the Rocky Mountain Regional Office initiated a review of all parks' museum collections to ensure compliance with regulations and "long-term preservation" of collections.[213] The inspection of Jewel Cave revealed that the monument needed to "upgrade collection management to conform with present [NPS] standards." Storage facilities and collection security were not adequate for proper

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[207] Dennis Ditmanson to Kenneth L. Diem, September 26, 1986, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

[208] Ken Diem to Park Superintendents and Concerned Natural Resource Managers and Research Scientists, August 1, 1988, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

[209] Outline of Planning Requirements, Jewel Cave National Monument, May 15, 1986, 2; Outline of Planning Requirements, Jewel Cave National Monument, June 2, 1989, 1–2.

[210] Cockrell to Greenwald, April 7, 2020.

[211] Herschel E. Schulz, "Jewel Cave National Monument Scope of Collection Statement," January 10, 1986, 1–2, Cabinet 3, Drawer 1, Folder H20 Collections Management & Preserv. (I. Cultural A. Museum), Jewel Cave NM CF.

[212] Schulz, "Jewel Cave National Monument Scope of Collection Statement," January 10, 1986.

[213] Richard Strait to Superintendents Rocky Mountain Region, March 16, 1989, Cabinet 3, Drawer 1, Folder Museum Storage & Exhibit Space, Jewel Cave NM CF.

preservation of photographs, historic clothing, and a large cave exploration map. However, the monument's space and staffing limitations made collections management difficult.[214]

At the request of the Jewel Cave staff, a park curator and museum technician from Badlands National Park came "to begin to bring the collections management at Jewel Cave into complete compliance with National Park Service policies and procedures." They catalogued collections, suggested supplies and materials needed for proper storage, and installed the Automated National Catalogue System (ANCS) on the monument's computer.[215] After their visit, the park curator noted,

> The Chief Ranger and Site Manager are both interested and concerned about the collection, but with such a small staff and low budget they have little, if any, time to spend in the museum. But they DO want things done right, and would appreciate whatever support they can get from the Regional Office.

The curator called Jewel Cave's collection "small, neat," and "very manageable," commenting that it could easily be "a model collection, fully catalogued on ANCS," if funding became available.[216]

Interpretation and Education

The majority of Jewel Cave staff in the 1970s and 1980s were seasonal interpreters (see Figure 98). Al Hendricks later characterized Jewel Cave as "primarily an interpretive park . . . our primary responsibility to the public was making sure that they had the opportunity to see Jewel Cave, take a cave tour, and learn about the features there at the park."[217] Both interpretation and resource management fell under a single division chief, and since there were no resource management staff until 1985, the chief of interpretation, resource management, and visitor protection focused primarily on interpretation. While visitor numbers rose steadily, funding and staffing did not increase proportionately, which made accommodating the demand for cave tours increasingly difficult. The monument's cooperating association assisted with funding interpretive programs to ameliorate the shortage, but superintendents and unit managers continued to struggle with an underfunded interpretive program.



Figure 98. A park ranger staffs the information desk at the Jewel Cave visitor center, ca. 1974.

Source: NPS, Jewel Cave NM.

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[214] [illegible signature], Trip Report, February 15, 1989, Cabinet 3, Drawer 1, Folder Museum Storage & Exhibit Space, Jewel Cave NM CF.

[215] Jack W. Neckels to Superintendent, Badlands National Park, July 12, 1989, Cabinet 3, Drawer 1, Folder Equipment Needs, Jewel Cave NM CF.

[216] Valerie Naylor and Marjorie Glass, "Trip Report to the Regional Curator, Rocky Mountain Region," June 13, 1989, Cabinet 3, Drawer 1, Folder Museum Storage & Exhibit Space, Jewel Cave NM CF.

[217] Hendricks, interview.

Tours and Visitor Services



Figure 99. A tour group passes through the "Torture Room" along the Scenic Tour route, 1973.
Source: NPS, Jewel Cave NM.

In the early 1970s, Jewel Cave staff offered four different tours: the Scenic Tour (the most popular tour, which visitors accessed via the new cave elevator) (see Figure 99), the Historic Tour (from the Michauds' entrance to the cave), the Long Spelunking Tour (five to six hours), and the Short Spelunking Tour (three to four hours). Monument staff gave cave tours from Memorial Day to Labor Day, from 8:30 am until around 7:30 pm (the visitor center closed at 7:45 pm to give tour participants time to visit the bookstore before leaving).[218] In the wintertime, the Historic Tour was not offered, but the staff gave the Scenic Tour on the infrequent occasion that a visitor arrived and requested one. For example, on a February day in 1979, Hendricks noted that no one had arrived by 1:00 pm. Low visitation meant the lights in the cave remained off for most of the winter.[219] In the

[218] Hendricks, interview; Wiles, comments on draft, April 7, 2020; Jewel Cave National Monument, informational brochure (US GPO, 1972), File 712c, Jewel Cave NM MF; Statement for Management, Jewel Cave National Monument, March 1987, SFM-4.

[219] Al Hendricks, daily note log, February 10, 1979; June 24, 1979, from Hendricks' personal files; Wiles, comments on draft, April 7, 2020.

1980s, Jewel Cave offered from 3 to 30 tours per day, depending on staff availability and demand of visitors.[220]

Tour groups were limited to 25 people except for the Long Spelunking Tour and the Short Spelunking Tour, both of which were limited to 10 participants (see Figure 100).[221] Hendricks explained how the staff regulated tour size on the fly:

> There was a size limit on the tours. I don't know what it is today, but when I was there, it was twenty-five per tour, on the Scenic Tour. The rule of thumb was that if you had sold up to twenty-four tickets and five more people walked in, up to twenty-nine, you could sell the tickets up to twenty-nine. The moment you hit twenty-five, or a number between twenty-five and twenty-nine, you stopped selling tickets for that tour and you moved on to the next tour. We did not take reservations at that time. You had to actually physically show up to purchase tickets.

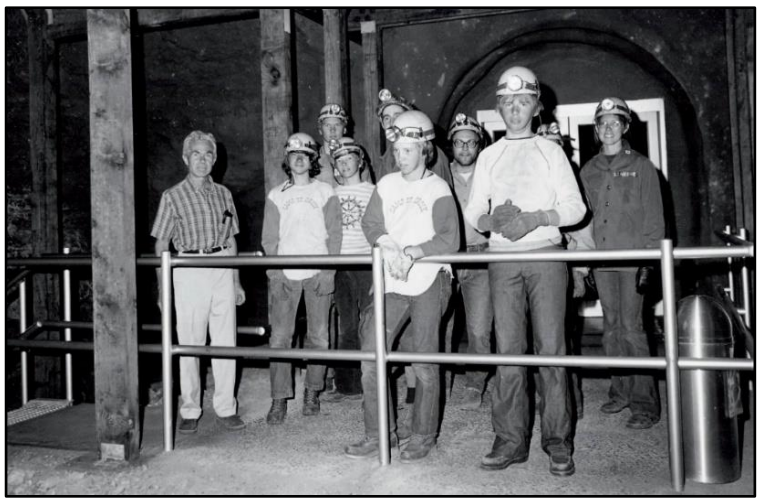


Figure 100. Herb Conn with a Spelunking Tour, state of South Dakota photograph, 1975.

Source: NPS, Jewel Cave NM.

Tours brought in significant funds for Jewel Cave, and although most it went to a general NPS fund rather than staying at the monument, collecting and depositing fees from the tours became a major part of the management assistant or unit manager's job.[222]

McClanahan wanted staff to wear Class A uniforms while giving all cave tours, which included wool pants and wide-brimmed NPS Stetson hats. Hendricks tried to explain to McClanahan that such attire was not practical for the Historic Tour. The dusty historic area mucked up uniforms, forcing staff to use their own money to dry-clean their wool pants (whereas the less formal uniforms could be washed in a machine at home). McClanahan insisted, however, so Hendricks invited him for a Historic Tour, which they took with seasonal ranger Bruce Bitz, all in their Class A uniforms. Hendricks explained how it went:

> So Bruce took us off on the left hand tour. I believe it was called the Dungeon Route. And that's when I learned that Les [McClanahan], apparently, is also claustrophobic. Which didn't help. So, standing in the first room in the cave, you can look out the natural entrance and you can still see

[220] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 14; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 3.

[221] Statement for Management, Jewel Cave National Monument, March 1987, SFM-4; Wiles, comments on draft, April 7, 2020.

[222] Hendricks, interview.

> daylight. It was a nice, bright day out. And so, the room was light, even though there's no electric lights; you can still see everything, it's just fine. But there is this kind of ominous feeling when the ranger goes over and closes the gate and puts the padlock on, because you're now locked in the cave. You can still see daylight, but if you're claustrophobic, that doesn't help. And sometimes even visitors would say, "You know, I think it's time for me to leave."
>
> But Les was apparently game. And off we went down the left-hand passage, following the whole tour group. Les and I brought up the rear. And almost immediately, you're practically on your hands and knees. And so in we go, and Les is in front of me. And I'm not saying a word. But I did happen to notice that within, I'd say, the first fifty feet, he knocked his Stetson off at least four or five times because it's so narrow. You can't keep it on. And it was probably about a five-minute trek to the next room that was big enough to hold the size of the group that we had; the visitors, and Les and me, of course. We were considerably late in arriving. But Bruce had waited for us. And then he gave his geology talk and told everybody about what they were seeing. And of course, Les and I, and Bruce, and all the visitors, were now pretty well covered with cave dirt. And when Bruce finished his talk and answering whatever questions there were, he said, "Okay, it's another five minutes to the next room that's large enough for all of us to gather in. Watch your head as you go on through, and just follow me." And off they went.
>
> Les turned to me, and he said, "Hendricks! You've made your point." And he turned around and without another word, he beelined it towards the exit.[223]

After that point, staff were not required to wear Class A uniforms while giving historic cave tours (see Figure 101).

Spelunking Tours were led by rangers who had served at least one year as a GS-4, who could then be hired as a GS-5 Spelunking Tour guide the following year (other tours could be led by lower-grade rangers).[224] On one four-hour Spelunking Tour in August 1975, a visitor got stuck in the "Brain Drain," a tight squeeze along the route. The visitor weighed around 240 pounds, and staff had already taken precautions ahead of the tour in case his size became an issue (two other employees had met the tour at an intersection near the Brain Drain).[225] Despite this, the visitor remained stuck for almost four full hours. Staff brought him blankets and a thermos of coffee to keep him warm. Staff eventually chiseled away dogtooth spar to extricate him from the squeeze.[226]

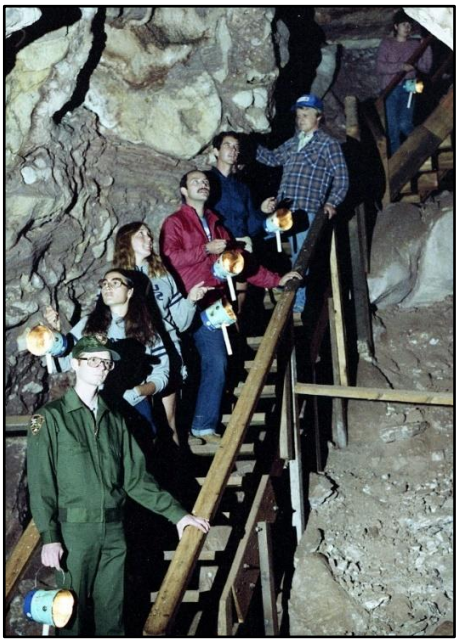


Figure 101. Jim Basinger leads a Historic Tour in the 1980s.

Source: NPS, Jewel Cave NM.

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[223] Hendricks, interview.

[224] Wiles, interview.

[225] DOI, NPS, Case Incident Record, August 3, 1975, Cabinet 1, Drawer 1, [loose in drawer], Jewel Cave NM CF; Thomas P. Martin, account, August 3, 1975, Cabinet 1, Drawer 1, [loose in drawer], Jewel Cave NM CF.

[226] John Roth, account, August 3, 1975, Cabinet 1, Drawer 1, [loose in drawer], Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

McClanahan considered discontinuing the Spelunking Tour after the incident, but Management Assistant Hurd recommended keeping it. Hurd argued that the Spelunking Tour was an important part of the interpretive program, and, if anything, the park simply needed more guides to lead it. Hurd also had an idea about how to prevent similar incidents:

> A handspan squeeze should be constructed of concrete that would simulate the Brain Drain. This would be placed behind the Visitor Center. All individuals would be required to go through this squeeze prior to being allowed to go through the Brain Drain.[227]

Staff constructed such a device and installed it outside of the visitor center (see Figure 102).

McClanahan discontinued the Long Spelunking Tour out of safety concerns. Even before the incident, staff had expressed concerns about groups coming out late and participants being overly exhausted. Dilts argued, as Hurd had, that the Spelunking Tour was an "important interpretive activity at Jewel Cave" that provided "the more hardy and adventuresome an opportunity to learn more about the cave and caving." He recommended having four guides on staff who could lead the Spelunking Tour.[228] But the tour consistently failed to bring in enough funds to pay for itself, which limited offerings. In 1979, thanks to a $4,500 budget surplus at Wind Cave, Jewel Cave increased Spelunking Tours to three times a week.[229]

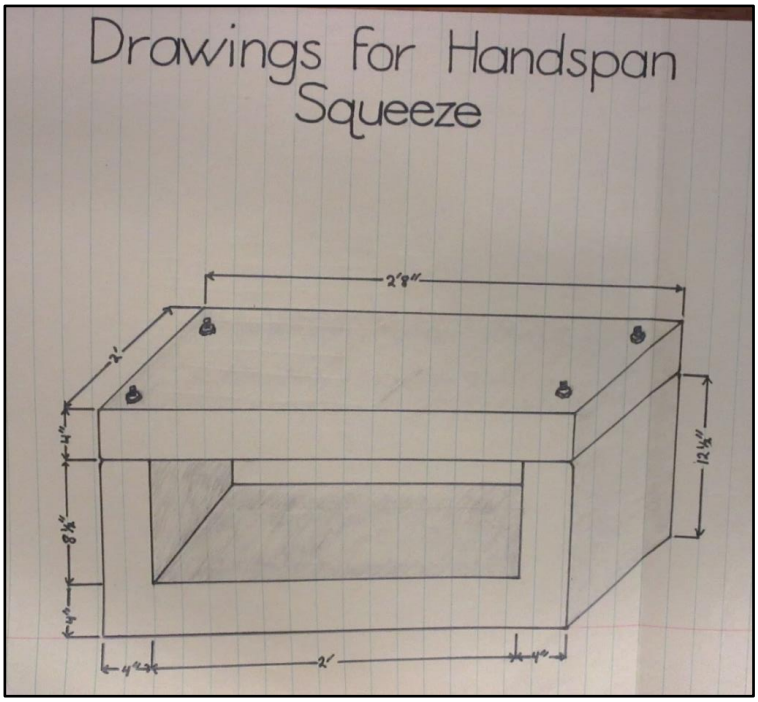


Figure 102. Jewel Cave managers developed a "Handspan Squeeze" to put outside of the visitor center, so that people thinking of going on the spelunking tour could simulate fitting through tight passages.

Source: NPS, Jewel Cave NM.

[227] Jewel Cave NM Management Assistant Stephen M. Hurd to Wind Cave National Park Superintendent, memorandum, October 10, 1975, Cabinet 1, Drawer 3, Folder K187 Interp Prospectus, Jewel Cave NM CF.

[228] Larry D. Dilts to Management Assistant, Jewel Cave, memorandum, October 9, 1976, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[229] Al Hendricks, daily note log, March 21, 1979, from Hendricks' personal files; Wiles, comments on draft, April 7, 2020.

To accommodate visitors who had to wait several hours for a tour during the busy summer months, Jewel Cave managers developed additional aboveground programs (see Figure 103). In 1977, Hendricks started scheduling short (15- to 30-minute) presentations by seasonal staff "during the busiest part of each day when visitors are waiting up to an hour and a half for a cave tour," which was usually from 11 am to 3:30 pm. During the 1977 season, staff presented 342 of these surface programs on topics such as "cave climbing techniques, demonstrations of the use of carbide lamps, Black Hills history, [and] fire ecology."[230] Interpretive staff continued to present these short, surface programs in the 1980s, expanding the topics to bats, exploration techniques, geology, and more.[231]



Figure 103. Park rangers developed short interpretive programs to give outside of the cave, so that people waiting for cave tours had something to do.

Source: NPS, Jewel Cave NM.

An interpretive nature trail provided another way to give those waiting for cave tours something to do. After years of planning, monument staff began working on the interpretive trail in 1981. Staff considered several options for a route. They wanted a trail long enough to play out an interpretive theme about the local environment, but short enough to allow for a quick return when the next cave

[230] Jewel Cave National Monument Objectives, 1979 FY, 1, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plans, Jewel Cave NM CF.

[231] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 3.

tour began. The agreed-upon route ran about 100 yards from the visitor center to a scenic overlook of Hell and Lithograph Canyons. It offered viewing of wildflowers, a large variety of grasses and forbs, ponderosa pine in various stages of maturity, and stumps illustrating the history of logging in the Black Hills. Numbered signs with accompanying pamphlets would explain the specific features, and a speaker mounted at the overlook could announce upcoming tours.[232] The Burlington Northern Railroad donated used railroad ties for trail construction, and Youth Conservation Corps (YCC) crews completed the trail in 1984.[233]

Managers asked for more staffing to meet the demand for tours, but little came through. During a period of leaner budgets in the early 1980s, the NPS Washington Office promoted increasing volunteer hours as part of "management efficiency." At Jewel Cave, Chief of Interpretation and Resource Management Herschel Schulz used volunteers and SCA interns to supplement paid interpretive staff. Schulz's efforts paid off: in 1982, volunteers had donated 289 hours for both interpretation and exploration, but only two years later, volunteers donated 2,296 hours to the interpretive program alone. SCA interns gave tours and performed other interpretive duties starting in 1984, funded through the Wind Cave/Jewel Cave Natural History Association and a separate private donation.[234] Schulz essentially "added [the SCA interns] to staff" to make up for a decrease in seasonal staff, and he reorganized division funds to hire two seasonal supervisors to manage the staff, SCA interns, and volunteers.[235] By 1987, labor from SCA interns and volunteers allowed Jewel Cave to remain open for cave tours through November, but there was no concerted effort to keep the visitor center open year-round.[236]

Even with the help of volunteers and SCA interns, staff struggled to keep up with the demand for tours. Ditmanson hypothesized that increased visitation

> may be attributed to a growing awareness of the cave's stature as one of the longest caves in the world, a national effort to divert attention to the lesser-visited park areas, and a local effort to keep the media informed of activities at the Monument.[237]

1986 was the busiest year in the monument's history up to that point, with 134,973 visitors to the monument, 66,012 of whom went on cave tours. (For visitation figures by year, see Appendix E.) In the busy summer season, staff could accommodate 710 people per day on tours, but informal

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[232] Interpretive Nature Trail notes, undated, Cabinet 3, Drawer 3, Folder Construct Interpretive Trail from Visitor Center, Jewel Cave NM CF.

[233] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 18; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 3.

[234] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 3; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 3–4.

[235] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1984, 3; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 3–4.

[236] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 1; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 1; Wiles, comments on draft, April 7, 2020.

[237] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 2.

surveys indicated that over 400 people were turned away some days.[238] Ditmanson asked the South Dakota Tourism office to take Jewel Cave off its promotional brochures, because staff could not keep up with existing demand.[239]

Interpretive planners from Harpers Ferry Center (Bill Clark) and the Rocky Mountain Regional Office (Peggy Dolinich) visited Jewel Cave in 1988 to investigate the continued failure to provide cave tours for all who wanted to take one.[240] They offered the following assessment:

> The immediate and future situation at Jewel Cave is that the demand for tours exceeds the capacity. This is based upon the number of rangers available to give tours, the cave capacity for ranger-led tours, and the visitation. The current ½ mile trail can only accommodate four tours an hour, and even that is pushing it. Therefore, hiring more rangers will not help the situation. Currently the maximum tour capacity is 25 persons. Visitation continues to increase at a rate of 7% per year. Highway 16, the state highway that goes right by the entrance to Jewel Cave, is the east-west access to Yellowstone National Park. The highway is currently being widened to four lanes [a plan that was not carried out at the time]. The park will be affected in 1993 when the road is realigned. All this equates to long waits to tour the cave, and the inability to accommodate everyone who wishes to tour the cave. Last year, only 60% of those visiting the park were able to tour the cave. Since the cave is the primary resource of the park, this is very low.[241]

Dolinich recommended increasing tour sizes from 25 to 40 people, and she considered, but recommended against, opening more of the cave to visitors. A larger group size would necessitate widening certain stops along the tour route and adding wayside exhibits, and many Jewel Cave employees were concerned that larger groups would lead to increased damage of cave resources.[242] In response to these concerns, Dolinich wrote,

> We believe that the number of persons on the cave tour has nothing to do with the damage to the cave. It is rather a function of who is on the tour. Therefore to believe that the ranger is watching each and every visitor, keeping them from destroying the cave, is false. The cave is and continues to be damaged in the present situation.[243]

To accommodate even more people, Dolinich suggested developing a self-guided audio tour, narrated by Herb and Jan Conn and Art and Peg Palmer. She recommended partnering with Antenna Theater, which had recently completed an audio tour for the NPS at Alcatraz Island, to

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[238] Superintendent's Annual Report, Jewel Cave National Monument, 1986, 3; Superintendent's Annual Report, Jewel Cave National Monument, 1987, 1; Statement for Management, Jewel Cave National Monument, March 1987, 13, 23; Superintendent's Annual Report, Jewel Cave National Monument, 1988, 1.

[239] Dennis L. Ditmanson to Eileen Daily, Tour Development Coordinator, South Dakota Tourism, September 4, 1985, Cabinet 1, Drawer 2, Folder 6.A.1 Correspondence, Jewel Cave NM CF.

[240] Peggy Dolinich, Interpretive Planner, Rocky Mountain Regional Office, to Rocky Mountain Regional Director, memorandum, October 11, 1988, 1, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF.

[241] Dolinich to Rocky Mountain Regional Director, memorandum, October 11, 1988, 1. Not reflected in these numbers is the fact that many people who came to the visitor center did not want to tour the cave. Wiles, comments on draft, April 7, 2020.

[242] Dolinich to Rocky Mountain Regional Director, memorandum, October 11, 1988, 2, 4; Wiles, comments on draft, April 7, 2020.

[243] Dolinich to Rocky Mountain Regional Director, memorandum, October 11, 1988, 2.

develop the audio tour and a spin-off video.[244] A self-guided tour would require an electronic security system with video cameras monitoring visitors, which Jewel Cave staff worried would be difficult to operate in the humid cave environment (where even phones malfunctioned) and ineffective in deterring damage to cave resources.[245]

The Rocky Mountain Regional Office supported the plan to increase the tour group limit, but Holder expressed concerns about the self-guided tour. He suggested the problem be remedied by expanding staff, so that interpreters could offer tours every 15 minutes, using schedules in which interpretive staff each gave four tours per day—a grueling pace for employees, but better than the self-guided alternative, Holder believed.[246] He explained,

> The idea of developing a self-guiding tour on the caliber of the Alcatraz experience is exciting but I think it needs to be made clear that the park still considers this method of interpretation an option and not necessarily the final solution. One thing that needs to be remembered is that no matter what means of interpretation the park decides to present, whether it is media or personnel services based or a combination of both, all visitors to the park will not be served. In your trip report you correctly state that "the immediate and future situation at Jewel Cave is that the demand for tours exceeds the capacity", but this situation will always exist. Visitation to the park is already close to or beyond that which that cave itself can sustain. One solution may be to open more cave for visitation, but this option would have the greatest negative impact on the cave and [is] therefore not appropriate. What we need to seek is the best method of utilizing or adapting present cave development that protects the cave and its resources while allowing as many visitors as possible the opportunity to learn about and experience the cave.[247]

The Conns and the Palmers strongly opposed self-guided tours and a security system at Jewel Cave, and they were not willing to participate in recording the audio tour.[248] To support their position, Herb and Jan Conn solicited feedback on the idea from other cavers. Dwight Deal thought it would be a "huge mistake," and Dave Schnute was "equally distressed at the prospect of self-guided tours." The Conns wrote to Holder,

> Jewel Cave means a lot to us. We've devoted many years of our lives to it in one way or another, and we would hate to see it despoiled for the sake of increasing visitation or as an experiment in modem technology.[249]

The Conns and Palmers went on an exploratory trip in 1989 "to investigate the possibilities of additional tours from the existing elevator landings within Jewel Cave," in lieu of self-guided audio

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[244] Dolinich to Rocky Mountain Regional Director, memorandum, October 11, 1988, 3–4.

[245] Mike Wiles later noted that self-guided tours at Carlsbad Caverns, where there is more room for visitors to maneuver than at Jewel Cave, have resulted in damage to or theft of thousands of stalactites. Wiles, comments on draft, April 7, 2020: Steve L. Holder to Rocky Mountain Regional Director, memorandum, December 13, 1988, 2, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF.

[246] Note on memo from Peggy Dolinich to RMR Director, October 11, 1988, 1, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF; Holder to Rocky Mountain Regional Director, memorandum, December 13, 1988, 2; Steve L. Holder to Herb and Jan Conn, May 8, 1989, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[247] Holder to Rocky Mountain Regional Director, memorandum, December 13, 1988, 1.

[248] Holder to Rocky Mountain Regional Director, memorandum, December 13, 1988, 2.

[249] Herb and Jan Conn to Steve Holder, May 3, 1989, Cabinet 3, Drawer 2, Folder N3023 Speleology Jewel Cave, Jewel Cave NM CF.

tours. They suggested four possibilities: 1) a walking tour at the upper landing, between 20 and 40 minutes; 2) a wheelchair tour, which would require removing the manmade wall to the left of the lower elevator landing and adding bridges and ramps; 3) a shorter (15-minute) walking tour, that would follow the wheelchair tour; 4) and a different route of the shorter walking tour. They proposed these as guided tours.[250] Wiles reviewed these tour options several years later and recommended a 45-minute tour loop going east from the Target Room, but no new tours resulted.[251]

Ultimately, Holder and Adams decided to increase the size of the scenic tour from 25 to 40 and to keep offering only guided tours. They briefly experimented with self-guided tours, but the Conns again rallied the caving community to object to these, and the self-guided tours were discontinued.[252] Even with these changes, waits of one-and-a-half-hours or longer remained common during the 1989 season.[253]

Tours brought in increasing amounts of money as group size went up and offerings expanded. Jewel Cave tour fee revenue was $116,847 in 1983; $130,482 in 1984; $137,249 in 1986; and $161,845 in 1989.[254] Some of those funds came back to Jewel Cave directly, in compliance with a 1972 law (P.L. 92-347) that provided for a portion of recreational use fees collected on federal lands to return to the federal lands "for the enhancement of the fee collection system."[255] Parks could use these funds for things like hiring staff who collected fees or gave the tours that the user fees paid for. In 1988, Holder reported that "the effective use of fee enhancement funds" had enabled the hiring of additional interpretive rangers at Jewel Cave and a longer visitor season.[256]

In addition to tours, interpretive staff worked on a variety of projects throughout the 1980s. They updated slide files, prepared interpretive handouts, researched historical information about the park, and updated educational programs.[257] Staff partnered with local schools through the Custer County Environmental Education Coordinating Committee—members were Jewel Cave, Wind Cave, Custer State Park, Black Hills National Forest, the BHPFA, and the Custer County School System—to develop an environmental education program for grade school students.[258] Jewel Cave

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[250] Herb Conn, Jan Conn, Art Palmer, Peggy Palmer, Trip Report, Jewel Cave, August 3, 1989, Cabinet 3, Drawer 4, [untitled orange folder], Jewel Cave NM CF.

[251] Wiles, comments on draft, April 7, 2020.

[252] Wiles, interview; Wiles, comments on draft, April 7, 2020.

[253] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 5.

[254] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 1; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1984, 1; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 1; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1989, 1.

[255] An Act of July 11, 1972, 86 Stat. 459 (P.L. 92-347).

[256] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 5.

[257] Research Projects at Jewel Cave National Monument by Seasonal Staff, Status Report, 1984, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 3.

[258] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 5.

had no junior ranger program as of 1988, but staff hoped to develop one in the future, if funding and staffing became available.[259]

Jewel Cave partnered with the Forest Service and other NPS sites in interpretive programming. In 1987, Jewel Cave initiated a ranger exchange with Wind Cave. On scheduled days, a Jewel Cave ranger and Wind Cave ranger would swap places. The objective of the program was "to provide job diversity for the employees involved and to develop a cadre of employees that can provide tours at either park and provide emergency assistance when needed." Holder found the swap to be "beneficial for the two park areas and the Rangers involved."[260] The ranger exchange program continued into 1989.[261] Jewel Cave also entered a three-year agreement with the Black Hills National Forest (1988–1990) for a cooperative visitor services program, through which the NPS and the Forest Service shared the costs of supporting a volunteer position. The NPS provided housing at Jewel Cave, an NPS uniform, a vehicle as needed, and informational materials for distribution, while the Forest Service provided a job description, day-to-day supervision, and a daily stipend.[262] The volunteer could thus represent both the NPS and the Forest Service and could inform tourists about activities available in the Black Hills generally.[263]

Brochure and Maps

The NPS produced a new mini-folder (brochure) for Jewel Cave National Monument in 1972, to reflect the new visitor center and the new tours.[264] Two years later, Management Assistant Steve Hurd asked the Harpers Ferry Center (HFC) to help with professionalizing the Jewel Cave map by fixing lettering, highlighting different cave tour trails, and showing the four different primary cave levels in color.[265] Hurd had tested out an uncolored version of the map, but he did not think that it was adequate.[266] The HFC was not able to help at the time and suggested that Hurd ask the Denver Service Center (DSC), but it is not clear whether the DSC ended up helping with a new map.[267] In

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[259] Steve Holder to Mary L. Peterson, November 4, 1988, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[260] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 4.

[261] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 5.

[262] Memorandum of Understanding Between Jewel Cave National Monument and Black Hills National Forest, Agreement No. MU—1569-8-8002, March 16, 1988, Cabinet 1, Drawer 3, Folder A54 Inspections, Surveys, Appraisals Jewel Cave NM CF.

[263] Project Description, Volunteer, attached to Memorandum of Understanding Between Jewel Cave National Monument and Black Hills National Forest, Agreement No. MU—1569-8-8002, March 16, 1988, Cabinet 1, Drawer 3, Folder A54 Inspections, Surveys, Jewel Cave NM CF.

[264] Dave Todd, Annual Budget Request, for Informational Printing (Free and Sales), Jewel Cave National Monument, February 17, 1972, Cabinet 1, Drawer 2, Folder 6.A.2 Annual Budget Requests Printing 10-81, Jewel Cave NM CF.

[265] Stephen M. Hurd to Bruce Hopkins, March 11, 1974, Cabinet 1, Drawer 3, Folder K38 NPS Publications, Jewel Cave NM CF.

[266] Hurd to Hopkins, March 11, 1974.

[267] Bruce Hopkins to Stephen M. Hurd, April 3, 1974, Cabinet 1, Drawer 3, Folder K38 NPS Publications, Jewel Cave NM CF.

1979, the HFC printed a Jewel Cave map, although it is not clear whether it was the same as the 1972 one or if it was new.[268]

In 1987, the NPS printed the first Jewel Cave brochure in the new unigrid format, after having denied requests from Jewel Cave managers for a new brochure earlier in the 1980s.[269] The NPS Division of Publications solicited content, images, and advice from Jewel Cave staff for the new brochure. The Division of Publications determined the front side would be interpretive content with a brief introduction to the cave. The back side would be titled "Exploring Jewel Cave" and would include a history of exploration and information about cave tours, surface activities, and general visitor information. The NPS asked the Conns to review the brochure for accuracy and asked for their permission to include excerpts from the 1981 reprint of their 1977 book, *The Jewel Cave Adventure*.[270]

Maintenance and Facilities Management

The Jewel Cave facilities management division consisted of a full-time maintenance lead, a few seasonal employees, and, starting in 1988, a subject-to-furlough maintenance employee.[271] Some of the seasonal employees were long-term. For instance, Don Lytle was a seasonal maintenance employee for over two decades. He won a DOI "Special Achievement Award" in 1984 for assuming maintenance lead responsibilities for 10 months while the position was vacant.[272] Jewel Cave's equipment as of the late 1980s consisted of a pickup truck, a Bobcat frontloader/backhoe, a utility vehicle, a sedan, a hatchback, a harvester/snowblower, a utility trailer, two fire pumpers, and a dump truck.[273] Wind Cave sent its maintenance crew and machinery to assist Jewel Cave staff for major projects like road paving or snow plowing, and Jewel Cave staff occasionally assisted Wind Cave with similar heavy lifts. Wind Cave possessed specialized large machinery like dump trucks, road graders, and steel face rollers that Jewel Cave did not have.[274]

Starting in 1984, Jewel Cave hosted a 12-week, non-residential YCC program comprising four enrollees and one NPS GS-4 employee as a group leader (see Figure 104). The goal of the YCC program was "to provide gainful employment for 15 through 18 year old males and females; to

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[268] Al Hendricks, daily note log, June 11, 1979, from Hendricks' personal files.

[269] Jewel Cave NM, Annual Budget Request, "Jewel Cave Mini-folder," May 31, 1983, Cabinet 1, Drawer 3, Folder K42 Publications/Other, Jewel Cave NM CF; Steve Holder to Chief, Branch of Natural History, Division of Publications, Harpers Ferry Center, memorandum, June 30, 1987, Cabinet 1, Drawer 3, Folder K38 NPS Publications, Jewel Cave NM CF.

[270] Bruce Hopkins, Chief, Branch of Natural History, Division of Publications, to Jewel Cave Unit Manager, memorandum, July 9, 1986, Cabinet 1, Drawer 3, Folder K38 NPS Publications, Jewel Cave NM CF.

[271] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 1.

[272] "Don Lytle honored at Jewel Cave," *Custer County Chronicle*, September 5, 1984, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF.

[273] Statement for Management, Jewel Cave National Monument, March 1987, 19–20; Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 17–18; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 8–9.

[274] Statement for Management, Jewel Cave National Monument, March 1987, 8.

develop an environmental understanding of the park's resources; and to accomplish needed conservation work on park lands."[275] YCC crews assisted Jewel Cave maintenance staff with a variety of projects, including trail maintenance, housing maintenance, repair of signs and gates, fuel reduction, janitorial work, natural resource management, and other miscellaneous tasks.[276] In later years, the monument shortened the program to eight weeks.[277]



Figure 104. Jewel Cave had Youth Conservation Corps (YCC) crews assisted with trail maintenance and other tasks, ca. 1984.

Source: Jewel Cave NM.

Even with the help of YCC workers, maintenance needs exceeded available staff and funding levels. In 1984, Ditmanson evaluated cyclic maintenance needs of the monument and came up with over $239,000 of needed improvements. Ditmanson wanted to develop a property inventory and

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[275] Gary A. Shelley to Jewel Cave NM Unit Manager, memorandum, August 31, 1984, Cabinet 3, Drawer 3, Folder A98 Conservation and Preservation YCC Program, Jewel Cave NM CF.

[276] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1985, 1; Youth Conservation Corps Work Projects, Jewel Cave National Monument, 1987, and William Waxler, Jewel Cave National Monument YCC Program Review, 1987, Cabinet 3, Drawer 3, Folder A98 Conservation and Preservation YCC Program, Jewel Cave NM CF; Brian R. Adams to Joe Helmcamp, memorandum, March 21, 1990, Cabinet 3, Drawer 3, Folder A98 Conservation and Preservation YCC Program, Jewel Cave NM CF.

[277] NPS, Youth Conservation Corps Program Review, Jewel Cave National Monument, August 8, 1987, Cabinet 3, Drawer 3, Folder A98 Conservation and Preservation YCC Program, Jewel Cave NM CF; Adams to Helmcamp, memorandum, March 21, 1990.

maintenance guide for the monument's structures, but staff did not accomplish either task.[278] They made progress on routine maintenance in 1986, but Congress failed to appropriate construction funding for projects that Ditmanson considered important, such as installing a second elevator, constructing a 12-unit apartment building, developing a picnic ground and comfort station, and expanding the visitor center and shop facility. These goals were the monument's top four priorities, but none of them ranked highly on the Rocky Mountain Regional Office's list. Installing a second elevator, the park's first priority, was the region's 391st.[279]

Starting in 1989, Jewel Cave switched to the Maintenance Management System (MMS). This was a service-wide initiative that grew out of a June 1984 report by the Government Accountability Office (GAO) entitled, "The National Park Service Needs a Maintenance Management System."[280] That report drew attention to the growing backlog of maintenance needs in the system and the disorganized way the agency maintained and serviced existing structures and equipment.[281] Its findings prompted Congress to pass legislation requiring the NPS to implement an MMS to track maintenance and operations of NPS facilities. The legislation defined MMS as:

> (1) a work load inventory of assets including detailed information that quantifies for all assets (including but not limited to buildings, roads, utility systems, and grounds that must be maintained) the characteristics affecting the type of maintenance work performed;
>
> (2) a set of maintenance tasks that describe the maintenance work in each unit of the National Park System;
>
> (3) a description of work standards including frequency of maintenance, measurable quality standard to which assets should be maintained, methods for accomplishing work, required labor, equipment and material resources, and expected worker production for each maintenance task;
>
> (4) a work program and performance budget which develops an annual work plan identifying maintenance needs and financial resources to be devoted to each maintenance task;
>
> (5) a work schedule which identifies and prioritizes tasks to be done in a specific time period and specifies required labor resources;
>
> (6) work orders specifying job authorizations and a record of work accomplished which can be used to record actual labor and material costs; and
>
> (7) reports and special analyses which compare planned versus actual accomplishments and costs and can be used to evaluate maintenance operations.[282]

In 1988, NPS Director William Penn Mott Jr. required regional directors to comply with the new MMS for the first time.[283] At Jewel Cave, tracking had started in 1986, and staff completed their first

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[278] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Management Goals for FY1986, 1, 3.

[279] Superintendent's Annual Report, Jewel Cave National Monument, 1986, 4–5; Statement for Management, Jewel Cave National Monument, March 1987, 6.

[280] Jewel Cave NM, Maintenance Management Implementation Final Report, March 1989, 1–2, Cabinet 2, Drawer 3, Folder A6437 Maintenance Management 1989–, Jewel Cave NM CF.

[281] GAO, "The National Park Service Needs a Maintenance Management System," June 1, 1984, i–vi.

[282] Act of October 24, 1984, 98 Stat. 2718 (P. L. 98-540).

[283] NPS Director to Regional Directors, memorandum, October 31, 1988, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

MMS report in March 1989. To implement the new system, Jewel Cave staff began an inventory existing features in the monument and assessed deferred maintenance on those features in labor hours and cost.[284] To keep current with the MMS, staff collected data, wrote reports, filed updates, and trained personnel on the system.[285] Through one MMS initiative—identifying surplus equipment at parks and selling it to other parks when possible—Jewel Cave purchased Wind Cave's surplus five-ton dump truck in 1988.[286]

Visitor Center Maintenance

The elevator in the new visitor center malfunctioned often, sometimes during thunderstorms and sometimes for no particular reason. Issues occurred often enough to disrupt tour schedules.[287] The elevator was under warranty, and contractors replaced "worn and unsafe cables" in 1987. Hendricks, Ditmanson, and Holder all tried to get funding for a second elevator, especially in light of the heavy demand for cave tours, but the Rocky Mountain Regional Office did not consider it a priority.[288]

Otherwise, the visitor center required only minimal maintenance during the 1970s. The roof leaked a little in 1979 and was repainted later in the year using cyclic maintenance funds.[289] The NPS finally reroofed the visitor center in 1987.[290] Maintenance crews installed 45 storm windows in the 1980s as part of energy-saving retrofits.[291] In 1985, after the hydrology study found a water leak under the visitor center sidewalk and wooden deck, crews repaired the deck.[292]

When an environmental sanitation consultant found "unacceptably high" radon levels in the visitor center in 1987, Philip C. Nyberg of the EPA advised that the radon likely entered the visitor

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[284] Jewel Cave NM, Maintenance Management Implementation Final Report, March 1989, 6, 8, 11, 17. This inventory remained incomplete for several decades. Wiles, comments on draft, April 7, 2020.

[285] Jewel Cave NM, Maintenance Management Implementation Final Report, March 1989, 6.

[286] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 8–9.

[287] Al Hendricks, daily note log, September 7, 1979, from Hendricks' personal files; Al Hendricks, daily note log, September 16, 1979, from Hendricks' personal files; Hendricks, interview.

[288] Jewel Cave NM, Briefing Statement, February 198[7?], Cabinet 3, Drawer 2, Folder F34 Budget Execution (2), Jewel Cave NM CF; Steve L. Holder, to Rocky Mountain Regional Director, Attention: Peggy Dolinich, memorandum, December 23, 1988, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, Jewel Cave NM CF; Statement for Management, Jewel Cave National Monument, March 1987, 6; Hendricks, interview.

[289] Al Hendricks, daily note log, February 7, 1979, from Hendricks' personal files; Al Hendricks, daily note log, June 25, 1979, from Hendricks' personal files.

[290] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 6; Reroof Visitor Center, Headquarters, Jewel Cave National Monument, blueprint, March 23, 1987, eTIC; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 6.

[291] Jewel Cave National Monument Objectives, 1979 FY, 1; Superintendent's Annual Report, Jewel Cave National Monument, 1986, 4–5; DOI, NPS, DSC, Install Insulated Glass in V.C., Headquarters, Jewel Cave National Monument, July 24, 1986, eTIC; Jewel Cave National Monument Objectives, 1980 FY, 1.

[292] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 7–8.

center through the elevator shaft as a result of cave breathing.[293] Nyberg recommended replacing the existing elevator doors with "pairs of well sealed revolving doors on each level," providing "a more positive air seal" and minimizing intrusion of outdoor air into the cave, with switches indicating to staff at the front desk whether the doors were closed.[294] If the problem persisted, Nyberg recommended that the NPS consider isolating the elevator lobby from the rest of the visitor center's air circulation system.[295] Nyberg noted that monitoring staff exposure to radon had been curtailed somewhat because of budget cuts, but levels remained high enough to require staff be monitored routinely as required by NPS Directive 14.[296] A year later, radon levels were still elevated, and no changes had been made. Holder recommended

> venting the elevator shaft to the outside with a suction fan to create a negative pressure in the shaft. This fan could be controlled by a barometric switch which would shut off the system when the cave breathes in.
>
> In the visitor center, a set of doors would be installed across the hallway leading to the elevator. The air returns in the basement, main floor, the air handlers room, and the penthouse would be located elsewhere. Positive pressure created in this area would always force air into the negative pressure of the elevator shaft thus not allowing the radon to enter the visitor center.[297]

The doors were installed, which drastically reduced radon levels for many years.[298]

Cave Trail Maintenance

Inside the cave, the asphalt surface of the Scenic Tour route laid in 1972 had "been worn very smooth" as a result of 600,000 people taking tours in the space of 13 years. This created a safety hazard, especially in wet areas of the cave.[299] In 1985, the NPS used Park Restoration and Improvement Program (PRIP) funds to hire a crew of 14 local day laborers, who rehabilitated the Scenic Tour route in just five weeks, three weeks ahead of schedule.[300] The new surface was concrete with a "heavily brushed surface for better footing" and a lighter coloring for improved visibility.[301]

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[293] Philip C. Nyberg, EPA Region VIII, Radiation Programs Branch, Radon Investigation Jewel Cave National Monument, April 5–8, 1988, 1, Cabinet 2, Drawer 4, Folder D22 Construction, Jewel Cave NM CF.

[294] Nyberg, Radon Investigation Jewel Cave National Monument, April 5–8, 1988, 2.

[295] Nyberg, Radon Investigation Jewel Cave National Monument, April 5–8, 1988, 3.

[296] Nyberg, Radon Investigation Jewel Cave National Monument, April 5–8, 1988, 3.

[297] Steve Holder to Chief, Construction and Maintenance, RMR, memorandum, January 26, 1989, Cabinet 2, Drawer 4, Folder D22 Construction, Jewel Cave NM CF.

[298] Wiles, comments on draft, April 7, 2020.

[299] NPS, "Trail Rehabilitation Underway at Jewel Cave National Monument," press release, March 8, 1985.

[300] NPS, "Trail Rehabilitation Underway at Jewel Cave National Monument," press release, March 8, 1985; Superintendent's Annual Report, Jewel Cave National Monument, 1985, 8; NPS, "Special Achievement Awards Presented at Jewel Cave National Monument," press release, September 10, 1985, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF.

[301] NPS, "Trail Rehabilitation Underway at Jewel Cave National Monument," press release, March 8, 1985.

The process of removing the asphalt and installing concrete was tricky, since most of the cave was difficult to access. An NPS press release explained the situation:

> Virtually, all of the half-mile trail was inaccessible to powered equipment. Thus, all of the 12,000 pounds of asphalt had to be carried out of the cave by hand, and some 56,000 pounds of concrete was taken in by the same method. The route required negotiating a labyrinth of twists, turns, ramp, bridge and platforms while carrying a 30–40 pound load. In addition, the delicate cave environment required that extreme caution be exercised to minimize the impact of the project.[302]

Ditmanson recalled that workers carried the concrete into the cave using inner tubes on their shoulders.[303] Dilts described the process:

> We had a maintenance tunnel that came in, and we mixed our concrete out there. We'd fill up a tire inner tube, half tire, and throw it up on our shoulders then carry that down to where we were working. . . . It also became a little competitive in that the crew was divided into two teams. Each team tried to outdo the other. It made the job a little more fun.[304]

The 14 workers who rehabilitated the cave trail received an award for their efforts.[305]

Crews made other minor improvements to the Scenic Tour over the next several years. In 1986, they replaced light fixtures along the trail and added waterproof switches at each fixture.[306] YCC crews cleaned cave handrails and cleaned and replaced cave steps.[307] And in 1989, maintenance crews widened six areas on the route to accommodate larger groups, part of the decision to expand cave tours from 25 to 40 people.[308]

Surface Roads, Trails, and Maintenance Buildings

Aboveground, maintenance staff and YCC crews maintained park roads within the monument and built the new interpretive nature trail. They repaved the sidewalk from the historic ranger cabin to the historic cave entrance, sealed sidewalk cracks, painted handrails, extended the interpretive nature trail, and installed benches.[309] They slurry-sealed the parking lot and chipped and sealed the

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[302] NPS, "Special Achievement Awards Presented at Jewel Cave National Monument," press release, September 10, 1985.

[303] Ditmanson, interview.

[304] Dilts, interview.

[305] NPS, "Special Achievement Awards Presented at Jewel Cave National Monument," press release, September 10, 1985.

[306] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Maintenance Goals for FY1986, 4, Cabinet 3, Drawer 3, Folder A6419 Goals/Objectives Long Term Management Plan, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[307] Youth Conservation Corps Work Projects, Jewel Cave National Monument, 1987, and William Waxler, Jewel Cave National Monument YCC Program Review, 1987; Superintendent's Annual Report, Jewel Cave National Monument, 1988, 7.

[308] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 7.

[309] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 7–8; Dilts, interview.

main entrance road.[310] In 1985, YCC crews built and installed a new entrance gate that Schulz had designed, made of aluminum-colored steel.[311] Jewel Cave acquired surplus picnic tables from Wind Cave, which the maintenance staff refurbished and installed near the main parking area, on the fill from the 1968 excavation of the elevator shaft. They moved other picnic tables from the historic area to the new picnic area and removed the old campsites and pit toilets at the historic area.[312]

In conjunction with energy-saving retrofits occurring at the visitor center, maintenance crews retrofitted the maintenance building by installing storm windows and a drop ceiling to save fuel.[313] They erected a pole barn in 1984, intended as a recreational hall for the staff. Two years later, maintenance staff hosted a "shed-raising" party to raise another pole barn in the maintenance yard, a long building with a series of garage door bays for storing equipment and supplies. Planning had been underway for several years, and several groups had donated materials. NPS, Forest Service, and Custer State Park employees came to help. The 30-odd people who showed up raised the pole barn in just one day. When they finished, they gathered for a chili potluck. An NPS write-up reported, "Enthusiasm for the project was infectious."[314]

Housing

As early as 1973, Jewel Cave managers began working with the Rocky Mountain Regional Office, Wind Cave, and the Denver Service Center to design three 12-unit apartment buildings, two three-bedroom residences, and walking areas around them, to replace existing trailers that were in rough condition.[315] Rocky Mountain Regional Director Lynn H. Thompson wrote to US Senator James Abourezk (D-SD) about the need for permanent, year-round housing, for which Congress would need to appropriate an estimated $713,000.[316] Managers wanted the housing to be located at the monument rather than off site, because travel from Custer generally took 40 to 45 minutes round-trip, and the roads were often impassable in the winter and spring. Some staff should be required to be on site, they argued,

> so that trained manpower is readily available for emergencies such as forest fires, building fires, and storm damage; for protection of lives and property; and to provide around-the-clock protection to the entire installation against vandalism, potential arsonists, poachers, thieves, out-of-season hunters, etc.

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[310] DOI, NPS, Slurry Seal, Visitor Center Parking Lot, Jewel Cave National Monument, June 3, 1989, eTIC; DOI, NPS, Pave Parking Lot, Visitor Center Parking Lot, Jewel Cave National Monument, March 25, 1988, eTIC.

[311] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 8; Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1985, 1; Wiles, comments on draft, April 7, 2020.

[312] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 18; Wiles, comments on draft, April 7, 2020.

[313] Jewel Cave National Monument Objectives, 1980 FY, 1.

[314] "Jewel Cave Hosts 'Barn – Raising,'" July 18, 1986, Cabinet 1, Drawer 3, Folder K38 NPS Publications, Jewel Cave NM CF; Statement for Management, Jewel Cave National Monument, March 1987, 17; Wiles, comments on draft, April 7, 2020.

[315] Planning Directive, Jewel Cave National Monument, September 18, 1973, 1–2, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[316] Lynn H. Thompson to Sen. James Abourezk, March 17, 1975, 1, Cabinet 2, Drawer 4, Folder D2215 – JECA Project Construction Proposals, Jewel Cave NM CF.

> Continuity of operation of facilities such as water and sewer systems and cave operations requires trained personnel available at the Monument. The Monument at this time has no permanent year-around housing and it is critical for safety, administration protection, and maintenance that this area be provided with year-around housing.[317]

Stubs for the proposed housing had been installed during construction at the new development area in the late 1960s, but no funding had ever been allocated for the buildings.[318]

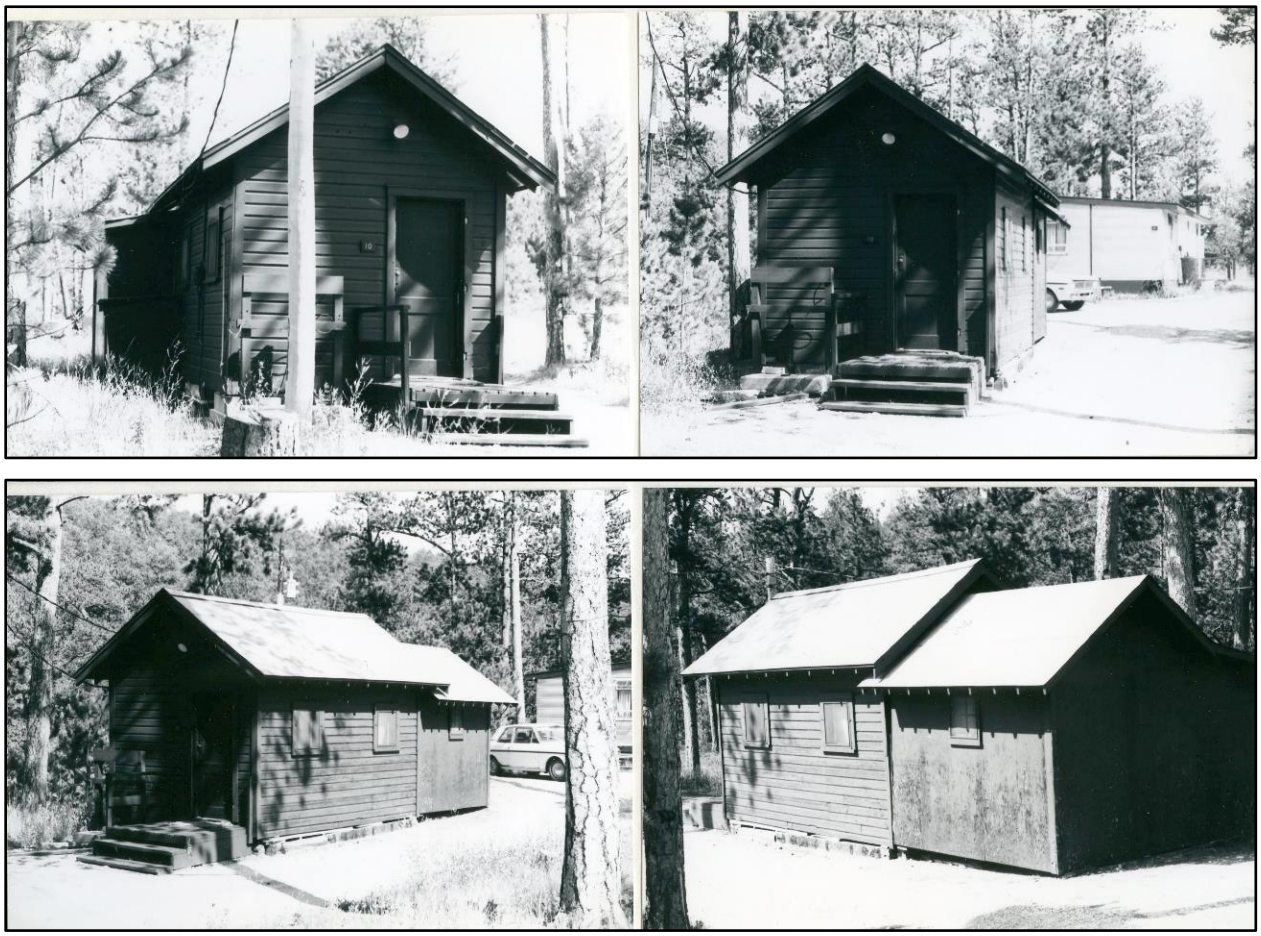


Figure 105. This cabin, built by the US Biological Survey at Wind Cave in 1916 and transferred to Jewel Cave in 1959, was torn down in 1980.

Source: NPS, Jewel Cave NM.

[317] Employee Housing Jewel Cave National Monument, attached to Lester F. McClanahan to RMR Director, memorandum, March 28, 1975, 2, Cabinet 2, Drawer 4, Folder D2215 – JECA Project Construction Proposals, Jewel Cave NM CF.

[318] Employee Housing Jewel Cave National Monument, attached to McClanahan to RMR Director, memorandum, March 28, 1975, 2.

In 1978, the NPS built two identical modular houses with three bedrooms each. They were supposed to be followed by two more houses the next year, but those never arrived.[319] An additional three-bedroom mobile home arrived in 1980 for use by seasonal employees. At this point, the NPS declared several houses at the historic area as excess property, including the old kit trailers and Transa-Hut.[320] One of the structures disposed of was "Building 10," a cabin built by the US Biological Survey in 1916 and used as a bunkhouse for game ranch employees at Wind Cave (see Figure 105). The NPS likely had acquired the cabin in 1934, when the game ranch was disestablished, and moved the building from Wind Cave to Jewel Cave around 1959. A lean-to room was added sometime after the move.[321] Although no one had used Building 10 for three years due to electrical issues and structural instability, demolishing a building that was more than 50 years old required Rocky Mountain Regional Office and South Dakota State Historic Preservation Office approval to comply with the National Historic Preservation Act.[322] Another new modular house was installed in 1987 (Quarters 13) to replace an older trailer, which was removed.[323] Quarters 11 and 12 (modular houses built in 1978), and 13 were originally intended to provide required occupancy for the unit manager, the chief ranger, and the chief of maintenance. However, permission was granted over the years for the employees in each of these positions to live off-site.[324]

In 1988, the NPS completed a Housing Management Plan for Jewel Cave. It echoed earlier recommendations in calling for on-site housing to address safety concerns, resource protection, and staff convenience.[325] Employees paid rent to live in these houses, amounting to $8,751 in 1987, $11,750 in 1988, and an estimated $12,331 in 1989.[326] The Housing Management Report noted that "approximately one-half of the quarters income goes toward amortizing the three mobile homes installed since 1979." The remaining rental income was insufficient to perform adequate upkeep.[327] Crews did what they could to maintain housing, including installing new roofs, painting, upgrading utilities and lighting, redoing trails, installing new appliances, and adding flagstone walkways.[328] They

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[319] Statement for Management, Jewel Cave National Monument, March 1987, 17; Jewel Cave NM, Housing Management Plan, April 28, 1988, 6, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF; Contracting Officer Mary L. Reiter to Sun Rise Construction Company, December 13, 1979, Cabinet 2, Drawer 2, Folder work Order 1569-7102-404 Construct Two 3-Bedroom Residences-JECA, Jewel Cave NM CF; Al Hendricks, daily note log, May 1, 1979, from Hendricks' personal files; Wiles, comments on draft, April 7, 2020.

[320] Jewel Cave NM, Housing Management Plan, April 28, 1988, 6; US, DOI, Requisition, Property Review Board, Rocky Mountain Region, June 4, 1980, Cabinet 2, Drawer 2, Folder Contract CX-1200-1-B003 Mobile Homes, Jewel Cave NM CF; Wind Cave NP Superintendent to RMR Director, memorandum May 15, 1980, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[321] DOI, Report of Survey, RS1560-2-0004, August 17, 1982, 3, File 3389m, Jewel Cave NM MF.

[322] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 2.

[323] Larry Dilts to Contracting Officer, RMR, memorandum, January 8, 1980, Cabinet 2, Drawer 4, Folder CX1200-6-B024 Century Housing, Jewel Cave NM CF; Jewel Cave NM, Housing Management Plan, April 28, 1988, 6, 10.

[324] Wiles, comments on draft, April 7, 2020.

[325] Jewel Cave NM, Housing Management Plan, April 28, 1988, 7–8.

[326] Jewel Cave NM, Housing Management Plan, April 28, 1988, 12.

[327] Jewel Cave NM, Housing Management Plan, April 28, 1988, 10.

[328] Rocky Mountain Regional Office, Jewel Cave National Monument, Annual Goals for FY1985, 3; Superintendent's Annual Report, Jewel Cave National Monument, 1986, 4–5; Rocky Mountain Regional Office, Jewel

took steps to abate radon in the housing, installed new decks, and installed water saver toilets and shower heads.[329] They also hooked up new units to water and sewer lines.[330]

Since most housing was in fairly bad shape, the NPS recommended replacing the remaining trailers (which had been installed in 1964) with eight two-bedroom units from the Housing Corporation of Ft. Morgan, Colorado.[331] Instead, the NPS began compliance planning for a new 12-unit apartment complex to replace six temporary quarters.[332] MAC Construction in Rapid City won a bid for a smaller, four-unit modular apartment in 1989, and it completed installation in October 1990 at a cost of $211,087.33.[333] The park also created two basement units. One was actively used (Quarters 14E), but the other (Quarters 14F) became home to the park's museum collection and uniform cache.[334] This helped the housing situation, but Ortega noted that Jewel Cave needed the other eight units to replace obsolete trailers.[335]

Utilities

As of 1978, Jewel Cave's water supply came from a 700-foot well, located 200 feet southeast of the picnic area. The water was chlorinated and pumped to a 100,000-gallon concrete reservoir. The supply was adequate, but the NPS considered constructing an additional well or increasing storage capacity as a precautionary measure.[336] In 1983, the Public Health Service (PHS) recommended drilling a second well, in light of some technical problems with the first well.[337] The NPS completed

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Cave National Monument, Annual Maintenance Goals for FY1986, 1–2; Superintendent's Annual Report, Jewel Cave National Monument, 1987, 6; Youth Conservation Corps Work Projects, Jewel Cave National Monument, 1987, and William Waxler, Jewel Cave National Monument YCC Program Review, 1987.

[329] Superintendent's Annual Report, Jewel Cave National Monument, 1989, 7–8.

[330] Superintendent's Annual Report, Jewel Cave National Monument, 1988, 7.

[331] Jewel Cave NM, Housing Management Plan, April 28, 1988, 6, 11, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

[332] Richard A. Strait to Junius Fishburne, April 5, 1989, File 3384c, Jewel Cave NM MF.

[333] Completion Report, October 25, 1990, Cabinet 2, Drawer 2, Folder D52 Jewel Cave Modular Housing Project, MAC Construction Co., Inc. Building #14 Jewel Cave NM, CX1200-9-C056, Jewel Cave NM CF; RMR to Jewel Cave NM Superintendent, fax cover sheet, August 31, 1989, Cabinet 2, Drawer 2, Folder D52 4-Plex Housing Units at JECA IFB-1200-9-C056 MAC Construction Co., Rapid City, SD, Jewel Cave NM CF.

[334] Wiles, comments on draft, April 7, 2020.

[335] Ernest W. Ortega to RMR Director, memorandum, November 16, 1989, Jewel Cave NM CF, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[336] Albert V. Soukup, Report on Survey of Environmental Health Facilities, Jewel Cave National Monument, South Dakota, June & August 1978, 1, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[337] Albert V. Soukup, USPHS Environmental Sanitation Survey Report Work List, August 22, 1983, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF. Neither well draws water from the Madison, which is dry; but from the upper Deadwood Formation. Wiles, comments on draft, April 7, 2020.

the second well in 1984, close to the first well location. Both wells retrieve water from sandstone in the upper Deadwood Formation.[338]

For solid waste, Jewel Cave contracted with a disposal company that hauled the waste to a landfill in Rapid City.[339] Environmental sanitation inspectors found the disposal system satisfactory in the mid-1980s.[340] As of 1989, Jewel Cave did not have a recycling program on site. Adams explained that a recycling program was "not feasible or cost effective due to limited number of staff & transportation cost."[341]

Sewage disposal still occurred on site, using a septic tank in the historic area and a sewage lagoon at the new development.[342] To meet "public health service inspection standards" in the historic area of the monument, the NPS in 1977 installed two larger septic tanks and a gravity line leading to a leach field in Hell Canyon, demolished the old septic tank, and partitioned one cell of the existing sewage lagoon to maintain adequate depth.[343] In 1980, the sewage lagoons were "virtually empty due to low flows" (possibly because the clay tile pipe was broken and leaking). The sewer line was then slip-lined, the small triangular cell was removed from the lagoon and the remaining two cells were lined with a plastic barrier. Then, in 1983, the PHS found the lagoons "full and overflowing" and recommended dividing one of the unused cells into two cells to handle the overflow.[344] The NPS allocated PRIP funding to change the lagoon to three cells in 1984.[345] The environmental sanitation consultant returned and reported, "for the first time in many years, I was impressed with the condition of the sewage lagoons, they were well maintained, the weeds were cut, and the sewage was not creating any odor problems."[346] He called the changes to the sewage lagoon "amazing!"[347]

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[338] Dilts, interview; Statement for Management, Jewel Cave National Monument, March 1987, 18; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 6.

[339] Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975.

[340] Albert V. Soukup to Jewel Cave NM Area Manager, memorandum, July 11, 1985, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[341] Brian Adams, Solid Waste Recycling Questionnaire, Jewel Cave, undated [ca. November 1989] Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[342] Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975.

[343] Jewel Cave National Monument Objectives, 1979 FY, 1; Albert V. Soukup, Report on Survey of Environmental Health Facilities, Jewel Cave National Monument, South Dakota, June & August 1978, 2, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[344] Albert V. Soukup, Report on Evaluation of Environmental Health Facilities, Jewel Cave National Monument, South Dakota, March 1980, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF; Albert V. Soukup, USPHS Environmental Sanitation Survey Report Work List, August 22, 1983, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[345] Superintendent's Annual Report, Jewel Cave National Monument, 1984, 6.

[346] Albert V. Soukup to Wind Cave NP Superintendent, memorandum, June 25, 1984, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

[347] Albert V. Soukup to Jewel Cave NM Area Manager, memorandum, July 11, 1985, Cabinet 2, Drawer 4, Folder D5031 Sanitation Matters, Jewel Cave NM CF.

The good news did not last long. In 1985, an investigation showed that liquid from the lagoons was leaking into the cave system.[348] In addition, some of the sewer lines had completely collapsed, and others were leaking.[349] To address these problems, maintenance crews and contractors sliplined the sewer lines.[350] Alexander, Davis, and Alexander's hydrology study then found that effluent was still seeping into the cave, due to the lack of lining in the third cell.[351] Maintenance crews lined that cell in 1989 (see Figure 106).[352]

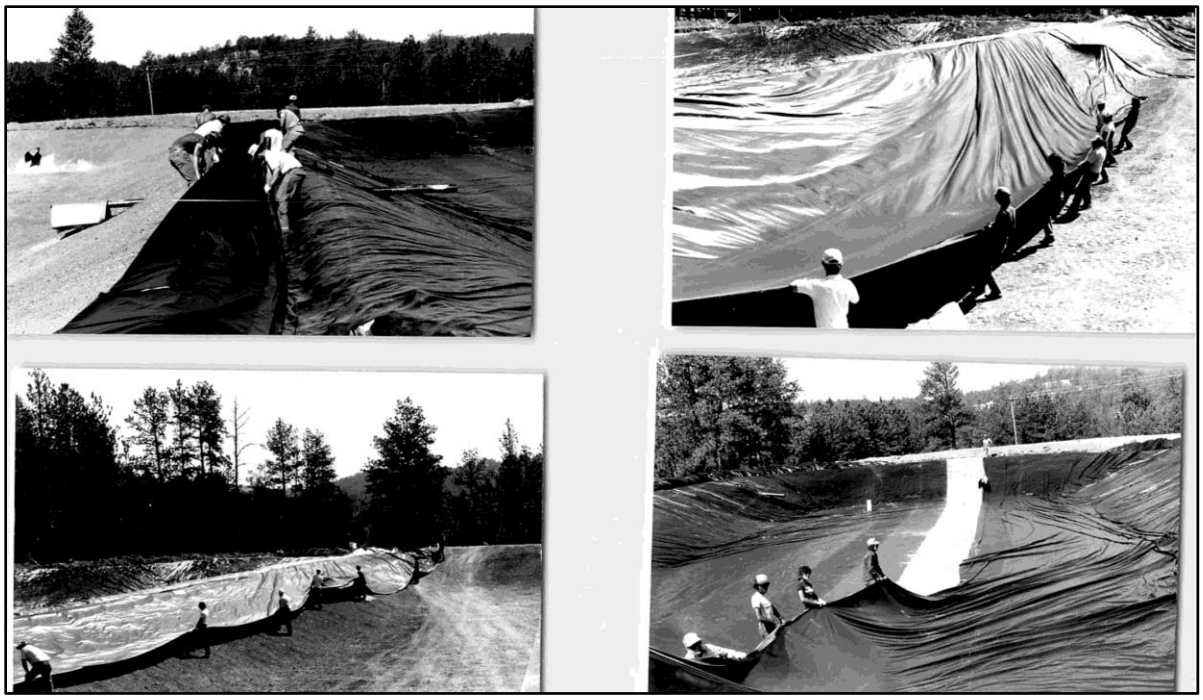


Figure 106. Relining the sewage lagoon, ca. 1989.

Source: NPS Jewel Cave NM.

For electric service, the NPS renewed the Black Hills Electric Cooperative permit through 1988.[353] While the cooperative owned and maintained the surface electric lines, the NPS owned and

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[348] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 8; Statement for Management, Jewel Cave National Monument, March 1987, 24.

[349] Assessment of Effect Form, "Sewer Line Repair 87002 Package #J91," February 27, 1987, File 3385v, Jewel Cave NM MF.

[350] Superintendent's Annual Report, Jewel Cave National Monument, 1987, 6–7; Contracting Officer Keith Warner to Janice Camp, April 15, 1987, Cabinet 3, Drawer 2, Folder Rehab Third cell sewer lagoon, Jewel Cave NM CF.

[351] Alexander and Davis, "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2," August 1987, 3.

[352] Assessment of Effect Form, "3rd Cell Sewage Lagoon Rehabilitation, 87003 Package #J00," February 27, 1987, File 3385zb, Jewel Cave NM MF; Larry D. Dilts, Installation of Sewer Lagoon Liner, July 2, 1987, Cabinet 2, Drawer 2, Folder D5217 CX 1200-7-B031 Mousel Construct, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1989, 8; Dilts, interview.

[353] Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975.

maintained the electrical system within the cave.[354] For telephone service, the NPS renewed the Bison State Telephone Company special use permit for telephone lines through 1984, and then through 1990.[355] As noted above, maintenance crews buried power lines in the historic area in the early 1980s as part of a series of changes to make the area more visually pleasing.[356] All housing units had phone service by 1985, and most had internal phone extensions.[357] The Bison State Telephone Company also provided Jewel Cave with a radio system (170.050 MHz with 103.5 Hz Channel Guard).[358]

Law Enforcement

As with firefighting efforts, Jewel Cave National Monument entered into cooperative agreements for law enforcement. In 1976, Congress passed a bill that granted the secretary of the Interior "concurrent legislative jurisdiction within units of the National Park System" and directed the secretary to "diligently pursue the consummation of arrangements" with each state in which an NPS unit was located.[359] On August 27, 1980, in response to the 1976 act, South Dakota Governor William J. Janklow signed a state law ceding concurrent jurisdiction on NPS lands in South Dakota to the United States.[360]

In September 1980, Jewel Cave and Wind Cave formalized an agreement with the Custer County Sheriff's Office to implement concurrent jurisdiction. The agreement aimed to "provide National Park Service law enforcement personnel with a capability to legally perform protection activities, within the scope of their employment, when enforcing South Dakota State Criminal Code" within NPS boundaries. NPS law enforcement would provide copies of case incident reports to the sheriff's department as part of "reciprocal exchange of information."[361] The director of the NPS commented, "this action will allow for more efficient conduct of both State and Federal functions within the parks."[362]

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[354] Statement for Management, Jewel Cave National Monument, March 1987, 18.

[355] Hurd, Statement for Management, Jewel Cave National Monument, December 3, 1975; Statement for Management, Jewel Cave National Monument, March 1987, 7.

[356] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1983, 18; Superintendent's Annual Report, Jewel Cave National Monument, 1984, 6.

[357] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 8.

[358] Statement for Management, Jewel Cave National Monument, March 1987, 19.

[359] An Act of October 7, 1976. 90 Stat. 1939 (P.L. 94-458).

[360] Memorandum of Understanding Between the National Park Service and the Custer County Sheriff's Department, August 12, 1999, 1, Cabinet 2, Drawer 2, Folder Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[361] Memorandum of Cooperative Agreement Between the Custer County Sheriff's Office and Wind Cave National Park and Jewel Cave National Monument, September 1980, 2–3, Drawer 1, Folder 2.A.1 1980 Custer County Agreements, Jewel Cave NM CF.

[362] Russell E. Dickenson to William J. Janklow, June 9, 1980, Drawer 1, Folder 2.A.1 1980 Concurrent Jurisdiction Establishment, Jewel Cave NM CF.

In 1986, the monument received a new law enforcement sedan, which replaced an older unit (a station wagon equipped to handle a stretcher) that did not meet NPS standards.[363] A low-band radio with the state police frequencies was installed in the monument's patrol vehicle to facilitate interagency cooperation. Few law enforcement incidents occurred at the monument, but the NPS coordinated with the South Dakota Department of Transportation and the Custer County Sheriff's Department in responding to traffic accidents on Highway 16 near the monument boundaries.[364]

Conclusion

From 1972 to 1989, Jewel Cave staff expanded the interpretive and resource management programs at Jewel Cave. The new visitor center brought in many more visitors for elevator-access cave tours. The funding from the tours, combined with use of volunteers and cooperation with other organizations, enabled the NPS to expand programming at Jewel Cave. The first part-time cave management staff assisted with preliminary development of baseline data for the cave, which then informed resource management and visitor operations. Additional studies were still needed, as was a second elevator into the cave. As cavers logged the 75th mile of passageway and kept discovering more and more cave, the NPS cooperated increasingly with Forest Service officials and other partners to ensure the protection of fragile cave resources (see Figure 107).



Figure 107. Caver in a fissure near Corrigan Passage, ca. 1984.

Source: NPS, Jewel Cave NM.

[363] Superintendent's Annual Report, Wind Cave National Park and Jewel Cave National Monument, 1986, 1; Wiles, comments on draft, April 7, 2020.

[364] Statement for Management, Jewel Cave National Monument, March 1987, 7.

Chapter 6: Independent Administration (ca. 1990–1999)

From 1990 to 1999, Jewel Cave National Monument (Jewel Cave) transitioned from a small staff of generalists to a slightly larger staff of specialists in cave resource management, interpretation, and administration. Some of that specialization was made possible by partnering with other National Park Service (NPS) units in the Black Hills. Superintendent Kate Cannon prioritized the completion of biological and geological studies of Jewel Cave to establish baseline scientific data, which had been lacking, and she secured funding to construct an elevator in the second shaft that had been drilled two decades prior. She also spearheaded partnerships with the Forest Service that led to a cooperative agreement for cave management and a land exchange that protected portions of Jewel Cave outside of the monument's approximately 1,274 surface acres. During this time, a nationwide NPS reorganization shifted responsibility for the South Dakota parks from the Rocky Mountain Regional Office in Denver, Colorado, to the Midwest Regional Office in Omaha, Nebraska.

General Administration

Personnel

In 1990, Wind Cave National Park Superintendent Ernest Ortega hired Kate Cannon, who had previously been the concessions specialist at Glen Canyon National Recreation Area, as superintendent of Jewel Cave (see Figure 108). Like previous managers of the monument, Cannon reported to the Wind Cave superintendent, but she was the first manager of Jewel Cave to hold the title "superintendent" rather than "assistant manager" or "unit manager."[1] As required, she communicated with the Rocky Mountain Regional Office through the Wind Cave superintendent, but she managed Jewel Cave without close oversight from the Wind Cave superintendents who succeeded Ortega, Marty Ott and then Jimmy Taylor.[2]

As of 1990, Jewel Cave's staff consisted of five permanent employees: the superintendent; a chief ranger of interpretation, resource management, and visitor protection (Brian Adams and then Tom Casey); a lead interpreter (Donna Bentley); and a maintenance leader (Larry Dilts). Dilts' title changed to chief of maintenance in 1992.[3] The monument also had twenty-five seasonal or

[1] Ernest Ortega, interview by Jackie Gonzales, April 22, 2019, Santa Fe, NM; Kate Cannon, interview by Emily Greenwald, June 13, 2019, Moab, UT; Superintendent's Annual Report, Jewel Cave National Monument, 1990, 2, Cabinet 1, Drawer 2, Folder A2621 Annual Reports, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF).

[2] Marty Ott, interview by Jackie Gonzales, April 24, 2019, Kanab, UT; Cannon, interview.

[3] Superintendent's Annual Report, Jewel Cave National Monument, 1990, 2; Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 1, files provided by Katie Atkins, Folder 1991 & 1992 Superintendents Report, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1993, 3, files provided by Katie Atkins, Folder 1993 Superintendents Report, Jewel Cave NM CF.

temporary employees, including six Youth Conservation Corps (YCC) employees, one Student Conservation Association (SCA) intern, and one student intern. Cannon continued recruitment efforts at Lakota College to hire American Indian employees.[4]

In 1991, Cannon hired Mike Wiles into the first non-seasonal cave resource management position at Jewel Cave: a full-time term (not to exceed four years) park ranger–resource management (cave technician). In 1992, the monument received funds to hire a full-time, permanent cave resource specialist for the first time.[5] After advertising it competitively, Tom Casey hired Wiles to fill the position.[6]



Figure 108. Kate Cannon became superintendent of Jewel Cave in 1990.

Source: NPS, Jewel Cave NM.

In 1997, Cannon changed the roles of the lead interpreter (Karen Rosga, who had replaced Bentley) and Cave Specialist Mike Wiles into division chiefs. This meant the monument now had formal and separate divisions of Interpretation and Resource Management.[7] Casey remained the generalist chief ranger, but with his scope reduced to law enforcement and emergency management, since Rosga and Wiles now led the interpretation and resource management divisions and reported directly to the superintendent.[8] This shift was part of a broader, service-wide initiative to convert generalist park rangers into specialists. Rangers would be hired into one of three specialist series—interpretation, resource management, or law enforcement—rather than performing functions in all three areas.[9] Creating separate divisions allowed Jewel Cave staff to specialize in their respective fields and led to enhanced interpretive programming and more in-depth resource management.

Cannon left Jewel Cave in 1997 to take a management position with the Bureau of Land Management (BLM). A series of acting superintendents followed her, until Wind Cave Superintendent Taylor hired Peggy O'Dell in early 1998. O'Dell remained for a little less than two years, followed by acting superintendents until mid-2000. The Midwest Regional Office used these acting appointments to prepare division chiefs from other parks to be superintendents. Frequent

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[4] Kate Cannon to H. Paul Friesma, Professor, Center for Urban Affairs and Policy Research, Northwestern University, December 13, 1990, Cabinet 1, Drawer 3, Folder N4617 Demography, Jewel Cave NM CF.

[5] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 2.

[6] Superintendent's Annual Report, Jewel Cave National Monument, 1993, 1; Mike Wiles, interview by Jackie Gonzales, June 26 and 27, 2019, Custer, SD.

[7] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1, 3, files provided by Katie Atkins, Folder 1996 Superintendents Report, Jewel Cave NM CF.

[8] Wiles, interview; Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1, 5; Lawrence E. Johnson to J. J. Martin, memorandum, November 17, 2011, Cabinet 1, Drawer 1, Folder 2.D 2011 David Yim, Jewel Cave NM CF.

[9] Paul Menard, interview by Jackie Gonzales, April 9, 2019, Sequim, WA.

turnover in leadership between 1997 and mid-2000 made management for remaining staff members more difficult than it had been during Cannon's tenure.[10]

Black Hills Administrative Group

In 1995, the NPS reorganized as part of the Clinton-Gore "National Partnership for Reinventing Government" program. To cut staff and trim payroll, the NPS reduced the number of regions from ten to seven and eliminated 1,400 permanent positions. South Dakota parks, including Jewel Cave, were transferred from the Rocky Mountain Regional Office back to the Midwest Regional Office in Omaha, Nebraska, which had last administered South Dakota parks in 1974, an absence of 21 years. Initially, Jewel Cave staff found the transition difficult, because they had built relationships with people at the Rocky Mountain Region and now had to start again with the Midwest Region. Cannon recalled that the move ultimately benefitted Jewel Cave, because the Midwest Regional Office was especially good at dealing with smaller parks, whereas in the Rocky Mountain Region, smaller parks had to compete for funding with large flagship parks like Yellowstone.[11]

The budget cuts that accompanied the reorganization left regional offices with less funding for regional administrative positions, such as contracting officers, budget specialists, and human resources (HR) employees.[12] Administrative staff at individual parks were expected to take on these duties, but a small park like Jewel Cave lacked the capacity to do so. Prior to 1996, Wind Cave staff performed most of the administrative tasks for Jewel Cave, including HR, payroll, contracting, budgeting, and purchasing. Jewel Cave had hired Jill Hart as its first full-time administrative officer (AO) in 1996, and it had a GS-3/4 office clerk, Marie Curtain, who worked under the superintendent and then under Mike Wiles after Cannon left (Curtain later took on additional responsibilities relating to the monument's museum collection program and invasive species control).[13] These two staff members would not be able to absorb all of the functions that were being transferred down from the regional level.

Wind Cave AO Paul Menard, who had been hired by Taylor in 1996, devised a solution. He realized that administrative staff at Wind Cave and Jewel Cave were devoting significant time to IT needs as staff increasingly relied on computers and the internet to manage the sites. However, neither Wind Cave nor Jewel Cave had the funding to hire an IT employee outright. Mount Rushmore was in a similar position.[14] After running some numbers, Menard developed a proposal to

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[10] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 1, files provided by Katie Atkins, Folder 1996 Superintendents Report, Jewel Cave NM CF; Cannon, interview; "Margaret G. (Peggy) O'Dell Named New Superintendent of Jewel Cave National Monument," news release, February 11, 1998, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; David Given, interview by Jackie Gonzales, April 9, 2019, Port Hadlock, WA; Wiles, interview; Menard, interview.

[11] Cannon, interview; Wiles, interview; Given, interview; Ron Cockrell, Midwest Regional Historian, NPS, to Emily Greenwald, April 7, 2020.

[12] Field Manager, Jewel Cave National Monument, to CMT Chairperson, Great Plains System, memorandum, June 25, 1996, Cabinet 3, Drawer 3, Folder A74 Shared Services, Jewel Cave NM CF; Menard, interview.

[13] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1, 5.

[14] Menard, interview.

pool the administrative funds of Wind Cave, Jewel Cave, and Mount Rushmore in order to support an IT person, a budget specialist, and an overseeing AO (Menard). Menard called the proposed unit the Black Hills Administrative Group (BHAG). He used park size, budget, staffing levels, and needs to calculate how much each park would contribute to the BHAG and what services they would get out of it. He left the superintendents' clerks (such as Curtain) out of the equation.[15]

Menard pitched the BHAG idea to the superintendents of Wind Cave and Mount Rushmore (Cannon had already left Jewel Cave, so there was no permanent superintendent at the time), who supported it, as did the Midwest Regional Office. Having administrative support staff stationed at parks enabled quicker and more personal support than a regional office could provide. Since funding came from park budgets, the BHAG also eased financial pressure on the trimmed-down regional office. While other multipark groupings have existed in the NPS, the BHAG may have been unique in that park staff proposed it to the regional office, rather than the other way around.[16]

The BHAG worked so well in its first year that park superintendents, Midwest Regional Office staff, and Menard discussed how a similar grouping might cover HR and contracting functions. The Midwest Regional Office had struggled to provide these services to its parks since the 1995 reorganization. They created the NEKOTA group, which encompassed all 11 parks in Nebraska, North Dakota, and South Dakota. The NEKOTA group handled HR, contracting, and purchasing. The BHAG, which covered different functions (budgeting, IT, and basic administration), continued to function alongside the NEKOTA group and remained limited to Jewel Cave, Wind Cave, and Mount Rushmore. Menard was the lead AO for both the BHAG and the NEKOTA group.[17]

Jewel Cave staff reported a relatively smooth transition to the BHAG and NEKOTA group.[18] Employees in both groups retained a primary office duty station, but they traveled often to the other parks they covered. The primary downside for Jewel Cave was losing its first dedicated, full-time AO (Hart), who became a shared budget specialist working from Mount Rushmore. Despite this, the BHAG and NEKOTA group provided Jewel Cave staff with better access to administrative functions than had been available in the past.[19]

Partners

Jewel Cave partnered closely with community organizations and the cooperating association that ran the bookstore, the Black Hills Parks and Forests Association (BHPFA). The NPS maintained the cooperative agreement with the BHPFA to run the bookstore, and BHPFA remained the "NHA" (natural history association) for the monument. Wind Cave's park naturalist no longer ran the

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[15] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1, 5; Menard, interview; Jill Hart, interview by Jackie Gonzales, June 27, 2019, Custer, SD.

[16] Given, interview; Menard, interview; Hart, interview; Mike Wiles, comments on draft administrative history, April 7, 2020.

[17] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 1–2, files provided by Katie Atkins, Folder 1996 Superintendents Report, Jewel Cave NM CF; Menard, interview.

[18] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 2.

[19] Menard, interview; Hart, interview; Wiles, interview.

cooperating association, as had been customary in the past, but many seasonal staff served as BHPFA board members. Some friction existed among the BHPFA executive director, the board, and NPS representatives in the early 1990s, but it appears to have smoothed out as the decade progressed.[20]

The bookstore at Jewel Cave was in the visitor center. Items for sale were displayed on one wall of the octagonal lobby and on a set of standalone two-sided shelves about four feet from the wall. Some smaller items, like postcards and camera film, were sold at the front desk. From 1990 until 1997, sales at Jewel Cave's bookstore were higher than those at Wind Cave, despite there being no separate, dedicated space for sales items at Jewel Cave.[21] From sale proceeds, the BHPFA funded an annual cave management intern. Interns served a full year, received a $100/week stipend, and assisted with cave management, interpretation, the fire program, and the park's webpage.[22] In 1998, the association began selling *Jewel Cave: The Story Behind the Scenery*, which Rosga wrote with help from other monument staff. Unlike other publications sold at the Jewel Cave bookstore, this one dealt with both cave *and* surface resources.[23]

Cannon maintained close ties with the Custer Chamber of Commerce, as previous superintendents had done. It appears that ties to the Newcastle Chamber of Commerce diminished in this period. Cannon fostered relationships with the tourism community of the Black Hills and all of South Dakota. She provided informational packets to local motels, restaurants, and other businesses so they would have accurate and up-to-date information about Jewel Cave to share with people visiting the Black Hills. She proposed an annual "Community Day" to give local residents and businesspeople a closer look at Jewel Cave, but it appears this never occurred.[24]

General Planning

In 1989, the Rocky Mountain Regional Office initiated the process of completing General Management Plans (GMPs) for Jewel Cave and Wind Cave. The two plans were separate, but the NPS funded and worked on them concurrently.[25] Jewel Cave's GMP would update the outdated 1962 Master Plan. Planner Roberta McDougall from the NPS Denver Service Center (DSC) led the planning team, Rocky Mountain Regional Office staff conducted the environmental review

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[20] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1–2; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 5.

[21] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 5; Wiles, comments on draft, April 7, 2020.

[22] Later, when the BHPFA directed aid funds away from the internship, Wiles used funds from the resource management portion of elevator transportation fees to fund the cave management intern for several years. Wiles, comments on draft, April 7, 2020; Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 7.

[23] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 4.

[24] Park Staff Action Statements, Jewel Cave National Monument Management Assessment, 1993, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[25] Superintendent's Annual Report, Jewel Cave National Monument, 1990, 6.

processes, and Jewel Cave staff assisted with public outreach and processing public comments.[26] In August 1990, McDougall and her team completed a Task Directive and Development Concept Plan for the GMP, which described project requirements and scope.[27] The task directive listed the following issues for the GMP to address: future use of the historic area, long waits for cave tours, insufficient office space for staff in the visitor center, and managing cave areas outside of the monument boundaries.[28]

In February 1991, the planning team visited Jewel Cave and Wind Cave to see the units in person and to discuss the process and any concerns with staff.[29] Following their visit, work on the GMP stalled due to Rocky Mountain Regional Office staff being pulled to other projects. It resumed in 1992.[30] In July 1993, the NPS finished a complete draft of the GMP and the associated draft Environmental Impact Statement (EIS) and released them for public comment.[31] Following the incorporation of public input, the NPS published the final GMP and EIS in 1994. The GMP called for expanding the visitor center "to accommodate a 50-seat auditorium and additional exhibit space" and suggested opening "a new cave area . . . for visitor use." Other infrastructure recommendations included adding to administrative and maintenance space, increasing capacity of the sewage and water systems, making facilities accessible to persons with disabilities when feasible, and installing fire and intrusion alarms "in the cave and all facilities."[32]

Concessions

In the early 1990s, the BHPFA managed soft drink and snack machines in the breezeway next to the visitor center, but the park had no other concessionaires on site.[33] In 1996, in response to visitor requests for food or beverage services at the monument, Jewel Cave entered into a contract for vending machines at the visitor center. To comply with the federal Randolph-Sheppard Act of 1936,

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[26] Roberta McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 19, Cabinet 1, Drawer 2, Folder D18 General Management Plan/DCP, Jewel Cave NM CF.

[27] "FY-91 General Management Plan Program," attached to Richard A. Strait to Rocky Mountain Region Superintendents, memorandum, August 17, 1990, Cabinet 1, Drawer 2, Folder D18 General Management Plan/DCP, Jewel Cave NM CF.

[28] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 10–12.

[29] Team Captain, Central Team, Branch of Planning, DSC, to Manager, Central Team, DSC, memorandum, February 25, 1991, Cabinet 1, Drawer 2, Folder D18 Planning Program, Jewel Cave NM CF.

[30] Kenneth Raithel Jr., to Rocky Mountain Regional Director, memorandum, July 11, 1991, Cabinet 1, Drawer 2, Folder D18 General Management Plan/DCP, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 7.

[31] NPS, "Draft Future Plans for Jewel Cave National Monument Released for Public Review of Comment," news release, July 14, 1993, Cabinet 1, Drawer 2, Folder D18 General Management Plan/DCP, Jewel Cave NM CF.

[32] NPS, Final General Management Plan/Environmental Impact Statement, Jewel Cave National Monument, South Dakota, June 1994, iv, Jewel Cave National Monument Digital Files (hereafter Jewel Cave NM DF).

[33] Annual Statement for Interpretation, Jewel Cave National Monument, 1991, 18, Cabinet 1, Drawer 3, Folder K1817 Interp Prospectus, 1991, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

which required "that vending machine operations on federal property be operated by blind persons whenever possible," the NPS awarded the contract for vending services to Myron Eggers of Custer in 1996.[34] The next year, the agency began a new contract with Larry Renz, who remained the concessionaire for vending services at Jewel Cave for several years.[35]

Law Enforcement and Safety

While the Jewel Cave chief ranger had law enforcement duties in addition to interpretation and resource management responsibilities, Jewel Cave had no dedicated law enforcement staff in the 1990s.[36] Instead, the NPS entered into agreements with the Custer County Sheriff's Office to cooperate on law enforcement at Jewel Cave, Wind Cave, and Mount Rushmore. The agreements were renewed every five years.[37] In addition, Jewel Cave fell under the Department of the Interior's (DOI's) agency-wide cooperative agreements for law enforcement with the Department of Agriculture (USDA). The DOI and USDA signed a memorandum of agreement (MOA) on February 27, 1990, allowing for cross-designation of law enforcement powers across the Forest Service, NPS, BLM, Bureau of Indian Affairs (BIA), and US Fish and Wildlife Service (USFWS). They shared services under the "closest forces" concept, meaning that the closest available law enforcement would respond to emergencies and incidents. Each management unit was required to complete a supplemental MOA.[38] The units in the Black Hills area entered into a supplemental MOA later in 1990, which covered the Black Hills National Forest, Nebraska National Forest, Wind Cave, Jewel Cave, Mount Rushmore, Badlands, and Devils Tower. The MOA provided for cross-designation on investigative operations, security or law enforcement operations "during wildland fires or other major events or incidents," and emergency assistance calls.[39]

In the absence of full-time law enforcement personnel, Jewel Cave struggled with vandalism at the historic cave entrance, a longstanding problem.[40] To deal with this, Cannon required the chief

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[34] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1; An Act of June 20, 1936, 49 Stat. 1559 (P.L. 74-732).

[35] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 5; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 5.

[36] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 2; Superintendent's Annual Report, Jewel Cave National Monument, 1996, 5–8.

[37] Memorandum of Understanding Between the National Park Service and the Custer County Sheriff's Department, August 12, 1999, 1–6, Cabinet 2, Drawer 2, Folder Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[38] Associate Deputy Chief Charles R. Hartgraves to Regional Foresters, March 29, 1990 and attached Memorandum of Agreement between the U.S. Department of Agriculture and the U.S. Department of the Interior, February 27, 1990, Cabinet 2, Drawer 2, Folder Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[39] Interagency Supplemental Memorandum of Agreement USDA-USDI Law Enforcement Between Black Hills National Forest and Nebraska National Forest and National Park Service [numerous], November 28, 1990, Cabinet 2, Drawer 2, Folder Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[40] Project Statement, Jewel Cave NM, April 1, 1998, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

ranger, the cave specialist, and the interpretive lead to live on-site in park housing. This meant staff were present 24/7 and could quickly report issues to the Custer County sheriff.[41]

A 1997 Visitor Management-Resource Protection Assessment Program (VRAP) analysis concluded that Jewel Cave needed 3.17 full-time equivalent (FTE) law enforcement staff, but no funding became available for those positions.[42] In 1998, Curtain completed a Park Safety Program Statement of Purpose for Jewel Cave, as required by the Midwest Regional Office.[43] The plan established a Safety Committee and safety officer, and delineated their responsibilities. Committee members reviewed accident reports, took follow-up actions after accidents, reviewed employee complaints, monitored the workplace for safety compliance, advised management on safety and health issues, and trained employees in safety matters.[44]

Facilities Management

During the 1990s, Chief of Maintenance Larry Dilts and his crew oversaw the building of a second elevator, maintained structures within the cave, built a new building to house low-flow vacuum toilets to alleviate overflowing in the sewage lagoon, completed a joint housing structure with the Forest Service in Custer, installed fiberoptic cables to bring internet to monument offices, and cooperated with the South Dakota Department of Transportation on Highway 16 improvements. The maintenance division worked closely with the interpretive and resource management divisions. Although the maintenance division had several buildings to house equipment and workshops, it requested additional space for storage and shopwork.[45]

Elevator

Plans for the visitor center in the late 1960s had included two elevators into the cave, and the contractor at that time excavated an elevator shaft large enough to accommodate both. However, the NPS ran out of funding before the contractor could build the second elevator. After the visitor center opened in 1972, Jewel Cave unit managers advocated construction of the second elevator, which they argued would accommodate more people on tours and to ensure safety of visitors in the event that one of the elevators malfunctioned. Even with a second elevator, however, the tour route

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[41] NPS, Certifications of Required Occupancy, February 14, 1995, 3, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF; NPS, Final General Management Plan/Environmental Impact Statement, Jewel Cave National Monument, South Dakota, June 1994, 102.

[42] Jewel Cave National Monument Law Enforcement Needs Assessment, July 8, 2003, 9, Cabinet 1, Drawer 1, [loose in drawer], Jewel Cave NM CF.

[43] Statement of Purpose for the Documented Safety Program at Jewel Cave National Monument, April 22, 1998, cover page, Folder 2.A.1 1998 JECA Safety Program, Jewel Cave NM CF.

[44] Statement of Purpose for the Documented Safety Program at Jewel Cave National Monument, April 22, 1998, 1–4.

[45] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 12.

itself remained the limiting factor for accommodating visitors to the cave. Citing safety reasons, the NPS proposed evaluating the need for a second elevator as part of the GMP process.[46]

As work on the GMP continued, the existing elevator experienced a series of malfunctions that raised further safety concerns. For several months, it was out of service, and cave tours proceeded through the maintenance access tunnel.[47] US Senator Larry Pressler (R-SD) heard about the problems and wrote to Rocky Mountain Regional Director Robert M. Baker:

> It is quite obvious that installing a second elevator would improve the current safety situation at Jewel Cave National Monument. In fact, the availability of a second elevator for rescue and evacuation purposes could literally mean the difference between life and death if an underground emergency were to occur. In addition, the availability of a second elevator would expand the number of tours which could be accommodated each year during the busy summer months. Last year over 25,000 visitors were turned away because all of the cave tours were full. Many visitors waited two hours or longer to take a tour. Thus, a second elevator would improve the quality of visitor services.
>
> The serious safety issue and the potential for tourism enhancement make very compelling arguments for reducing Jewel Cave's current reliance on a single, twenty-year old elevator. I respectfully request that a second elevator at Jewel Cave National Monument be installed as quickly as possible. I also would appreciate being kept apprised of any actions taken by the National Park Service to address this situation.[48]

Assistant Rocky Mountain Regional Director John King responded that the Rocky Mountain Regional Office shared Pressler's concern. He continued,

> We recently contracted with an independent elevator consulting company to assess the condition of our elevators, analyze maintenance and rehabilitation needs, and provide an estimate of upgrade and repair costs. Their report was recently received and will provide the basis for a prioritized elevator improvement program for both Wind Cave and Jewel Cave.
>
> The report findings, together with the safety and visitor service issues that you are aware of, make it clear that the installation of a second elevator at Jewel Cave is of paramount importance. The cost to do this, however, is substantial and will require program adjustments that will affect start-up or completion of other regional projects that are of equal significance.
>
> This year, we are committed to insuring that elevators at both park areas are fully inspected, tested, and certified safe for public use. Inspections are complete at Wind Cave, and the elevators are fully operational. The inspection of the elevator at Jewel Cave revealed the need to replace several components, and we expect that this will be completed and service restored not later than mid-May. In addition, we have allocated funds to prepare the design and specifications for a second elevator. We are hopeful that we can then contract for the installation of the new elevator early in FY93.[49]

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[46] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 11.

[47] NPS, "Cave Access Altered at Jewel Cave," news release, March 1992, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; NPS, "Jewel Cave Mother's Day Open House Cancelled," news release, April 20, 1992, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[48] Senator Larry Pressler to Rocky Mountain Regional Director Robert M. Baker, March 6, 1992, Cabinet 2, Drawer 3, Folder D24 Elevator Modrn. & Installation, Jewel Cave NM CF.

[49] John A. King, for Rocky Mountain Regional Director Robert M. Baker, to Senator Larry Pressler, March 31, 1992, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

Cave tours had reached capacity, and Cannon reported, "There is little potential for increasing the number of visitors on cave tours further until we have two working elevators and fund a significant number of additional interpretive positions."[50] In the meantime, Cannon and her staff developed motorized and manual methods to extract visitors—one by one—from a stuck elevator cab. She also had a backup generator installed, so that the elevator could be used to bring people out of the cave in the event of a power failure.[51]

Contractors Lerch, Bates & Associates, Inc., completed an "Elevator Clinic Report" on March 20, 1992, with recommendations for modernizing the existing elevator and installing a second. Based on these recommendations, Cannon and Dilts prepared "specifications for elevator installation and rehabilitation" and sent them to the Rocky Mountain Regional Office.[52] Among other things, they recommended that "the existing elevator car should be retrofitted with a side door and that specifications for the new car should include both a side and top door."[53] After completion of the design and specifications, construction began in October 1993, under the Rocky Mountain Regional Office's oversight.[54] No cave tours operated during the winter of 1993–1994, while the elevator work continued.[55] Contractors completed installation of the new elevator in 1994, and the NPS opened it to the public.

For the rest of the 1990s, most elevator maintenance was minor and related to upkeep. Repairs usually were completed through a service contract, although maintenance crews assisted with minor fixes.[56] Cannon began an "elevator cost recovery" fund with money from cave tours fees. NPS units were allowed to retain some proceeds from fees collected on site for transportation needs, and she made the case that the elevator was an essential mode of transportation to the primary resource of the park, the cave.[57] From every cave tour ticket, 75 cents went to the new fund for elevator cost recovery, and 75 cents went to cave resource protection. In 1997, using these funds, the monument added "an elevator car-to-car rescue system" and trained staff in its use (that practice has since been deemed unsafe).[58] In 1999, the retained fees amounted to an estimated $37,000 for elevator maintenance and $37,000 for cave protection (which the resource management division used to hire

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[50] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 7.

[51] Wiles, comments on draft, April 7, 2020.

[52] Martin C. Ott to Rocky Mountain Regional Director, memorandum, May 22, 1992, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

[53] Untitled, May 20, 1992, attached to Martin C. Ott to Rocky Mountain Regional Director, memorandum, May 22, 1992, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

[54] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 4; Superintendent's Annual Report, Jewel Cave National Monument, 1993, 2.

[55] "Jewel Cave hours change," *Hot Springs Star*, December 21, 1993, Cabinet 1, Drawer 3, Folder K34 News Media, Jewel Cave NM CF; NPS, "Jewel Cave National Monument," news release, undated [ca. January 1993], Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[56] Larry Dilts, interview by Jackie Gonzales, April 17, 2019, Colby, KS.

[57] It is unclear what year this program began, but it was ongoing by 1997. Wiles, interview; Cannon, interview.

[58] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 3.

cave resource management staff).[59] Maintenance crews and contractors conducted ongoing repairs to control water leaks into the elevator shaft, paint the walls and divider beams, and repair the elevator ropes and brakes as needed.[60]

Visitor Center

Maintenance of the visitor center building in the 1990s included replacing aging parts, fireproofing, and planning for a possible redesign. Crews removed asbestos in 1990 and replaced the visitor center deck over the following two years.[61] Dilts, his team, and maintenance employees from Wind Cave began infrastructure modifications for the installation of an emergency power generator in the visitor center, to supply the visitor center and the elevator during a power outage. Contractors installed the generator in 1997, the same year the visitor center received a new metal roof.[62]

In 1995, Larry Klein Design/Point Zero Design assessed the visitor center to "mak[e] recommendations to alleviate congestion and increase the quality of visitor experience at the park." The resulting report explained,

> There are two principle [sic] problems with the visitor experience during peak season at Jewel Cave National Monument. The current process for purchasing cave tour tickets creates long waiting periods, overcrowding and congestion in the visitor center and the outside terrace area. The waiting time for tours can be as long one and one-half to two hours with tours selling out by the middle of the afternoon. The lack of interesting exhibits and additional visitor experiences is a year-round problem at the center, but is especially aggravated during the long waiting periods encountered in peak season.
>
> A third major problem at the center is the lack of sufficient administrative staff space.[63]

The report also noted flow problems caused by multiple entrances, the location of the information desk, and the location of the ticket desk.[64] The consultants recommended changing the layout of the visitor center, installing new interpretive exhibits, changing the ticketing process, and improving

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[59] NPS, "FY 1999 Budget and Annual Performance Plan for Jewel Cave National monument are Available for Public Review," news release, April 14, 1999, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[60] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 5.

[61] Larry Dilts to Jewel Cave NM Unit Manager, memorandum, February 2, 1990, Cabinet 2, Drawer 3, Folder D26 Reports, Jewel Cave NM CF; Larry D. Dilts, "Replace Visitor Center Deck," undated [ca. June 1992], Cabinet 2, Drawer 4, Folder D22 Construction, Jewel Cave NM CF.

[62] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6; Larry D. Dilts, "Visitor Center Generator," November 25, 1991, Cabinet 2, Drawer 4, Folder D22 Construction, Jewel Cave NM CF.

[63] Larry Klein Design/Point Zero Design, "Jewel Cave National Monument Planning Report," October 1995, 1–2, National Park Service Electronic Technical Center (hereafter eTIC).

[64] Larry Klein Design/Point Zero Design, "Jewel Cave National Monument Planning Report," October 1995, 2.

signage.[65] In 1997, Dilts' crew remodeled the visitor center's administrative office space to add a new office and copy room, but none of the other proposed changes were made.[66]

Cave Tour Structures

In 1991, Dilts initiated a structural survey of the Jewel Cave tour routes in response to issues that had arisen at Mammoth Cave. There, the humid cave environment had corroded aluminum handrails and weakened the structures to the point of being unsafe.[67] The humidity "causes the protective oxide surface layers on aluminum and stainless steel to become hydrated," which "renders the oxide more vulnerable to attack by chloride ion."[68] Dilts received funding from the Rocky Mountain Regional Office for a DSC structural engineer, Richard Ohmstede, to conduct a structural survey of aluminum structures on Jewel Cave's scenic tour route.[69] Ohmstede reported that the aluminum structures were "generally found in good condition" and able to support design loads, with the exception of two platforms. He recommended ongoing cleaning of corrosion from structures in order to extend their lifespan. In addition, he suggested, "If stair treads continue to crack and replacement becomes prohibitively costly the park may want to experiment with a different tread type such as fiberglass or bar grading. These may have a longer life under the heavy usage that occurs at Jewel Cave."[70]

Concerns about corrosion of the cave tour structures continued, and in 1999, the NPS contracted Black & Veatch to report on the condition of the cave's aluminum structures. Black & Veatch noted, "More than one type of corrosion mechanism is at work, including galvanic corrosion and surface and pitting corrosion." They concluded that the corrosion could not be prevented, but "its rate of progression can be considerably slowed." Black & Veatch recommended that maintenance crews make minor changes to the structures over the following years and indicated that the cost should be "relatively modest."[71] They recommended other improvements, including augmenting structural supports as needed, replacing corroding stair tread attachment bolts with stainless steel bolts, and evaluating coating options for rails and anchor bolts[72]

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[65] Larry Klein Design/Point Zero Design, "Jewel Cave National Monument Planning Report," October 1995, 2–6.

[66] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6.

[67] Rick Olson, "Aluminum Handrail Corrosion in Mammoth Cave," eTIC.

[68] Rick Olson, "Corrosion of Handrails Along Cave Tour Routes," *Cave Research Foundation 1991 Annual Report*, eTIC.

[69] Larry D. Dilts, "Cave Structural Strength Survey," undated [ca. August 1991], Cabinet 2, Drawer 4, Folder D22 Construction, Jewel Cave NM CF; Homer L. Rouse to Jewel Cave Unit Manager, memorandum, January 24, 1991, and Jewel Cave Scope of Work: Load rate walking tour platforms, stairs, and bridges for pedestrian traffic, December 3, 1990, both in Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

[70] Richard Ohmstede, "Structural Inspection Report Cave Tour Structures: Jewel Cave National Monument, South Dakota," August 1991, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF.

[71] Black & Veatch, "Summary Report on the Corrosion and Condition of the Existing Aluminum Structural Assemblies Within the Cave, Jewel Cave National Monument," June 1999, 1-1–1-3, eTIC.

[72] Black & Veatch, "Summary Report on the Corrosion and Condition of the Existing Aluminum Structural Assemblies," June 1999, 6-6.

In the historic area of the cave, maintenance crews replaced and repaired wooden cave tour structures. In 1996, crews replaced rotting wooden staircases along the Heavenly Route. None of the staircases were original material, having been replaced several times since the Michaud and CCC eras.[73] In 2000, they began replacement of eight flights of deteriorating wooden stairs along the Dungeon Route, work that continued through 2001.[74]

Sewage

Due to heavier than normal rainfall and high visitation, the sewage lagoons at Jewel Cave continued to have overflow issues in the 1990s, raising concerns because studies had shown that leaks affected cave hydrology.[75] The 1990 GMP Task Directive identified sewage leaks as a way in which infrastructure affected natural resource management.[76] To minimize water going into the lagoon, maintenance staff installed low-flow toilets in the visitor center and low-flow toilets and showers in the housing area in 1991 (Cannon made some calculations that showed staff living on site made significant contributions to overall water use at the monument).[77] Although the new toilets "cut sewage production by over 60%," the overflow problems persisted.[78]

In 1993, Cannon and Dilts took emergency measures to mitigate overflow from the sewage lagoon. Dilts and his crew built earthen berms around the lagoons, but that was still not enough to stop the overflow.[79] Cannon received permission from the NPS, the Forest Service, and the state of South Dakota to construct a "temporary spray irrigation field" on Forest Service land "approximately a mile down Hell Canyon." Dilts and his crews "virtually completely discharged" the contents of two of the three cells over a 10-day period. Cannon recognized that this was not a permanent solution but that it "bought the time needed to resolve the sewage problem permanently."[80]

Heavy rains continued, and overflow of the lagoons remained a problem. In spring 1996, Dilts installed vacuum toilets in a new building, constructed across the patio from the visitor center and with a large tank in the basement of the building. Dilts and Cannon hoped that the vacuum toilets would lower water levels in the lagoons and prevent future overflow at a cheaper price than building

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[73] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 3.

[74] Jewel Cave NM Superintendent Peggy O'Dell to Central Files, memorandum, April 3, 2000, Cabinet 3, Drawer 1, Folder 2004 send to NARA 2034 Restoration/Historic Area Stairs 1988–2004 subsurface, Jewel Cave NM CF.

[75] Superintendent's Annual Report, Jewel Cave National Monument, 1985, 8, files provided by Katie Atkins, Folder 1984 Superintendent's Report, Jewel Cave NM CF; Statement for Management, Jewel Cave National Monument, March 1987, 24, Cabinet 1, Drawer 2, Folder D18 Statements for Management, Jewel Cave NM CF.

[76] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 11.

[77] Wiles, comments on draft, April 7, 2020.

[78] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 4.

[79] Kate Cannon to Bernie [last name unknown], July 30, 1993, Folder D5039 Sewer Lagoon Irrigation Project, Jewel Cave NM CF.

[80] Superintendent's Annual Report, Jewel Cave National Monument, 1993, 3.

new sewage lagoons.[81] The vacuum toilets were very loud, and in 1998, Dilts worked with a contractor (Vemco) to minimize the noise.[82] In the meantime, the interpretive division created signs explaining the reason for installing toilets that made such a loud "vroomp" sound.[83]

Still, the vacuum toilets did not solve the problem of overflow, and in 1998, Dilts again requested emergency discharge of the lagoons by spray irrigation.[84] In July 1999, Jewel Cave received permission from the South Dakota Department of Environment and Natural Resources and the Forest Service to irrigate one lagoon cell onto Forest Service land (bacteria levels were low enough that the state deemed it safe).[85] O'Dell requested permission to irrigate the second cell, as well as funds for a long-term solution to the overflow issues.[86] In the meantime, Dilts and his staff underwent training needed to conduct annual testing of the sewage lagoon, so that they would not have to bring in staff from other parks for that task.[87]

Solid Waste

In 1997, monument staff conducted a solid waste audit. They found that the monument produced 16,600 pounds of waste each year, of which 4,200 was recycled. Over half of the waste from the housing area was food waste, so the audit recommended adopting an employee composting program.[88] A recycling program already initiated in the housing area was "**extremely** effective" (emphasis in original) at over 90 percent compliance. Office waste was 40 percent paper, so the audit recommended installing paper recycling bins at each employee desk.[89] The audit recommended installing a trash compactor to reduce the number of times the sanitation contractor visited Jewel Cave, and to install blow driers instead of providing paper towels in the historic area restrooms (the visitor center restrooms already had driers).[90]

The audit also addressed the "Boneyard," a storage area on monument grounds where staff deposited miscellaneous items. Materials stored there were often no longer needed by the park,

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[81] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 2; Dilts, interview; Cannon, interview; Wiles, interview.

[82] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 5.

[83] Wiles, comments on draft, April 7, 2020.

[84] Eric Meintsma to Larry Dilts, December 10, 1998, Cabinet 2, Drawer 4, Folder D5039 Sewer Lagoon Irrigation Project, Jewel Cave NM CF.

[85] Larry Dilts, "Sewer Lagoon Irrigation Project," October 29, 1999, Folder D5039 Sewer Lagoon Irrigation Project, Jewel Cave NM CF.

[86] The irrigation occurred the following decade. See Chapter 7 for more. Peggy O'Dell to Dave Given, July 26, 1999, Folder D5039 Sewer Lagoon Irrigation Project, Jewel Cave NM CF.

[87] Midwest Region Public Health Service Consultant to Superintendent, Jewel Cave NM, memorandum, February 5, 1999, Cabinet 2, Drawer 4, Folder D5039 Sewer Lagoon Irrigation Project, Jewel Cave NM CF.

[88] Jewel Cave National Monument Solid Waste Audit Summary, Summer 1997, 1, Cabinet 2, Drawer 4, File D5031 Sanitation Matters, Jewel Cave NM CF.

[89] Jewel Cave National Monument Solid Waste Audit Summary, Summer 1997, 2.

[90] Jewel Cave National Monument Solid Waste Audit Summary, Summer 1997, 2.

including aluminum steps, barbed wire, old tin garbage cans, metal posts, fire extinguishers, and porcelain toilets. The audit recommended surveying the area periodically to assess what needed to stay there and what could be removed, which resulted in crews hauling several large items to Rapid City for recycling soon after the audit.[91]

Housing

As of 1990, Jewel Cave's housing was substandard and inadequate. Trailers installed in the 1960s and 1970s were in poor condition, and the frequent repairs they required drained the monument's operating funds[92] The 1990 Housing Management Plan recommended replacing the remaining outdated trailers with two additional fourplexes.[93] Crews replaced three of the existing two-bedroom trailers with two fourplexes in the same general area (the housing and administration area uphill from the main visitor center).[94] It recommended keeping some housing on monument grounds, since it was helpful to have staff on site while the visitor center was closed, in order to protect the monument from vandalism and fire, and to help visitors as needed.[95] Three permanent employees were "required occupants" in order to ensure safety at the monument (Mike Wiles, Donna Bentley, and Tom Casey).[96] Seasonal staff lived in trailers on site and in the historic Civilian Conservation Corps (CCC) cabin.[97]

The 1994 GMP and a 1995 Housing Management Plan concluded that Jewel Cave needed to continue to provide housing because local towns lacked sufficient rental capacity for seasonal employees, and older and non-local employees did not usually accept positions offered without housing. Some of the older trailers still needed to be replaced.[98] However, comments on the GMP included concerns that building more structures on monument grounds could harm fragile cave resources below. The final GMP concluded that building housing off site was not feasible.[99]

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[91] Jewel Cave National Monument Solid Waste Audit Summary, Summer 1997, 2; Marie Curtain to Mike Wiles, June 1, 1998, Cabinet 3, Drawer 2, Folder N26 Reports, Jewel Cave NM CF. In the mid-2000s, a maintenance leader had everything removed from the Boneyard. Wiles, comments on draft, April 7, 2020.

[92] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 11.

[93] Attachment to Housing Management Plan, Jewel Cave, 1990, Cabinet 2, Drawer 4, Folder D3423 Buildings – Individual, Jewel Cave NM CF.

[94] Attachment to Housing Management Plan, Jewel Cave, 1990; Superintendent's Annual Report, Jewel Cave National Monument, 1990, 5.

[95] Housing Management Plan, Jewel Cave, 1990, 9, Cabinet 2, Drawer 4, Folder D3423 Buildings – Individual, Jewel Cave NM CF.

[96] NPS, Certifications of Required Occupancy, February 14, 1995, 3.

[97] Tom Casey to InterMountain Field Area Regional Historical Architect, memorandum, May 28, 1995, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF.

[98] Jewel Cave National Monument Housing Management Plan, 1995, 4–6, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF; NPS, Final General Management Plan/Environmental Impact Statement, Jewel Cave National Monument, South Dakota, June 1994, 102.

[99] Wiles, comments on draft, April 7, 2020; NPS, Final General Management Plan/Environmental Impact Statement, Jewel Cave National Monument, South Dakota, June 1994, 89.

Later, the NPS began to reconsider building seasonal employee housing off site.[100] In 1996, Cannon, Hart, and Midwest Regional Office staff forged a partnership with the Forest Service to build joint seasonal employee housing in Custer.[101] That year, Forest Supervisor John Twiss "made the commitment that the [Jewel Cave] housing facility could be built in the USFS compound whether or not it included any USFS housing."[102] The Midwest Regional Office helped to secure funding, and in 1997, the NPS planned, the Forest Service designed, and the NPS contracted out the construction of a ten-unit housing complex on Forest Service land just outside of Custer.[103]

The joint NPS-Forest Service housing complex was dedicated in September 1998 and finalized in 1999. The agencies held a ribbon-cutting ceremony in October 1998, which Cannon (by then the former superintendent), O'Dell, and District Ranger Mike Lloyd attended.[104] The final agreement allotted nine beds to NPS employees and five to the Forest Service.[105] The NPS obtained office furniture and supplies for inside of the building. The two agencies signed a contract for the Forest Service to provide maintenance. This was one of the first examples in the country of interagency cooperation on a housing project.[106] Following completion of the Custer apartments, Jewel Cave disposed of three on-site trailers.

Wiles coordinated a project, in partnership with a private construction contractor and the National Guard, to remove asphalt from the unused portion of the housing parking lot in order to reduce artificial surface runoff and protect cave resources. They then transported material from a large dirt pile in Hell Canyon (created during the original excavation of the sewer lagoons) to the former housing site to restore the area to near-natural topography and restored vegetation at the site.[107]

Highway 16

In the late 1980s, the South Dakota Department of Transportation (SDDOT) had improved the section of the highway from Custer to just east of Jewel Cave. SDDOT planned next to improve and reroute the section of Highway 16 that went through the monument. This including bypassing several dangerous curves, which SDDOT planned to do by relocating the road and erecting a bridge

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[100] Jewel Cave National Monument Housing Management Plan, 1995, 7.

[101] Hart, interview; Cannon, interview.

[102] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 2.

[103] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6; NPS, Justification for New and/or Replacement Housing, February 12, 1997, Cabinet 2, Drawer 3, Folder D34 Buildings, Jewel Cave NM CF; Hart, interview.

[104] "Employee Housing – a first in the nation," *Custer Chronicle*, October 22, 1998, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[105] "Employee Housing – a first in the nation," *Custer Chronicle*, October 22, 1998.

[106] Hart, interview; Menard, interview; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 2, 5.

[107] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 2, 7; Wiles, comments on draft, April 7, 2020.

over Hell Canyon, as Senator Peter Norbeck had first proposed back in the 1930s (see Chapter 3).[108] Jewel Cave staff assisted the state with the environmental and cultural review processes starting in 1990.[109] Ortega wanted SDDOT to commit to paying for a new access road to the Jewel Cave visitor center, if one was needed after the rerouting.[110] SDDOT held public meetings in November 1990 in Custer and Newcastle, and the NPS assisted with developing the design and provided comments in on the proposed rerouting in 1991.[111]

SDDOT completed the Environmental Assessment for the Highway 16 realignment in January 1993.[112] The realignment project proposed eliminating sharp curves, moderating the grading of the road, and building a bridge over Hell Canyon. These changes shifted the road's alignment through Jewel Cave to the north.[113] Abandoned sections of the road within the monument would either be used as access roads or recontoured to original grade and revegetated.[114]

Plans to reroute Highway 16 stalled for several years due to a lack of funding, but Jewel Cave resource management staff prepared "Highway Stipulations" as part of an updated Resource Management Plan (RMP). These included:

- All roads must be designed at no more than 10-mph design speeds through the monument.
- Construction must be halted if cave resources are encountered. Resource management staff would investigate and propose a mitigation.
- SDDOT must mitigate runoff however possible to protect cave (such as using less salt or installing catchment basins and/or retention ponds).
- Plans must include measures to decrease erosion, including using native soils and limited tree removal.
- Fencing should not be directly adjacent to the highway, but SDDOT should build a fence on the monument boundary north of the present highway.

The NPS requested that SDDOT complete a new boundary survey when rerouting Highway 16, because "the legal description of the Monument is partially based on the centerline of U.S. Highway

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[108] RobertaMcDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 11.

[109] Superintendent's Annual Report, Jewel Cave National Monument, 1990, 6.

[110] Jewel Cave NM Superintendent to files, memorandum, January 2, 1991, Cabinet 2, Drawer 3, Folder D30 US16 recon. Chronology/Comments, Jewel Cave NM CF.

[111] Jewel Cave NM Superintendent to files, memorandum, January 2, 1991; US DOT, FHWA, SDDOT, Environmental Assessment and Programmatic Section 4(f) Evaluation, January 29, 1993, 14, Cabinet 2, Drawer 3, Folder D30 US16 recon. Final Draft/Approval, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[112] Jim Nelson, Environmental Engineer, SDDOT, to Kate Cannon, Jewel Cave National Monument, memorandum, January 29, 1993, Cabinet 2, Drawer 3, Folder D30 US16 recon. Final Draft/Approval, Jewel Cave NM CF.

[113] Nelson to Cannon, memorandum, January 29, 1993.

[114] US DOT, FHWA, SDDOT, Environmental Assessment and Programmatic Section 4(f) Evaluation, January 29, 1993, 4–5.

16, where it winds up the west side of Hell Canyon," and an altered roadbed would therefore mean an unclear western boundary of the monument.[115]

The Custer Chamber of Commerce and US Congressman Tim Johnson (D-SD) supported the rerouting of Highway 16 and the construction of a bridge over Hell Canyon, which would cost roughly $21.7 million. Johnson spoke before the House Subcommittee on Surface Transportation to request authorization of the $17.3 million federal share of the project, but no funding was forthcoming for the next several years.[116] In late 1999, the rerouting and bridge project remained tentative, subject to federal funding levels. Despite SDDOT efforts to move it forward, it was difficult to find funding for the bridge without detracting from other pressing needs.[117]

Surface Trails

In the 1990s, monument staff formalized and named two previously extant surface trails. The "Canyons Trail" connected Lithograph Canyon with Hell Canyon, providing a path for visitors to walk between the main visitor center and the historic area of the monument. This route was a footpath, about 18 inches wide, that staff had used to go between the two areas since the 1970s. To establish a formal trail, maintenance crews widened the path, installed water bars, and laid gravel on it. The second trail was the "Walk on the Roof Trail," meaning the "roof" of the cave. This trail utilized the interpretive nature trail built by YCC crews in the 1980s. That trail departed from the visitor center and was about a quarter mile long.[118]

Natural Resource Management

During the 1990s, cavers found significant additional segments of Jewel Cave outside of the monument boundaries. The new segments even extended beyond the Forest Service land that had been withdrawn from mineral entry in 1990. Resource managers therefore spent much of the 1990s trying to figure out how to protect the cave outside of monument boundaries. They continued efforts to develop baseline studies of underground and aboveground biological and geological processes in order to better manage the cave. And the first full-time cave resource management employee at Jewel Cave learned from and shared resources with cave specialists at other NPS-managed caves and others in the caving community.

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[115] Appendix C: Highway Stipulations, Resource Management Plan, Jewel Cave National Monument, 1999, 21–23, Jewel Cave NM DF.

[116] "Chamber supports Hell Canyon Bridge project," *Custer Chronicle*, March 31, 1994, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[117] "Construction of bridge to span Hell Canyon," *High Country Herald*, March 17, 1999, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[118] Wiles, comments on draft, April 7, 2020; Jewel Cave Squad Notes, October 16, 2001, Jewel Cave NM DF; Superintendent to Central Files, memorandum, March 24, 2008, Cabinet 1, Drawer 2, Folder 2007, Jewel Cave NM CF.

Cave Exploration

Mike Wiles held the permit to explore Jewel Cave in the late 1980s and early 1990s, as Herb and Jan Conn had before him. He had initially shared the permit with Ken Allgier, but when Allgier moved away, Wiles became the sole permit holder and lead explorer (although Adams sometimes allowed others to lead caving trips).[119] Wiles remained the primary explorer of the cave and managed the exploration program, but he still was required to request permission from Jewel Cave management to explore, as previous permit holders had done. He continued under an annual permit until Adams and Holder decided to manage cave exploration under a special use permit. The time Wiles or other employees spent in the cave exploring was as volunteers: no one was ever paid for exploration work.[120]

At the beginning of the decade, there were around 82 known miles of Jewel Cave.[121] A major breakthrough occurred in the early 1990s on the southeastern edge of the known cave. That launched a boom in activity southeast of the monument boundaries, with cavers discovering approximately six miles a year for several years (see Figure 109). The known cave now extended significantly outside of the area of Forest Service land withdrawn from mineral extraction in 1990.[122] As of 1993, there were 10 known miles of cave passages outside of the monument's western boundary and 15.2 miles outside of its south and eastern boundary.[123] In 1994, cavers found the cave's 100th mile. Upon returning to the surface, they were greeted by staff and friends in a celebration prepared by the Conns. Subsequent discoveries during the 1990s were mostly in this southeastern corner in the cave, beyond Hurricane Corner and Seventh Heaven.[124]



Figure 109. Exploration of Jewel Cave continued in the 1990s.

Source: Jewel Cave NM.

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[119] Superintendent's Annual Report, Jewel Cave National Monument, 1993, 1; Wiles, interview.

[120] Wiles, interview; Marc Ohms, interview by Jackie Gonzales, June 30, 2019, Custer, SD; Rene Ohms, interview by Jackie Gonzales, June 28, 2019, Custer, SD; Wiles, comments on draft, April 7, 2020.

[121] Superintendent's Annual Report, Jewel Cave National Monument, 1990, 4.

[122] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 3; Mike Wiles, "Jewel Cave Exploration from 1979 to 2005," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019.

[123] Michael E. Wiles, Jewel Cave Exploration, Summary Report, Jan. 1 to Dec. 31, 1993, Cabinet 3, Drawer 2, Folder N2621 Annual Exploration Reports, Jewel Cave NM CF.

[124] Wiles, comments on draft, April 7, 2020.

The new leads in the far southeastern corner of the cave eventually took six or seven hours to reach, leaving only four hours for additional exploration before cavers had to turn back. To remedy this, caver Joel Despain suggested setting up a camp inside of Jewel Cave, such as the one at Lechuguilla in Carlsbad Caverns National Park. Many of the active explorers had concerns that a camp would damage the resource and be simply a "lazy person's way" to explore. But, with leads so far out, Wiles decided the concerns could be mitigated and drafted a preliminary underground camping policy.[125]

Wiles and other cavers first set up a trial camp, halfway between Seventh Heaven and the Big Duh. When that worked, they established the first full cave camp near the Big Duh, which they called "southeast camp." Wiles led the first overnight exploration trip in June 1997.[126] The team left a small kitchen, supplies, and sleeping bags at southeast camp, to avoid having to carry items back and forth every time.[127] Camping allowed explorers to spend more time surveying in remote locations.[128] With the first cave camp set up, new discoveries continued at a rapid pace, and by 1998, there were over 115 miles of known cave.[129]

As exploration took cavers deeper into the cave, the need for a Search and Rescue (SAR) Plan became apparent. Wiles completed a draft SAR plan in 1996, and staff placed rescue stashes at strategic locations in the cave.[130] Wiles rewrote the plan the following year in cooperation with Wind Cave, in order to ensure the two policies were consistent.[131] The revised plan emphasized the fundamental differences between cave and surface SAR operations. For example, "Moving an injured caver in a stretcher from the end of the cave would take *at least* three days, and could potentially involve the use of over 100 cavers." It continued, "There are some situations where the body of a deceased caver would be interred within the cave, rather than needlessly endangering cavers attempting a body recovery." It noted that parts of the cave "are exceedingly fragile" and "SAR activities are likely to result in resource damage. . . ." The plan advised, "While the interests of the patient will always be kept in mind, NPS resource preservation mandates much be considered as well. These concerns will likely slow the progress of rescue teams through some areas."[132] The plan included basic procedures for a SAR operation in the cave and contact lists of local NPS leadership,

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[125] Wiles, interview; Marc Ohms, interview.

[126] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Marc Ohms, interview; Wiles, interview.

[127] Dan Austin, "Jewel Cave Exploration from 2005 to Present and the Southwest Splinter Breakthrough," talk, Jewel Cave 200-mile Reunion, Custer, SD, June 29, 2019.

[128] Wiles, "Jewel Cave Exploration from 1979 to 2005"; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 7.

[129] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 7.

[130] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 4.

[131] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7.

[132] Emphasis in original. Cave Search and Rescue Plan: Jewel Cave National Monument, February 1999, 1, Cabinet 2, Drawer 2, Folder D18 Cave Search & Rescue Plan, Jewel Cave NM CF.

technical specialists (cavers familiar with Jewel Cave), and other local cavers. Later, staff added Cave Rescue Pre-Planning documents.[133]

Cave Research and Resource Management

Cannon, like the Jewel Cave managers in the late 1980s, requested funding for baseline studies in order to better assess condition changes and to inform interpretation of the cave.[134] Cannon emphasized this point to staff at the Rocky Mountain Regional Office and the DSC who completed the GMP, and they responded by calling for baseline studies in the GMP task directive.[135] Cannon and Wiles also updated the 1983 RMP to include more on managing cave resources, which the 1983 plan had only "marginally" addressed.[136] Efforts in the early 1990s to develop a cave management plan stalled due to lack of staff time and ongoing negotiations with the Forest Service about managing cave resources under forest lands.[137]

Cave lint and algae continued to build along the scenic route, potentially damaging cave resources. Cave lint is material resulting from human activity, made up of "clothing fiber, hair, skin, and other small particles left unintentionally by visitors."[138] In 1992, Jewel Cave received funding to continue lint control through periodic vacuuming and using collection tarps below platforms and stairs along the Scenic Tour route, and to control algae through shielding light fixtures (algae grew near lights due to the heat the lights emitted).[139]

In 1994, Pat Jablonsky, who had led an annual "lint camp" in Carlsbad Caverns since 1988 to remove accumulated materials from the cave, completed a study of lint in Jewel Cave.[140] Jablonsky and her team researched the composition and characteristics of the lint in Jewel Cave and recommended ways to slow its accumulation.[141] Jablonsky concluded,

> Microscopic analyses of lint samples collected at Wind Cave, Jewel Cave, and other tour caves, clearly demonstrates that it is composed of more than fabric fibers. Other major components are mineral

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[133] Cave Search and Rescue Plan: Jewel Cave National Monument, February 1999, 1–6.

[134] Kate Cannon to Rocky Mountain Regional Director, memorandum "Natural Resources Project Funding FY '91 Proposals," February 28, 1991, Cabinet 2, Drawer 2, Folder D18 Resources Management Plan, Jewel Cave NM CF.

[135] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 13.

[136] Outline of Planning Requirements, Jewel Cave National Monument, May 30, 1990, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[137] Superintendent's Annual Report, Jewel Cave National Monument, 1993, 4.

[138] Pat Jablonsky, et al., Final Report: Develop Preventive Measures For Future Accumulations Of Cave Lint, Wind Cave National Park, June 1, 1994, 1, Jewel Cave NM DF.

[139] Project Statement, Natural Resource Preservation, Restoration, and Mitigation Program, Jewel Cave NM, "Control Algae," 11992, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

[140] NPS Cave and Karst Programs, "Carlsbad Cavern Restoration," *Inside Earth* 15, no. 2 (Fall 2012): 10.

[141] Jablonsky, et al., Final Report: Develop Preventive Measures For Future Accumulations Of Cave Lint, Wind Cave National Park, June 1, 1994, 1.

> particles, wood, insect parts, human hair, other animal hair, fungus, processed tobacco, paper, and a number of other, not obviously, identifiable materials.[142]

Jablonsky suggested strategies to minimize the lint accumulation, including air showers, electrical ionization techniques, surfaced and curbed trails for easier cleanup, routine trail surface cleaning (but not sweeping, which just kicks up the lint into the air), and trail features that "clean footwear" like the mats or runners used in the entryways of public buildings.[143] The monument tried out air showers, but they demonstrated no additional benefit. The curbed trails were installed in 2020.[144] As a result of Jablonsky's research and input, Jewel Cave and Wind Cave hosted lint cleaning camps for the first time in 1994, modeled on the camp held at Carlsbad. Jablonsky noted that the camp was "highly successful," and Jewel Cave held it annually for many years.[145]

From 1992 to 1995, John Moore, an associate professor of Biological Sciences at the University of Northern Colorado, and several of his graduate students completed biological surveys of Jewel Cave and Wind Cave. They analyzed sediments to determine the cave's microbiota and the origin of organic carbon inputs. They reported,

> In both Wind Cave and Jewel Cave the highest concentrations of carbon inputs and biota were at the entrances and along the tour routes. The distribution of lint input rates was closely coupled to the tour routes. Heterotrophic bacterial and fungal densities in these locations approached those found in soils collected outside the entrances. Beyond the tour routes, lint deposition dropped of[f] markedly in both caves, more so in Jewel Cave than in Wind Cave. Within Jewel Cave, the high bacterial and fungal densities closely paralleled lint deposition, and mammal activity. This pattern was less apparent in Wind Cave. . . . Both caves supported Protozoa, nematode and arthropod populations. While Protozoa were found throughout the caves, nematode and arthropod were largely restricted to the entrances, tour routes and well travelled corridors.
>
> We concluded that the cave ecosystems are largely detritus-based. There is strong coincidental evidence that human activity has impacted the caves by increasing carbon inputs in the form of lint or by augmenting entrances thereby increasing access to rodents and bats. The increased carbon inputs has facilitated the colonization of several arthropod and nematode species from immediately outside the cave and from accidental introduction by tourists. The increase in species diversity that is coincidental with areas impacted by humans and small mammals is restricted to tour routes and entrances at Jewel Cave, and beyond these areas at Wind Cave.[146]

Jewel Cave supported a number of resource management projects, and personnel to carry them out, with funds from the elevator cost recovery fund supported by cave tour fees. Wiles completed mapping efforts as part of his 1992 Master of Science thesis, completed in part on NPS time since it was directly related to management of Jewel Cave resources. In the late 1990s, Wiles mapped out

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[142] Jablonsky, et al., Final Report: Develop Preventive Measures For Future Accumulations Of Cave Lint, Wind Cave National Park, June 1, 1994, 4.

[143] Jablonsky, et al., Final Report: Develop Preventive Measures For Future Accumulations Of Cave Lint, Wind Cave National Park, June 1, 1994, 14–15.

[144] Wiles, comments on draft, April 7, 2020.

[145] Jablonsky, et al., Final Report: Develop Preventive Measures For Future Accumulations Of Cave Lint, Wind Cave National Park, June 1, 1994, 74; Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6.

[146] John C. Moore, Survey of the Biota and Trophic Interactions Within Wind Cave and Jewel Cave, South Dakota, August 15, 1996, 1, Jewel Cave NM DF.

cave under private land in the Pass Creek Area.[147] In 1997 and 1998, the US Geological Survey (USGS), Marsha Davis (a Jewel Cave seasonal employee who had co-authored the monument's hydrology study), and private contractors Ted Jennings and Mark Fahrenbach completed a geologic mapping project.[148] Staff measured radon levels throughout the cave and found that levels tended to decrease deeper in the cave (at least toward southeastern camp).[149] They monitored microclimates in Jewel Cave, including how additional entrances affected cave climate and airflow (see Figure 110). As a result of this work, Wiles researched, and maintenance crews installed, stainless steel air lock doors in the Upper Cave and Lower Cave elevator lobbies.[150]



Figure 110. Volunteer D. Kruse monitors temperature in Jewel Cave, 1991.

Source: NPS, Jewel Cave NM.

The monument received funding from the NPS and the Wind Cave and Jewel Cave Natural History Association to inventory and monitor bat populations at the historic entrance to the cave.[151] David J. Worthington and Michael A. Bogan used the funds to complete a study of the Jewel Cave

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147 Wiles, comments on draft, April 7, 2020.

148 Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6.

149 Monitoring Jewel Cave Microclimate and Radon Concentrations, undated [c. 1995], Cabinet 3, Drawer 2, Folder N3615 Pollution/Environmental Quality – Air, Jewel Cave NM CF; NPS, Jewel Cave National Monument, "Geologic Resources Inventory Report," March 2009, 14, eTIC.

150 McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 12; Project Statement, Natural Resource Preservation, Restoration, and Mitigation Program, Jewel Cave NM, "Restore Normal Airflow", 1992, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects; Monitoring Jewel Cave Microclimate and Radon Concentrations, undated [ca. 1995], Cabinet 3, Drawer 2, Folder N3615 Pollution/Environmental Quality – Air, Jewel Cave NM CF.

151 Mini-Proposal, Competitive Cooperative Research Program, "Inventory and monitor bat populations," 1992, Cabinet 3, Drawer 4, Folder N2219 Research Proposals & Projects, Jewel Cave NM CF.

bat population, including its history and how cave entrance modifications had affected populations over the years.[152] They concluded,

> While it is possible and perhaps likely that Jewel Cave was not used by bats at the time of its discovery and subsequent development by humans, it appears to have been used extensively by bats since at least the late 1950's, and continues to be an important winter roosting site. Even if bats were not historic occupants of Jewel Cave, the large number of bats now using the cave suggests that Jewel Cave is a significant resource, especially for *P. townsendii*. Colonies of over 1,000 individuals of this species are known to exist presently in the eastern United States (C. Stihler, B. Kennedy, pers. comm.), but hibernating colonies approaching this size in the west are rare.[153]

Worthington and Bogan analyzed how a new gate at the historic entrance might affect bats using the cave. They advised that any gate to replace the 60-year-old entrance gate should allow for passage of bats, not affect air flow, and be installed in the summer so as not to disturb the bat hibernacula.[154] The gate installed copied the original in every detail except it had horizontal rather than vertical bars in the middle section, in order to allow for the easier passage of bats. Bogan oversaw bat research at Jewel Cave for the remainder of the 1990s, and Jewel Cave staff conducted an annual winter count of hibernating bats.[155]

Bogan also partnered with Cynthia A. Ramotnik to conduct a field survey for small mammals in summer 1993. Cannon provided them room in the pole barn for a laboratory and allowed them to camp near monument headquarters (the pole barn is now called the "Training Facility").[156] They found mostly small mammals and several medium-sized mammals, as well as several amphibians and reptiles, all residing on the surface except for the bats. Their work provided baseline data about the occurrence of animals at Jewel Cave.[157] Ramotnik, a curator, collected and prepared specimens to be added to Jewel Cave's museum collection.[158]

Jewel Cave superintendents continued to request funding for a cave management plan, but it was not forthcoming. In the meantime, staff worked on other supplemental plans to improve management of cave resources. In 1998, Wiles completed a Draft Human Use Document, an internal guide that Wiles intended "to provide basic concepts to help our staff offer helpful answers

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[152] David J. Worthington and Michael A. Bogan, Cave Entrance Modification and Potential Impact on Bat Populations at Jewel Cave National Monument, South Dakota, February 19, 1993, 1, Cabinet 3, Drawer 4, Folder N1427 Bats – JECA Bogan & Worthington, Jewel Cave NM CF.

[153] Worthington and Bogan, Cave Entrance Modification, February 19, 1993, 2.

[154] Worthington and Bogan, Cave Entrance Modification, February 19, 1993, 5–6.

[155] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 4; Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 7; Wiles, comments on draft, April 7, 2020.

[156] Wiles, comments on draft, April 7, 2020.

[157] Michael A. Bogan and Cynthia A. Ramotinik, Baseline Surveys for Mammals at Jewel Cave National Monument South Dakota, March 1, 1994, Files 1783a–k, Jewel Cave NM MF.

[158] U.S. Biological Survey Collections Manager Cindy Ramotnik to Donna Bentley, March 3, 1995, Files 1781a–b, Jewel Cave NM MF.

to difficult questions" about human impacts on the cave.[159] The document addressed human-caused contamination of the cave from runoff that originated on roads, parking lots, sidewalks, roofs, lawns, and the sewage lagoons. To reduce contamination from its own facilities, the NPS had,

> replaced asphalt cave trails with concrete; reduced algae growth by annual treatment and by modifying our lighting system; installed air lock doors; installed lint collection tarps; facilitated restoration camps; installed vacuum toilets; moved seasonal housing off-site; begun a photomonitoring program; conducted water-quality and biologic studies; monitored underground fuel tanks; reduce[d] our use of hazardous materials; contained spills of used oil, antifreeze, and fuels; established conservation-minded exploration policies; reduced tour size; restored disturbed land; used bio-control of exotic plants rather than pesticides; conducted geologic mapping to identify vulnerable areas; had public land overlying known cave passages removed from mineral entry; and encouraged a land exchange that will place more land under the Federal Cave Resources Protection Act. Wind Cave is taking action to mitigate the effects of parking lot runoff, and we will likely follow in their steps after evaluating the effectiveness of their efforts.[160]

As part of the initiatives to mitigate contamination of the cave through surface runoff, Jewel Cave had also requested funding to measure the precise impact of human sewage on cave resources.[161]

In 1999, O'Dell approved a new RMP, updated by Wiles, that dealt with cave resources more thoroughly than the 1983 RMP had. The new RMP listed the park's resource management objectives:

> To understand, monitor, maintain, restore and protect the natural systems and conditions that exist in Jewel Cave.
>
> To plan and manage surface resources and developments in order to maintain, restore, and protect natural systems and conditions within Jewel Cave National Monument.
>
> To work with the Black Hills National Forest and neighboring landowners to ensure that land uses adjacent to the monument do not threaten portions of the Jewel Cave system that extend beyond park boundaries.
>
> To identify, document, and protect significant vegetative and wildlife resources within the Monument.
>
> To identify, document, preserve and protect significant cultural resources within the monument.[162]

The RMP listed what baseline information existed for the monument, the current conditions of natural resources, threats to those natural resources, and future plans for managing both natural and cultural resources.[163] It identified three top priorities for additional natural resources baseline data: (1) a study of microclimate and airflow dynamics, (2) an inventory and map of cave microbiology, and (3) completion and analysis of the bat survey.[164]

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[159] Mike Wiles to Chief of Resource Management, memorandum, "Human Use Issues," July 14, 1998, Cabinet 3, Drawer 4, Folder L7617 Statements & Studies – NPS Areas, Jewel Cave NM CF.

[160] Wiles to Chief of Resource Management, memorandum, "Human Use Issues," July 14, 1998.

[161] Project Statement, Jewel Cave NM, April 1, 1998.

[162] Resource Management Plan, Jewel Cave National Monument, 1999, 6, Jewel Cave NM DF.

[163] Resource Management Plan, Jewel Cave National Monument, 1999, 6–16.

[164] Resource Management Plan, Jewel Cave National Monument, 1999, 13.

Cooperation with Other Caves

In 1991, the NPS renewed a service-wide memorandum of understanding (MOU) with the Cave Research Foundation for cooperative cave management, along with a Declaration of Mutual Interest.[165] The Cave Research Foundation was a non-profit, all-volunteer organization, established in 1957 and dedicated to researching cave and karst features.[166] The agreement stated that the Cave Research Foundation could conduct studies to help understand cave/karst systems in the National Park System; the NPS could use results of the foundation's studies in its cave management policies and for interpretive purposes; the foundation had permission for field operations, surveying, and mapping, as long as it provided the NPS the maps and results of its research; and the foundation would obtain NPS approval before making public statements about caves on NPS lands.[167] Jewel Cave never utilized this agreement.[168]

Jewel Cave continued to benefit from its association with the National Speleological Society (NSS). Cave specialists at NPS sites across the country knew each other through the NSS and maintained a strong network. Cavers at Jewel Cave had been involved in the NSS for decades, including Herb and Jan Conn, Art and Peg Palmer, and Dwight Deal. In the 1990s, Wiles, Marc Ohms, Rene Ohms, Steve Baldwin, Stan Allison, and other cavers active at Jewel Cave were all members of the NSS and many attended annual NSS conventions. Through this national network, they shared experiences from Jewel Cave and learned from cavers elsewhere. For instance, after attending an NSS convention in 1991, Art Palmer wrote to Wiles about surveying progress at Lechuguilla.[169]

Similarly, the International Congress of Speleology (ICS) provided valuable opportunities to learn from managers of other caves. After attending the ICS meeting in 1997, Wiles asked to visit Mammoth Cave National Park to observe cave management procedures with the park ecologist, Rick Olson. O'Dell explained to Mammoth Cave Superintendent Ronald R. Switzer,

> Last August Mike had an opportunity to visit with Rick at the International Congress of Speleology. He found it helpful to discuss the different solutions to management issues arrived at in different NPS units, and felt the interaction to be very productive. I believe that further discussion during an on-site

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[165] F. Eugene Hester to Regional Directors, memorandum, April 29, 1991, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF; Declaration of Mutual Interest by the National Park Service, Department of the Interior, and the Cave Research Foundation, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[166] Declaration of Mutual Interest by the National Park Service, Department of the Interior, and the Cave Research Foundation.

[167] Memorandum of Understanding Between the National Park Service, Department of the Interior and the Cave Research Foundation, April 1991, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[168] Wiles, comments on draft, April 7, 2020.

[169] Art & Peg Palmer to Kate, Brian, Mike, and all, July 17, 1991, Cabinet 3, Drawer 2, Folder N3023 Palmer, Art & Peg, Jewel Cave NM CF.

> visit would be beneficial to both parks. We would greatly appreciate the opportunity for Rick to show Mike around your park and discuss ecosystem management issues.[170]

Wiles attended and presented at Mammoth Cave's Annual Science Conference and participated in a Cave Research Foundation caving trip to re-survey a known area of Mammoth Cave.[171] Wiles subsequently reported,

> This first-hand experience helped me understand some of the differing practices of cavers in different regions regarding such matters as: travel speed, pack size and contents, type of clothing, and camping (not often done in Mammoth Cave). Such considerations are as well thought-out as at Jewel. The conclusions are different, however, because of nature of the cave itself, as well as the attitudes of the surrounding community.[172]

Wiles and Olson discussed relationships between NPS cave sites and nearby landowners, microclimates and entrance changes' effects on them, archeological resources, bat populations, hydrology, vandalism mitigation, and tour policies.[173] Their discussions led to a later collaboration between Mammoth Cave and Jewel Cave to coordinate a meeting of all cave management and natural resource specialists in the NPS, in order to share best practices and learn from each other.[174]

In 1998, Congress established the National Cave and Karst Research Institute (NCKRI) (P.L. 105-325). The NPS was tasked with the initial planning for the new organization, and Wiles served on NCKRI's steering committee, chaired by Zelda Bailey.[175] The organization's purpose was to:

- further the science of speleology;
- centralize and standardize speleological information;
- foster interdisciplinary cooperation in cave and karst research programs;
- promote public education;
- promote national and international cooperation in protecting the environment for the benefit of cave and karst landforms; and
- promote and develop environmentally sound and sustainable resource management practices.

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[170] Peggy O'Dell to Ronald R. Switzer, Mammoth Cave National Park Superintendent, July 6, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF.

[171] Mike Wiles, Mammoth Cave trip report, July 31, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF.

[172] Mike Wiles, Mammoth Cave trip report, August 1, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF.

[173] Mike Wiles, Mammoth Cave trip report, July 28, 1998, and July 30, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF.

[174] Ronald R. Switzer to Jewel Cave NM Superintendent, memorandum, July 24, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF; Larry Dilts for Peggy O'Dell to Mammoth Cave National Park Superintendent, October 5, 1998, Cabinet 3, Drawer 2, Folder N3023 Geologic Features – Speleo., Jewel Cave NM CF.

[175] An Act of October 30, 1998, 112 Stat. 3038 (P.L. 105-325); Wiles, comments on draft, April 7, 2020.

NCKRI was based in New Mexico and was a partnership among the NPS, the New Mexico Institute of Mining and Technology (a state institution), and the City of Carlsbad.[176]

Cooperation with Forest Service on Cave Management (including Pass Creek Land Exchange)

As cavers discovered more and more passageways under Forest Service property, Cannon and Wiles faced the challenges of managing parts of the cave that fell outside monument lands. The 1990 GMP task directive (for the GMP finalized in 1993) noted that "long-standing concerns about activities on adjoining lands have intensified" with the discoveries of more cave under Forest Service land.[177] During the GMP process, NPS planners concluded that Jewel Cave's enabling legislation and the Federal Cave Resource Protection Act "clearly provides authority for boundary changes necessary to protect the cave."[178] However, boundary changes required an act of Congress, a high bar that would be difficult to clear.

In order to protect cave resources in the meantime, Cannon entered into a 1991 interagency agreement with the Black Hills National Forest "for cooperative management of those sections of Jewel Cave that underlie USFS lands."[179] Forest Service and NPS officials met annually pursuant to the agreement and updated each other about cave management, research projects, and the most recent cave maps. Cannon investigated the possibility of another mineral withdrawal, in addition to the one completed in 1990.[180]

The agencies also pursued protecting Jewel Cave through land exchanges between the Forest Service and owners of private land above the cave. This was a particularly attractive solution for the Pass Creek area, where the cave lay under private land owned by a variety of individuals (the cave is only known to go under three parcels but is expected to cross under many more). Some landowners in the Pass Creek area had penetrated cave passages (not all of which were necessarily connected to known cave) while drilling water wells. Since the Federal Cave Resource Protection Act of 1988 only applies to caves on federal land, federal agencies had no legal recourse if a landowner drilled into the cave with ill intent, or if pollutants leaked from private land into the cave. In addition to the potential problems caused by drilling, the NPS had concerns about the possibility of private septic tanks or pesticides leaking into the cave.[181]

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[176] National Cave and Karst Research Institute, "About NCKRI," accessed November 21, 2019, http://www.nckri.org/about_nckri/about_nckri.htm.

[177] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 12.

[178] Team Captain, Central Team, Branch of Planning, DSC, to Manager, Central Team, DSC, memorandum, February 25, 1991, 2.

[179] Superintendent's Annual Report, Jewel Cave National Monument, 1991 and 1992, 3.

[180] Kate Cannon to Roberta Moltzen, March 30, 1993, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[181] Bob Paulson and Corissa Busse, interview by Jackie Gonzales, June 26, 2019, Rapid City, SD; Wiles, interview; Cannon, interview; Wiles, comments on draft, April 7, 2020.

In the mid-1990s, Cannon approached The Nature Conservancy (TNC) about orchestrating a land exchange in coordination with the Forest Service. An exchange can be more politically expedient than a boundary expansion, because it can be designed to result in no net increase of federal lands and requires no act of Congress. Land exchanges are also a useful management tool for the Forest Service, since they can allow the agency to fill inholdings while also getting rid of lands that are isolated or do not contribute to the agency's mission (it is difficult for a federal land management agency to sell off lands). The Forest Service already had a long-term defragmentation plan, and an exchange at Jewel Cave could help them to implement it.[182]

In 1996, Cannon spoke with Joe Satrom in Bismarck, the director of TNC's North Dakota and South Dakota programs, and launched an exchange of private land with the Forest Service to protect cave resources. The Forest Service provided TNC with a list of private landowners in the Pass Creek Area, and TNC staff began contacting the landowners to see if any would be interested in selling their properties at fair market value. TNC hired a licensed appraiser to evaluate the properties and purchased the first three tracts in 1996 with money from an internal Land Protection Fund (LPF).[183] In 1997, Satrom passed the project off to Bob Paulson, TNC's new South Dakota director. That year, TNC purchased an additional 399.54 acres and continued negotiations with other landowners.[184]

TNC eventually acquired 15 properties in the Pass Creek area. When TNC acquired a property, it coordinated with the Forest Service to either auction off the buildings or burn them, and then it rehabilitated the vegetation on the land. Meanwhile, the Forest Service identified nine parcels of land that it could dispose of, mostly in and around Custer. One parcel was part of the high school football field and another was part of the Custer airport. The appraiser and USGS staff then evaluated the parcels for land value and type—any exchange of federal land would have to ensure that there was no net loss of wetlands. During the back-and-forth, the Forest Service pulled several possible tracts off the table.[185]

The Pass Creek Land Exchange was finalized in April 2000, as a four-way agreement among the NPS, the Forest Service, TNC, and the Custer County Commission. In the final exchange, TNC purchased 15 parcels comprising 366 acres in the Pass Creek area and donated them to the Forest Service, in exchange for seven tracts in and around Custer, which TNC acquired from the Forest Service and sold to private parties on the same day. The City of Custer acquired parcels that previously belonged to the Forest Service on the airport runway, the town dump, and the high school football field. It also acquired other developable parcels, which was helpful to the city since it is surrounded by national forest lands and therefore has difficulty expanding its tax base. The Custer

[182] Paulson and Busse, interview; Wiles, interview; Wiles, comments on draft, April 7, 2020.

[183] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 1, 3; Paulson and Busse, interview.

[184] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 1; Paulson and Busse, interview.

[185] Paulson and Busse, interview.

Housing Authority purchased 10 acres of land that it then sold to developers. The NPS provided $1,000 for closing costs, the agency's only financial contribution to the exchange.[186]

The land exchange allowed the Forest Service to dispose of unwanted parcels, the NPS to protect Jewel Cave, and the City of Custer to expand economically. It did not fully work out for TNC, however. The value of the tracts TNC had purchased exceeded the value of the Forest Service tracts, and because the land exchanged had to be equal in value, TNC was left with one remnant tract of land. Since 2000, TNC has owned, managed, and paid taxes on this parcel in the Pass Creek area. As of 2019, someone had leased the land for grazing, which lowered TNC's tax burden and ensured the land was managed. TNC still wanted to donate the property to the Forest Service if possible, since TNC is not in the business of managing widespread or isolated lands.[187]

Paulson commented that the turnover in federal agencies makes land exchanges difficult for third-party partners. He explained,

> When I started with Joe and went to the first meeting, there were two of us with the Conservancy. There were 13 feds in the room, federal people: USGS, BLM, Park Service, Forest Service. When we finished the land exchange . . . in 2000, it had been going for a while, that was year four, I was the only Nature Conservancy staffer and there were 16 feds in the room. But none of the 16 were the original 13. Within four years,. . . . complete turnover. So we became the institutional memory. And nobody knew why they were doing it, or why it was important.[188]

O'Dell was out of town for that final meeting and Wiles was unable to attend, but Wiles did hold some institutional memory on the part of the NPS, and he and O'Dell expressed strong support for the project.[189]

TNC in South Dakota has completed numerous land exchanges with the Forest Service and the state, but the organization has become increasingly reluctant to get involved in exchanges because of the amount of time they take and the risk of being saddled with managing land that had been intended for donation the Forest Service. Paulson elaborated,

> So it has become quite cumbersome. And it's also something on the Forest Service side that nobody gets credit for, because the way supervisors move through their positions. If a forest supervisor starts a land exchange, they're not the one that's going to finish it. So it's always kind of like an asterisk at the end of their annual report. Because nobody gets credit for it. It just takes too long. And technically we're in year 24 [of the Pass Creek Land Exchange], we've owned this land for 24 years, waiting to get it into the Forest Service. And paying taxes on it and having to maintain it.[190]

The South Dakota director who succeeded Paulson, Corissa Busse, has approached Wiles, other NPS officials, and the Forest Service about arranging another land exchange to transfer the remaining parcel at Pass Creek to Forest Service ownership. But the proposed exchange has been caught in the lengthy environmental review processes and has lacked a champion in either the NPS

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[186] "Nature Conservancy enjoys growth spurt," *Rapid City Journal*, May 17, 2002; Paulson and Busse, interview; Wiles, interview.

[187] Paulson and Busse, interview.

[188] Paulson and Busse, interview.

[189] Wiles, comments on draft, April 7, 2020.

[190] Paulson and Busse, interview.

or the Forest Service. Paulson and Busse both noted that land exchanges are successful when there is someone at a federal agency willing to push it (which Paulson said Cannon did at Jewel Cave) and when the agency has staff that really understand the complexities of the process (Busse identified Cindy Hockelberg with the Forest Service as such a person). As of 2019, TNC remained interested in exchanging the final parcel at Pass Creek but was reluctant to engage in new exchanges out of concern for being left again with excess land.[191]

Fire

In 1991, the Forest Service, the NPS, the states of South Dakota and Wyoming, and two Wyoming counties (Weston and Crook) signed an agreement for "Cooperative Use of Prescribed Fires" in the Black Hills. All of the signatory agencies agreed to "cooperate in prescribed burning projects where such cooperation best serves the public interest and where it is mutually beneficial." The agreement aimed to increase efficiency and cost-effectiveness, and it included provisions for such collaboration.[192]



Figure 111. Jewel Cave held several prescribed burns in the 1990s, in partnership with other NPS units, the Forest Service, and the state of South Dakota. Here, a prescribed burn in 1990.

Source: NPS, Jewel Cave NM.

Around the same time, Jewel Cave initiated a Hazard Fuel Reduction Program to decrease the risk heavy vegetative growth posed to the monument's built infrastructure. Casey reported,

> On the surface, the intense overloading of hazard fuels presents a great risk to the park's real property, including the park Visitor Center, maintenance area and housing area. Mechanical thinning around the park's developed zone over the last several years has lessened the threat to real property, but the rest of the park is still in great danger of uncontrollable wildfire. The uncontrolled overgrowth

[191] Paulson and Busse, interview.

[192] 1991 Interagency Agreement for Cooperative Use of Prescribed Fire Between USDA, Forest Service, USDI, National Park Service, South Dakota Division of Forestry, Wyoming State Forestry Division, Weston County, Wyoming, and Crook County, Wyoming, March 1991, 1, Cabinet 2, Drawer 2, Folder Inspections, Surveys, Appraisals, Jewel Cave NM CF.

> of the park's forest resources is also encouraging bug and pest disease in and around the park. Since the park is surrounded by National Forest lands there is great concern by the Forest Service regarding the threat of a major forest fire occurring in the area. A Fire Management Plan was approved in 1987 and the park is now in the process of implementing a comprehensive mechanical thinning and prescribed burning program funded by the Hazard Fuel Reduction Program.[193]

Forest Service and Wind Cave firefighting staff assisted Jewel Cave with mechanical thinning and prescribed burns (see Figures 111 and 112).

Casey completed a Wildland Fire Prevention Plan for Jewel Cave in 1992. All parks were required to have such plans. The plan for Jewel Cave sought to "reduce the threat of human caused wildland first through employee and visitor awareness and education"[194] During the prior decade, only 2 human-caused fires had occurred at the monument, both in 1991, and 11 human-caused fires had occurred within a three-mile radius of the monument. The plan defined zones within the park and spelled out risks, hazards, and value of each zone, as well as enforcement and education actions needed in each zone.[195]



Figure 112. Hazardous fuel reduction at Jewel Cave through mechanical thinning, 1991.

Source: NPS, Jewel Cave NM.

[193] Annual Statement for Interpretation, Jewel Cave National Monument, 1991, 16.

[194] Jewel Cave National Monument, Wildland Fire Prevention Plan, August 1992, 1, Cabinet 2, Drawer 2, [loose in drawer], Jewel Cave NM CF.

[195] Jewel Cave National Monument, Wildland Fire Prevention Plan, August 1992.

In 1994, Peter M. Brown of the Forest Service's Rocky Mountain Forest and Range Experiment Station developed a fire history of Jewel Cave. Using "fire scars recorded in dendrochronologically-dated tree ring series," Brown determined past fire frequency, timing, spatial patterning, and "the maximum age structure of ponderosa pine communities in the Jewel Cave area."[196] He concluded,

> It is obvious that these forests are not burning today nearly as often as they did in the past. Even the longest interval recorded by trees at Jewel Cave (78 years from 1706 to 1785 at JCS) has been exceeded by the absence of fire events during the twentieth century settlement period. . . . Meaningful reintroduction of fire as a[n] ecosystem process should be a prime component of any management strategy to restore natural conditions at Jewel Cave National Monument.[197]

The same problem existed across the country: forest areas had burned far less frequently than they had previously, due to a century of fire suppression. Following an especially devastating fire season in 1994, the DOI and USDA completed a Federal Wildland Fire Management Policy and Program Review Report. In response to a directive in that report to "reduce flammable wildland fuels and restore fire as an ecosystem process," the NPS organized four five-person fire modules around the country that would be dedicated to prescribed fire activities and assist with regional and national needs. It later expanded to eight modules of seven people each, one of which was stationed at Jewel Cave.[198]

The Jewel Cave Fire Use Module comprised a GS-7 module leader, a GS-6 assistant leader, and five GS-5 forestry technicians. NPS general funding for fires paid for the crews' salaries, and Jewel Cave housed the staff. Parks in the Midwest Region (including Jewel Cave) could request the use of the module for prescribed fires only, not for suppression. The idea was to reduce fuels on public lands and to reduce the likelihood of catastrophic fires, which had become increasingly frequent because of fire suppression policies and a warming climate.[199]

The USDA and DOI maintained cooperative fire protection agreements for all public lands in the Black Hills area.[200] Units included in that agreement were the Black Hills National Forest, Jewel Cave, Wind Cave, Devils Tower, and Mount Rushmore. The local plan included procedures for creating a crew, reporting a fire, using resources, contact points, and initial attack.[201] In 1997, the

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[196] Peter M. Brown, "Fire History of the Southern Black Hills, South Dakota," June 13, 1994, 3, File 1670c, Jewel Cave NM MF.

[197] Brown, "Fire History of the Southern Black Hills, South Dakota," June 13, 1994, 9, File 1670i, Jewel Cave NM MF.

[198] 1999 Jewel Cave Fire Use Module, [1999], NPS, Cabinet 2, Drawer 2, Folder Y14 Jewel Cave Fire Module, Jewel Cave NM CF.

[199] 1999 Jewel Cave Fire Use Module, [1999], NPS.

[200] Interagency cooperative Fire Protection Agreement Between DOI and USDA and the State of South Dakota, May 1995, Cabinet 2, Folder 2, Folder 1995 SD State Interagency Fire Protection Cooperative Agreement, Jewel Cave NM CF.

[201] Annual Operating Plan to Interagency Cooperative Fire Protection Agreement, May 26, 1999, Cabinet 2, Drawer 2, Folder Y14 Wildland Fire Mgt, Wildland Fire Plan, Jewel Cave NM CF.

NPS was included in a nationwide agreement for cooperative fire management among the BLM, BIA, NPS, USFWS, and the Forest Service.[202]

Jewel Cave conducted several prescribed fires in the 1990s in cooperation with the Black Hills National Forest, Wind Cave, Mount Rushmore, and Devils Tower. A prescribed burn in 1990 encompassed 47 acres along the south side of Highway 16 (see Figure 113).[203] Crews completed a small prescribed burn in 1997 and burned slash piles.[204] In 1999, fire crews from Jewel Cave and Wind Cave burned 154 acres south and east of the visitor center, an area bounded by the main park road, Highway 16, and the service road to the sewage lagoons.[205] Objectives for the 1999 fire were to

> reduce hazardous fuels around monument structures to protect them from wildland fire, reduce fuel loads to reduce likelihood of catastrophic fire, reintroduce fire into the ecosystem, and preserve multi-class stands of ponderosa pine.[206]

These objectives proved prescient. Within a year, one of the worst fires in Black Hills history passed through the monument but spared its buildings, thanks in part to these prescribed burns (see Chapter 7).



Figure 113. A prescribed fire at Jewel Cave National Monument, 1990.

Source: NPS, Jewel Cave NM.

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[202] Interagency Agreement for Fire Management Between the BLM, BIA, NPS, FWS of the DOI and the Forest Service of the USDA, February 1997, files provided by Katie Atkins, Folder A44 Memorandums of Agreement, Jewel Cave NM CF.

[203] "Jewel Cave Completes Successful Prescribed Burn," news release, December 11, 1990, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[204] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7.

[205] "Prescribed Fires Planned at Jewel Cave National Monument," news release, March 21, 1999, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[206] Kelly Mathis and Andy Thorstenson, Northern Great Plains Fire Monitoring Team, Jewel Cave National Monument, Lithograph Canyon Prescribed Fire Monitoring Report, September 27, 1999, 1, Cabinet 2, Drawer 2, Folder Y14 Burning Index, Jewel Cave NM CF.

Surface Resources

Jewel Cave staff partnered with the Forest Service and private landowners to control the invasive species leafy spurge, which damaged ranchlands. Originally from the Caucasus Mountains in central Eurasia, leafy spurge was first found at Jewel Cave in 1991 by a Forest Service employee. To control the plant, Cannon opted to use biological control agents (insects) instead of herbicides to avoid "potential groundwater contamination" in areas overlying cave resources.[207] Biological control of leafy spurge using the black dot spurge flea beetle (*Aphthona nigriscutis*) began in 1995, with insects from an insectary in Wyoming. The South Dakota Department of Agriculture provided the insects to the NPS at no cost.[208] After the first year, Casey asked for permission to release an additional 5,000 beetles.[209]

In the Pass Creek Area, Cannon initiated, and Curtain carried out, a program encouraging private owners of property over cave resources to use the beetle in place of herbicides. The Forest Service and the Custer County Weed Inspector cooperated with the NPS on this initiative, pursuant to a national MOU between the Forest Service and the NPS (MOU-88-37) for cooperation in "pest management and pesticide use, and other issues that may cross jurisdictional lines or impact the overall ecosystem."[210] The NPS partnered with the Forest Service, Custer County, and the state of South Dakota to release beetles in the Pass Creek area and establish an insectary on Forest Service land in the Pass Creek area.[211] Curtain developed an informational pamphlet about the program in 1998 and mailed it to 75 Pass Creek landowners.[212]

Forest Service partners helped Jewel Cave collect baseline data regarding birds. District Ranger Frank Cross conducted a migratory bird survey by the sewer lagoons to help Jewel Cave develop a bird list. Cross counted 167 birds spanning 21 different species.[213] In spring 1996, Black Hills National Forest Biological Technician Duane Weber conducted a breeding bird survey within the monument. Jewel Cave paid the Forest Service for Weber's time and materials. To conduct the service, Weber used a point-count method in which he set up a census route and ran it four times. Cannon hoped to repeat the count in future years and suggested using Wind Cave staff, if Weber

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[207] Kathleen M. Burzynski, "The Biological Control of Leafy Spurge at Jewel Cave National Monument," July 30, 1995, 2–4, Cabinet 3, Drawer 1, Folder Natural Surface Vegetation, Jewel Cave NM CF.

[208] Burzynski, "The Biological Control of Leafy Spurge at Jewel Cave National Monument," July 30, 1995, 13.

[209] Tom Casey for Kate Cannon to Rocky Mountain Regional Director, memorandum, February 23, 1995, Cabinet 3, Drawer 1, Folder Natural Surface Vegetation, Jewel Cave NM CF.

[210] District Ranger Burns L. Davison, to Kate Cannon, December 11, 1996, Cabinet 3, Drawer 4, Folder N1617 Plant Life Management Leafy Spurge (Insectary), Jewel Cave NM CF.

[211] Management Assistant to Files, October 16, 1996, Cabinet 3, Drawer 4, Folder N1617 Plant Life Management Leafy Spurge (Insectary), Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6–7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6.

[212] Marie Curtain to Mike Wiles, June 1, 1998, Cabinet 3, Drawer 2, Folder N26 Reports, Jewel Cave NM CF.

[213] District Ranger Frank J. Cross to Superintendent Kate Cannon, June 2, 1993, Cabinet 3, Drawer 4, Folder N1419 Birds, Jewel Cave NM CF.

was not available.[214] The count was conducted in 1997 and 1998 using the same method employed by Weber, although it is not clear by whom.[215]

Cultural Resource Management

In addition to natural resource studies, Cannon prioritized baseline studies of cultural resources at Jewel Cave, since almost none had been done before. The NPS did not know whether any tribes had specific connections to Jewel Cave, as Cannon explained in a 1990 letter:

> as far as we can determine, is not specifically sacred to the Lakota or other Plains Tribes but is sacred as part of the Paha Sapa (Black Hills). We have not yet found any cultural sites in the Monument specific to Plains Indians' use.[216]

This uncertainty made cultural resource compliance and interpretation of cultural resources difficult for staff. Cannon repeatedly requested funds for studies to address the issue.[217]

The park's 1999 RMP included recommendations for cultural resource management. It outlined all archeological resources and studies undertaken, which included two studies by Glenna Sheveland.[218] It also noted existing historic resources (the historic cabin topped the list) and cultural landscapes, and it identified the following cultural resource management needs: a cultural landscape report for the historic area, an assessment of ethnographic resources at the monument, and continued cataloging and addressing deficiencies of the museum collection.[219]

Archeological Studies

In 1992, Glenna Sheveland completed a report that detailed previous archeological surveys and findings at Jewel Cave and within a one-mile radius of the monument. Sheveland, in a volunteer capacity, performed a pedestrian survey of the entire monument and conducted a file search at the State of South Dakota Archeological Research Center. She found that between 1979 and 1992, there had been 16 surveys done on or within one mile of the monument.[220] Almost all of the surveys were outside of the monument on Forest Service land, probably as a precursor to timber sales, prescribed burns, or activities that triggered cultural and natural resource compliance. Sheveland's summary of

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[214] Kate Cannon to Files, memorandum, September 9, 1996, Cabinet 3, Drawer 4, Folder N1419 Breeding Bird Survey, Jewel Cave NM CF.

[215] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 7; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6.

[216] Kate Cannon to H. Paul Friesma, Professor, Center for Urban Affairs and Policy Research, Northwestern University, December 13, 1990, Cabinet 1, Drawer 3, Folder N4617 Demography, Jewel Cave NM CF.

[217] Outline of Planning Requirements, Jewel Cave National Monument, May 30, 1990, Cabinet 1, Drawer 2, Folder D18 Outline for Planning Requirements, Jewel Cave NM CF.

[218] Jay D. Vogt to Peggy O'Dell, March 31, 1998, Cabinet 3, Drawer 1, Folder H32 National Register of Historic Places and State Plans, Jewel Cave NM CF.

[219] Resource Management Plan, Jewel Cave National Monument, 1999, 15–16, Jewel Cave NM DF.

[220] Sheveland, "An Intensive Cultural Resource Survey of Jewel Cave National Monument," January 10, 1993, 3–5.

previous archeological surveys gave Jewel Cave managers accurate, well-documented data on archeological sites in one easy-to-access report, which facilitated better cultural resource compliance and management in future years. Sheveland updated the report in 1998.[221]

Historic Ranger Cabin

As part of the GMP process, Barbara Bevin Long completed a Historic Resource Study (HRS) for Jewel Cave. The HRS served as a guide for future archeological and architectural surveys and provided a base of information to use for future nominations to the National Register of Historic Places.[222] Long's report explained the historical development of Jewel Cave, dividing it into distinct eras that could be used for interpretive planning.[223] Long identified two historic contexts for Jewel Cave and developed a description, significance, registration requirements, and associated properties for each:

1. "Recreation and Tourism in the Black Hills and at Jewel Cave, 1890–1942." Associated resources included the razed log hotel that the Michauds built near Prairie Dog Spring and the historic cave entrance.
2. "Development and Administration of Jewel Cave National Monument, 1908–1942." Associated resources included the cave itself, the historic cave entrance, retaining walls, early signs, and the CCC cabin.[224]

Long recommended archeological surveying and testing for prehistoric, historical, and exploration-era archeological sites, and further research into transportation routes, mining sites, homestead claims, and CCC facilities. She also advised, "The second intended phase of the project, survey and nomination of historic properties, should be completed."[225]

The HRS provided an impetus for preserving, rehabilitating, and interpreting the CCC ranger cabin. Chief Ranger Tom Casey outlined his plans for the cabin, in the context of revitalizing the historic area of Jewel Cave:

> My vision is to develop the historic area of the park into a destination location rather than the place one goes to to take the historic tour after having purchased their ticket at the visitor center. Therefore, the visitors experience begins once they approach and subsequently enter the area. The entrance sign and gate, picnic tables, etc. should be replicas of the originals. Landscaping would be representative and possibly so would roadway composition. When visitors approach and enter the cabin, they will be greeted by a ranger in period uniform. The cabin will appear as it did in the early 40's with period furnishings adhering to the original layout. Visitors taking the tour will continue their historic

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[221] Sheveland, "An Intensive Cultural Resource Survey of Jewel Cave National Monument," January 10, 1993, 10; Wiles, comments on draft, April 7, 2020.

[222] Barbara Bevin Long, "Jewel Cave National Monument Historic Resource Study: Historic Contexts and National Register Guidelines," prepared for DOI, NPS, Rocky Mountain Regional Office, 1992, Introduction, eTIC.

[223] Long, "Jewel Cave National Monument Historic Resource Study," 1992, 6/36.

[224] Long, "Jewel Cave National Monument Historic Resource Study," 1992, 8/47–8/52.

[225] Long, "Jewel Cave National Monument Historic Resource Study," 1992, 10/55–10/56.

> experience by being greeted and led by a ranger in period costume through the tour route in the traditional manner of carrying a candle bucket dating back to the early 1900's.
>
> The cabin while being used as an office/contact center will also function as a living exhibit where visitors can tour and enjoy the facility. Compromises to the integrity of its function may include pictorial displays of CCC camps, early ranger families, and historic photos and a small NHA book sales display.
>
> Surface interpretive opportunities will eventually be developed such as: walks to the CCC camp and historic hotel, talks on the original use of the cave and early explorers, and installation of wayside exhibits.[226]

As a first step in realizing this vision, he contacted Rocky Mountain Regional Historical Architect Richard Cronenberger about completing a historic structure report for the cabin with regional interpretive funding, in tandem with a visitor use study the Rocky Mountain Regional Office was already planning to conduct for Jewel Cave.[227]

Cronenberger and Historical Architect Nancy MacMillan completed a preliminary historic structure report in 1995. They assessed the building and developed design specifications for contracting out the rehabilitation and historical restoration work.[228] The Rocky Mountain Regional Office funded the report and the restoration using fee demo funds (from park use fees).[229] After Jewel Cave was transferred to the Midwest Region, the Midwest Regional Office found weaknesses in the report that needed to be corrected before rehabilitation could continue. In 1996, Historical Architect Laura Johnson of the Midwest Systems Support Office began compiling information to update the report, but she left the regional office before finishing the project. In the meantime, the regional office procured funding to rehabilitate the cabin, which made completing the report more urgent.[230]

In November 1999, Midwest Region Historical Architect Alan O'Bright completed the updated historic structure report for the cabin, with help from O'Dell, Dilts, Wiles, Rosga, Midwest regional staff, and engineering and design contractors. The updated report used written and oral accounts to assess historic room functions, appearance, and building materials. It also addressed compliance with the Americans with Disabilities Act (ADA) and recommended removing non-historic

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[226] Tom Casey to InterMountain Field Area Regional Historical Architect, memorandum, May 28, 1995, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF. Note that candle lanterns were not used historically at Jewel Cave: the practice was adopted from the example of Wind Cave's tours. Wiles, comments on draft, April 7, 2020.

[227] Richard J. Cronenberger to Jewel Cave Superintendent, memorandum, May 18, 1995, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF.

[228] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 2; Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6.

[229] Recreation Fee Demonstration Program, Regional Priority List of Projects for Funding from "20% Funds," Midwest Region, September 15, 1997, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF.

[230] Alan E. O'Bright, "Rugged Charm: Ranger Cabin (HS-1) Historic Structure Report, Jewel Cave National Monument, Custer, South Dakota," 1999, 3–4, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF.

restrooms and adding a fire suppression system.[231] The rehabilitation and restoration of the cabin began that year, and most of the work was completed within two years (see Figure 114).[232]

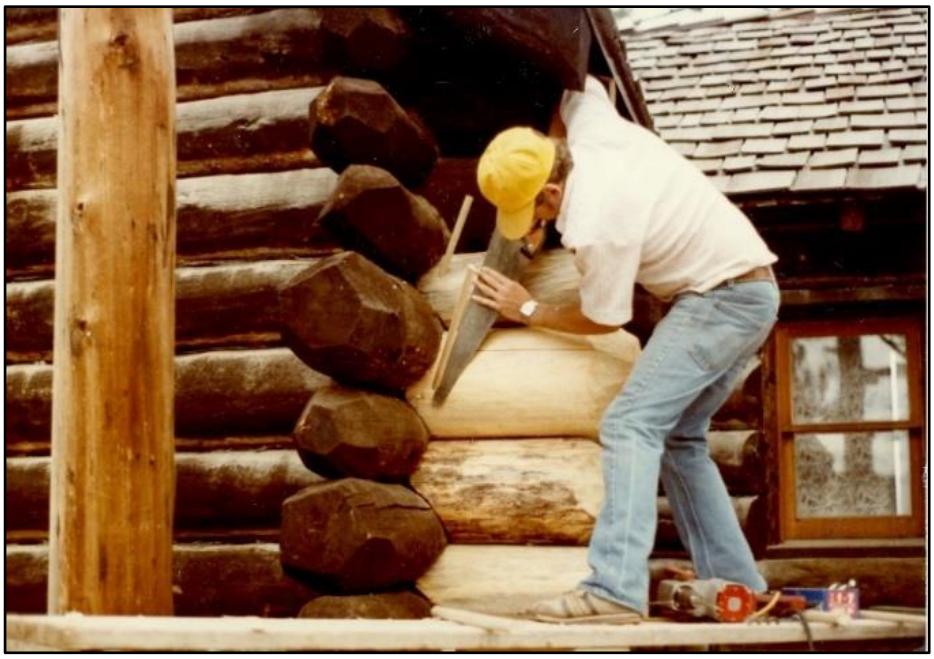


Figure 114. Historic rehabilitation and restoration of the ranger cabin began in 1999.

Source: NPS, Jewel Cave NM.

Museum Collection

As of 1990, some of the monument's museum collection was stored at Jewel Cave and the rest was stored at Wind Cave. The situation was not ideal, as Cannon explained:

> At the present time the Monument does not have proper storage units for its archival materials and historically important cave survey maps. Archival materials that are needed for research are stored at Wind Cave National Park and the Monument's cave survey maps are stored in damaged cabinets surplused by the Black Hills National Forest several years ago.[233]

In 1992, Matt Wilson, a curator from the Rocky Mountain Regional Office, and Layne Consultants, Inc., visited the monument to assess storage of the museum collection storage. They concluded that the collection needed fire protection and dedicated space, and they recommended remodeling the basement of Building 14 (one of the housing units) "to create a curatorial office/researcher

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[231] Alan E. O'Bright, "Rugged Charm: Ranger Cabin (HS-1) Historic Structure Report, Jewel Cave National Monument, Custer, South Dakota," 1999, 3–4, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF.

[232] Al O'Bright, "Work Plan: Ranger Cabin (HS-1), Jewel Cave National Monument," February 17, 1999, Cabinet 3, Drawer 1, Folder H4219 Historic Structure Report (Ranger Cabin), Jewel Cave NM CF; Jewel Cave Superintendent to all employee, memorandum, July 6, 2001, Cabinet 3, Drawer 1, Folder Cabin – Misc. reports, Jewel Cave NM CF.

[233] Kate Cannon to Associate Rocky Mountain Regional Director for Planning and Resource Preservation, memorandum, October 14, 1990, Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

workspace, museum collection storage area, and restroom."[234] Over the next several years, Cannon implemented their recommendations.[235]

With the new dedicated space for the museum collection, Jewel Cave staff was able to catalog, accession, and re-accession several items. In 1995, Donna Bentley catalogued the mammal specimens that Ramotnik and Bogan had collected on their field survey of mammals in Jewel Cave.[236] Two years later, Marie Curtain re-accessioned 26 bat specimens collected at Jewel Cave by John Anderson that had been stored at the Sternberg Museum of Natural History at Fort Hays State University in Hays, Kansas. She was able to bring the bat specimens back to Jewel Cave because the updated storage facility now met museum collection standards, such as being windowless, insulated, fireproofed, secured, and used solely for museum object storage. Curtain noted,

> We value our collection and believe that it should be stored at or near Jewel Cave National Monument. Scientific endeavors regarding the Jewel Cave ecosystem will, in most instances, be conducted at [Jewel Cave]. If the collection is stored here, a complete research history, with associated specimens, is then available.[237]

By the end of 1997, Curtain had catalogued 1,854 items in the museum collection, bought four additional storage cabinets, and received a list of specimens from Jewel Cave that were housed at the University of California, Berkeley, museum collection.[238] When the monument replaced the historic entrance gate, the original gate was accessioned into the museum collection.[239]

Despite these improvements, Jewel Cave's collection was too large to fit in the new space and the monument could not maintain the collection to museum-quality standards. The NPS had been moving to a system of sharing museum storage, with larger parks housing collections of smaller nearby parks, rather than developing state-of-the-art curatorial facilities at each location. In December 1998, Jewel Cave signed an MOA with Mount Rushmore, by which Mount Rushmore would store Jewel Cave's museum collection. At the time, the collection contained

> over 2500 objects from a variety of disciplines, including: archeology, paleontology, dendrochronology, mammalogy, entomology and geology, as well as historic items, photographs and archival documents. Many of the natural history items are voucher specimens which support both published and unpublished research; these items are sensitive, and require and deserve storage as mandated by Federal laws and regulations, as well as National Park Service Standards.[240]

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[234] Matthew Wilson, November 6, 1992, Trip Report of June 16, 1992, Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF; Steven P. Layne, National Park Service: Jewel Cave National Monument, undated [ca. 1992], Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

[235] Kate Cannon to Regional Curator, memorandum, January 27, 1993, Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

[236] U.S. Biological Survey Collections Manager Cindy Ramotnik to Donna Bentley, March 3, 1995, Files 1781a–1781b, Jewel Cave NM MF.

[237] Marie M. Curtain to Ann Hitchcock, April 9, 1997, Cabinet 2, Drawer 4, Folder D62 Museum and Exhibits, Jewel Cave NM CF.

[238] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 6.

[239] Resource Management Plan, Jewel Cave National Monument, 1999, 15–16, Jewel Cave NM DF.

[240] Memorandum of Agreement between Mount Rushmore National Memorial and Jewel Cave National Monument, December 1998, 1, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

Under the five-year agreement, Jewel Cave would designate one permanent staff member (Wiles) to be the liaison for the Jewel Cave collections stored at Mount Rushmore. Jewel Cave was supposed to pay Mount Rushmore $1,800 annually for the curatorial services provided (equivalent to two weeks of the curator's time), but Curator Bruce Weisman waived the fee. Jewel Cave was responsible for purchasing cabinets and storage containers, and Jewel Cave staff continued to accession and catalog items for the collection.[241]

Before transferring the collection, Jewel Cave staff prepared a complete inventory and provided the Mount Rushmore curator with a hard copy.[242] As part of this effort, the staff catalogued an additional 714 items in the collection.[243] Chief of Resource Management Wiles and Mount Rushmore Curator Bruce Weisman finalized the MOA, and in 1999, Curtain, Wiles, and Weisman physically moved the collection to its new home at Mount Rushmore.[244]

Interpretation

The interpretive division continued to be staffed primarily with seasonal employees. Visitation declined overall in the 1990s, but high demand and low staffing levels still made it impossible for interpretive staff to provide enough cave tours. Around 25 percent of those who wanted to go on tours were turned away.[245] This "substantial unmet need for tours" drove interpretive planning and the initiative to build the second elevator, as discussed above.[246] Cannon requested additional seasonal interpreters. She recommended hiring interpreters not at the GS-3 and GS-4 level, as was currently done, but at the GS-5 level.[247] Cannon and Casey continued to ask for additional seasonal interpreters and collaborated with the Forest Service on a joint interpretive training program.[248] By 1998, seasonal staff had expanded to include two lead seasonal interpreters (GS-5), which allowed for an increase in interpretive programming.[249]

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[241] Memorandum of Agreement between Mount Rushmore National Memorial and Jewel Cave National Monument, December 1998, 1; Wiles, comments on draft, April 7, 2020.

[242] Memorandum of Agreement between Mount Rushmore National Memorial and Jewel Cave National Monument, December 1998, 2–3.

[243] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 6.

[244] Wiles, interview.

[245] Superintendent's Annual Report, Jewel Cave National Monument, 1993, 4; [no title], January 10, 1992, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[246] Superintendent's Annual Report, Jewel Cave National Monument, 1990, 3.

[247] [no title], January 10, 1992.

[248] FY 1993 Budget Call Seasonal Interpretive Initiative, Jewel Cave, undated [ca. 1993], Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF; Challenge Cost-Share Agreement between Jewel Cave National Monument and Black Hills National Forest, June 1993, Cabinet 2, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[249] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 5; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 4.

Cannon and Casey also recommended hiring a permanent full-time interpreter, since the chief of interpretation and resource management was in charge of all interpretive programming, as well as the growing resource management needs of the monument.[250] Karen Rosga was hired by Tom Casey as the monument's lead interpreter in 1996, and she became chief of interpretation in 1997. This helped the interpretive programming at Jewel Cave have greater oversight and direction.[251] Two years later, the monument added another full-time, permanent interpreter under Rosga.[252]

In 1997, Rosga and Cannon reduced the tour limit size on the Scenic Tour from 40 to 30, where it had been in the early 1980s. Because visitation had declined somewhat, it was easier to decrease the tour size without forcing people to wait longer for the next tour.[253] Even with the second elevator installed and the smaller tour group size, staff continued to transport tour groups down via two elevator trips on the same elevator. This was due to a lack of staff available to run two elevators simultaneously and a policy of not allowing visitors to ride the elevator without monument staff present.[254] Rosga and Cannon also decreased the size limit on the Spelunking Tour from 10 to 5 people, based on Wiles' recommendation. Cannon explained,

> In keeping with the monument's policy and the generally accepted conduct in the caving community where caving (exploration, mapping) trips are limited to no more than six individuals, allowing up to eleven people (10 plus a guide) on a Spelunking Tour was sending a poor message to the public.

Other factors driving the change included concerns about monitoring tour-goers so they did not damage fragile speleothems, dealing with people who moved at different paces, improving tour quality, and safety.[255] The price of the spelunking tour increased from $15 to $18 in 1998.[256] Tickets for the Scenic Tour and Historic Candlelight Tour had risen from $4 to $5 in 1995 and later increased to $8.[257]

Interpretive staff and volunteers also offered "Target Tours," 30-minute talks at the platform in the Target Room for those who could not or did not want to take the more strenuous Scenic Tour. After a brief period of charging for these tours, Cannon decided to offer them for free again, since many participants expressed that they expected more of a tour of the cave and had been disappointed when they remained in one room the whole time.[258]

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[250] [no title], January 10, 1992.

[251] Superintendent's Annual Report, Jewel Cave National Monument, 1996, 3.

[252] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 5; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 4.

[253] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 3–4.

[254] Wiles, comments on draft, April 7, 2020.

[255] Jewel Cave National Monument, 1997 Supt's Annual Report, Interpretation, 1997, files provided by Katie Atkins, Folder Annual Rpts Park Interp, Jewel Cave NM CF.

[256] Superintendent's Annual Report, Jewel Cave National Monument, 1998, 3.

[257] NPS, "Fee Schedule Resumes at Jewel Cave," news release, undated [ca. December 1991], Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 3; Linda L. Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000, transmitted February 26, 2001, 4, files provided by Katie Atkins, Folder 2000 Superintendents Report, Jewel Cave NM CF.

[258] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 3–4.

Jewel Cave staff began offering costumed interpretation at the historic area in the 1990s, in the manner of tours given at Wind Cave. Interpretive rangers staffing the historic ranger cabin and giving candlelight tours through the historic entrance to the cave wore reproductions of circa 1939 NPS uniforms. Cannon and Rosga considered the program successful and purchased nine more historic replica uniforms in 1997. They also worked with Dilts to construct and install a reproduction of the monument's historic entrance sign at the historic entrance. The replica sign caused some confusion for visitors, who thought that the sign denoted the monument's main entrance. At the request of monument staff, SDDOT added road signs that mitigated the confusion.[259] The program at the historic area successfully supported itself in the 1990s, bringing in as much money as it cost to run it (see Figure 115).[260]

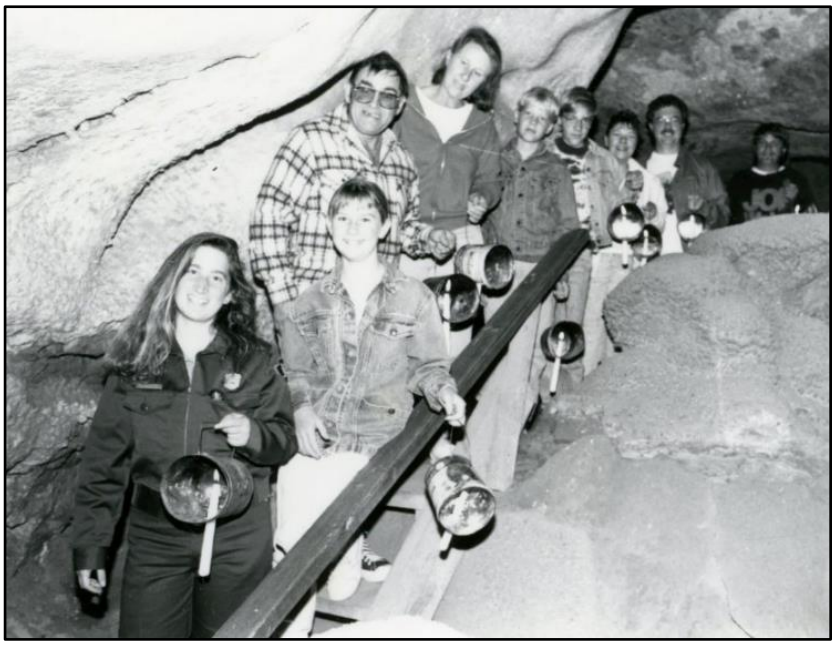


Figure 115. Ranger Michelle Gleicher gives a Historic Candlelight Tour in July 1991.

Source: NPS, Jewel Cave NM.

As of 1991, the monument lacked an interpretive plan. The most recent interpretive prospectus had been completed in 1966, before the construction of the visitor center. As part of the GMP process, planners updated Jewel Cave's interpretive prospectus.[261] It identified the monument's primary natural resources as mountain systems and caves/springs. Its primary cultural resources were "none," and secondary resources were "westward expansion" and "the mining frontier."[262] The prospectus noted the status of the interpretive program at Jewel Cave, its effects on resource

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[259] Superintendent's Annual Report, Jewel Cave National Monument, 1997, 4.

[260] Jewel Cave National Monument, 1997 Supt's Annual Report, Interpretation, 1997; Superintendent's Annual Report, Jewel Cave National Monument, 1998, 4.

[261] McDougall, Task Directive, General Management Plan and Development Concept Plan, Package 110, Wind Cave National Park and Jewel Cave National Monument South Dakota, August 1990, 13.

[262] NPS, Rocky Mountain Region, "Interpretive Prospectus, Jewel Cave National Monument, South Dakota," 1992, 7 (of pdf), Cabinet 1, Drawer 3, Folder K1817 Interp Planning 1988– , 1991, Jewel Cave NM CF.

management, and aims for the program.[263] It noted that the lack of funding Jewel Cave had experienced in the past was unlikely to change:

> Given current and future economic realities and the backlog of work System wide, Jewel Cave will probably not receive adequate Federal funding or staff to fully implement this plan. Creative solutions and priorities need to be developed so that this plan can be implemented in phases. Alternate sources of funding or methods of accomp1ishing management objectives will include:
>
> - Cooperative Agreements
> - Cooperating Association Programs and Donations
> - Gift Catalogues
> - Grants
> - Donations, both funds and services
> - Friends Organization[264]

The prospectus recommended reassessing traffic flow in the visitor center, redesigning the bookstore, installing a travelers information station on the visitor entry road, installing a wayside at Mount Rushmore describing Jewel Cave, and modifying the ramp from the parking lot to the visitor center to meet ADA standards.[265] For the rest of the decade, interpretive planning consisted mostly of an annual interpretive plan that updated yearly staffing needs to meet cave tour demands.[266]

Conclusion

During the 1990s, Jewel Cave made significant progress in its management of cultural and natural resources. The monument went from having a combined chief of resource management and interpretation to having separate resource management and interpretation divisions with their own division chiefs. The separation enabled monument staff to expand and improve programming in both areas. Superintendent Kate Cannon spearheaded this change, spurred construction of a second elevator, promoted research to establish baseline data for the monument, and triggered a land exchange to protect the cave outside of monument boundaries. Establishment of the BHAG and the NEKOTA groups improved the monument's access to administrative services. Moving the museum collection to Mount Rushmore addressed the problem of inadequate storage space. Finally, the NPS prioritized prescribed fires and mechanical thinning of Jewel Cave's forests, a management shift that would prove remarkably important in summer 2000.

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[263] NPS, Rocky Mountain Region, "Interpretive Prospectus, Jewel Cave National Monument, South Dakota," 1992, 10–12.

[264] "Interpretive Prospectus, Jewel Cave National Monument, South Dakota," 1992, 29.

[265] "Interpretive Prospectus, Jewel Cave National Monument, South Dakota," 1992, 21–22.

[266] Connie Rudd to Chief of Interpretation in the Rocky Mountain Region, memorandum, February 6, 1995, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning 1988–, Jewel Cave NM CF.

Chapter 7: Jewel Cave in the New Millennium (2000–present)

Jewel Cave National Monument started the new millennium in a period of crisis. In August 2000, the Jasper Fire ravaged the monument and only narrowly avoided the park's aboveground structures. The still-small resource management staff faced a variety of post-fire problems: erosion, flooding, an explosion of invasive weeds, and collateral effects on cave resources. Staff rose to the challenge of reinterpreting and protecting a monument with a very different aboveground landscape. Several years later, Jewel Cave staff completed the first ever Cave and Karst Management Plan for the monument, which guided exploration, safety, and resource protection. Interpretive staff expanded tour and programmatic offerings in and outside of the cave, and the Black Hills Parks and Forest Association continued to support monument operations. The cave became a hub of scientific study, and cavers' continued discoveries brought Jewel Cave past the 200-mile mark, with no end in sight.

Jasper Fire and Aftermath

During the 1990s, the National Park Service (NPS) as a whole, and Jewel Cave specifically, shifted away from total fire suppression and toward a policy of hazardous fuels reduction, in order to prevent catastrophic fires.[1] The Jewel Cave Fire Use Module, Jewel Cave staff, Wind Cave staff, and the Forest Service had completed several prescribed burns at Jewel Cave in order to reduce hazardous fuels near the monument's built infrastructure (see Chapter 6).[2] Those prescribed burns proved essential for protecting the monument's built infrastructure when fire ravaged the area in 2000.[3]

On August 24, 2000, a 47-year-old woman named Janice Stevenson stopped on the side of Highway 16, two miles west of Jewel Cave, not far from the entrance to Jasper Cave. She lit a cigarette and then dropped the match on the side of the road. That match started one of the largest fires in Black Hills history.[4] It doubled in size every hour on the first day it burned, spreading at a

[1] 1999 Jewel Cave Fire Use Module, [1999], NPS, Cabinet 2, Drawer 2, Folder Y14 Jewel Cave Fire Module, Jewel Cave National Monument Central Files, Custer, SD (hereafter Jewel Cave NM CF).

[2] "Prescribed Fires Planned at Jewel Cave National Monument," news release, March 21, 1999, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; Kelly Mathis and Andy Thorstenson, Northern Great Plains Fire Monitoring Team, Jewel Cave National Monument, Lithograph Canyon Prescribed Fire Monitoring Report, September 27, 1999, 1, Cabinet 2, Drawer 2, Folder Y14 Burning Index, Jewel Cave NM CF.

[3] David Given, interview by Jackie Gonzales, April 9, 2019, Port Hadlock, WA.

[4] Jim Holland, "Jasper Arsonist gets 25 Years," *Rapid City Journal*, August 23, 2001; Joe Kafka, "Black Hills arsonist's sentence upheld," *Rapid City Journal*, October 2, 2002; Mike Wiles, interview by Jackie Gonzales, June 26 and 27, 2019, Custer, SD.

rate of over seven acres per minute. By the end of the first day, it had consumed 3,655 acres (see Figure 116).[5]



Figure 116. The Jasper Fire burned 3,655 acres in its first day, 2000.

Source: NPS, Jewel Cave NM.

The Forest Service took the lead on fighting the fire, since most of it was within the Black Hills National Forest. They called it the "Jasper Fire" because it started near the highway turn-off on the road that goes to Jasper Cave. The new Wind Cave National Park Superintendent, Linda Stoll, was unable to commit Wind Cave's fire crew to fight the Jasper Fire, because fires were burning at Wind Cave at the same time.[6] On the second day of the fire, the Forest Service reported,

> Over 250 firefighters from across the Black Hills and the surrounding area battled the fire through the night. Due to the extended hot, dry weather and heavy concentrations of ground fuels, fire behavior has been extreme. The weather provided little relief during the night and a wind shift around midnight caused the fire to jump Hell Canyon and cross to the south of Highway 16.
>
> Firefighting efforts are being hampered by the steep terrain and limited access in the area of the fire. Fire engines are in place to provide structure protection for the buildings in Jewel Cave.[7]

At Jewel Cave, staff evacuated everyone around 4:00 pm on the first day of the fire. The fire burned through monument lands over the next two days (see Figure 117). Forest Service firefighting crews foamed buildings, established a fire line around Jewel Cave buildings, and back-burned, while monument staff moved files and other critically important items into the cave to protect them.[8]

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[5] "Jasper Fire Rapid Assessment," Black Hills National Forest, September 2000, 5, Cabinet 2, Drawer 2, Folder Y14 Jasper Fire August 2000, Jewel Cave NM CF.

[6] Linda Stoll, interview by Jackie Gonzales, July 22, 2019, The Villages, FL.

[7] USFS, NPS, South Dakota Department of Agriculture, "Jasper Fire," news release, August 25, 2000, Cabinet 2, Drawer 2, Folder Y14 Jasper Fire, August 2000, Jewel Cave NM CF.

[8] Chief of Interpretation to Superintendent, "Input for FY00 Supt's Annual Narrative Report," January 21, 2001, files provided by Katie Atkins, Folder Annual Rpts Park Interp, Jewel Cave NM CF.

The Forest Service established a voluntary evacuation zone of 300 square miles during the Jasper Fire. Schools in Custer closed, and Highway 16 was closed starting four miles west of Jewel Cave. By the second day of the fire, 624 firefighters were battling the blaze, along with five airtankers and four helicopters.[9] On the third day, extreme weather conditions "caused the fire to grow by 48,555 acres, or 76 square miles, in the space of only a few hours" (more than half the total of the entire fire). On subsequent days, the weather improved and "fire behavior moderated," but the fire continued to grow slowly.[10] By September 1, firefighters had established a perimeter around the fire and the Forest Service lifted evacuation orders outside of that area. Within the fire area, burning continued and Hot Shot crews and hand crews continued to work.[11]



Figure 117. The Jasper Fire burned close to the Jewel Cave Visitor Center, pictured here during the fire, 2000.

Source: NPS, Jewel Cave NM.

Forest Service fire crews contained the Jasper Fire on September 8, 2000, and fully controlled it on September 25. In total, the fire burned 83,508 acres, including an estimated 224 million board feet of timber, 15 miles of range fencing, livestock water facilities, wooden powerline structures, and 2,738 feet of aboveground telephone lines (see Figure 118).[12] Fire suppression cost $8.2 million, and total damage reached $42 million.[13] The severity of the fire resulted in part from the century of fire-suppression management by the Forest Service, which left thick and flammable growth that became vulnerable in a drought. There were no serious injuries and almost no property damage (apart from fences). Stevenson was sentenced to 25 years in prison on state charges and a concurrent 10 years on federal charges for starting the fire.[14]

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[9] USFS, NPS, South Dakota Department of Agriculture, "Jasper Fire," news release, August 27, 2000.

[10] "Jasper Fire Rapid Assessment," Black Hills National Forest, September 2000, 5.

[11] "Jasper Fire Key Information," Friday September 1, 2000, "Jasper Fire," Cabinet 2, Drawer 2, Folder Y14 Jasper Fire, August 2000, Jewel Cave NM CF.

[12] Black Hills National Forest, "Jasper Fire," Cabinet 2, Drawer 2, Folder Y14 Jasper Fire, August 2000, Jewel Cave NM CF.

[13] Black Hills National Forest, "Jasper Fire"; Kafka, "Black Hills Arsonist's Sentence Upheld."

[14] Kafka, "Black Hills arsonist's sentence upheld."

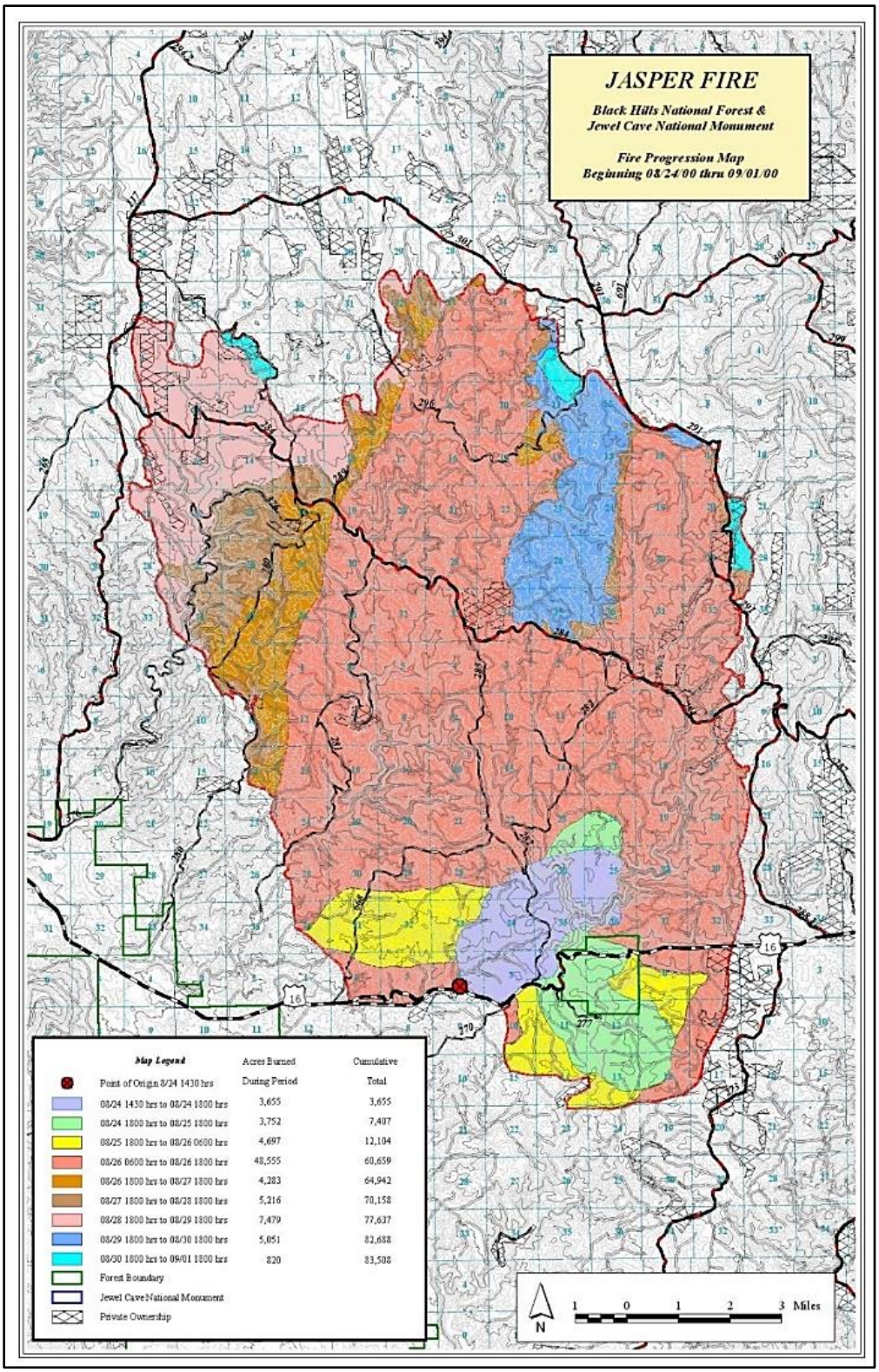


Figure 118. The Jasper Fire in 2000 burned 83,508 acres, making it the largest fire in the recorded history of the Black Hills.

Source: Forest Service, NPS.

The fire burned through most of Jewel Cave's surface area and destroyed the old-growth ponderosa pine on and near the monument. However, in terms of structures, it destroyed only two outbuildings that had been used for pit toilets, which was not a huge loss, as Larry Dilts recalled. "We were hoping to get rid of them anyways," he said (see Figure 119). The rest of Jewel Cave's structures survived thanks to the heroic efforts of fire fighters, and to the earlier prescribed burns that had reduced hazardous fuels at the monument. Despite the severity of the fire, it moved so quickly through the monument that the visitor center had reopened for cave tours by September 4. Wind Cave Chief Ranger Denny Ziemann, who had firefighting experience, managed the NPS side of the fire response in the aftermath of the fire.[15]



Figure 119. The Jasper Fire burned close to the monument's residential structures, pictured here in background, 2000.

Source: NPS, Jewel Cave NM.

Critical in the fire response was the Burned Area Emergency Rehabilitation (BAER) team, managed by the Forest Service, and the funding that came with it. The BAER team was on the ground at Jewel Cave even before the fire stopped burning in order "to assess potential threats to natural resources and property that might result from the fire." Resource Management Division Chief Mike Wiles participated in the BAER team as the NPS liaison. The BAER team made recommendations for post-fire resource management work, some of which were funded immediately through the BAER process. These included repairs to the damaged fence along the

[15] Chief of Interpretation to Superintendent, "Input for FY00 Supt's Annual Narrative Report," January 21, 2001; Black Hills National Forest, "Jasper Fire"; Larry Dilts, interview by Jackie Gonzales, April 17, 2019, Colby, KS; Wiles, interview; Given, interview; Stoll, interview.

boundary, felling hazardous trees that threatened buildings or traffic on Highway 16, a timber sale for remaining trees along the highway, and repair of culverts under the highway. Tasks identified by the BAER team that remained unfunded included monitoring and treating the spread of noxious weeds due to fire disturbance, assessing and stabilizing archeological sites, and removing debris from the Hell Canyon Stream Channel to prevent the Highway 16 culvert from clogging during flash flooding.[16]



Figure 120. Flash flooding caused major erosion and runoff issues after the Jasper Fire burned much of the ponderosa pine forest around Jewel Cave. Here, deeply eroded channels in Lithograph Canyon in 2002.

Source: NPS, Jewel Cave NM.

The NPS expressed concern about post-fire runoff and its potential to infiltrate the cave. The US Geological Survey (USGS) monitored the volume and content of waterflow in Hell Canyon and Lithograph Canyon monthly for three years after the fire (see Figure 120). Wiles did not expect the runoff to seriously damage the cave, although he anticipated increased dripping and changes to water chemistry, including more phosphorous than before, as well as localized flooding inside the cave. Wiles and other resource management staff monitored the cave to examine how erosion changed the cave environment, and they kept a close eye on surface erosion and exotic plant growth in the years following the fire (see Figure 121).[17]

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[16] Chief of Resource Management to Jewel Cave Staff, "Memorandum: Jasper Fire and Subsequent Resource Management Activities," December 20, 2000, Cabinet 2, Drawer 2, Folder Y14 Jasper Fire August 2000, Jewel Cave NM CF.

[17] The flooding inside the cave did not occur because of droughts in the following years. Chief of Resource Management to Jewel Cave Staff, "Memorandum: Jasper Fire and Subsequent Resource Management Activities," December 20, 2000; Wiles, interview; Mike Wiles, comments on draft administrative history, April 7, 2020.



Figure 121. The Jasper Fire burned many acres of the monument and resulted in increased erosion and altered hydrology after the fire. Here, the sewage lagoon is left of center and the visitor center and parking lot are visible to the upper left, 2000.

Source: NPS, Jewel Cave NM.

Following the initial mitigation and environmental rehabilitation efforts, Jewel Cave staff incorporated the Jasper Fire into the interpretive mission of the monument. Chief of Interpretation Karen Rosga created a temporary exhibit on the Jasper Fire for display inside of the visitor center.[18] She also partnered with the Forest Service to fund outdoor interpretive exhibits explaining the fire's effects on the monument.[19] Jewel Cave maintenance crews installed these interpretive panels (fiberglass embedded in an aluminum frame) onto the deck railing outside of the visitor center in 2002.[20] Situated to provide a view of a the burned area, the panels described the history of the fire,

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[18] Chief of Interpretation to Superintendent, "Input for FY01 Supt's Annual Narrative Report," February 1, 2002, files provided by Katie Atkins, Folder Annual Rpts Park Interp, Jewel Cave NM CF.

[19] Fire Waysides Meeting, March 14, 2001, Cabinet 2, Drawer 3, Folder Fire Wayside Project, Jewel Cave NM CF; USDA, Forest Service, Rocky Mountain Center for Design and Interpretation, Project Plan and Agreement, March 1, 2001, Cabinet 2, Drawer 3, Folder Fire Wayside Project, Jewel Cave NM CF.

[20] Karen Rosga to Ron Eilefson, memorandum, August 15, 2001, Cabinet 2, Drawer 3, Folder Fire Wayside Project, Jewel Cave NM CF; Jewel Cave Squad Meeting Notes (hereafter JCSM), July 23, 2002, Jewel Cave National Monument Digital Files (hereafter Jewel Cave NM DF); Karen Rosga to Ron Kerbo, January 26, 2002, Cabinet 2, Drawer 3, Folder Fire Wayside Project, Jewel Cave NM CF; Chief of Interpretation to Superintendent, April 23, 2003, 4, Cabinet 1, Drawer 1, Folder Annual Rpts. Park – interp, Jewel Cave NM CF.

its effects on natural and man-made resources, and restoration efforts. The NPS and Forest Service installed a second exhibit at the Hell Canyon trailhead, which described the behavior of the fire and its effects on natural resources in the area.[21]

After the Jasper Fire, the monument recommitted to using prescribed burning as a management technique. In 2004, NPS staff considered the importance of fire as a natural and historical process as they wrote a new Fire Management Plan and Environmental Assessment. The plan recognized that fire "played a major role in maintaining the natural ponderosa pine ecosystem" and that "one hundred years of wildland fire suppression" had created the potential for severe, life-threatening wildfires. In considering how the NPS would move forward with fire management at the monument, staff wrote, "in spite of this fire [the Jasper Fire], there is still a need to re-establish the natural fire regime to the ponderosa pine forest and preserve native plant communities while at the same time protecting visitors, facilities, and resources on and adjacent to the Monument."[22]

General Administration

Personnel

Superintendent Peggy O'Dell left Jewel Cave for a post at the Harpers Ferry Center just before the Jasper Fire. Linda Stoll had recently arrived as the new Wind Cave superintendent, and with no one to run Jewel Cave, she served as the acting superintendent of the monument during the fire and its aftermath. In autumn 2000, Tina Orcutt was detailed as the acting superintendent at Jewel Cave for several months.[23] During these management changes and the commotion after the fire, Tom Casey's former position of chief of resource management and interpretation lapsed, the interpretive supervisory park ranger left, and the administrative officer position lapsed.[24] These vacancies presented difficulties as staff tried to resume normal operations after the fire. Stoll cautioned that the monument's budget was so low as to be "a serious concern," and even if "the Monument were to have all positions filled during the year, there would not be sufficient funds to operate the park."[25]

In March 2001, Stoll hired Todd Suess as superintendent (GS-12) at Jewel Cave (see Figure 122). Suess had been the chief of resource management at Devils Tower National Monument before

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[21] USDA, Forest Service, Rocky Mountain Center for Design and Interpretation, Project Plan and Agreement, March 1, 2001.

[22] Todd J. Suess, Superintendent, "Finding of No Significant Impact," Fire Management Plan, Jewel Cave National Monument, December 2004, Cabinet 2, Drawer 2, [loose in drawer], Jewel Cave NM CF.

[23] Linda L. Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000, transmitted February 26, 2001, 1, files provided by Katie Atkins, Folder 2000 Superintendents Report, Jewel Cave NM CF.

[24] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 1, files provided by Katie Atkins, Folder 2001 Superintendents Report, Jewel Cave NM CF; Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

[25] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

coming to Jewel Cave.[26] Like previous Jewel Cave superintendents, Suess reported to Stoll rather than directly to the Midwest Regional Office. The regional office had bumped most superintendents up to GS-13 after a review in the late 1990s, but it kept some superintendencies (like Jewel Cave) at GS-12 and continued having them report to other superintendents. This provided a training opportunity for promising division chiefs, former Deputy Midwest Regional Director Dave Given explained:

> . . . Jewel Cave is quite a success story in that area, because if you look at where some of the former superintendents of Jewel Cave are today, one of them became deputy director of the National Park Service, Peggy O'Dell. . . . Todd Suess is superintendent of Mojave, a very complicated park in California. And Larry Johnson is now GS-15 superintendent of Ozark National Scenic River, another one of the most complicated parks in the Midwest Region. They all started out as GS-12 superintendents at Jewel Cave National Monument. In part, because we still were able to maintain some GS-12 superintendencies.[27]

From the monument perspective, the turnover of park superintendents resulting from this strategy created a lack of continuity of management that sometimes negatively impacted the ability of park staff to carry out their missions.[28] Several years later, the NPS as a whole trended toward eliminating superintendents that reported to other superintendents. As a part of this and a simultaneous regional reorganization, the Midwest Regional Office changed the Jewel Cave superintendent position so that it now reported directly to the regional office and promoted Suess to a GS-13. This marked the first time that the Jewel Cave superintendent was not under the Wind Cave superintendent.[29]



Figure 122. Todd Suess served as superintendent of Jewel Cave National Monument from 2001 to 2010.

Source: NPS.

[26] Stoll, interview; NPS, "Todd Suess Named to Top Post at Jewel Cave National Monument," press release, January 30, 2001, Cabinet 3, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 1.

[27] Given, interview.

[28] Wiles, comments on draft, April 7, 2020; Wiles, interview; Paul Menard, interview by Jackie Gonzales, April 9, 2019, Sequim, WA.

[29] Stoll, interview.

Under Suess, Karen Rosga continued as the chief of interpretation (GS-11) and Mike Wiles continued in the role of cave resource specialist, with duties that included all natural and cultural resource management (Wiles had been promoted to chief of resource management by Cannon in 1997, but his official title and corresponding grade level were not changed to reflect that promotion until 2014) (see Figure 123). Other permanent staff included Chief of Maintenance Larry Dilts (assisted by a permanent, subject-to-furlough maintenance employee) and Rene Ohms in a full-time term biological technician position (it later became a full-time permanent position).[30] At some point in the early 2000s, Larry Dilts retired, and Bob King became chief of facilities management.[31] Suess also had a full-time administrative assistant for the superintendents' office, a position filled by Miriam Gola and then Beckie Carder.[32]



Figure 123. Mike Wiles, chief of resource management at Jewel Cave starting in 1997, pictured here in 2013.

Source: NPS, Jewel Cave NM.

In April 2001, Merrith Baughman filled the supervisory park ranger/assistant chief of interpretation position (GS-9 with promotion potential to GS-11) and reported to Rosga. Baughman oversaw seasonal interpreter hiring and visitor center operations.[33] The interpretive division operated in summers with sixteen seasonal interpretive staff (GS-4), three part-time or intermittent interpretive rangers (GS-4), five fee collectors (GS-3), two park rangers (GS-5) as lead interpreters, one information receptionist (GS-3), and two Student Conservation Association (SCA) resource assistants. In autumn and early winter, the interpretive division had thirteen seasonal rangers (GS-3 or GS-4), and in late winter and early spring, eight seasonal rangers (GS-3 or GS-4).[34]

Additions to the staff necessitated some office changes. In 2000, Menard spearheaded the conversion of an existing housing trailer to office space in order to address overcrowding in the visitor center offices. All except for interpretive staff moved their offices to the converted trailer, which allowed more space for the interpretive division in the visitor center.[35] Resource management and administrative staff moved around occasionally over the next several years in response to space

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[30] JCSM, June 19, 2001, Jewel Cave NM DF; JCSM, July 31, 2001, Jewel Cave NM DF.

[31] JCSM, October 3, 2006, Jewel Cave NM DF.

[32] Phil Heckman, interview by Jackie Gonzales, June 27, 2019, Custer, SD.

[33] JCSM, March 4, 2003, Jewel Cave NM DF; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 4–5; Wiles, comments on draft, April 7, 2020.

[34] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 5.

[35] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Menard, interview; Wiles, interview.

needs: administrative staff moved from the visitor center to the administrative building, resource management moved from the visitor center service room, and the chief of interpretation and chief of maintenance moved briefly to the administration building before moving back to the visitor center and maintenance building, respectively.[36]



Figure 124. Jewel Cave permanent staff in 2007.

Source: NPS, Jewel Cave NM.

Full-time staff funded from Operation of the National Park System (ONPS) dollars hit a high of 15.28 full-time equivalent (FTE) in fiscal year 2002, and a low in fiscal year 2007 with 12.71 (see Figure 124).[37] Due to this decrease and projected additional budget decreases, the NPS required units to complete a Core Operations Report (see Appendix G). A Core Operations Report stated the "park's purpose, essential operational functions, and the most efficient organization and necessary staffing levels to operate the park at a safe and professional level," and it identified steps for addressing future funding shortfalls.[38] Staff identified six core management objectives and park priorities in the final Jewel Cave Core Operations Report, released in 2008:

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[36] JCSM, August 20, 2002, Jewel Cave NM DF; JCSM, October 1, 2002, Jewel Cave NM DF; Superintendent, Jewel Cave NM, to all employees, memorandum, February 13, 2008, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.

[37] Jewel Cave National Monument, Core Operations Report, 2008, 17, Jewel Cave NM DF.

[38] Jewel Cave National Monument, Core Operations Report, 2008, 5.

1. Maintain the current level of buildings, infrastructure, and facilities in good condition for a high quality visitor experience that provides for a safe and healthy location for visitors and staff.
2. Provide high quality visitor orientation and information services which instill environmental ethic and high visitor understanding of park resources.
3. Inventory, monitor, preserve and restore natural and cultural resources, where cave resources are located within park boundaries, to prevent unacceptable impacts to monument resources.
4. Inventory, monitor, preserve and restore natural and cultural resources, where cave resources are located outside park boundaries, to prevent unacceptable impacts to monument resources.
5. Actively implement a cave research and exploration program to enhance the monument's knowledge of cave resources so that the maximum protection can be placed on cave resources.
6. Perform critical legal, administrative and employee support functions and maintain a safe environment for visitors and staff.[39]

The report concluded that Jewel Cave's budget had "lagged behind the NPS-wide average for base budget increases over a period of many years," and that the park had already lapsed key positions and failed to meet multiple core functions of the park because of funding shortfalls. If faced with further budget cuts, staff concluded, "several additional positions will have to be lapsed, with a resulting significant decline in organizational capacity, effectiveness, facilities and services available to the public, employee and visitor safety and morale."[40] Furthermore, cutting seasonal interpretive staff would result in less fee revenue from cave tours, which meant lower fee revenue funds to supplement low ONPS budgets.[41] The report explained,

> A fee revenue decrease will have a domino effect on other programs in the monument. Cost of collection will not decrease with a decrease of programming. The same fee collection staff will be needed to collect fees for a full day, regardless the number of cave tours offered. A decrease of fee revenue will also affect the project that can be funded with FLREA [Federal Lands Recreation Enhancement Act] funds. This will affect the ability of the monument to decrease the deferred maintenance backlog.[42]

Therefore, the most important financial needs were to restore administrative staff, restore the resource and visitor protection divisions, and maintain visitor services.[43]

While the NPS anticipated budget cuts from Congress, it prepared for temporary increases leading up to the 2016 NPS Centennial, thanks to $3 billion in private-public investments.[44] As part

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[39] Jewel Cave National Monument, Core Operations Report, 2008, 6–7.

[40] Jewel Cave National Monument, Core Operations Report, 2008, 30.

[41] Jewel Cave National Monument, Core Operations Report, 2008, 22–24.

[42] Jewel Cave National Monument, Core Operations Report, 2008, 29.

[43] Jewel Cave National Monument, Core Operations Report, 2008, 29.

[44] NPS, "President's NPS Budget Proposed Record Increases for Park Operations and Centennial Initiative for $3 billion Public-Private Investment Over 10 Years," press release, February 5, 2007, Cabinet 3, Drawer 4, [loose in drawer], Jewel Cave NM CF.

of the centennial funding, Jewel Cave received a park base increase for seasonal employees, comprising three extra maintenance seasonal employees ($33,000) and one protection seasonal employee ($11,000).[45] Additional seasonal employees added to the already considerable workload that hiring seasonal staff had created for administrative staff, the interpretive division chief, and the maintenance division chief, especially in the first half of every year.[46] The interpretive division continued to use Student Temporary Employment Program (STEP) hires for some seasonal interpreters.[47] While most seasonal employees came on during the summer, the interpretive division also had a couple winter seasonal interpreters most years to assist with cave tours in the off-season (see Figure 125).[48]



Figure 125. Jewel Cave interpretive staff in 2010.

Source: NPS, Jewel Cave NM.

[45] Park Base Increases for Seasonals, undated [c. 2007], Cabinet 3, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[46] Jewel Cave Management Meeting Notes (hereafter JCMM), April 11, 2012, Jewel Cave NM DF; Jewel Cave Leadership Team Meeting (hereafter JCLTM), February 13, 2014, Jewel Cave NM DF.

[47] All Staff Meeting Notes, Jewel Cave NM, February 13, 2008, Jewel Cave NM DF.

[48] JCMM, October 5, 2010, Jewel Cave NM DF; JCSM, August 14, 2012, Jewel Cave NM DF.

In 2010, Suess left his role as superintendent for a new position at Olympic National Park. A few acting superintendents served after he left, until the Midwest regional director hired Larry Johnson, the first superintendent at Jewel Cave hired by a regional director rather than the Wind Cave superintendent.[49] Before Suess left, around 2008, he hired a new chief of interpretation, Bradley Block, who had previously been at Custer State Park.[50] After Chief of Facilities Management Don Morrison left, longtime maintenance staff Dave Tashner served as acting chief until Johnson hired John Black around 2012.[51] And in 2013, Johnson hired the first ever chief ranger dedicated solely to visitor protection, David Yim.[52]

Later in 2013, Johnson was detailed temporarily to Badlands National Park to serve as acting superintendent. In his absence, division chiefs and some personnel from other parks served as acting superintendents at Jewel Cave.[53] Johnson remained at Badlands longer than anticipated, and in 2015, the regional director decided that he would not return to Jewel Cave.[54] The Midwest regional director hired Bonnie Schwartz as the next Jewel Cave superintendent (GS-13) in early 2015. Schwartz had previously served as the deputy chief ranger at Yellowstone National Park, where she had supervised a large law enforcement operation.[55] She hired a new chief of law enforcement in early 2016, Nancy Martinz, who held the position until late 2019, when she retired.[56] Schwartz left Jewel Cave in late 2017, and in August 2018, Midwest Regional Director Cameron Sholly hired Michelle Wheatley as the new superintendent (GS-13). Wheatley had previously served as superintendent at Florissant Fossil Beds. She was the first superintendent of Jewel Cave to have served a superintendent at another park, perhaps a sign that the Midwest Regional Office no longer viewed Jewel Cave as a training ground for new superintendents.[57]

Shared Administrative Services

In the early 2000s, the Black Hills Administrative Group (BHAG) continued to function as shared staff among Jewel Cave, Wind Cave, and Mount Rushmore National Memorial. BHAG staff covered budgeting, purchasing, information technology (IT), and other administrative needs. The

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[49] Given, interview; Wiles, interview; NPS, "Jewel Cave Bids Farewell the Superintendent Suess," news release, February 5, 2010; JCMM, September 27, 2010, Jewel Cave NM DF.

[50] JCMM, September 27, 2010; JCMM, November 16, 2010, Jewel Cave NM DF.

[51] JCMM, September 27, 2010; JCMM, October 5, 2010; JCSM, November 22, 2011, Jewel Cave NM DF; JCSM, December 10, 2013, Jewel Cave NM DF.

[52] JCSM, December 10, 2013.

[53] JCLTM, April 15, 2014, Jewel Cave NM DF; JCLTM, May 20, 2014, Jewel Cave NM DF; JCLTM, September 2, 2014, Jewel Cave NM DF.

[54] JCMM, February 3, 2015, Jewel Cave NM DF; JCMM, February 11, 2015, Jewel Cave NM DF.

[55] JCMM, March 17, 2015, Jewel Cave NM DF; JCLTM, March 15, 2016, Jewel Cave NM DF; Wiles, interview; "New Superintendent at Jewel Cave National Monument," *Cave Talk: The Official Newsletter of the National Caving Association* (December 2015): 7.

[56] JCLTM, January 30, 2018, Jewel Cave NM DF.

[57] JCLTM, August 21, 2018, Jewel Cave NM DF; Wiles, interview; Chris Huber, "Wheatley selected as Jewel Cave superintendent," *Rapid City Journal*, May 22, 2018.

NEKOTA group (parks in Nebraska, North Dakota, and South Dakota) also continued, with shared human resources (HR), purchasing, and contracting functions. Parks continued to contribute funds to both BHAG and NEKOTA based on a formula that considered park budgets, staff, and needs. As before, the Jewel Cave administrative assistant/clerk (Gola and then Carder) did not factor into the shared budget and staffing calculations. In 2000, 14.49 percent of Jewel Cave's base operations funding went to BHAG and NEKOTA.[58]

In 2001, Menard left for a position at Olympic National Park, and Phil Heckman replaced him as the administrative officer (AO) supervising the BHAG and the NEKOTA group.[59] Heckman was hired by Wind Cave Superintendent Linda Stoll, and his duty station was at Wind Cave, but he divided his time among the three parks. During a typical week, he spent two days at Wind Cave, two days at Mount Rushmore, and one day at Jewel Cave. Jill Hart remained the BHAG budget specialist, and her duty station moved back to Jewel Cave in the mid-2000s, but she remained assigned full-time to budget matters, not general administration for Jewel Cave. BHAG Contracting Officer Ron Eilefson and IT Specialist Chuck Weichler (followed by Jayne Weiss) had offices at Mount Rushmore. In 2006, Heckman left Wind Cave and Menard returned, this time with a duty station at Mount Rushmore.[60]

Around 2008, the NPS initiated a service-wide expansion of its use of regional groupings for administrative support services. Staff from the NPS Washington Office visited Black Hills area parks to examine the NEKOTA group, which then became a model for a national shift to sharing support functions among parks. Menard assisted the Washington Office in developing a model for these groupings.[61]

The NPS created two types of groupings: Servicing Human Resources Offices (SHROs), which handled HR and personnel matters, and Major Acquisition Buying Offices (MABOs), which handled purchasing and acquisition.[62] In the Black Hills, the institution of the SHROs and MABOs effectively supplanted the BHAG and NEKOTA, both of which dissolved soon after the new groupings were established. Jewel Cave leadership debated the most cost-effective way to continue administrative services and eventually secured funding for a dedicated AO for the first time since Hart's brief stint in that position before the BHAG. Suess hired Katie Keil (later Atkins) into the position.[63]

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[58] Stoll, interview; Menard, interview; Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

[59] JCSM, July 31, 2001; JCSM, August 21, 2001, Jewel Cave NM DF; Menard, interview; Heckman, interview.

[60] Heckman, interview; Jill Hart, interview by Jackie Gonzales, June 27, 2019, Custer, SD; Menard, interview; JCSM, September 4, 2001, Jewel Cave NM DF; JCSM, September 11, 2001, Jewel Cave NM DF; Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; All Staff Meeting Notes, Jewel Cave NM, February 13, 2008.

[61] Menard, interview; Hart, interview; Given, interview; Wiles, interview.

[62] NPS, "New Superintendent Handbook," October 2008, 24–25, https://www.nps.gov/training/nsa/supt_handbook_102008.pdf; DOI, Office of Human Resources, accessed January 14, 2020, https://www.doi.gov/employees/employmentlaw/human-resources.

[63] JCMM, September 27, 2010; JCMM, October 5, 2010.

Weiss's IT functions were not covered by the new SHROs and MABOs, but since IT support was still needed at Jewel Cave, Wind Cave, and Mount Rushmore, the three units decided to continue sharing an IT employee and invited Badlands National Park into the arrangement.[64] Weiss assisted Jewel Cave staff with phones, computers, servers, internet, credit card wiring, cell service, security systems, and more.[65] She remained the IT person for the four parks until 2014, after which point Bruce Baird filled the position.[66] Black Hills area superintendents continued to look for opportunities to share resources even after the dissolution of the BHAG and NEKOTA group, such as when they considered hiring a shared assistant housing coordinator in 2014.[67]

Volunteer Program

Jewel Cave increasingly relied on Volunteers In Parks (VIP) to fill unfunded needs central to the monument's mission (see Figure 126). As part of the professionalization, as it were, of the volunteer program, Chief of Interpretation Karen Rosga (followed by Bradley Block) assumed the role of VIP program coordinator.[68] Block led the initiative to craft the first formal position descriptions for volunteer roles. Previously, potential volunteers learned of opportunities by word of mouth, and job descriptions consisted of brief narratives on volunteer work agreements.[69] Working with other division chiefs, Block made annual lists of potential VIP positions and projects, submitted funding requests for those projects as part of



Figure 126. Volunteers In Parks (VIPs) assist with interpretation, resource management, exploration, administration, and maintenance. Here, a VIP brushes lint from the Scenic Tour trail, ca. 2004.

Source: NPS, Jewel Cave NM.

[64] JCMM, October 9, 2012, Jewel Cave NM DF.

[65] JCSM, May 8, 2012, Jewel Cave NM DF.

[66] JCLTM, August 12, 2014, Jewel Cave NM DF; JCLTM, March 15, 2016; JCLTM, August 29, 2016, Jewel Cave NM DF.

[67] JCLTM, April 15, 2014.

[68] Bradley Block, Volunteers In Parks Annual Activity and Expense Report, Jewel Cave National Monument, October 25, 2010, Cabinet 2, Drawer 4, Folder P94 VIP Emp Program Files, Jewel Cave NM CF; JCMM, December 7, 2010, Jewel Cave NM DF.

[69] Block, Volunteers In Parks Annual Activity and Expense Report, Jewel Cave National Monument, October 25, 2010.

the VIP budget, and oversaw prioritization of that budget.[70] Positions included visitor center host, maintenance worker, resource management worker, photographer, and publications designer. He then posted these openings on the federal volunteer website, volunteer.gov.[71]

Two residential volunteers joined Jewel Cave in 2010, John Brooks and Karen Brooks. The Brooks lived on monument grounds and volunteered nearly full-time. John developed a VIP manual for the monument and assisted with fee collection, while Karen served as a visitor center host, assisted with fee collection, and organized the monument's central files.[72] In 2013, Patrick Curry and Diana Curry lived on-site as VIPs and served as visitor center hosts for the summer season. Their duties included helping at the front desk, giving discovery and scenic tours, taking photos, and assisting with fee collection. The Currys did not return in 2014, but Block and other Jewel Cave leadership had been pleased with how the on-site hosts had worked and sought ways to secure similar VIP support in future years.[73]

Planning and Evaluations

In 2010, a team of specialists from the Midwest Regional Office and other parks in the region completed an evaluation of operations at Jewel Cave. The Operations Evaluation team came to the monument from October 25 to 29, 2010, and interviewed division chiefs, met with staff, toured the monument, and reviewed monument files. Their conclusions prompted several changes in management at Jewel Cave, which are discussed elsewhere in this chapter. Regarding general planning, the Operations Evaluation team noted that strategic plans and annual work plans "usually are adjusted to fit what happened in the current year to meet mandatory reporting requirements," rather than these documents leading actions. "Park staff is hungry for a plan," the report concluded, and it noted, "The entire staff at the park has strong buy in to the park and are all willing to work together." In lieu of a General Management Plan (GMP), for which the NPS lacked funding service-wide at the time, the report recommended several division-specific plans and better adherence to strategic planning and documentation protocols.[74]

Other general administrative recommendations included better accession and organization of central files, updated Standard Operations Procedures (SOPs) for administrative tasks, utilizing financial and property documentation management systems, training administrative staff, and developing a written uniform policy.[75] The report praised Jewel Cave for the good condition of public and non-public facilities, excellent fire protection standards and efforts, information

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[70] JCSM, March 20, 2012, Jewel Cave NM DF; JCSM, April 15, 2014, Jewel Cave NM DF.

[71] Bradley Block to Larry Johnson, Annual Report – Interpretive Division, September 30, 2012, 7, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[72] Block, Volunteers In Parks Annual Activity and Expense Report, Jewel Cave National Monument, October 25, 2010; JCMM, September 27, 2010; JCMM, October 5, 2010; JCMM, November 16, 2010.

[73] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 8; JCLTM, July 18, 2017, Jewel Cave NM DF.

[74] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 3, 39.

[75] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 28–34, 51.

technology support, its radio plan, efforts to include Americans with Disability Act (ADA) standards in projects (but recommended designating an "Accessibility Coordinator"), and the lack of Equal Employment Opportunity (EEO) issues. It also noted that monument staff were successful at partnering with outside organizations and incorporating sustainability concerns into projects.[76]

In 2011, staff completed a Modified Environmental Management System plan (MEMS), to comply with Executive Orders (EOs) 13423 ("Strengthening Federal Environmental, Energy, and Transportation Management") and 13514 ("Federal Leadership in Environmental, Energy, and Economic Performance").[77] The MEMS spelled out Jewel Cave's strategies for promoting sustainable environmental practices.[78] One outcome of MEMS planning was a "dramatic increase in the scope of the employee recycling program." Among other things, the program included separating aluminum and selling it to recyclers and then using the revenue to "create a self-sustaining program for the purchase of new recycling bins, signs, etc.," and it encouraged staff to bring recyclables from home.[79]

The monument's "Green Team," a committee of several staff members, held a regional Climate Friendly Parks Workshop in 2012, attended by staff from Badlands, Mount Rushmore, Minuteman Missile National Historic Site, and Scotts Bluff National Monument.[80] Jewel Cave's Green Team completed the monument's Climate Friendly Parks Plan in 2013, in conjunction with updating the MEMS. These documents complied with EOs 13423 and 13514, the NPS "Green Park Plan" directive, the NPS and Midwest Regional Office "Climate Change Response Strategy," the Midwest Regional Office "Green Environmental Management System (GEMS), and the NPS-wide "Climate Friendly Parks Program."[81]

Other planning activity addressed topics such as emergencies and safety. In 2012, Larry Johnson drafted a "Continuity of Operations Plan" for the monument, which was intended to provide clear guidance for staff in the event of a fire or another disaster.[82] The same year, Johnson reestablished a Park Safety Committee. That committee doubled as the Accident Review Committee.[83] Staff prepared a Superintendent's Compendium, a unit-specific regulatory document that the Midwest Regional Office had identified as a need at Jewel Cave as early as 2003. The monument apparently

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[76] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 4–6, 9–10, 23–25, 31–32.

[77] NPS, Midwest Regional Office, Jewel Cave National Monument Modified Environmental Management System Plan – MEMS, May 10, 2011, Cabinet 1, Drawer 3, Folder [no title], Jewel Cave NM CF; Executive Order 13423 of January 24, 2007, "Strengthening Federal Environmental, Energy, and Transportation Management," 72 Fed. Reg. 3919; Executive Order 13514 of October 5, 2009, "Federal Leadership in Environmental, Energy, and Economic Performance," 74 Fed. Reg. 52117.

[78] NPS, Midwest Regional Office, Jewel Cave National Monument Modified Environmental Management System Plan – MEMS, May 10, 2011, 2.

[79] NPS, Midwest Regional Office, Jewel Cave National Monument Modified Environmental Management System Plan – MEMS, May 10, 2011, 11.

[80] JCSM, March 20, 2012.

[81] DOI, NPS, Jewel Cave National Monument, Modified Environmental Management System (MEMS) / Climate Friendly Parks (CFP) Plan FY 2013, January 15, 2013, 2.

[82] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 3.

[83] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 3.

had a compendium at one point, but it had not been updated for many years.[84] Yim updated the compendium, and Martinz and Schwartz finalized it in 2016. The Superintendent's Compendium is a living document that staff update as new issues and regulations arise.[85]

In 2014, Midwest Regional Office staff began working with Jewel Cave staff on a Foundation Document. This was part of a service-wide shift away from detailed general management plans, which the NPS perennially lacked funding to complete. Instead, a Foundation Document identified a unit's central themes, purposes, and legislative mandates. Jewel Cave staff participated in a Foundation Document workshop in September 2014, and the Midwest Regional Office completed the first draft of the document in February 2015. Cave lakes were discovered in 2015, and the park was able to add information about them to the document before it was finalized.[86] Block served as the liaison between the regional office and Jewel Cave and collected comments on drafts of the document.[87]

The Midwest Regional Office completed the final Foundation Document in February 2016 (see Figure 127).[88] It distilled Jewel Cave's many facets down to a brief statement of purpose:

> The purpose of Jewel Cave National Monument is to preserve, protect, and interpret one of the last great frontiers by managing and exploring an expansive cave system and the overlying surface for continued scientific and personal interest, and for inspiring public discovery.

The purpose statement served as a touchstone for four statements of significance, which would guide management of the monument:

- Jewel Cave represents a pristine and relatively unchanged underground environment featuring subterranean lakes, unusual speleothems, and abundant calcite spar.
- The cave's extensive length, three-dimensional complexity, prominent barometric wind, and single natural entrance define its unique nature.
- Scientific research has shown that most of the cave is yet to be discovered, creating opportunities for exploration and new scientific knowledge.
- Jewel Cave National Monument provides important surface and subsurface habitat for wildlife and nine species of bats, including one of the largest known hibernacula for the Townsend's big-eared bat and the threatened Northern long-eared bat.[89]

Those statements, in turn, provided the foundation for the monument's fundamental resources and values and its interpretive themes.[90]

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[84] Jewel Cave National Monument Law Enforcement Needs Assessment, July 8, 2003, 8, Cabinet 1, Drawer 1, Folder [loose in drawer], Jewel Cave NM CF.

[85] JCLTM, August 12, 2014; JCLTM, March 25, 2014, Jewel Cave NM DF; JCLTM, May 17, 2016, Jewel Cave NM DF; JCLTM, June 7, 2016, Jewel Cave NM DF.

[86] JCLTM, September 2, 2014; JCLTM, February 11, 2015, Jewel Cave NM DF; JCMM, February 11, 2015; Wiles, comments on draft, April 7, 2020.

[87] JCMM, February 24, 2015, Jewel Cave NM DF; JCMM, October 7, 2015, Jewel Cave NM DF.

[88] JCLTM, March 15, 2016.

[89] DOI, NPS, *Foundation Document Overview, Jewel Cave National Monument, South Dakota*, undated [2016], 2.

[90] DOI, NPS, *Foundation Document Overview, Jewel Cave National Monument, South Dakota*, undated [2016], 3.

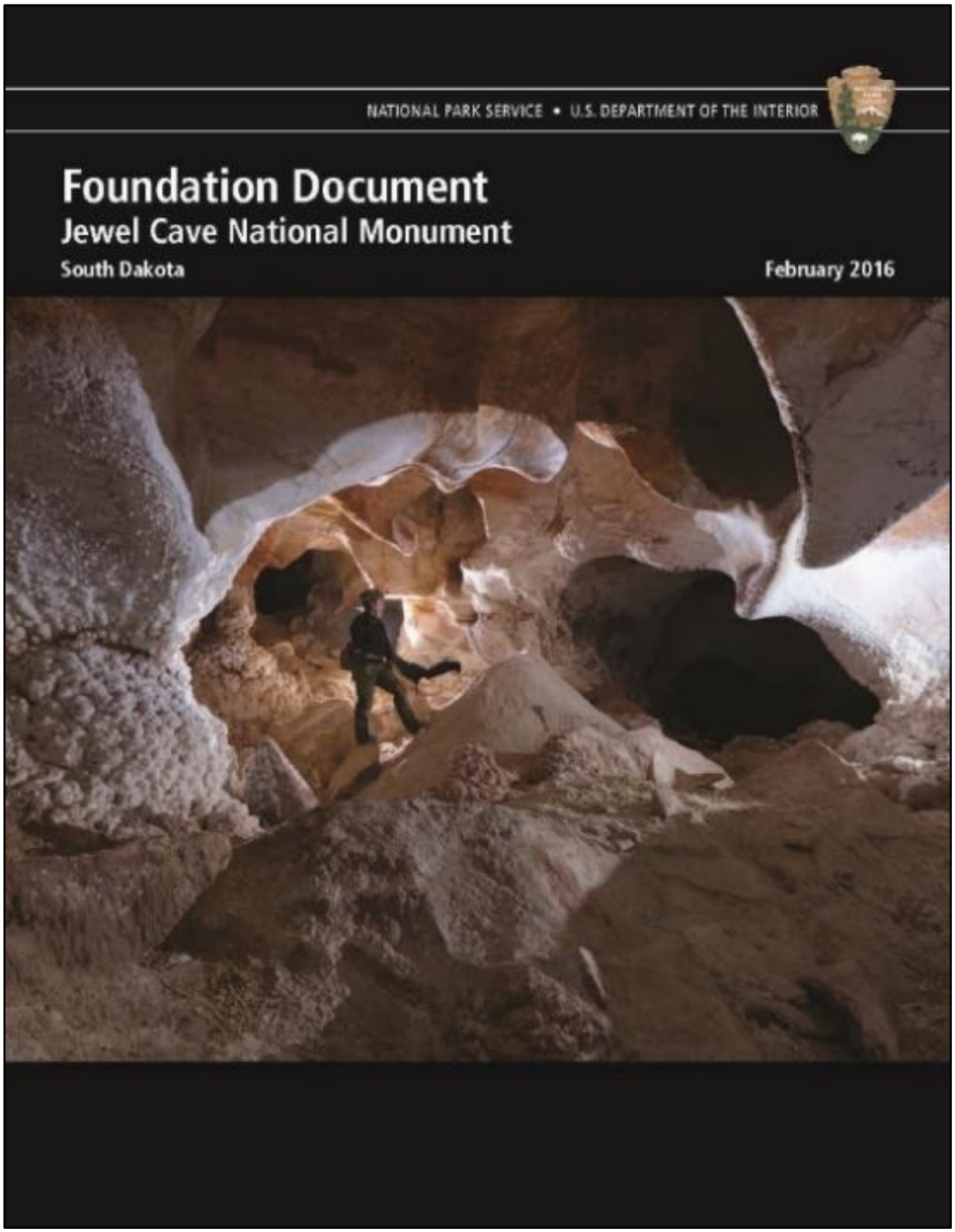


Figure 127. The Midwest Regional Office completed the Foundation Document for Jewel Cave National Monument in February 2016.

Source: NPS.

Black Hills Parks and Forest Association

The Black Hills Parks and Forest Association (BHPFA) continued to manage the bookstore in the Jewel Cave visitor center. In addition, the BHPFA operated sales outlets at 11 other locations at Wind Cave, Black Hills National Forest, Buffalo Gap National Grassland, and Custer State Park.[91] Steve Baldwin was the executive director of the BHPFA for several years (see Figure 128), followed by Patty Ressler, who remained director as of 2020.[92] At Jewel Cave, the BHPFA sold geology booklets, posters, lapel pins, postcards, patches, and (starting in 2005) sweatshirts, since many visitors on hot summer days were not dressed for a chilly cave tour.[93]



Figure 128. Steve Baldwin, who had previously caved in Jewel Cave, was executive director of the Black Hills Parks and Forests Association for many years. Pictured here in 2013.

Source: NPS, Jewel Cave NM.

The BHPFA worked with the NPS through five-year cooperating agreements. One was signed in 1999, with a provision for autorenewal after five years. In 2004, Midwest Regional Director Ernest Quintana notified Baldwin that NPS Director's Order 32 for Cooperating Associations might necessitate a new standard agreement. Tom Richter, the NPS Midwest Regional cooperating association coordinator at the time, drew up the revised document.[94] The BHPFA continued to operate under five-year agreements with an option to autorenew. In 2015, the Midwest Regional Office renewed the agreement without concerns.[95]

A portion of the BHPFA's proceeds went to Jewel Cave to fund the interpretation program, Student Conservation Association (SCA) interns, cave management interns, conference attendance by interpretive staff, membership in the local chambers of commerce, general supplies, and printing of the Junior Ranger booklet and other interpretation bulletins.[96] For several years, the interpretive

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[91] Steve Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, February 15, 2005, files provided by Katie Atkins, Folder A42 Coop Associations, Jewel Cave NM CF.

[92] Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, February 15, 2005; Regional Director Cameron H. Sholly to BHPFA Executive Director Patty Ressler, September 23, 2015, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[93] Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, February 15, 2005.

[94] Ernest Quintana to Steve Baldwin, November 1, 2004, files provided by Katie Atkins, Folder A42 Coop Associations, Jewel Cave NM CF.

[95] Sholly to Ressler, September 23, 2015.

[96] Chief of Interpretation to Superintendent, April 23, 2003, 4, and Chief of Interpretation to Superintendent, January 21, 2001, 4, both in Cabinet 1, Drawer 1, Folder Annual Rpts. Park – interp, Jewel Cave NM CF; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6; JCSM, October 30, 2001, Jewel Cave NM DF; Chief of Interpretation to Superintendent, February 13, 2004, 5, Cabinet 1, Drawer 1, Folder Annual Rpts. Park – interp, Jewel

division used BHPFA-donated funds to place an ad in the *Southern Black Hills Tourism Magazine*.[97] The superintendent or the chief of interpretation attended BHPFA meetings and kept the organization informed of the monument's needs.[98] The 2010 Operations Evaluation Report recommended that the NPS develop a "Scope of Sales" in partnership with the BHPFA, and that the association be involved in any future discussion of redesigning the visitor center and its bookstore area.[99]



Figure 129. Black Hills Parks and Forests Association bookstore in the Jewel Cave visitor center, 2018.

Source: NPS, Jewel Cave NM.

For special occasions, such as the monument's 100th anniversary in 2008 and the 200-mile reunion in 2019, the BHPFA helped plan events and worked with other community partners.[100] It hosted a book signing when local historian Judy Love published *Images of America: Jewel Cave National Monument* in partnership with Arcadia Publishing and BHPFA.[101] When Jewel Cave expanded the visitor center to provide more space for the bookstore and to restore the main entrance to its original location, Chief of Facilities Management Black and Chief of Interpretation Block were in touch with Ressler regarding construction documents and design of the bookstore. The BHPFA contributed some funds to the bookstore construction (see Figure 129).[102]

Cave NM CF; Steve Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, May 3, 2007, files provided by Katie Atkins, Folder A42 Coop Associations, Jewel Cave NM CF.

[97] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 4.

[98] JCMM, November 16, 2010; JCMM, September 16, 2014, Jewel Cave NM DF.

[99] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 18–19.

[100] Steve Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, March 30, 2008, files provided by Katie Atkins, Folder A42 Coop Associations, Jewel Cave NM CF.

[101] "Jewel Cave Plans Book Signing Event on Memorial Day Weekend," news release, May 13, 2010, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[102] JCLTM, February 13, 2014; JCLTM, March 25, 2014; JCLTM; February 3, 2015, Jewel Cave NM DF.

Partnerships

Partnerships with local civic groups remained paramount, as they had been since the Michauds managed the cave. Jewel Cave leadership attended Custer Chamber of Commerce quarterly meetings and stayed connected with the Custer Rotary Club and the Newcastle Chamber of Commerce.[103] In 2009, the Custer Chamber of Commerce honored Suess as "Government Employee of the Year."[104] Other local partners included tourist promotional organizations and publications, such as the South Dakota Tourism Department, the Rapid City Convention and Visitor's Bureau, Crazy Horse Memorial, *Rapid City Visitors Guide*, *Black Hills Discovered*, and *South Dakota Magazine*. Jewel Cave continued to partner with the Black Hills and Badlands Association (formerly the Black Hills, Badlands, and Lakes Association), and interpretive staff partnered with school districts on several programs.[105] In the early 2000s, the Jewel Cave Employee Association raised money from an annual Christmas silent auction, donated funds to the Custer Christmas for Kids program, and built a float for the Custer Christmas Parade.[106]

Starting in 2012, Larry Johnson worked with Custer Regional Hospital on a "Park Prescription Program," in response to a call to action by the Midwest Regional Office. The NPS had initiated this program nationally as a way for parks to partner with physicians to encourage outdoor recreation and healthy lifestyles. It described the program as follows:

> The NPS works with local healthcare professionals to identify trails and recreational avidities that are suitable to prescribe to patients. Each patient may be prescribed a different activity or trail depending on their individual need and ability. Patients act as Volunteers in Parks (VIPs) and are often provided a uniform.[107]

Johnson told the hospital that Jewel Cave wanted to start such a program

> to provide opportunities for Regional Health patients to use their National Park for exercise while also performing valuable service to their community. . . .
>
> We are excited about the potential of this program to help Custer Regional Hospital's health care providers prescribe exercise for their patients while helping the National Park Service meet our goal of helping citizens recognize parks as a place to improve their health and well-being.[108]

The program was no longer in place as of 2020.[109]

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[103] JCSM, February 26, 2008, Jewel Cave NM DF; Jewel Cave National Monument, Long Range Interpretive Plan, Action Items – FY2001, Cabinet 1, Drawer 3, Folder K1817 Interpretive Planning, Jewel Cave NM CF; Stoll, interview.

[104] NPS, "Jewel Cave Bids Farewell the Superintendent Suess," news release, February 5, 2010.

[105] JCSM, November 19, 2002, Jewel Cave NM DF; JCSM, April 1, 2008, Jewel Cave NM DF; JCSM, August 30, 2011, Jewel Cave NM DF; JCSM, May 8, 2012; JCSM, September 25, 2014, Jewel Cave NM DF; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 4.

[106] JCSM, July 10, 2001, Jewel Cave NM DF; JCSM, February 26, 2002, Jewel Cave NM DF; JCSM, November 5, 2002, Jewel Cave NM DF; JCSM, November 19, 2002; JCSM, December 17, 2002, Jewel Cave NM DF; JCSM, October 5, 2010, Jewel Cave NM DF; JCSM, December 7, 2010, Jewel Cave NM DF.

[107] NPS, Jewel Cave National Monument, "Park Prescription Program," undated [ca. 2012], 2, Cabinet 3, Drawer 3, Folder [no file title], Jewel Cave NM CF.

[108] Larry Johnson to Veronica Schmidt, July 17, 2012, Cabinet 3, Drawer 3, Folder [no file title], Jewel Cave NM CF.

[109] Wiles, comments on draft, April 7, 2020.

Perhaps the most active partner of Jewel Cave since 2000 has been the caving community, locally and nationally. Many of Jewel Cave's resource management employees, and some interpreters, have explored Jewel Cave and other caves in their free time. Some were already cavers when they came to Jewel Cave, and others started caving after working at the monument. The Paha Sapa Grotto, the local chapter of the National Speleological Society (NSS), continued to partner with Jewel Cave, Wind Cave, and other caves in the Black Hills. Individual members of the grotto explored Jewel Cave, while Jewel Cave staff continued to manage cave exploration. Employees who were cavers often joined the grotto.[110] The grotto participated in the annual cave restoration camp, adopted the portion of Highway 16 running through Jewel Cave's boundaries in 2007 (a program in which the adopter promises to help clean litter from the highway), and partnered with the Forest Service on cave resource protection. The grotto is the primary partner supporting exploration (see Figure 130). Primary supporters of cave resource protection and management include the Forest Service, the USGS, and The Nature Conservancy.[111]



Figure 130. Volunteer cavers donate thousands of hours to exploring, surveying, and mapping the cave. Here, Chris Pelczarski and Adam Weaver. Photo by Ben Smith, 2018.

Source: NPS, Jewel Cave NM.

Jewel Cave staff used networks within the caving community to connect with cave management professionals and volunteers at other NPS-managed caves, as well as other caves across the country. For instance, when Wiles was developing procedures for monitoring cave vital signs, he spoke with Dennis Dave from Timpanogos Cave, and when he developed procedures related to white nose syndrome, he sought advice from Rick Toomey at Mammoth Cave National Park. Wiles worked closely with Rod Horrocks, the cave specialist at Wind Cave, on a range of cave resource management issues, and Wind Cave and Jewel Cave held joint search and rescue trainings (see Figure 131).[112]

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[110] Rene Ohms, interview by Jackie Gonzales, June 28, 2019, Custer, SD; Marc Ohms, interview by Jackie Gonzales, June 30, 2019, Custer, SD; Wiles, interview.

[111] Paha Sapa Grotto, "About Us," accessed January 17, 2020, https://www.pahasapagrotto.org/about-us.html; JCLTM, August 29, 2016; Wiles, interview; Wiles, comments on draft, April 7, 2020.

[112] JCMM, October 5, 2010; Wiles, interview; Wiles, comments on draft, April 7, 2020.

To facilitate communication between cave resource managers, the NPS developed a role of "National Cave and Karst Coordinator," which was filled, in order, by Ron Kerbo, Dale Pate, and Joel Despain. Gretchen Schenk, the cave specialist at Great Basin National Monument and a former seasonal employee at Jewel Cave, informally coordinated with cave specialists when the national coordinator position lapsed for several years. To keep up-to-date on cave management, Wiles, Ohms, and Dan Austin (a volunteer caver since 1998 and former seasonal interpretive employee who was hired as a physical science technician in 2009) attended annual NSS conventions, spoke at National Cave and Karst Management Symposiums, and participated in (and helped to develop, in Wiles' case) the National Cave and Karst Research Institute (NCKRI).[113]



Figure 131. Jewel Cave search and rescue training, 2004.
Source: NPS, Jewel Cave NM.

For some time, Jewel Cave managers have wanted to establish a friends group for the monument, but the monument lacked long-term support from a superintendent for such an organization. Friends groups are non-profit organizations affiliated with a park whose purpose is to support the park, often through raising funds or completing projects that the NPS lacks time or money to complete. The BHPFA donated funds to the park, but it served multiple units and functioned differently than a dedicated friends group would. The 2008 Core Operations Report included a goal to "begin the development of a park's non-profit fundraising group."[114] The 2010 Operations Evaluation Report weighed in further:

> The park Staff has discussed the potential of supporting the development and establishment of a "Friends Group" for the Monument. The MWR AD for Partnerships and [the] Partnership Coordinator support the concept, with the caveat that Superintendent and staff believe that it is appropriate, feasible, and sustainable. MWR Partnership staff will provide support and guidance as requested, including facilitating an onsite meeting with park staff and interested prospective partners to gain traction and determine "next steps."[115]

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[113] JCMM, August 30, 2011, Jewel Cave NM DF; JCLTM, August 29, 2016; Wiles, comments on draft, April 7, 2020; Wiles, interview.

[114] Jewel Cave National Monument, Core Operations Report, 2008, 28.

[115] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 37.

Wiles hoped that a friends group would purchase private lands overlying the cave, addressing a key resource protection issue more easily than federal agencies can.[116] Although discussion of a friends group has continued over the years, the monument did not yet have one as of early 2020.[117]

Concessions

In the early 2000s, Jewel Cave continued contracting through the South Dakota Department of Human Services (SDDHS) for concessions. The contract, held by Larry Renz for several years, covered vending machines serving snacks and drinks in the lobby of the restroom facility.[118] When Renz's contract expired on June 3, 2010, the SDDHS informed the Midwest Regional Office that they would not seek to renew it. The Midwest Regional Office and park managers agreed that a Commercial Use Authorization (CUA) would be more appropriate than a concession contract, and the park smoothly transitioned to a CUA for vending machine services at that point.[119] In 2014, Jewel Cave entered into an additional CUA with the BHPFA that was "focused on the sale of non-perishable food items and convenience items within the existing park store."[120] A separate vending company held the CUA for vending machines in a new stand-alone shelter at the base of the parking lot near the ticket kiosk, and the BHPFA expanded the availability of snacks available for purchase in the bookstore.[121]

Law Enforcement

Jewel Cave had no dedicated law enforcement staff as of 2000. In light of the monument's already stressed budget, Suess prioritized sharing law enforcement capabilities with local agencies, Wind Cave, and Mount Rushmore, rather than hiring dedicated staff.[122] In 2003, Wind Cave Chief Ranger Rick Mossman and Midwest Regional Chief Ranger Bill Blake completed a Law Enforcement Needs Assessment (LENA) for Jewel Cave, pursuant to Director's Order/Reference Manual 9, *National Park Service Law Enforcement Policies*.[123] They cited as major issues the lack of intrusion alarms in the historic cave entrance or historic cabin and the lack of fire suppression

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[116] Wiles, interview.

[117] JCMM, March 17, 2015.

[118] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Chief of Interpretation to Superintendent, January 21, 2001, 3; Chief of Interpretation to Superintendent, February 1, 2002, 4, Cabinet 1, Drawer 1, Folder Annual Rpts. Park – interp, Jewel Cave NM CF; Chief of Interpretation to Superintendent, February 13, 2004, 5.

[119] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 6–7.

[120] JCLTM, March 25, 2014.

[121] JCMM, March 28, 2017, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.

[122] Wiles, interview.

[123] Jewel Cave National Monument Law Enforcement Needs Assessment, July 8, 2003, 2, Cabinet 1, Drawer 1, [loose in drawer], Jewel Cave NM CF.

system in the cabin.[124] The report referred to the 1997 Visitor Management-Resource Protection Assessment Program (VRAP) analysis, which had put Jewel Cave's law enforcement needs at 3.17 FTE. The VRAP recommended that the staff include one full-time chief ranger (GS-7), one full-time field ranger (GS-7/9), one 75 percent-time field ranger (GS-7/9) and one full-time, subject-to-furlough field ranger with shared costs with Wind Cave (GS-7/9). Suess pointed out that making the positions permanent or subject-to-furlough rather than seasonal would provide more continuity for the monument.[125]

In the absence of funds to implement the 2003 LENA, Jewel Cave continued to meet its law enforcement needs through cooperative agreements. In 2005, the NPS signed a Memorandum of Understanding (MOU) with the Custer County Emergency Services Office (CCESO) for Jewel Cave and Wind Cave law enforcement. The purpose was to "initiate a cooperative program relating to Dispatch service to the National Park Service," which would be provided by CCESO. The NPS paid CCESO $2,000 per year for 24/7/365 service through the agreement, to be updated annually.[126] The following year, the NPS signed a cooperative agreement with the Custer County Sheriff's Office to cooperate on law enforcement with all Black Hills area parks.[127] The Forest Service also cooperated with Black Hills area parks on law enforcement, as detailed in a 2009 MOU.[128]

Wind Cave and Jewel Cave maintained a Law Enforcement Operations Agreement, which the two units reviewed annually. As of early 2010, the agreement stated that Jewel Cave planned eventually to hire a full-time law enforcement ranger, but until that happened, Wind Cave would store Jewel Cave firearms, complete law enforcement reports, assist with orientation of new law enforcement personnel, conduct any necessary investigations at Jewel Cave, and respond to immediate emergencies at Jewel Cave (as it had in the past). Once Jewel Cave hired permanent law enforcement staff, Wind Cave staff would respond to emergencies at Jewel Cave as needed, provide one CPR/first aid class each spring until Jewel Cave had qualified instructors, notify Jewel Cave law enforcement staff of Wind Cave firearms training so they could participate, and allow Jewel Cave law enforcement staff to use the Wind Cave firearms range. As part of the agreement, Jewel Cave would contribute $1,000 annually from 2010 to 2014 "to pay its share of the Custer County dispatch agreement."[129]

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[124] Jewel Cave National Monument Law Enforcement Needs Assessment, July 8, 2003, 8.

[125] Jewel Cave National Monument Law Enforcement Needs Assessment, July 8, 2003, 9–10.

[126] Cooperative Agreement Between the United States Department of the Interior, National Park Service, Wind Cave National Park and Jewel Cave National Monument, and Custer County Emergency Services Office, 2005, Cabinet 1, Drawer 1, Folder 2.A.1 Custer County Agreements, Jewel Cave NM CF.

[127] Memorandum of Understanding Between the National Park Service, Wind Cave National Park, Jewel Cave National Monument, Mount Rushmore National Memorial, and Custer County Sheriff's Department, 2006, Cabinet 1, Drawer 1, Folder 2.A.1 Custer County Agreements, Jewel Cave NM CF.

[128] Superintendent, Jewel Cave NM, to all employees, memorandum, February 13, 2008; Memorandum of Understanding Between the United States Forest Service, Black Hills National Forest, et al., and the National Park Service, Wind Cave National Park, et al., 2009, Cabinet 1, Drawer 1, Folder 2.A.1 2009 NPS/USFS LE MOU, Jewel Cave NM CF.

[129] Vidal Davila to Todd Suess, memorandum, January 11, 2010, Cabinet 1, Drawer 1, Folder 2.A.1 2010 JECA WICA LE Coverage Agreement, Jewel Cave NM CF.

In September 2010, Suess hired Casey Osback into a seasonal law enforcement position (GS-9), the first law enforcement presence at the cave since Tom Casey left in 1998, and the first employee dedicated solely to law enforcement.[130] Osback completed a Jurisdictional Inventory for the monument and wrote annual law enforcement reports.[131] Several months after Osback arrived, the Operations Evaluation Report declared, "the [LE] program was permitted to atrophy by prior administrations and only in the past three months has a protection ranger been hired." The report recommended continuing to hire seasonal law enforcement rangers and seeking additional partnership opportunities with other Black Hills area NPS units. Most law enforcement SOPs were "out of date or non-existent" and the monument needed a physical security plan, a law enforcement needs assessment program, and an updated Emergency Operations Program.[132]

To address these deficiencies, Larry Johnson hired David Yim as the chief law enforcement ranger for Jewel Cave in 2011. Yim was the first full-time employee dedicated solely to law enforcement in the monument's history.[133] He had previously served at Big Bend National Park and was a crucial addition to the Jewel Cave staff.[134] Yim assisted in developing cave rescue SOPs and evaluating risks on the Wild Caving Tour route. He updated radio repeater equipment and the security system in the historic ranger cabin, and he continued to partner with cooperating law enforcement units.[135]

Around 2016, Yim left for another assignment and Nancy Martinz was hired as the chief law enforcement ranger at Jewel Cave (see Figure 132). Martinz had previously been at Mount Rushmore and had good relationships with NPS and Forest Service officials in the Black Hills area. Martinz and her seasonal law enforcement staff handled traffic stops, security systems, radio issues, vandalism responses, and ticketing individuals off-

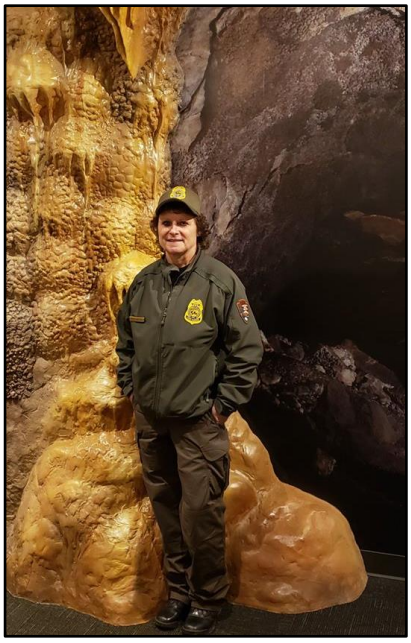


Figure 132. Nancy Martinz became chief of law enforcement at Jewel Cave in 2016.

Source: NPS, Jewel Cave NM.

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[130] JCMM, September 27, 2010; Jewel Cave National Monument Jurisdictional Inventory, 2010, Cabinet 1, Drawer 1, Folder 2.A.1 2010 JECA Jurisdictional Inventory, Jewel Cave NM CF.

[131] Jewel Cave National Monument Jurisdictional Inventory, 2010; Lawrence E. Johnson to Midwest Regional Director, memorandum, January 7, 2011, Cabinet 1, Drawer 1, Folder 2.D Annual LE Reports, Jewel Cave NM CF.

[132] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 10–13, 22.

[133] JCSM, August 30, 2011; JCSM, November 22, 2011.

[134] Lawrence E. Johnson to J. J. Martin, memorandum, November 17, 2011, Cabinet 1, Drawer 1, Folder 2.D 2011 David Yim, Jewel Cave NM CF.

[135] JCLTM, October 5, 2010; JCMM, February 2, 2011; JCMM, March 20, 2012; JCLTM, May 8, 2012; JCLTM, January 7, 2014, JCLTM, February 13, 2014; JCLTM, February 24, 2015; JCMM, March 12, 2015, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.

trail in the cave.[136] The dedicated law enforcement presence that came with having a chief ranger has helped Jewel Cave protect its natural and cultural resources and better partner with outside law enforcement.

Facilities Management

A chief of maintenance and facilities management (filled by four different people from 2000 to 2010), assisted by a full-time, subject-to-furlough maintenance mechanic, was responsible for maintaining Jewel Cave's built infrastructure. Several seasonal maintenance staff assisted most years. Volunteers and Youth Conservation Corps (YCC) crews occasionally assisted with maintenance tasks, but not every year. Maintenance staff cooperated with Wind Cave and Mount Rushmore for training, as they had in the past, and Wind Cave sometimes loaned maintenance employees or equipment to Jewel Cave to help with large projects.[137] The 2010 Operations Evaluation Report noted the maintenance team did an excellent job of maintaining facilities at Jewel Cave, but it concluded that the facilities manager and maintenance staff needed to do a better job with reporting functions, including the NPS scoping tool for facilities projects, FMSS and PMIS, and environmental and safety monitoring.[138]

Parking Lot and Roads

For several years after the Jasper Fire, maintenance crews put significant effort into mitigating damage to roads, trails, and buildings caused by the erosion of newly barren hillsides. In 2001, after the Lithograph Canyon road washed out completely, crews filled it "to minimal standards" and worked with the Forest Service to rebuild the road. Resource management staff worked with maintenance teams to ensure that the roads had low water crossings instead of culverts, which could plug up and cause overflowing water to erode deep holes on the downstream side.[139] Crews repaired damage to the Canyons Trail caused by flash flooding and reopened it to visitors in 2001.[140] They "milled and overlaid" the visitor center parking lot and removed the lower end of the housing parking lot.[141] As part of the parking lot repairs, the monument received funding to rebuild the ticket

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[136] JCLTM, April 12, 2016, Jewel Cave NM DF; JCLTM, January 17, 2017, Jewel Cave NM DF; JCLTM, February 28, 2017, Jewel Cave NM DF; Wiles, interview; Stoll, interview.

[137] JCMM, October 9, 2012; Bradley Block to Phyllis Cremonini, FY16 Youth Programs Accomplishments Report, September 23, 2016, 5, Drawer 1, Cabinet 2, [loose in drawer], Jewel Cave NM CF; JCMM, September 21, 2010, Jewel Cave NM DF; JCSM, January 21, 2003, Jewel Cave NM DF.

[138] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 3, 8, 51–54.

[139] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6.

[140] JCSM, October 16, 2001, Jewel Cave NM DF.

[141] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

kiosk, install electrical service to it, and expand the carpenter workshop area in the maintenance building.[142]

Studies by consulting engineers in 2010 and 2011 found that runoff from the visitor center parking lot introduced pollutants into the cave, and they recommended redesigning the lot to mitigate this contamination.[143] The NPS Denver Service Center (DSC) contracted out the parking lot design to Martin and Martin, who published the following concept in 2012:

> The site will be graded to capture stormwater runoff and convey it to the underground detention vault located at the southwest comer of the site, via inlets and storm piping. The detention vault will have a perforated plate to ensure stormwater is released at an acceptable rate during the minor (first flush) storm events. During the minor storm event the captured stormwater will exit the storage compartment of the vault through a perforated plate that will allow the total volume of stormwater to discharge within a 24 hour time period. Once the stormwater flows through the perforated plate, it will flow to the treatment unit (Smart Sponge system by AbTech Technologies) within the vault and then through a discharge storm pipe. A restrictor plate will control flows from larger storm events. Runoff will be conveyed to the south, towards Lithograph Canyon to an energy dissipation box. The stormwater entering the energy dissipation box will be routed through a level spreader where the storm water will be discharged in a manner that will mitigate erosion along the existing embankment. For the 100-year storm event, the captured stormwater will overtop the initial perforated plate and the treatment sponges. The restrictor plate will be sized to ensure the discharge of the 100-year storm event will not exceed the 100-year predeveloped offsite flow rate.[144]

In July 2012, Zonge International conducted seismic investigations around the parking lot to "locate hard rock lenses in the upper 10 feet," and Yeh and Associates completed construction documents in August.[145] Plans included new retaining walls and a 26 by 82 by 13-foot detention vault beneath the parking lot to catch run-off, which would then flow through oil/water separators before draining back into the ground. New structures built as part of the reconstruction included a new ticket kiosk (an octagonal design, mirroring the visitor center) and both stairs and an accessible ramp from the parking lot to the lower level of the visitor center plaza.[146]

Construction on the new parking lot began in 2014 and including repaving of the service road near the parking lot and expanding the lot. The parking lot now covered some of the former picnic area that had been built up with material excavated from the elevator shaft in 1968, but space was

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[142] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6; JCSM, January 2, 2002, Jewel Cave NM DF.

[143] Bill Willis and Joe Rausch, Jewel Cave National Monument, Repair Drainage System to Eliminate Parking Lot Pollution Entering Jewel Cave, Pre-Design Report, December 24, 2010, 1, National Park Service Electronic Technical Center (hereafter eTIC); Yeh and Associates, Inc., Geotechnical Engineering Report, Jewel Cave National Monument, Visitor Center Parking Lot, August 31, 2012, 1, eTIC; JCSM, March 15, 2011, Jewel Cave NM DF; JCSM, April 11, 2012.

[144] Martin/Martin, Inc., for NPS, "Drainage Study for Jewel Cave National Monument Parking Lot a National Park Service Project," March 23, 2012, 5–6, eTIC.

[145] Yeh and Associates, Inc., Geotechnical Engineering Report, Jewel Cave National Monument, Visitor Center Parking Lot, August 31, 2012, 2, 5, eTIC.

[146] Yeh and Associates, Inc., Geotechnical Engineering Report, Jewel Cave National Monument, Visitor Center Parking Lot, August 31, 2012, 1, eTIC; Contract Price Schedule, PMIS JECA 087492, "Repair Drainage System to Eliminate Parking Lot Pollution Entering Jewel Cave," undated [ca. 2012], eTIC; JCLTM, September 2, 2014.

left for a few picnic tables.[147] After a pause during the winter, the project was mostly completed by summer 2015, when the company walked away from the project. Unfortunately, problems arose with the new facilities. The ticket kiosk ceiling collapsed during heavy rain in July 2016, and the detention pond and filters did not function as expected. Water flowed into the high drains and then gushed out of the lower drains back onto the parking lot, spilling down the stairs and toward the theater, where it caused flooding and erosion. To address these issues, maintenance crews made modifications to the parking lot drainage system over subsequent years. As modified, the parking lot was not able to accommodate a filtering mechanism, which had been the impetus behind the redesign. Total parking capacity remained at 150 vehicles (see Figure 133).[148]



Figure 133. Reconstruction of the parking lot, 2018.

Source: NPS, Jewel Cave NM.

Highway 16

In the wake of the Jasper Fire, monument staff remained especially concerned about erosion and runoff. The state of South Dakota Department of Transportation (SDDOT) initiated repairs to Highway 16 after post-fire flash flooding caused major damage.[149] SDDOT continued to consider

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[147] JCLTM, August 12, 2014; Wiles, comments on draft, April 7, 2020.

[148] "Construction Continues on Jewel Cave Parking Lot," *Caving News*, January 20, 2015; Leadership Team Meeting Notes, July 5, 2016, Jewel Cave NM DF; Wiles, interview; Wiles, comments on draft, April 7, 2020.

[149] Todd J. Suess to Don Krauss, October 18, 2001, Cabinet 2, Drawer 4, Folder L2431 Road Construction, Jewel Cave NM CF.

building a bridge in Hell Canyon, but it again could not secure enough federal highway funding for the project which, by that point, would have cost an estimated $30 million.[150] In lieu of the bridge, Suess reported, SDDOT "identified a need to place some attention on the current stretch of highway 16 going through the monument" to address erosion, "failing road shoulders," and safety concerns.[151]

Plans to reconstruct parts of Highway 16 picked back up around 2012 and made their way through review processes.[152] Wiles communicated regularly with SDDOT and the Midwest Regional Office to track how the plans would affect natural and cultural resources at the monument.[153] The final plan did not include a bridge, and SDDOT promised to protect the former Michaud Hotel site. SDDOT explained the need for the change:

> This four-mile reconstruction and shoulder-widening project aimed to make some curves and some steep grades through rugged Black Hills topography less curvy and less steep— therefore safer for drivers of all vehicle types, including bicyclists.[154]

The regrading would flatten several curves "to address safety concerns" in two areas, one on either side of the monument (see Figure 134).[155] This necessitated some cutting into the slope at many locations in Hell Canyon.[156]

In response to NPS feedback and hydrological studies, the highway improvements included three detention ponds and filters that captured contaminants in runoff before it could reach the cave. The detention ponds and catch basin filtration systems were located at three drainage areas. One of the ponds, at Prairie Dog Spring, was just outside the park boundary, so an agreement was written to allow NPS to maintain the filter. The NPS planned to use the same filters at the Jewel Cave parking lot, and the NPS offered to take responsibility for changing the filters under the highway. SDDOT opened the new highway in 2015 and held a ribbon cutting on October 8, which Jewel Cave leaders attended.[157]

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[150] Jason Ferguson, "Bridge may not happen," *Custer Chronicle*, May 5, 2003, Cabinet 1, Drawer 2, Folder K3415 Press Releases, Jewel Cave NM CF.

[151] JCSM, July 16, 2002, Jewel Cave NM DF.

[152] JCMM, August 30, 2011.

[153] JCLTM, March 25, 2014; JCLTM, May 20, 2014.

[154] South Dakota Department of Transportation (SDDOT), Annual Report, 2014, https://dot.sd.gov/media/documents/2014AnnualReport.pdf.

[155] SDDOT, Environmental Assessment and Section 4(f) Evaluation, Project NH 0016(72)11, PCN 022E, Custer County, SD, July 2013, https://dot.sd.gov/media/documents/July_2013EASection4fEvaluation.pdf, 7.

[156] Alberta Settle to Lynn Kolund, November 15, 2010, Scope Review, in SDDOT, Environmental Assessment and Section 4(f) Evaluation, Project NH 0016(72)11, PCN 022E, Custer County, SD, July 2013, https://dot.sd.gov/media/documents/July_2013EASection4fEvaluation.pdf.

[157] SDDOT, Environmental Assessment and Section 4(f) Evaluation, Project NH 0016(72)11, PCN 022E, Custer County, SD, July 2013, 21; JCSM, August 14, 2012, JCLTM, September 16, 2014; JCLTM, October 7, 2015, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.



Figure 134. South Dakota realigned Highway 16 to eliminate dangerous curves. Photo of construction work in 2014.

Source: NPS, Jewel Cave NM.

Historic Area

In the historic area, staff completed extensive remodeling of the Civilian Conservation Corps (CCC) cabin in 2001.[158] Inside the cave's historic entrance, maintenance crews replaced rotting wooden staircases along the Dungeon Route in 2001 and 2002.[159] The oldest stairs dated to 1964; therefore, no Section 106 compliance was necessary to remove them. The replacement wood was treated to protect it in high humidity, and the stairs were "similar in design and capacity to the original." Crews completed the project in the summer to avoid disturbing hibernating bats and reopened the area to the public in June 2001.[160]

Elevator

At the visitor center, Thyssen-Krupp Elevator (TKE) continued to hold the service contract for the elevators and performed maintenance such as rope and electrical repairs.[161] Jewel Cave leadership justified noncompetitive procurement of the elevator service contract due to the elevators having been "designed and constructed specifically for this location," where many components were unique to the elevators. Jewel Cave staff explained,

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[158] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6.

[159] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6.

[160] Peggy O'Dell to Central Files, memorandum, April 3, 2000, Cabinet 3, Drawer 1, Folder 2004 send to NARA 2034 Restoration Cave/Historic Area Stairs 1988–2004 Subsurface, Jewel Cave NM CF; JCSM, June 19, 2001.

[161] JCSM, February 19, 2002, Jewel Cave NM DF.

> It is very difficult to design and maintain cave elevators due to the cave's environmental conditions. The humidity in the cave is constantly at 99% and the temperature 47 degrees. To ensure visitor safety, it is imperative that the cave elevators remain functional, and this requires that elevator mechanics have extensive knowledge of equipment operation in these special environmental conditions. . . . TKE has maintained a support agreement with MCE [Motion Control Engineering, the company that manufactured the controls] and has an effective and efficient working relationship with the elevator design engineers. The TKE mechanic is competent with our rescue procedures and with cave resources protection issues. He has demonstrated that he has the knowledge and experience of what it take[s] to properly maintain the elevators in the harsh cave environment.[162]

The NPS followed these recommendations and continued to retain TKE due to its mechanics' specialized knowledge about the Jewel Cave elevators.

The 2010 Operations Evaluation Report included serious criticism of the elevators and the underground lighting system. It concluded that Jewel Cave needed external professional assistance to determine the causes of elevator malfunctions and to ensure that safe evacuation of the cave could occur in the event of a power outage. The report's authors wrote,

> The elevators are currently not being operated as designed, installed, or according to the operational protocols. Inspection tags indicated the last elevator certifications shown to the team were conducted in July 1997 and September 1999. The elevator control circuits are persistently malfunctioning, requiring a manual reset procedure to be performed by a member of the park staff. The park maintained records that clearly indicated since May 2010 the elevator[']s control circuits failures had a 400 per cent increase with numerous days requiring multiple reset[s]. The park's contracted elevator service has been unable to identify the primary sources of system failure. The reset task is being performed by untrained and unauthorized park personnel in a mechanical room that has recognized mechanical and electrical hazards. In addition, both elevators are currently operating with a backup emergency braking devise disabled. These safety systems were removed without written documentation from the manufacturer or the park's elevator service company.
>
> Both elevators are powered by the same emergency generator (currently not in the FMSS database). An interruption of commercial and emergency power supply would render both elevators inoperable. The elevator passenger cars have the potential of being stranded at any point of the vertical path of travel. This situation is further exacerbated by the fact that there is no approved means of manually lowering the disabled car to an appropriate elevation for safe extrication except by the service technician who would have to respond from Rapid City, over an hour's drive away.

No full load test had ever been done on either elevator "to determine the actual power requirement for a fully loaded condition," so there was no certainty that the emergency circuit generator would be able to sufficiently power the elevator or the emergency lighting in the cave. Furthermore, the audit team found "inoperable" lighting devices for emergency egress from the cave. The evaluation recommended that, after figuring out what was wrong with the elevators, park staff should simulate a power outage to ensure that emergency generators and lighting were functioning and adequate.[163]

The safety concerns surrounding the elevators were so great that Johnson ordered their closure while the Operations Evaluation team was still performing its inspection of Jewel Cave.[164] Within

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[162] Justification for Noncompetitive Procurement, November 4, 2009, Cabinet 1, Drawer 2, Folder D20/Elevator 2010, Jewel Cave NM CF.

[163] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 20–21.

[164] Ron Cockrell, Midwest Regional Historian, NPS, to Emily Greenwald, April 7, 2020.

weeks of the evaluation, the generator repair company visited to inspect the generators, an independent elevator expert visited to offer suggestions regarding backup brake issues, and TKE ran new cables for the elevator controls, fixed and waterproofed position indicators, and waterproofed door interlock switches.[165]

In 2012, Tashner worked with Wind Cave and the regional MABO to "look into the possibility of doing a joint elevator contract," since neither Jewel Cave nor Wind Cave had found TKE's services satisfactory.[166] Elevator maintenance continued to be a costly problem for the cave, and issues with the elevators often necessitated resets or temporary closures, including an extended shutdown in 2019 at both Jewel Cave and Wind Cave.[167] The Wind Cave electrician assisted staff with elevator issues occasionally, such as in 2017, when he installed electric meters to better monitor electric use of elevators. Chief of Maintenance Black hoped these meters would enable Jewel Cave to charge the electricity used for the elevator to non-base funds.[168]

Scenic Tour Infrastructure

Jewel Cave maintenance crews performed most of the routine maintenance along the Scenic Tour route. Staff reassessed rockfall in the Target Room, which in the 1960s had been a problem and necessitated the building of a wooden roof structure to cover visitors as they emerged from the elevator landing (see Figure 135). In a 2007 report, the NPS concluded that the Target Room had become a "more stable environment" than it was in the 1960s, and that the "potential geohazard has been reduced" by sealing artificial openings into the room. Furthermore, the report called the wooden structure built to protect visitors a "geohazard," and elaborated,

> At this time the wooden structure has been in the cave for about 40 years and is showing signs of decay. Molds and fungus are readily seen on the posts, beams, and roof of this structure. A noticeable odor is emitted from the rotting process. This structure is affecting the natural environment of Jewel Cave.
>
> The roof structure is affecting the cave environment and the visitor experience. It is the parks mission to protect and preserve the resources and provide for an enjoyable visitor experience. The roof structure is impairing our ability to do both of these core missions and should be removed and not replaced. In order to mitigate any potential geohazard, the trail corridor should be narrowed to a width recommended by accessibility standards. This area has never been designated as a gathering spot and therefore cave guides should move through this area to the landing further in the Target Room.[169]

Soon after completing the report, the NPS removed the wooden structure.[170]

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[165] JCMM, November 2, 2010, Jewel Cave NM DF; JCMM, March 1, 2011, Jewel Cave NM DF; JCMM, August 16, 2011, Jewel Cave NM DF.

[166] JCMM, April 11, 2012.

[167] "Jewel Cave Updates Display models, roads, and online presence," *Custer Chronicle*, April 25, 2012, Cabinet 1, Drawer 3, Folder [no title], Jewel Cave NM CF; JCSM, May 8, 2012; Wiles, comments on draft, April 7, 2020.

[168] JCMM, January 31, 2017, Jewel Cave NM DF; JCMM, February 28, 2017, Jewel Cave NM DF.

[169] Jewel Cave National Monument Superintendent to Central Files, memorandum, January 23, 2007, Cabinet 3, Drawer 4, Folder Roof Structure Removal, Jewel Cave NM CF.

[170] Wiles, interview; NPS, Jewel Cave National Monument, "Geologic Resources Inventory Report," March 2009, 10, eTIC.



Figure 135. The NPS removed the wooden structure in the Target Room that had been installed in the late 1960s to protect people from rockfall. Here, the structure before it was removed, ca. 2004.

Source: NPS, Jewel Cave NM.

Every year, crews replaced approximately one-fifth to one-fourth of the aluminum tread along the Scenic Tour route (see Figure 136).[171] This consumed considerable time and resources, and both the maintenance and resource management divisions wanted to find a better way to manage the tour route structures.[172] Starting in 2008, Wiles worked with contractor HDR to assess the cost of upgrading Scenic Tour structures.[173] From the resource management perspective, Wiles and his staff hoped to come up with a new tour route structure that took into consideration the need for lint collection.[174] Two serious accidents involving children falling through handrails occurred in 2013 and 2014, which further highlighted the need for redesigned structures. The maintenance staff performed some emergency mitigation with chain link fencing, while management pursued a long-term solution. In 2014, John Black estimated costs for full replacement of structures to be around $5 million.[175]



Figure 136. Every year, maintenance crews replaced between one-fifth and one-fourth of the aluminum steps along the Scenic Tour. Here, after replacement in 2007.

Source: NPS, Jewel Cave NM.

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[171] PMIS Project Detail Sheet, Project Number 130835, printed December 18, 2009, Cabinet 3, Drawer 3, Folder #1308356 1569-2T02-MCG REPLACE ALUMINUM, Jewel Cave NM CF; JCSM, January 21, 2003; Dilts, interview.

[172] PMIS Project Detail Sheet, Project Number 130835, printed December 18, 2009.

[173] All Staff Meeting Notes, Jewel Cave NM, February 13, 2008.

[174] JCSM, October 18, 2011, Jewel Cave NM DF.

[175] JCLTM, September 25, 2014, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.

In 2015, Wiles and Tom Farrell attended a meeting with congressional staffers to explain the need to replace Scenic Tour structures.[176] After that meeting, project funding came through, and technical planning began in 2016 in partnership with outside experts, the Midwest Regional Office, and the DSC.[177] A contractor completed a structural assessment of existing tour infrastructure in May 2017 and found that "the grating has an average life span of eight to ten years in the humid cave environment." Maintenance had replaced existing grating at up to 20 percent per year for the last 35 years, which had reduced a "clanking noise" that had existed as a result of the material. Furthermore, the aluminum structures had corroded in areas where they touched the concrete.[178]

In 2018, MAC Construction of Rapid City, which had installed Jewel Cave's air lock doors, "won the contract to improve the safety of Jewel Cave National Monument's half-mile-long Scenic Tour route by refurbishing and replacing metal stair treads, guardrails and handrails, installing concrete walkways and upgrading the electrical lighting." An NPS news release explained the extent of the repairs and methods used to protect fragile cave resources:

> The construction project will replace or refurbish 1,550 square feet of metal platform grating, 720 metal stair treads, 2,750 linear feet of metal guardrails and handrails, and 820 square feet of metal bridge structures. New construction will include the installation of approximately 2,300 linear feet of concrete curbing . . . plus upgrades to the cave's electrical system and lighting.
>
> Many precautions will be taken to prevent damage to the sensitive cave environment. Blankets will be used to protect cave surfaces, and dust will be captured by filters that attach to tools and by plastic enclosures built atop some work spaces. The concrete will be mixed outside — in a heated, temporary shelter when it's especially cold — before being brought into the cave. Any power tools or powered equipment used in the cave will be electronic, to avoid damaging the cave with exhaust fumes or other fuel-related contaminants.[179]

While the NPS originally hoped to replace all aluminum structures with stainless steel, a lack of funding led the monument to retain the original aluminum structural components and only replace the handrails, stair treads, and decking with stainless steel.[180] The Scenic Tour route reopened on April 20, 2019, after the first phase of construction, with the expectation that the tour would again close in autumn 2019 for the second phase of construction to take place over winter 2019–2020.[181]

Visitor Center

Aboveground, monument leadership planned to renovate the visitor center and expand the bookstore area, with financial assistance from the BHPFA.[182] Design development began in

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[176] JCMM, February 3, 2015, Jewel Cave NM DF.

[177] JCMM, October 7, 2015; JCLTM, March 15, 2016; JCLTM, March 29, 2016, Jewel Cave NM DF.

[178] Jewel Cave National Monument, Build Safety Compliant Cave Tour Structures, Structural Assessment Report, PMUIS No. JECA 219033, May 22, 2017, 2–22, eTIC.

[179] Seth Tupper, "Local company chosen for $5 million project in Jewel Cave," *Rapid City Journal*, October 1, 2018.

[180] Wiles, comments on draft, April 7, 2020.

[181] NPS, "Jewel Cave Reopens on Saturday, April 20, 2019," news release, April 12, 2019, https://www.nps.gov/jeca/learn/news/jewel-cave-reopens-on-saturday-april-20-2019.htm.

[182] Superintendent, Jewel Cave NM, to all employees, memorandum, February 13, 2008; JCSM, November 22, 2011.

November 2011, and Midwest Regional Office architects completed preliminary drawings in early 2012 (see Figure 137).[183] The plans enclosed the patio and deck areas to add about 1,650 square feet to the visitor center, at an estimated cost of around $300,000. Split Rock Studios completed the work in 2013. The projects include many immersive interactive displays. In 2015, regional architects folded into this project the possibility of converting the former vacuum toilet outbuilding into a theater to accommodate viewings of the upcoming park film.[184] In 2015, the NPS awarded Pederson Excavating of Spearfish a contract for visitor center reconstruction, but it did not include full theater redesign.[185] The visitor center addition with the bookstore in it was completed around 2017. Following a separate contracting and construction process, the theater was completed in 2019.[186]

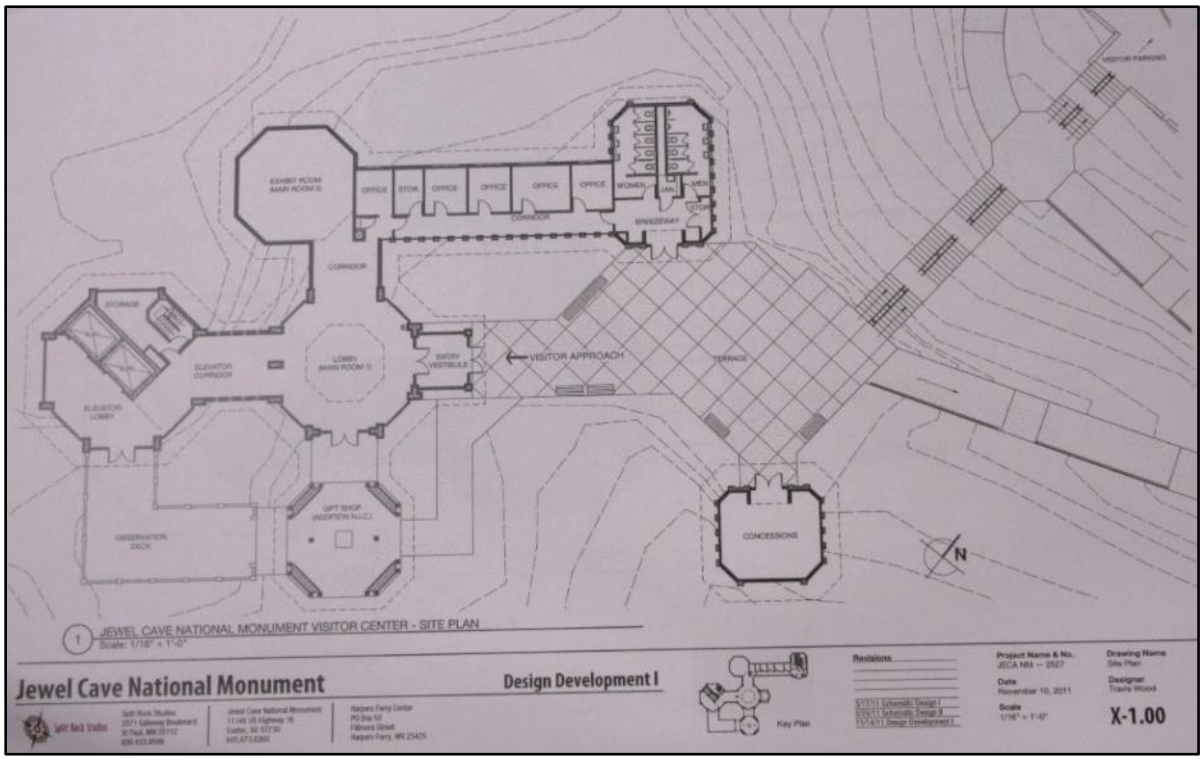


Figure 137. Split Rock Studios completed a blueprint for visitor center renovations in 2011.

Source: NPS, Jewel Cave NM.

[183] Split Rock Studios, Jewel Cave National Monument, Design Development I, November 10, 2011.

[184] JCSM, January 24, 2012, JCMM, February 11, 2015; JCMM, March 12, 2015; Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020; Wiles, interview.

[185] Nathan Ellenbecker, "Jewel Cave expanding visitor center, bookstore for educational opportunities," *Rapid City Journal*, June 15, 2015; JCMM, October 7, 2015.

[186] JCLTM, July 20, 2017, Jewel Cave NM DF; NPS, "Jewel Cave Hosts Ribbon Cutting Event," news release, September 27, 2019, https://www.nps.gov/jeca/learn/news/jewel-cave-hosts-ribbon-cutting-event.htm.

Housing

The NPS and Forest Service signed an updated interagency agreement in October 2002 for housing collaboration, which detailed maintenance and upkeep responsibilities for the joint NPS-Forest Service 10-unit apartment building in Custer (see Figure 138).[187] The Forest Service would provide grounds maintenance, conduct snow removal, and maintain underground utilities not maintained by the city. The NPS would pay utility bills and set rental rates. The split of the beds remained nine for the NPS and five for the Forest Service, and the Forest Service would reimburse the NPS when unpaid employees occupied park housing.[188]



Figure 138. Jewel Cave partnered with the Forest Service to build a 10-unit apartment building on Forest Service land in Custer, pictured here in 2005.

Source: NPS, Jewel Cave NM.

Other housing management consisted mostly of routine maintenance to the housing units in the Jewel Cave headquarters area, moving seasonal employees in and out of employee housing, and completing planning documents. Maintenance crews upgraded interiors, stained decks, and installed new siding on park housing.[189] In 2006, King completed a housing management plan and a standard operating procedures document for seasonal and permanent housing, and a contractor completed an updated Housing Management Plan in October 2011 (at the recommendation of the 2010

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[187] Forest Supervisor John C. Twiss to Todd Suess, December 6, 2002, Cabinet 1, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[188] Amendment No. 1, Project Agreement for Maintenance of the 10 Unit Apartment Building Located on United States Forest Service Land in Custer, SD, Forest Service Interagency Agreement No. 02-IA-11020300-047, Park Service Interagency Agreement No. F1505030001, Cabinet 1, Drawer 2, Folder A54 Inspections, Surveys, Appraisals, Jewel Cave NM CF.

[189] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

Operations Evaluation Report).[190] Once Katie Keil (Atkins) came on as administrative officer, she managed housing, which had a heavy administrative workload when seasonal employees arrived and departed.[191]

Sewage

In response to the sewage lagoon overflow issues that had plagued Jewel Cave in the 1990s, maintenance crews installed new liners in the lagoon in 2005 and continued maintenance on the vacuum toilets that had been installed to mitigate overflow (see Figure 139).[192] In subsequent years, rainfall amounts decreased, and the *lack* of water flow became an issue: there was not enough flow to keep the sewage lagoon wet and meet health department standards.[193] The dry weather persisted, and maintenance crews eventually removed the vacuum toilets.[194] This addressed the flow issue, but problems with the sewer lagoon persisted, and maintenance crews relined the lagoon due to leaks and sludge build-up.[195] Don Morrison and his maintenance team worked hard to address these issues, and in 2014, they won an "Operations and Maintenance Award" from the South Dakota Department of Environment and Natural Resources for their achievements maintaining and monitoring the wastewater system at Jewel Cave.[196]



Figure 139. Maintenance crews relined the sewage lagoon in 2005.

Source: NPS, Jewel Cave NM.

[190] JCSM, February 27, 2007, Jewel Cave NM DF; JCSM, October 18, 2011; Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 9.

[191] JCMM, February 2, 2011.

[192] JCSM, October 11, 2005, Jewel Cave NM DF; JCSM, November 29, 2005, Jewel Cave NM DF; Wiles, interview.

[193] Superintendent, Jewel Cave NM, to all employees, memorandum, February 13, 2008; Wiles, interview.

[194] Wiles, interview.

[195] JCMM, September 21, 2010; JCMM, July 26, 2011, Jewel Cave NM DF; JCMM, October 18, 2011, Jewel Cave NM DF; JCMM January 24, 2012, Jewel Cave NM DF.

[196] Albert Spangler, P.E., to Don Morrison, March 31, 2014.

Water

Most updates to the water system related to waterlines. There had been many leaks in waterlines over the years, some visible from inside of the cave.[197] In 2001, maintenance crews or contractors installed a new waterline between the reservoir and the historic area, cleaned both the 100,000- and 3,000-gallon reservoirs, and repaired a water main break.[198] Throughout this period, maintenance leads ensured the Jewel Cave water system met safe drinking water requirements in accordance with federal and state regulations.[199] And in 2019, the monument underwent a major waterline construction project, replacing almost the entire system of waterlines throughout the monument. This construction necessitated the temporary closure of the Canyons Trail and part of the Roof Trail.[200]

Utilities

Digital utilities were mostly serviced by the IT staff shared among Wind Cave, Jewel Cave, and Mount Rushmore (Jayne Weiss and then Bruce Baird). In 2000, Weiss installed fiberoptic cables for internet service, re-established computer connections, replaced damaged hardware, and then wired the ticket kiosk in the parking lot the following year.[201] New phone lines went in in 2001, in response to complaints from the public about busy signals.[202] In 2012, the park installed "courtesy phones" in the apartment laundry room and outside the visitor center for safety reasons (such as 911 calls), since there was no cell service within the park.[203] Inside the cave, Weiss worked with Black to replace the cave phones with phones used in mines that were better designed for high humidity. The phones cost around $1,200 each, but they began to fail by 2020.[204]

Natural Resource Management

For the first several years after the Jasper Fire, resource management staff focused on exotic plant management, erosion control, and monitoring the effects of changed surface hydrology on the cave environment (see Figure 140).[205] The monument received a temporary increase to base funding

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[197] Wiles, comments on draft, April 7, 2020.

[198] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; JCSM, July 10, 2001.

[199] Mark S. Mayer, Administrator, Drinking Water Program, to David Tashner, April 20, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[200] "Jewel Cave National Monument Temporarily Closes Surface Trails," *National Parks Traveler*, May 31, 2019.

[201] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; JCSM, August 21, 2001.

[202] JCSM, August 21, 2001.

[203] JCSM, March 20, 2012.

[204] JCSM, May 8, 2012; Wiles, comments on draft, April 7, 2020.

[205] Jewel Cave National Monument, FY2002 Natural Resource Challenge Report, Cabinet 3, Drawer 4, Folder N16 Mgmt of Natural Resources & Areas, Jewel Cave NM CF; Wiles, interview.

to support a term biological technician under Wiles in the early 2000s, which Rene Ohms filled for several years, but the division as a whole remained understaffed.[206]



Figure 140. Underground resource management has focused on monitoring and studying cave resources. Here, photomonitoring in 2018.

Source: NPS, Jewel Cave NM.

In 2011, Saint Mary's University of Minnesota completed a Natural Resource Condition Assessment under a task agreement with the NPS.[207] Study authors developed a framework that included Jewel Cave's natural resource components, ways to measure them, stressors or threats, and reference conditions. Wiles updated the Natural Resources Condition Assessment in 2015, and in 2019, the monument completed a resource stewardship strategy.[208] All of these plans informed both below- and aboveground natural resource management.

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[206] Wiles, interview; Rene Ohms, interview; Jewel Cave National Monument, FY2002 Natural Resource Challenge Report.

[207] DOI, NPS, Jewel Cave National Monument, Natural Resource Condition Assessment, December 2011.

[208] JCMM, October 7, 2015; Superintendent Michelle Wheatly, remarks, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD.

Cave Exploration and Mapping Pre-Cave and Karst Management Plan

Cavers found additional miles of passageways in the early 2000s, expanding the southeastern edge of the known cave (see Figures 141 and 142). By 2005, they had surveyed and mapped approximately 130 miles, about 70 of which had been found after Herb and Jan retired.[209] Continuing the process of digitizing survey data, Wiles and Ohms converted the trip report database into Microsoft Access.[210] For geological mapping, they received some outside help, such as when Brian Fagnan, a graduate student at the South Dakota School of Mines and Technology, undertook a karst mapping project "to correlate surface and subsurface geology." His results were inconclusive.[211] From around 2005 to 2008, most exploration trips were "mop-up" surveys to fill in gaps in previous surveys and check leads noted on earlier trips.[212] Several seasonal employees spent off-duty, volunteer hours assisting with mapping during those years, including Dan Austin, and the monument received some external USGS funding for mapping efforts.[213] Austin digitized the cave map in the early 2010s.[214]

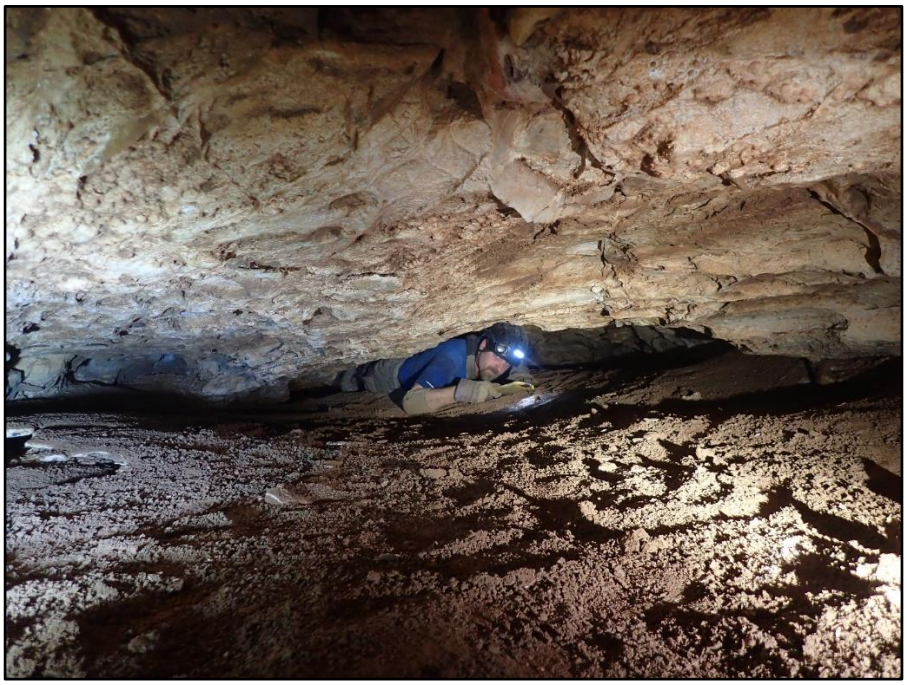


Figure 141. Dan Austin making his way through Dingo Pass, 2018.

Source: NPS, Jewel Cave NM.

[209] Mike Wiles, "Jewel Cave Exploration from 1979 to 2005," talk, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD.

[210] JCSM, June 19, 2001; JCSM, April 30, 2002, Jewel Cave NM DF.

[211] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 8; Wiles, comments on draft, April 7, 2020.

[212] Dan Austin, "Jewel Cave Exploration from 2005 to Present and the Southwest Splinter Breakthrough," talk, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD.

[213] All Staff Meeting Notes, Jewel Cave NM, February 13, 2008; JCSM, September 26, 2006, Jewel Cave NM DF.

[214] JCSM, October 18, 2011; Dan Austin, "Technical Advancements in Cave Survey and Cartography," talk, Jewel Cave 200-mile Reunion, June 28, 2019, Custer, SD.

As volunteer cavers surveyed and resource management staff mapped the ever-larger Jewel Cave, they accumulated more and more data about the exact location of the cave. At Wiles' urging, Superintendent Todd Suess drafted a Policy on the Distribution of Cave Data to control access to information about the cave's location. He reminded staff that Jewel Cave fell under the protections of the Federal Cave Resource Protection Act (FCRPA), which exempts cave location data from Freedom of Information Act (FOIA) requests. Congress had established the exemption out of concern that cave location data could encourage and assist "people constructing artificial entrances to gain access to cave systems via private land," as had happened in other parts of the United States. Suess identified four levels of cave data access:

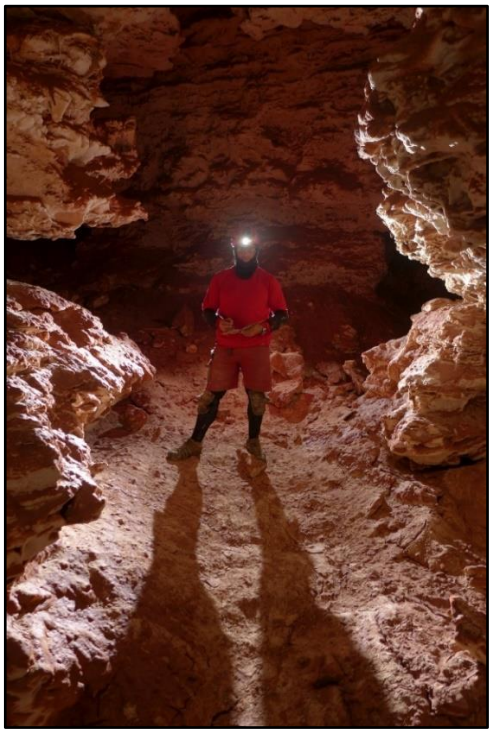


Figure 142. Volunteers have explored and surveyed over 200 miles of Jewel Cave's passageways. Here, on an exploration trip in 2017.

Source: NPS, Jewel Cave NM.

1. General Public: Their "requests for cave maps or location data require superintendent's approval and they can be denied if superintendent wants."
2. Visiting Public: They can see the wall map, the 1992 sales map, and the Powerpoint presentation in the display room. "Brochures and other publications may contain subsets of maps, approved by the superintendent on a case-by-case basis. No other information may be disseminated."
3. Explorers: They are permitted to see some information, but monument staff may not distribute digital survey data. Subsets of raw, hard copy data can be given to help with locating survey errors and to prepare for exploration trips, and "Volunteer Agreements will specify that this information may not be reproduced or distributed in any way."
4. Researchers: They "may be given subsets of the survey data that meet a justifiable need in a park-approved project, provided that the cave specialist and superintendent determine that this will cause no significant risk of misusing the data in ways that could cause impact to the cave system. Each researcher will sign an Agreement to 1) not copy or distribute any cave location information (or any intermediate forms of the data) without the approval of the superintendent, 2) to keep all data (digital or hardcopy) secure at all times, and 3) to completely destroy remaining data once the research is concluded."[215]

These guidelines remained in place until the monument completed a Cave and Karst Management Plan (CKMP) in 2007.

[215] Superintendent to Division Chiefs, draft memorandum, January 9, 2004, Cabinet 3, Drawer 2, Folder N3023, Jewel Cave NM CF.

Cave and Karst Management Plan Environmental Assessment (EA)

In the 1980s, Wind Cave Superintendent Ernest Ortega completed a CKMP at Wind Cave and suggested Jewel Cave do the same, but no funding came through. No further movement toward a CKMP occurred until the early 2000s, when Wiles and Ohms began reviewing other caves' management plans and regulations in order to inform their own (see Figure 143). Wiles and Ohms also worked closely with Wind Cave staff, who were in the process of rewriting their CKMP around the same time.[216] In 2002, Wiles held a public scoping meeting at the NSS convention, a joint NPS/Forest Service scoping meeting at the monument, and open houses in Rapid City, Custer, and Newcastle.[217]



Figure 143. Rene Ohms and Mike Wiles, pictured here on a cave exploration trip in 2004, worked on the Jewel Cave Cave and Karst Management Plan in the early 2000s, in partnership with Wind Cave staff.

Source: Jewel Cave NM.

The NPS completed Jewel Cave's CKMP in 2007. They explained,

> This plan has been written to establish and formalize specific direction and appropriate policies for science-based management of the cave and karst resources of Jewel Cave National Monument and adjacent mineral withdrawals. The purpose of the plan is to provide a consistent framework for addressing Jewel Cave's increasingly complex cave and karst issues in accordance with all legal authorities and in the spirit of its enabling legislation. The objectives of this plan are to:
>
> 1. Provide for appropriate science-based management of surface and subsurface resources within the Monument and in the adjacent mineral withdrawal areas.
>
> 2. Select key indicators of cave impacts based on detectable changes.
>
> 3. Establish appropriate surface/subsurface activities, access policies, and acceptable levels of use and impact.[218]

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[216] JCSM, December 18, 2001, Jewel Cave NM DF; Stoll, interview.

[217] "Jewel Cave is seeking input on Cave Management Plan," news release, April 9, 2002, Cabinet 3, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; JCSM, March 20, 2002, Jewel Cave NM DF.

[218] Michael Wiles and Rene Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 1–2, Jewel Cave NM DF.

The CKMP identified "desired future conditions" that would allow the monument to maintain a cave resource with a "high level of integrity" and to provide "a high quality experience for all users."[219] The plan laid out policies for the care of cultural and natural cave and karst resources, both above- and belowground; established "mitigation, monitoring, and restoration measures" for cave resources; and described which sections of the park were affected by the plan.[220]

The CKMP consolidated standard operating procedures for cave resource management into one document. It organized policies by division, so future chiefs of administration, interpretation, or maintenance could easily access the policies governing the use of the cave and its resources. For instance, maintenance staff now had procedures for replacing and cleaning features along tour routes, designated work paths to minimize tracking of manganese and other sediment, specifications for clothing and changing lights, lists of permissible materials, and standard operating procedures for any actions affecting surface hydrology. The CKMP recommended a formal maintenance training program to keep staff abreast of the policies.[221]

The CKMP established rules for cave access, for both the public and cavers. It identified what qualifications a person needed to lead tours and set protocol for off-trail exploration, including age limits, a waiver, equipment lists, human waste removal requirements, group size, and experience requirements for different levels of trip difficulty. It also finalized the Policy for Distribution of Cave Data, described in Suess's 2004 memorandum.[222]

The CKMP established a trip leader training program and set a minimum level of time caving in Jewel Cave to become a trip leader. It explained,

> The purpose of a [trip leader] training program is to help explorers see things through the eyes of the cave managers. Volunteer explorers serve as an extended staff to the park's resource management division and need to be just as capable and accountable as is required of any paid staff member. In order to ensure safety for cavers, protection of cave resources, and quality of exploration and research, all cave access is done with well-trained trip leaders who have an understanding of management needs and the ability to lead other cavers effectively during normal and emergency circumstances. Trip leaders are VIP's (Volunteers In Parks) and are treated as park employees to the extent allowed by the NPS VIP program. Exceptions to VIP status exist for paid staff performing duties within the scope of their position description.[223]

Trip leaders would be responsible for preparing the team, filling out trip reports, complying with policies, securing surface watch, and cleaning park-owned caving gear. Trip leaders trained to lead either taped routes, non-taped routes, or both. They had to maintain their certification, and their trip

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[219] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 2.

[220] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 16–30, 48–49, Appendices D and E; Finding of No Significant Impact, Jewel Cave National Monument, Cave and Karst Management Plan, October 2007, Cabinet 3, Drawer 2, Folder 2007, Jewel Cave NM CF.

[221] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 7–9; JCSM, June 19, 2001; JCSM, February 5, 2002, Jewel Cave NM DF.

[222] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 9–13, 17, 33–35, 45–46, 50–69.

[223] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 12–13, 45–46, Appendix C.

leader status could be revoked. The plan established guidelines for trip reports and included a glossary of terms and guidelines for standard drawings of cave features and levels. Wiles, Ohms, and Andy Armstrong developed the trip leader training program and held trainings for eligible cavers (see Figure 144).[224]

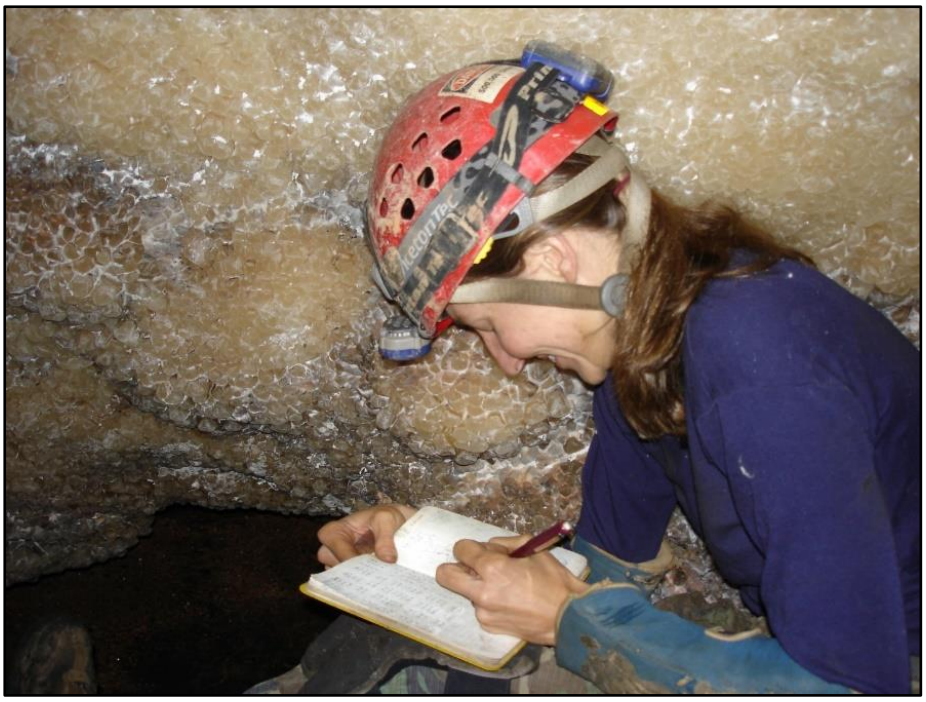


Figure 144. Rene Ohms, pictured here in the cave near the Curio Shop in 2005, worked with Mike Wiles and Andy Armstrong to develop the trip leader training program for Jewel Cave.

Source: NPS, Jewel Cave NM.

The CKMP included an updated Cave Search and Rescue Plan and a cave rescue pre-plan, which outlined how to carry out a rescue with minimal damage to cave resources (see Figure 145). The cave management staff at Jewel Cave modeled the plan after one at Carlsbad Caverns National Park for Lechuguilla Cave. Jewel Cave's rescue plan identified specific obstacles to rescuing an injured caver from each section of the cave and described the exact route and equipment needed for a rescue in that section. It also included a searchable database of cave features, with information on techniques and equipment needed to navigate specific obstacles. Based on the plan, Jewel Cave staff established a program to train cavers in rescue techniques. This process, Wiles and Ohms hoped, would address the issue that, at the time, "fewer than a dozen cavers ha[d] taken any cave rescue training" in the entire state of South Dakota.[225]

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[224] JCSM, March 25, 2008, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020; Rene Ohms, interview.

[225] Wiles and Ohms, "Jewel Cave National Monument Cave and Karst Management Plan," 2007, 12–13, 17, 33–35, 39–44, 50–69, Appendix B; Rene Ohms, interview; PMIS 120789, "Develop Cave Rescue Operation Procedures," last updated January 15, 2008, Cabinet 3, Drawer 3, Folder #10789 1569-Rt26-NNS CAVE RESCUE PLAN, Jewel Cave NM CF; JCLTM, May 17, 2016.



Figure 145. Marc Ohms, Blase Lasala, and Mike Wiles on a cave rescue pre-planning trip to the VACC (Victory After Continuous Contortions) in 2015.

Source: NPS, Jewel Cave NM.

Cave Exploration and Rescue Post-CKMP

The 2010 Operations Evaluation Report was critical of Jewel Cave continuing to classify exploration as a volunteer activity. The evaluation team recommended that the monument "[e]stablish cave exploration as an official on-duty activity." Further, it advised that NPS personnel in the resource management division were not allowed to volunteer as explorers: "This is a prohibited activity . . . because NPS employees cannot volunteer in the same work that they perform as paid employees." It also found issues with the lack of volunteer agreements for cave explorers and the fact that volunteer cavers "seem to have 24-hour access to NPS secured areas in the visitor center." The Operations Evaluation Report recommended, under the current system of classifying these individuals as volunteers, the following changes be made:

- Volunteer agreements and position description need to exist for each volunteer individual or volunteer group. For proper coverage under the Workers Compensation Program, it is essential that the volunteer agreements include a complete description of volunteer working conditions including a job hazard analysis. All individual volunteer cave explorers or volunteer group cave explorers must have a current volunteer agreement and position description.
- Performance appraisals are negotiable, depending upon the volunteer. There should be some opportunity or mechanism for feedback to the volunteer.
- The volunteer agreement with the cavers needs to include a personal gear clause if they use their own equipment.
- Work with the resource manager to incorporate the correct language for the position descriptions for the volunteer cave explorers.
- The volunteer cave explorers should not have access to any NPS secured location without at least a background investigation. The park should develop an SOP that places limits on the current practice of 24-hour cave access to volunteer cave explorers.[226]

[226] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 16–17.

Many of these recommendations were incorporated in the cave exploration program, but it remained a volunteer-led program and resource management staff continued to explore on their own time. To address this, Jewel Cave management removed exploration from resource management job descriptions, which clearly delineated exploration as a volunteer-only activity that did not overlap with official duties. Wiles explained, "working as cave managers, we do go in the cave. We do process data and draw maps. But for actual cave exploration, we clock out and do that on our own time."[227]

In 2011, an exploring group emerged from the cave after its scheduled time, leading Superintendent Larry Johnson to shut down Jewel Cave to exploration for part of 2012 out of concern for the safety of cavers. The caving community wanted to reopen the cave to exploration, and Jan Conn wrote to Johnson objecting to the closure.[228] In order to ensure the safety of cavers, Johnson shifted future caving expedition planning to the "GAR" model, a risk assessment model based on classifying actions as green (low risk), amber (mid-level risk), and red (high risk).[229] Cavers answered several questions as part of their trip requests, and the resource management team and the superintendent would then classify the exploration trip in one of the three levels based on how long and far into the cave the team went. Johnson also required there always be an on-call "hasty team" of three cavers who were experienced and trained in Jewel Cave rescue.[230] With this procedure in place, Johnson lifted the closure.[231]



Figure 146. Deep Camp near Hourglass Lake is one of several camps that allows cavers to extend the distance of exploration trips. Photo by Jonathan Venner, 2016.

Source: NPS, Jewel Cave NM.

As exploration continued in the far reaches of the cave, cavers established new camps to allow for longer trips. In 2016, making use of the well hole the Conns had drilled near Hell's Half Acre, resource management staff lowered gear into the cave and established West Camp. Later that year, they established "Deep Camp" near Hourglass Lake (see Figure 146).[232] Since then, Hell Canyon Camp has been added, located four hours of caving beyond Deep Camp.[233] Exploration expanded the known extent of the cave from around 180 miles in May 2016 to 200 miles in December 2018.

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[227] Wiles, interview.

[228] Jan Conn to Larry Johnson, May 12, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF; Larry Johnson to Jan Conn, May 15, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[229] JCSM, January 24, 2012; JCSM, March 20, 2012; JCSM, May 8, 2012.

[230] Rene Ohms, interview; Wiles, comments on draft, April 7, 2020.

[231] Cockrell to Greenwald, April 7, 2020.

[232] Austin, "Jewel Cave Exploration from 2005 to Present and the Southwest Splinter Breakthrough"; JCMM, September 27, 2016, Jewel Cave NM DF.

[233] Wiles, comments on draft, April 7, 2020.

In June 2019, cavers and former NPS staff held a "200-mile reunion" to celebrate this milestone for Jewel Cave, now the third-longest cave in the world (see Chapter 8).

Resource Management Projects and Research

Wiles, Ohms, Austin, and seasonal resource management staff conducted regular water quality and microclimate monitoring, documented and removed mold, reported graffiti, monitored bats, picked up trash, and maintained trail tape and rope within the cave.[234] Wiles, Ohms, and Austin all published work in the *Journal of Cave and Karst Studies* and elsewhere, and they attended NSS meetings. They and other staff spent also significant hours as volunteers exploring and surveying new sections of cave. On these trips, they often completed tasks that facilitated resource protection and research, such as radiolocation work, installing radon detectors, photographing the cave, and taking water samples (see Figures 147 and 148).[235]



Figure 147. In 2002, Father Paul Wightman returned to Jewel Cave to assist with radiolocation work, as he had in 1964 and 1977.

Source: NPS, Jewel Cave NM.



Figure 148. James McClean looking at aragonite frostwork in Rambling Loft. In the background is rope used to mark known routes and mitigate damage to cave resources. 2014.

Source: NPS, Jewel Cave NM.

Resource management staff continued to address algae, lint, and airflow issues. They continued the tradition of holding an annual cave restoration camp, during which participants spent a weekend in the cave performing tasks like treating algae, removing lint from the scenic tour route, and removing wax from the historic tour route.[236] Apart from the restoration camp, resource management staff developed and implemented new methods to address lint, algae, and wax in the

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[234] All Staff Meeting Notes, Jewel Cave NM, February 13, 2008; JCSM, July 3, 2001, Jewel Cave NM DF; JCSM, December 18, 2001; JCSM, August 21, 2001; JCSM, August 20, 2002; JCSM, October 22, 2002, Jewel Cave NM DF.

[235] JCSM, July 17, 2001, Jewel Cave NM DF; JCSM, September 4, 2001.

[236] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; "Jewel Cave is seeking input on Cave Management Plan," news release, April 9, 2002, Cabinet 3, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; JCLTM, August 19, 2014, Jewel Cave NM DF; JCLTM, September 21, 2010, Jewel Cave NM DF.

cave, including updates to the lint-catching tarps under the Scenic Tour Route structures (see Figure 149).[237]



Figure 149. Dan Austin installs a lint collection tarp underneath a bridge on the Scenic Tour route, 2016.

Source: NPS, Jewel Cave NM.

In 2009, the NPS completed a Geologic Resources Inventory Report, a standard NPS report to be used for "disseminating high priority, current natural resource management information with managerial application."[238] The report documented baseline information for geological resources and "provide[d] sound geologic information for use in park decision making." It identified the following geological issues at Jewel Cave: airflow, human impact on cave resources like lint and algae, contamination of cave hydrology from surface sources, land use and surface development (especially outside of monument boundaries), mining, radon, and geological hazards like rockfall and landslides, both in the cave and along Highway 16.[239]

Jewel Cave staff supported ongoing bat monitoring and research, as they had in the past. Most years, staff conducted a mid-winter hibernating bat count. Numbers remained relatively stable. In 2002, they estimated 1,168 bats, while counts from 2005 to 2011 ranged from a low of 1,164 to a high of 1,555.[240] In 2000, a contractor replaced the gate at the historic entrance with a "stainless

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[237] JCSM, June 19, 2001; JCSM, January 15, 2002, Jewel Cave NM DF; JCSM, February 26, 2008; JCSM, January 24, 2012; JCSM, August 14, 2012.

[238] NPS, Jewel Cave National Monument, "Geologic Resources Inventory Report," March 2009, eTIC.

[239] NPS, Jewel Cave National Monument, "Geologic Resources Inventory Report," March 2009, 2.

[240] "batcounts.xls," spreadsheet, undated [ca. 2011]; Rene Ohms to Jewel Cave Central Files, memorandum, January 14, 2002; Rene Ohms to Central Files, memorandum, January 5, 2004; Rene Ohms to Central Files, memorandum, January 11, 2005; Rene Ohms to Central Files, memorandum, January 11, 2006; Rene Ohms to Central Files, memorandum, February 6, 2007; Rene Ohms to Central Files, memorandum, January 8, 2008; Rene Ohms to Central

steel, bat friendly version to protect cave resources, as well as bats."[241] An alarm switch, tied into the cabin alarm system, was also installed as part of the upgrades.[242]

In 2011, the Center for Biological Diversity asked all cave parks to close caves to the public in order to slow the spread of white nose syndrome, a fungus that was infecting bats and devasting bat populations in the eastern United States.[243] Jewel Cave did not close, but Wiles and Block drafted a white nose syndrome policy and received $1,000 from NPS veterinarian funding to implement a plan to screen visitors and decontaminate the scenic tour route.[244]

In 2014, with the threat of white nose syndrome increasing nationwide but no sign of it at Jewel Cave, the monument received $91,000 for projects research on bat habitat related to preventing spread of the fungus.[245] Maintenance crews installed infrared bat video cameras to monitor the bat population.[246] In 2018, white nose syndrome was discovered in Jewel Cave bats for the first time. The monument received an addition grant that year for $23,600 to mitigate the spread of the fungus using hydrogen peroxide.[247]

Resource management staff have helped outside specialists conduct research at Jewel Cave. For example, Dr. Andreas Pflitsch of Germany's Ruhr-Universität Bochum has conducted air flow studies at Jewel Cave from 2002 through 2020. His research has built on the initial barometric studies that Herb Conn conducted in the 1960s. Pflitsch and his students have measured air flow and analyzed patterns, and their data and conclusions have aided the NPS in its management of the cave.[248]

Forest Service Cooperation

In 2005, the NPS, Forest Service, and Bureau of Land Management (BLM) (which controls mineral rights on all federal lands) initiated a mineral withdrawal for 4,696 acres of Forest Service land adjacent to Jewel Cave National Monument and above the known cave.[249] The Forest Service combined the proposed withdrawal with one in Wyoming, because the two were similar enough that

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Files, memorandum, January 23, 2009; Rene Ohms to Central Files, memorandum, January 20, 2011, all in Jewel Cave NM DF.

[241] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

[242] Wiles, comments on draft, April 7, 2020.

[243] JCMM, February 2, 2011.

[244] JCSM, August 16, 2011, Jewel Cave NM DF; JCSM, May 8, 2012.

[245] JCLTM, February 14, 2012, Jewel Cave NM DF; JCLTM, April 15, 2014; JCLTM, August 12, 2014.

[246] JCSM, February 21, 2012; JCSM, March 25, 2014; JCSM, August 14, 2012; JCSM, June 14, 2016; JCSM, September 20, 2016, all in Jewel Cave NM DF.

[247] JCLTM, March 20, 2018, Jewel Cave NM DF; Michelle Verant, "Saving Bats from white-nose syndrome," talk, Jewel Cave 200-mile Reunion, June 28, 2019, Custer, SD.

[248] Todd Suess to Andreas Pflischt, March 7, 2002, Cabinet 3, Drawer 2, Folder N3023 Microclimate Study of Jewel Cave (Wiles), Jewel Cave NM CF; JCSM, September 26, 2006, Jewel Cave NM DF; Andreas Pflisch, "Cave Climatology Research in Jewel Cave from 2002 to 2019," talk, 200-mile reunion, June 29, 2019, Custer, SD.

[249] 70 Fed. Reg. 14636 (March 23, 2005).

the Forest Service could streamline the processes.[250] In 2008, after comments and environmental review, the Forest Service withdrew from mineral entry 4,595.78 acres above the cave for 20 years in order "to preserve unique cave resources adjacent to Jewel Cave National Monument." The size of the withdrawal was just under the 5,000-acre limit, above which a withdrawal would require an act of Congress. The withdrawal did not affect any leases, licenses, or permits unrelated to mining.[251]

In 2010, the 1990 mineral withdrawal on Forest Service land above Jewel Cave expired. The Forest Service filed an application with the BLM to extend the 1990 withdrawal (Public Land Order [PLO] No. 6782), which covered 2,387.22 acres, for an additional 20 years.[252] Over the next several years, Wiles and Johnson worked with the BLM and the Forest Service to complete the renewal, but it stalled due to communication issues between the agencies.[253] On August 28, 2015, the renewal was finalized as PLO 7838, withdrawing the same 2,387.22 acres of Forest Service land above the known area of Jewel Cave from mineral entry for a term of 20 years.[254]

In 2011, the monument entered into an interagency agreement with the Forest Service that provided for coordination on natural resource management issues broadly, including all aboveground resources, cave resources, and fire management. The Forest Service agreed to seek NPS input when conducting any of the following actions on lands adjacent to Jewel Cave: National Environmental Policy Act (NEPA) analysis, timber sales, prescribed fire, geologic surveys for forest planning, land exchanges or adjustments, and mineral management projects. The NPS agreed to seek Forest Service input for surface management activity, annually provide the Forest Service with an updated map showing location of all discovered cave systems under forest lands, permit cave travel, provide the Forest Service reports on bat populations, survey and map cave passages, mitigate exploration effects on resources, and collect cave water for chemical analysis.[255]

The agencies hold annual meetings to share information and address issues, and the agreement extends to areas of cave not yet discovered.[256] For sections of the known cave under private land,

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[250] Wiles, interview; 70 Fed. Reg. 14636 (March 23, 2005).

[251] 73 Fed. Reg. 21151 (April 18, 2008); Wiles, interview; BLM, Table of Public Land Orders, July 2007–July 2008, https://www.blm.gov/sites/blm.gov/files/uploads/programs_lands-and-realty_land-tenure_withdrawals_public-land-orders_7679-7715.pdf.

[252] 75 Fed. Reg. 442 (January 5, 2010); 75 Fed. Reg. 51110 (August 18, 2010).

[253] JCMM, January 18, 2011, Jewel Cave NM DF; Larry Johnson to Black Hills National Forest Supervisor Craig Bobzien, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[254] 80 Fed. Reg. 52335 (August 28, 2015); BLM, Table of Public Land Orders, Feb. 2014–April 2016, https://www.blm.gov/sites/blm.gov/files/uploads/programs_lands-and-realty_land-tenure_withdrawals_public-land-orders_7823-7852.pdf.

[255] Interagency Agreement Between DOI, NPS, Jewel Cave National Monument and the Forest Service, Black Hills National Forest Hell Canyon Ranger District, February 9, 2011, 1–2, files provided by Katie Atkins, Folder A44 Memorandums of Agreement, Jewel Cave NM CF.

[256] JCSM, April 11, 2012; Wiles, interview.

Wiles has been in contact with Corissa Busse at The Nature Conservancy (TNC) about the possibility of additional land exchanges or conservation easements.[257]

Exotic Plant Management

In 2001, the NPS established regional inventory and monitoring networks to monitor "vital signs" of natural resources. Jewel Cave fell within the area of the Northern Great Plains Inventory & Monitoring Network (NGPN). The existence of the NGPN changed the way Jewel Cave managed its aboveground natural resources, enabling it to maintain data on vegetative resources even though it has no staff dedicated to the aboveground environment.[258] In 2002, the monument received funding in partnership with the NGPN to hire seasonal staff that would help manage exotic and invasive plants, populations of which had exploded after the Jasper Fire.[259]



Figure 150. NGPN crews released beetles to control leafy spurge, 2008.

Source: NPS, Jewel Cave NM.

[257] JCMM, October 7, 2015; Bob Paulson and Corissa Busse, interview by Jackie Gonzales, June 26, 2019, Rapid City, SD.

[258] DOI, NPS, Plant Community Composition and Structure Monitoring Protocol for the Northern Great Plains I&M Network, February 2012, 1; Wiles, interview.

[259] Jewel Cave National Monument, FY2002 Natural Resource Challenge Report, 2002; Wiles, comments on draft, April 7, 2020.

In 2003, the NGPN initiated an exotic plant management control program at 13 parks.[260] It completed the environmental review process for the program in 2005 and implemented it at Jewel Cave in 2008. The program used mechanical treatments (and later herbicides) to target Canada thistle, leafy spurge, houndstongue, common mullein, bull thistle, muck thistle, black henbane, and field bindweed.[261] The NGPN exotic plant management team conducted exotic plant sampling, research, and removal at Jewel Cave and shared monitoring data with Jewel Cave resource management staff (see Figure 150).[262] The 2010 Operations Evaluation Report commended Jewel Cave on its work with the NGPN and encouraged expansion of the cave's aboveground management capabilities, including possibly establishing a resource management position with an aboveground focus.[263]

Fire Management

In the years following the Jasper Fire, Jewel Cave updated its Wildand Fire Management plan. Staff finalized it in 2004 after public, tribal, partner, and interagency input and environmental and cultural resource review processes.[264] The final plan allowed for the use of prescribed fire to manage fuel loads and designated the entire monument as one Fire Management Unit (FMU), with five distinct units for prescribed burns (see Figure 151).[265] It also identified fire research needs, which included monitoring water quality and stream flow at the monument (Lithograph Canyon stream flows were higher after the Jasper Fire), assessing runoff and erosion differences in relation to burn severity, determining how the Jasper Fire changed the quantity and/or quality of water entering the cave, comparing responses of native and non-native vegetation, and determining how fire intensity affected ponderosa pine regeneration.[266]

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[260] Todd Suess to Central Files, memorandum, May 15, 2007, Cabinet 3, Drawer 1, Folder 2007 Send to NARA 2035 (sticky note: "Natural Surface Vegetation"), Jewel Cave NM CF.

[261] DOI, NPS, Northern Great Plains Exotic Plant Management Finding of No Significant Impact, September 2005, 2–5, Jewel Cave NM DF; Suess to Central Files, memorandum, May 15, 2007; Todd Suess to Central Files, April 15, 2008, Cabinet 3, Drawer 2, Folder 2007, Jewel Cave NM CF.

[262] DOI, NPS, Jewel Cave National Monument Plant Community Composition and Structure Monitoring, 2011 Annual Report, February 2012, vii, eTIC; JCLTM, July 20, 2017, Jewel Cave NM DF.

[263] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 44–48.

[264] Todd Suess to Interested Party, December 20, 2001, Cabinet 2, Drawer 2, Folder Y14 Wildland Fire Management, Jewel Cave NM CF; "Jewel Cave to Hold Fire Planning Meeting," news release, December 20, 2001, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; Finding of No Significant Impact, Fire Management Plan, Jewel Cave National Monument, December 2004, 3–6, eTIC; Superintendent Todd J. Suess to Chairman Ben Speak Thunder, August 13, 2004, Cabinet 2, Drawer 2, [loose in drawer], Jewel Cave NM CF; Stoll, interview.

[265] DOI, NPS, Fire Management Plan for Jewel Cave National Monument, December 22, 2004, 7–8, 36, Jewel Cave NM DF; Wiles, comments on draft, April 7, 2020.

[266] DOI, NPS, Fire Management Plan for Jewel Cave National Monument, December 22, 2004, 35.



Figure 151. The Fire Use Module at Jewel Cave, 2002.

Source: NPS, Jewel Cave NM.

In 2008, Jewel Cave signed an MOU for Wildland Fire Management with six other NPS units in the northern Great Plains. The agreement defined responsibilities of staff from all units, which included assistance on prescribed fires, fire prevention and suppression, reports, mobilization of NPS personnel as needed, fire-related training, and communication and coordination between NPS units and other agencies for wildland fire management.[267] The agreement explained,

> While it needs to be very clear that the fire staff serves all seven parks, they will be located at Wind Cave National Park, with the exception of the Black Hills Fire Use Module, which is located at Jewel Cave National Monument. The two parks will provide office facilities to the extent practical.[268]

Jewel Cave's fire use module worked with crews at these other parks and the Forest Service when the monument held prescribed fires in 2008, 2010, and 2014.[269]

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[267] Memorandum of Understanding for Wildland Fire Management, Agreement Number G1561080804, January 1, 2008, 1–2, files provided by Katie Atkins, Folder A44 Memorandums of Agreement, Jewel Cave NM CF.

[268] Memorandum of Understanding for Wildland Fire Management, Agreement Number G1561080804, January 1, 2008, 5.

[269] "Jewel Cave Conducts Prescription Fire to Clean-Up Jasper Debris," news release, October 10, 2008, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; "Jewel Cave National Monument Plans Prescribed Fire," news release, September 10, 2010, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; Canyons Prescribed Burn Plan, Jewel Cave National Monument, Hell Canyon Ranger District, Black Hills National Forest, approved September 2014, Jewel Cave NM DF.

In 2011, the NGPN Fire Ecology Program completed a Forest Structure and Fuel Loads study. It surveyed 60 forested plots and measured historic fires, fire potential, vegetative cover, and exotic plant presence.[270] The NGPN assisted Jewel Cave with a review of the monument's Fire Management Plan (FMP) in 2012, as required under policy changes described in 2009 *Guidance for Implementation of Federal Wildland Fire Management Policy*. The FMP was found to "be sound," so there were no changes in objectives.[271]

Cultural Resource Management

Chief of Resource Management Mike Wiles completed cultural resource management tasks in partnership with contractors and NPS specialists from other sites. In 2006, Quinn Evans|Architects completed a Cultural Landscape Report (CLR) for Jewel Cave, and Woolpert, LLC, completed an associated Environmental Assessment.[272] The CLR documented and described historic landscapes and structures within the park over time, with the intent of guiding future management.[273] It defined a new historic district in the park encompassing the area created by the overlap of the old and new park boundaries, which included the historic entrance to the cave and the historic ranger cabin. The report found the historic district eligible for listing in the National Register of Historic Places. Contributing features included the ranger cabin, the trail to the cave, the stone stairway, metal railing, and retaining wall along that trail, the cave entrance area, views to and from the cave entrance, the historic area entrance road, archeological sites in Hell Canyon, the Hell Canyon Road, a CCC-built manhole and cistern, remnants of a trail west of the ranger cabin, a portion of Highway 16 near the historic entrance, the former campground site, other signs and trails, the visitor center parking lot at the historic area, other historic area roads, and the stainless steel gate at the cave entrance.[274]

Also in 2006, Gail Evans-Hatch and Michael Evans-Hatch of Evans-Hatch and Associates completed a Historic Resource Study (HRS) for Jewel Cave.[275] Unlike an administrative history, an HRS describes the history that is significant to the park's legislative purpose and interpretive themes,

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[270] DOI, NPS, Forest Structure and Fuel Loads at Jewel Cave National Monument, 2011 Status Report, June 2012, vi.

[271] 2012 Fire Management Plan Review and Update for Jewel Cave National Monument, February 29, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF; JCLTM, February 20, 2018, Jewel Cave NM DF; Wiles, interview.

[272] Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*, March 2005.

[273] "Cultural Landscape Report Public Scoping Meetings," news release, June 9, 2003, Cabinet 1, Drawer 2, Folder K3415 Press Releases, Jewel Cave NM CF.

[274] Quinn Evans Architects, *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*, March 2005, 155–179.

[275] Michael Evans-Hatch to Midwest Region Historian Don Stevens, February 21, 2004, Cabinet 3, Drawer 1, Folder H14 Area and Service History, Cultural Park Hist. Research Documents, Jewel Cave NM CF.

essentially an extended historic context.[276] The interpretive staff at Jewel Cave use the HRS as a reference when interpreting the history of the monument.

In 2002 and 2003, Midwest Archeological Center (MWAC) Archeologist Bruce Jones brought a team to Jewel Cave to complete archeological testing and evaluation of multiple sites in the monument. Jones' findings added significantly to the knowledge of archeological resources at Jewel Cave. As a result of his investigations, Jones determined that 5 of the park's 14 sites were eligible for nomination to the National Register, and that one additional site was eligible as a contributing feature to an existing nomination. Jones recommended additional study at one site.[277]

The superintendent served as the de facto Section 106 coordinator until 1997, when Cannon assigned that responsibility to Wiles. Wiles completed most of the cultural resource compliance required under Section 106 and Section 110 of the National Historic Preservation Act (NHPA). Over the following years, there was little support for professionalization of that role. The 2010 Operations Evaluation Report found that Wiles serving in the role was problematic, since neither he nor anyone on staff met the secretary of the Interior's Professional Qualification Standards for a cultural resource management specialist. The report concluded, "The park has done a poor job at performing its Section 106 responsibilities for compliance with the National Historic Preservation Act." It recommended that the Section 106 coordinator and the superintendent be trained in Section 106, that the park improve documentation on cultural resource compliance, that all prescribed fires cease until better compliance with the NHPA occurred, and that the park develop formal agreements with the South Dakota State Historic Preservation Office (SHPO) and with tribes to better address cultural resource management issues in the future. Another important recommendation was that the monument hire a cultural resource management specialist at .5 FTE:

> The incumbent will meet the Secretary of the Interior's Professional Qualification Standards, serve as Park Section 106 Coordinator, and be a vocal advocate for incorporating CRM policies and practices into daily park operations. Most importantly, the CRM Specialist can ensure all PMIS project statements remain current and competitive.

No cultural resource staff was hired following the recommendation. However, Wiles has since attended training and has built stronger relationships with cultural resource staff at the regional office, the South Dakota SHPO, and tribal representatives.[278]

In the absence of dedicated cultural resource staff, Wiles and the superintendent continued to work with the South Dakota SHPO and tribes with ancestral homelands in the Black Hills.[279] Issues identified in the 2010 Operations Evaluation Report continued. During the paleoflood study in 2012, Jewel Cave failed to conduct required cultural resource compliance before disturbing sites with

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[276] Gail Evans-Hatch and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study* (Omaha: NPS Midwest Regional Office, 2006), 5–6.

[277] Bruce Jones, NPS, MWAC, *Archeological Investigations at Jewel Cave National Monument Custer County, South Dakota 2000–2003*, Technical Report 94a, 2006.

[278] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 42–44.

[279] Wiles, interview; JCMM, February 21, 2017, and JCLTM, August 29, 2016, in Jewel Cave NM DF.

potential archeological resources.[280] Johnson sent out after-the-fact letters to 21 tribal organizations that might have comments on the project, using a list provided by Mike Evans at the South Dakota SHPO.[281] Johnson invited them to a meet with Jewel Cave staff to forge a better partnership for future projects, but no one responded.[282] The monument later planned a broader meeting with tribes. Several tribal representatives expressed interest, but only Wanda Wells from the Crow Creek Sioux Tribe attended.[283]

Museum Collection

After the museum collection moved to Mount Rushmore (see Chapter 6), Wiles, who has overseen the park's museum collection since 1997, finished a museum inventory in partnership with Bruce Weisman, the curator at Mount Rushmore, and Zane Martin, who succeeded him.[284] In 2004, MWAC sent Jewel Cave cataloged archeological collections and sent monument staff a 3.5-inch disk of 525 catalog records, including 285 new ones.[285] In 2011, Martin, working with Wiles and MWAC, completed a Scope of Collections statement. The statement explained the extent and value of Jewel Cave's collections:

> The park's museum collection includes both natural history and cultural collections. The park's natural history collection includes: a mammal collection; the herbarium, which includes various species of vascular plants that occur in the park; one paleontological collection from an excavation just inside the original cave entrance; geological specimens from Jewel Cave and its natural formations; samples from a fire scar study, and associated project documentation and reports. Other natural history collections within the museum collection include reptiles and insects. At present, these collections are relatively small, and little research pertaining to these disciplines has been conducted in the park to date. The cultural collection includes: historical slides, negatives and photographs from throughout the history of the park, objects of historic significance to Jewel Cave and the surrounding infrastructure, personal journals and papers, oral histories, park regulations, newspapers, flyers, pamphlets, and administrative, scientific and resource management records.[286]

The collection continued to be managed "under the procedures and standards of the Mount Rushmore Collection Management Plan, and a written Agreement between Jewel Cave and Mount Rushmore for managing the Jewel Cave collection."[287] As part of the agreement, Martin assessed the

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[280] Lawrence E. Johnson to Paige Olson, March 30, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[281] Michael E. Wiles to Paige Hoskinson-Olson, SD SHPO, July 26, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[282] Lawrence E. Johnson to Paige Olson, May 15, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF; Lawrence E. Johnson to Lana Gravatt, Historic Preservation Officer, Yankton Sioux Tribal Bus. & Claims Comm., July 25, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF.

[283] Wiles, comments on draft, April 7, 2020.

[284] JCSM, October 1, 2002; Wiles, comments on draft, April 7, 2020.

[285] MWAC Manager Mark Lynott to Jewel Cave Superintendent, memorandum, June 7, 2004, Cabinet 3, Drawer 1, Folder Museum Storage & Exhibit Space, Jewel Cave NM CF.

[286] DOI, NPS, Jewel Cave NM, August 2011 Scope of Collection Statement, 4.

[287] DOI, NPS, Jewel Cave NM, August 2011 Scope of Collection Statement, 20.

status of the collection, and concluded that it met 83.05 percent of NPS collection standards. Deficiencies included lack of humidity control and light control.[288]

In 2014, Martin and Jewel Cave staff began updating the Scope of Collections statement and the agreement between Mount Rushmore and Jewel Cave. By then, Mount Rushmore also housed the Devils Tower National Monument collection, and both Jewel Cave and Devils Tower contributed funding to Mount Rushmore for the space and staff it provided for their collections. Wiles, Block, and other Jewel Cave staff met to discuss Jewel Cave's collection and provide feedback to Martin.[289] The updated statement was similar to the 2011 statement, with the addition of "Civilian Conservation Corps collections" to the scope.[290]

Interpretation and Education

Cave tours remained the most common way in which people interacted with Jewel Cave. The monument used fees from cave tours to improve interpretation, and interpretive staff expanded youth programming and outreach. Chief of Interpretation Bradley Block and other interpretive staff worked with the BHPFA on junior ranger programming and other interpretive initiatives (see Figure 152). They also partnered with outside organizations to conduct off-site programming. In 2012, as a result of the hard work of the interpretive staff, Jewel Cave received a "Great Service Star" from the South Dakota Department of Tourism.[291]



Figure 152. Bradley Block, chief of interpretation starting in 2008, pictured here 2008.

Source: NPS, Jewel Cave NM.

[288] NPS Checklist for Preservation and Protection of Museum Collections, Cabinet 1, Drawer 3, Folder [no file title], Jewel Cave NM CF.

[289] JCLTM, May 27, 2014, Jewel Cave NM DF; JCLTM, August 12, 2014; JCLTM, September 16, 2014.

[290] DOI, NPS, Jewel Cave National Monument–South Dakota, 2015 Scope of Collections Statement, 5, Jewel Cave NM DF.

[291] JCMM, October 9, 2012.

The 2010 Operations Evaluation Report recommended that Jewel Cave complete its Long-Range Interpretive Plan. The plan had been started by Rosga in the late 1990s and remained "stalled at 90% completion" as of 2010, in part due to disagreements over the monument's central interpretive themes. The evaluation team urged staff to move forward:

> The park should not allow disagreement over the interpretive themes in the draft plan to provide an additional excuse to stall the plan's completion. The park might include one or two themes to cover surface resources and cultural resources, but not at the expense of interpretive themes covering the park's primary natural resource, the cave.[292]

The report recommended a stronger focus on aboveground resources and cultural resources, particularly American Indian presence. The team determined the interpretive division was "under-staffed" and recommended the park "conduct a position management review to determine the needs of interpretation." It also concluded that the park needed to develop an education plan in partnership with local schools, teachers, and other educational organizations.[293]

Tours and Visitor Services

Jewel Cave relied heavily on seasonal interpretive staff to provide cave tours to tens of thousands of people who visited the monument (see Figures 153 and 154). (See Appendix E for visitation numbers.) Most seasonal staff worked in the summer. As of 2002, the seasonal staff included twelve interpretive park rangers (GS-4), six interpretive park rangers (GS-5), two lead interpretive park rangers (GS-3), four fee collectors (GS-3), and one information receptionist (GS-3). This was in addition to the assistant chief of interpretation, who was hired as a GS-9 and, during the summer for a couple of summer seasons, was upgraded to a GS-11. For several years, the monument had a "cabin" position (a GS-3 fee collector staffing the cabin), but it replaced the position in 2002 with "a cadre of GS-0025-05 Park Rangers assigned to conduct Historic Candlelight Tours, informal historic area programs, and Spelunking Tours [now called the Wild Caving Tour]."[294]

The 2008 Core Operations report found that the interpretive division had insufficient staff to carry out the core functions of providing environmental education programs, local community programs, and sufficient on-site interpretive programming.[295] The division improved in these areas over the following years, relying largely on seasonal staffing. In 2010, Block created a "mentorship style of teamwork" for the many seasonal staff and volunteers, in which a high-level seasonal employee was matched up with a small team of lower-level seasonal employees. Seasonal staff could express concerns to their mentors rather than directly to the division chief, although any pressing issues were communicated to the chief, which "create[d] a more cohesive team of front line interpreters."[296]

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[292] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 17–18.

[293] Jewel Cave National Monument, Operations Evaluation Report, October 25–29, 2010, 14–18.

[294] Chief of Interpretation to Superintendent, April 23, 2003, 3. The Spelunking Tour was later renamed the Wild Caving Tour.

[295] Jewel Cave National Monument, Core Operations Report, 2008, 20.

[296] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 12.



Figure 153. A park ranger leads visitors on a Scenic Tour, pictured here on the platform in the Target Room, 2010.

Source: NPS, Jewel Cave NM.

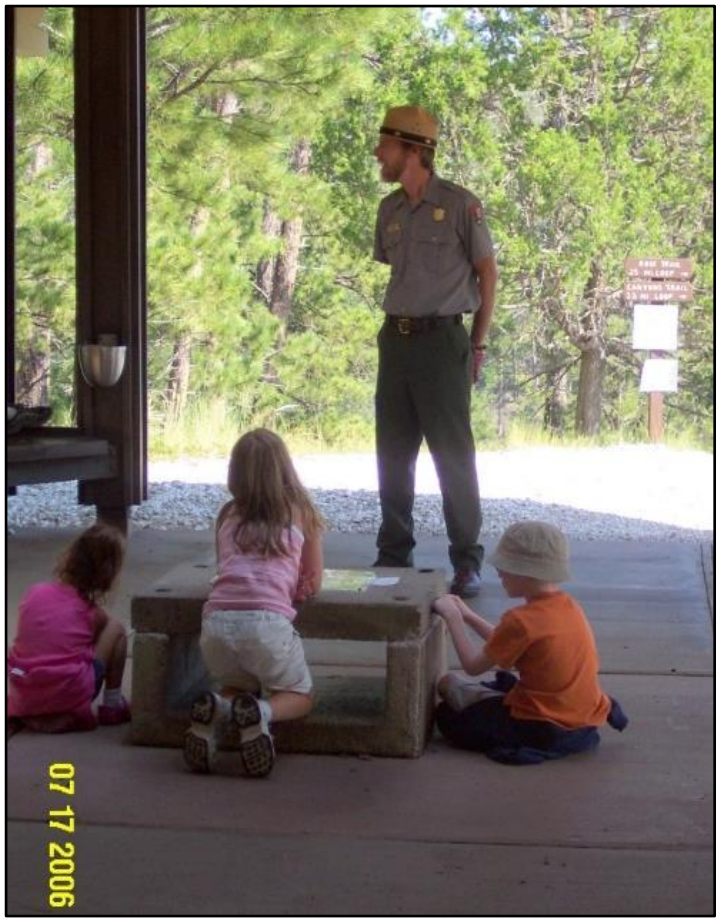


Figure 154. Interpretive rangers continued to offer aboveground programs while visitors waited for cave tours. Here, in 2006.

Source: NPS, Jewel Cave NM.

Jewel Cave offered Scenic Tours (limited to 30 people per tour), Historic Candlelight Tours (limit reduced from 25 to 20 people in 2000 "for safety and visitor enjoyment"), and Spelunking Tours (two to five people per tour), which were called "Wild Caving Tours" starting in 2009 (see Figure 155).[297] Scenic Tours were offered year-round, Historic Tours usually just for the summer months, and Wild Caving Tours were offered in the summer and occasionally the winter and autumn.[298]Aboveground, staff offered free hiking tours and orientation talks along the monument's trails and outdoor areas, including the Roof Trail, the Canyons Trail, and the visitor center patio.[299]



Figure 155. The Wild Caving Tour is an off-trail opportunity for both experienced and novice cavers, 2008.

Source: NPS, Jewel Cave NM.

The rehabilitation and renovation of the CCC ranger cabin ushered in major changes to interpretation in the historic area. The monument completed a Draft Comprehensive Interpretive Plan (CIP) around the time of the renovations, which outlined the plan for the historic area:

> The guided tour will include access to the interior of the Ranger Station. Standing as a very striking "artifact", the structure will provide a tangible connection to the monument's development, the role of park rangers in resources protection and visitor enjoyment during that period, and the contribution of the Civilian Conservation Corps to visitor facilities in the National Park System . . . Installation of historic furnishings will offer tangible reminders of the function of the Ranger Station and the people who served the monument. To support the effectiveness of the Ranger Station segment of the comprehensive guided tour of the Historic Area, the monument no longer will use the Ranger Station

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[297] "Jewel Cave National Monument Continues to Explore, Offering Wild Caving Tours," news release, September 4, 2009, Cabinet 3, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[298] "Jewel Cave National Monument Continues to Explore, Offering Wild Caving Tours," news release, September 4, 2009; "Jewel Cave National Monument Offers Off-Season Wild Caving Tours," news release, December 8, 2010, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; JCMM, August 23, 2016, Jewel Cave NM DF.

[299] JCMM, October 9, 2012; Chief of Interpretation to Superintendent, April 23, 2003, 2; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 1.

> for cooperating association sales, tour ticket sales, and staff work space. This will enable the public to focus their attention on the historic significance and meaning of the structure." Therefore, we have a need to develop purpose, goals, and objectives for the use of the cabin; in other words, a detailed plan for the cabin.[300]

The 2006 CLR (see above) and a Historic Furnishing Report (HFR) guided restoration and interpretation of the historic area.[301] The BHPFA set up a sales area in the cabin. Responsibilities for interpretive staff in the historic area included selling bookstore materials; fee collection; leading hikes, cave tours, roves, and surface programs in historic uniform; and staffing the cabin. In keeping with the cultural interpretive themes of the monument, interpreters addressed topics such as Jewel Cave's history, the CCC, and above- and belowground natural resources.[302]

Suess, Rosga, Dilts, Wiles, and Baughman almost decided to end costumed interpretation, for which rangers wore circa 1938 NPS uniforms, because of the cost to purchase and maintain the uniforms. Ultimately, they decided that the replica uniforms added significantly to interpretation in the historic area and that their use should be continued.[303] Starting in 2000, historic area staff rotated between the Historic Candlelight Tour and the Scenic Tour, as they had before 1996 when costumed interpretation began at the historic area, and they continued to wear replica uniforms in the historic area when possible (see Figure 156).[304] In 2003, the Historic Candlelight Tours were renamed "Lantern Tours" and staff switched to using paraffin-oil lanterns. The change aimed to protect cave resources, because wax deposits from candles had resulted in extensive mold growth in the historic area of the cave. Resource management staff undertook a four-year project to remove remnant candle wax.[305]

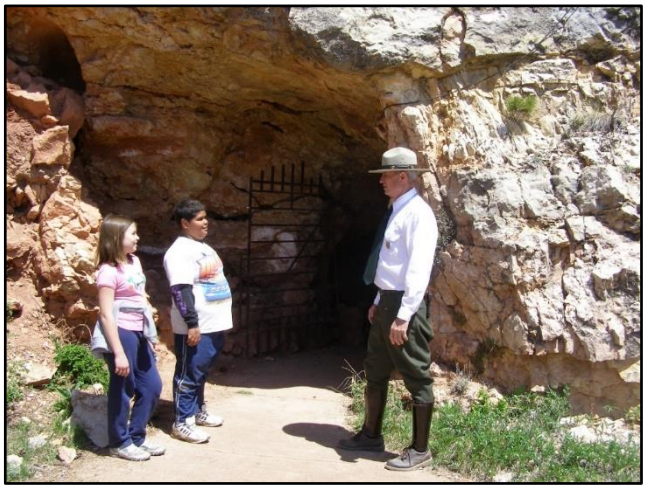


Figure 156. Jewel Cave Rangers giving cave tours from the historic entrance in ca. 1938 replica NPS uniforms.

Source: NPS, Jewel Cave NM.

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[300] Jewel Cave Superintendent to all employees, memorandum, July 6, 2001, Cabinet 3, Drawer 1, Folder Cabin – Misc. reports, Jewel Cave NM CF.

[301] Jewel Cave Superintendent to all employees, memorandum, July 6, 2001; Jewel Cave Superintendent to Jewel Cave Interpretive Staff, memorandum, August 6, 2001, Cabinet 3, Drawer 1, Folder Cabin – Misc. reports, Jewel Cave NM CF.

[302] "Historic Area Program," undated [ca. 2001], Cabinet 3, Drawer 1, Folder Cabin – Misc. reports, Jewel Cave NM CF.

[303] Cabin Meeting, notes, July 19, 2001, Cabinet 3, Drawer 1, Folder Cabin – Misc. reports, Jewel Cave NM CF.

[304] JCSM, July 31, 2001; JCSM, February 26, 2008; Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Chief of Interpretation to Superintendent, February 1, 2002, 1.

[305] Chief of Interpretation to Superintendent, February 13, 2004, 2; Wiles, comments on draft, April 7, 2020.

Fee Collection

Jewel Cave charged entrance fees for cave tours, but it operated differently from other NPS sites that charged entrance fees. Starting in April 2000, the monument was considered a "like Fee Demo" site, which meant that it sold National Park Passes (annual passes and Golden Eagle passes for seniors) but did not accept those passes for cave tour fees. The monument did not charge a fee to enter the monument and use the parking area.[306] Starting in 2003, in response to visitor frustration about not being able to use their National Park Passes at the monument, interpretive staff developed a Discovery Tour that could be paid for with National Park Passes. The Discovery Tour was a 20-minute visit to the first large room along the Scenic Tour route and was similar to the Target Tour offered in the 1990s. The Discovery Tour also gave visitors with physical disabilities a less demanding way to experience the cave.[307]

For the most part, dedicated fee collection personnel handled ticket transactions but did not provide cave tours (see Figure 157).[308] The Lead Visitor Use Assistant (VUA) ran the fee program at Jewel Cave and completed audits every year.[309] As of 2001, cave tour fees were $8 for adults and $4 for youths or seniors for the Scenic and Candlelight Tours and $20 for adults and $10 for seniors for the Spelunking Tour.[310] From every ticket sale, 75 cents continued to go the "Elevator Cost Recovery" fund and another 75 cents went to resource protection efforts at the cave.[311]



Figure 157. A ranger helps someone at the visitor center desk, while Jan Conn passes by in the background. 2013.

Source: NPS, Jewel Cave NM.

[306] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

[307] Chief of Interpretation to Superintendent, February 13, 2004, 1, 3.

[308] Chief of Interpretation to Superintendent, February 13, 2004, 1.

[309] JCLTM, July 12, 2016, Jewel Cave NM DF.

[310] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000.

[311] Chief of Interpretation to Superintendent, January 21, 2001, 2; Chief of Interpretation to Superintendent, February 13, 2004, 3; Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 4.

Ticket sales occurred mostly at the front desk and at an interpretive kiosk near the parking lot, completed in 2001.[312] Interpretive staff created temporary exhibits for the ticket kiosk, which they installed in 2004.[313] In 2008, crews installed a new front desk. The same year, monument leadership made the ticket kiosk the primary sales area for cave tour tickets. As part of this change, tour safety reminders—previously given verbally by the ticket seller—were added in text to the back of the ticket, in order to reduce transaction time.[314]

Jewel Cave began using an internet and call center reservation system for cave tours in 2000. Biospherics, Incorporated, held the contract to operate the system, which was called the National Park Reservation Service (NPRS). Mammoth Caves and Carlsbad Caverns National Parks already used the NPRS. Visitors could still purchase tickets in person. In 2001, Suess considered discontinuing Jewel Cave's association with the system, because it accounted for less than 10 percent of ticket sales and was a costly program that did not meet the needs of the monument. In addition, people who made reservations through the online system were not always prepared with proper clothing, footwear, and information about what the tour entailed.[315]

Suess and Rosga met with NPS officials in Washington, DC, along with staff from other parks, to discuss the online reservation system. The NPS decided to offer two tiers of service, and Jewel Cave opted for the lower level, which provided a call reservation system and a non-real-time connection to park ticket sales, which meant staff could not look up how many tickets had been sold up that point.[316] In 2003, Jewel Cave ceased using the NPRS and entered into a new contract with Electronic Solutions for phone and internet sales, which, staff determined, would be better meet the monument's needs. The new system was not functional for several years, and visitors continued to buy tickets for cave tours primarily in person. The system used proprietary software and had poor support as the system aged.[317]

Black Hills Central Reservations managed large tour groups and package tours starting sometime before 2011. Monument leadership considered asking the company to expand its offerings to cover all Jewel Cave tours, but the company charged a $3 transaction fee that would have been passed to visitors as a fee increase, which staff wanted to avoid.[318] At the urging of the NPS Washington Office, Johnson considered switching to Recreation.gov, the reservation system used by many other parks at that point, but that would also entail a fee of $3 per ticket.[319] In 2016, in need of some

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[312] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 5.

[313] Chief of Interpretation to Superintendent, February 1, 2002, 3; Chief of Interpretation to Superintendent, February 13, 2004, 4.

[314] Jewel Cave Superintendent to all employees, memorandum, March 11, 2008, Jewel Cave NM DF.

[315] "Jewel Cave and Wind Cave on Reservation System," news release, March 30, 2000, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF; JCSM, October 16, 2001, Jewel Cave NM DF; Chief of Interpretation to Superintendent, February 1, 2002, 1; Wiles, comments on draft, April 7, 2020.

[316] JCSM, October 30, 2001.

[317] Chief of Interpretation to Superintendent, April 23, 2003, 1; Chief of Interpretation to Superintendent, February 13, 2004, 3; Wiles, comments on draft, April 7, 2020.

[318] JCMM, March 15, 2011, Jewel Cave NM DF.

[319] JCMM, August 30, 2011; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 7.

solution to the online ticket sales problem, the NPS signed an agreement with Black Hills Central Reservations to manage Jewel Cave's cave tour ticket online sales, and the system went live in 2017.[320]

Brochures and Maps

Jewel Cave provided brochures, informational pamphlets, and newspapers to the public. In 2000, interpretive staff worked with the Harpers Ferry Center (HFC) to convert the monument brochures to the black-banded "unigrid" design that the NPS was adopting as standard across all units.[321] BHPFA funds supported other publications, such as a bulletin about bats in 2003 and park newspapers.[322] Interpretive staff drafted a Climate Friendly Parks Site Bulletin in 2012 and periodically produced bulletins about natural and cultural resources.[323] They assisted with the monument's website, which was converted to a standardized NPS format in 2000 and updated in 2012 according to revamped NPS guidelines.[324]

In 2015, Jewel Cave contracted out the production of a new park film to Aperture Films, to replace an older one created by South Dakota Public Broadcasting. The older film lasted about 12 minutes and provided general orientation. The new film used exploration as the central interpretive theme of the park. It improved "access" to the cave resource by showing viewers the far reaches of the cave, which only experienced cavers could see in person. Therefore, the monument was able to fund the film in part with NPS funds designated for projects that increased access to park resources. Interpretive and resource management staff completed the film script in 2016, which included interviews with explorers and audio from Jan Conn, singing a song she wrote and composed, called "It's a Long, Long Crawlway."[325] Two caver cinematographers, who had filmed caves for *National Geographic*, filmed some of the video. However, they did not feel comfortable going deep into the cave, so volunteer cavers shot the deep cave footage.[326]

Junior Ranger and Youth Education/Outreach

Jewel Cave interpretive staff offered a variety of educational and youth programs, both on site and in local schools and libraries. Staff participated in the Custer School District "Choice" program and then the "Adopt a Classroom" program to reach out to elementary schools and provide

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[320] JCLTM, August 2, 2016, Jewel Cave NM DF; JCLTM, July 18, 2017; JCLTM, July 20, 2017.

[321] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Chief of Interpretation to Superintendent, February 1, 2002, 3.

[322] Chief of Interpretation to Superintendent, February 13, 2004, 5; JCMM, October 5, 2010; JCMM, September 6, 2012, Jewel Cave NM DF; JCMM, March 12, 2015.

[323] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 13–14.

[324] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 4.

[325] JCLTM, August 2, 2016.

[326] Conversation between Bradley Block and the author, June 29, 2019.

students with cave tours (see Figure 158).[327] Teachers could apply for an Academic Fee Waiver to bring their classes on cave tours free of charge, and the monument encouraged these field trips in January and February, when other visitation was low.[328] Off-site offerings included programs for Boy Scouts and Girl Scouts and after-school library programs in Newcastle and Custer.[329]



Figure 158. Ranger Rene Ohms talks to students as part of the Adopt a Classroom program, 2011.

Source: NPS, Jewel Cave NM.

Jewel Cave interpretive staff applied for special grant funding for programming. For example, in 2002, Jewel Cave received a $7,850 grant through the National Park Foundation for digital imaging products from Kodak.[330] In 2010, Jewel Cave received a $9,958 grant from the National Park Foundation for a "Belt Loop-a-looza" program for Cub Scouts held at Jewel Cave in partnership with Wind Cave, Devils Tower, Black Hills National Forest, Custer State Park, and the BHPFA. Scouts came to Jewel Cave for a day and participated in activity stations on a day in July, and they

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[327] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 4; Chief of Interpretation to Superintendent, April 23, 2003, 2; NPS, "Jewel Cave Bids Farewell the Superintendent Suess," news release, February 5, 2010; JCSM, February 26, 2008; JCSM, October 7, 2015, Jewel Cave NM DF.

[328] "Jewel Cave National Monument Gears Up for School Programs," news release, January 1, 2010, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[329] Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 1; Block to Cremonini, FY16 Youth Programs Accomplishments Report, September 23, 2016, 1–2; PMIS 151979, "Develop Badge Partnership Between Jewel Cave National Monument and the BSA," February 17, 2009, Cabinet 3, Drawer 3, Folder #151979 1569-YPP9-SSC FY09. Jewel Cave NM CF; JCMM, September 6, 2012; JCMM, October 9, 2012.

[330] "Jewel Cave and Wind Cave Receive Grants from Kodak to Enhance Park Programs," news release, May 6, 2002, Cabinet 3, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

won belt loops for accomplishing the activities (see Figure 159).[331] Other special programs included a Junior Spelunking project and badge and a curriculum project called "Project Underground" (taught by resource management staff), both of which were modeled after programs at other NPS-managed caves.[332]



Figure 159. Jewel Cave held "Belt Loop-a-looza" events at the monument, in partnership with other NPS units, Custer State Park, and the BHPFA. Here, the event in 2011.

Source: NPS, Jewel Cave NM.

In 2000, interpretive staff developed Junior Ranger booklets for Jewel Cave (one for ages 5–8 and one for ages 9–12), which they tested the following year. They also developed a badge to give to children who completed a booklet.[333] The BHPFA usually paid for the printing of Junior Ranger booklets and purchasing Junior Ranger patches. Jewel Cave held a Junior Ranger weekend in 2003, during which families could try out the new Junior Ranger booklet.[334] More recently, the monument has held Junior Ranger Days on one Saturday per month throughout the summer, during which time interpretive staff offer hands-on activities in an effort to attract local families to the monument. Thousands of kids participate in the Junior Ranger program annually (6,000 in 2016 alone).[335]

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[331] JCMM, October 5, 2010; JCMM, December 7, 2010; Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 2; Jewel Cave Awarded National Park Foundation Impact Grants, news release, February 17, 2011, Cabinet 1, Drawer 3, Folder K3415 Press Releases, Jewel Cave NM CF.

[332] JCLTM, June 14, 2016, Jewel Cave NM DF; Jewel Cave Hosts Teacher Workshop about Cave Education, news release, August 5, 2016, Drawer 1, Cabinet 2, [loose in drawer], Jewel Cave NM CF; Wiles, comments on draft, April 7, 2020.

[333] Jewel Cave National Monument, Long Range Interpretive Plan, Action Items – FY2001; Stoll, Superintendent's Annual Narrative Report, Jewel Cave National Monument, 2000; Chief of Interpretation to Superintendent, April 23, 2003, 4.

[334] Jewel Cave NM FY01 Superintendent's Annual Report, 2001, 6; Chief of Interpretation to Superintendent, April 23, 2003, 4; Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, February 15, 2005; Steve Baldwin, Annual Narrative Report, Black Hills Parks & Forests Association, March 30, 2008.

[335] Block to Johnson, Annual Report – Interpretive Division, September 30, 2012, 2; Block to Cremonini, FY16 Youth Programs Accomplishments Report, September 23, 2016, 2.

Exhibits

The fire exhibits installed outside the visitor center in 2002 were intended to be temporary, but they still stood a decade later. In 2011, the NPS contracted with Lyn Henley to complete a wayside exhibit plan for the outdoor areas of the monument. Henley's contract included only the plan, not the installation of exhibits. As of 2020, no exhibits had been produced or installed.[336]

The visitor center originally housed formal, professionally curated and installed exhibits, along with temporary exhibits built in-house by interpretive or resource management staff. The latter included exhibits on monument history, speleothem protection, barometric winds, exploration, and other caves in the National Park System.[337] The formal exhibits had not changed substantively since they were installed in 1972, although interpretive staff worked with Mount Rushmore and HFC curators to clean the speleothems in the exhibits and install new bases and signs.[338] In 2011, Split Rock Studios won a contract to produce new visitor center displays at Jewel Cave, in partnership with the HFC and Jewel Cave staff. Fee revenues from cave tours paid for the $500,000 project, which was completed in 2013 (see Figure 160). These new exhibits more accurately represent current understandings of the cave and are more interactive than the previous exhibits.[339]



Figure 160. Jan Conn checks out the new visitor center exhibits, 2013.

Source: NPS, Jewel Cave NM.

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[336] Betsy Ehrlich to Bradley Block, June 23, 2011, Cabinet 1, Drawer 3, Folder [no title], Jewel Cave NM CF; Henley Company, Trip Report, June 10, 2011, 1–7, Cabinet 1, Drawer 3, Folder [no title], Jewel Cave NM CF; JCSM, May 8, 2012; Cockrell to Greenwald, April 7, 2020.

[337] JCSM, September 18, 2001, Jewel Cave NM DF; Chief of Interpretation to Superintendent, February 1, 2002, 3; Chief of Interpretation to Superintendent, April 23, 2003, 3–4; JCSM, February 26, 2008.

[338] JCSM, April 15, 2002, Jewel Cave NM DF; JSCM, April 30, 2002; Chief of Interpretation to Superintendent, April 23, 2003, 3–4.

[339] JCMM, January 18, 2011; JCMM, July 26, 2011; Jewel Cave response to Midwest Region Call to Action, 2012, Cabinet 1, Drawer 4, [loose in drawer], Jewel Cave NM CF; "Jewel Cave Updates Display models, roads, and online presence," *Custer Chronicle*, April 25, 2012, Cabinet 1, Drawer 3, Folder [no title], Jewel Cave NM CF; Nathan Ellenbecker, "Jewel Cave expanding visitor center, bookstore for educational opportunities," *Rapid City Journal*, June 15, 2015; Wiles, comments on draft, April 7, 2020.

Conclusion

Jewel Cave recovered from the devastating Jasper Fire with its buildings intact and the cave resource relatively unscathed, but fire focused new attention on fire management, exotic plant control, and the effects of surface hydrology on cave resources. While interpretation remained primarily focused on the cave, the Jasper Fire shifted some interpretive attention to the drastically changed surface environment. Natural resource managers made significant progress in this period, including the completion of a CKMP. The CKMP formalized exploration protocols consistent with responsible management of cave resources, while also providing for the safety of explorers (see Figure 161).

Jewel Cave National Monument exists for the purpose of protecting Jewel Cave, but the known size and extent of the cave is always changing. In the last several decades, protecting a changing and growing resource has become a central theme of both resource management and interpretation at the monument.



Figure 161. Cavers have discovered over 200 miles of passageways in Jewel Cave, but there is much left to explore. Here, inside the cave in 2015.

Source: NPS, Jewel Cave NM.

Chapter 8: Beyond 200 Miles

In December 2018, cavers surveyed the 200th mile of Jewel Cave. To celebrate the milestone, the Black Hills Parks and Forests Association (BHPFA) and the Paha Sapa Grotto of the National Speleological Society (NSS) assisted the park in hosting a 200-mile reunion in Custer the following June. Cavers who had explored Jewel Cave from the 1950s to 2019 attended, along with former and current National Park Service (NPS) staff, community partners, and other federal agency partners. Dwight Deal, Jan Conn, Mike Wiles, and Dan Austin gave talks on the history of exploration of Jewel Cave. Art Palmer emceed parts of the program. Dr. Andreas Pflitsch came from Germany to discuss his climatology research at Jewel Cave, Corissa Busse of The Nature Conservancy (TNC) spoke about land exchanges, and Forest Service and other state and federal partners discussed their cave management programs.

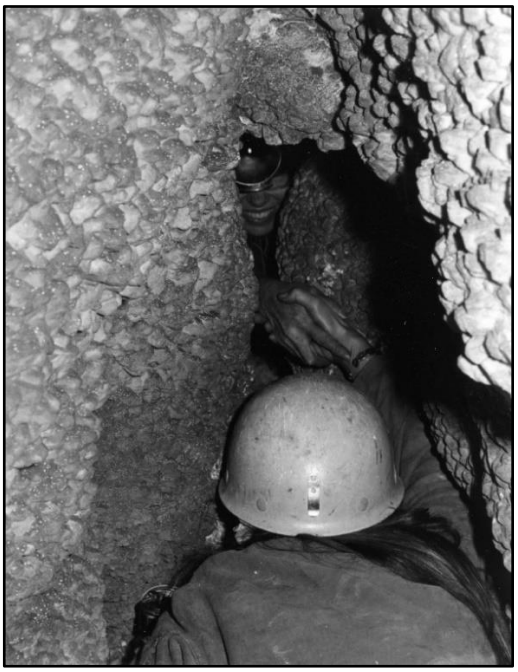


Figure 162. Jan Conn reaches out a helping hand to a fellow caver.

Source: NPS, Jewel Cave NM.

Three generations of cavers—Jan Conn and Dwight Deal, Mike Wiles, and Rene Ohms—took the stage on the last day of the reunion to answer questions about what it was like to explore Jewel Cave. They answered with humor and candor. Recalling the years when the NPS allowed only Herb and Jan Conn to enter the cave while they completed surveys of a new tour route, Jan remarked, "The Park Service stipulated that we weren't supposed to have fun in there" (see Figure 162).[1] She confessed that she and Herb kept exploring new cave during this period despite the restrictions placed on them, and that Herb gave the NPS those surveys in small chunks once they were allowed to cave again, so as not to arouse suspicion. Jan said, "We felt we were pioneering just as much as they [the astronauts] were and nobody knew about it—not even the Park Service!"[2]

These explorers transformed Jewel Cave in only a century from a "small cave" in the side of a cliff to the third-longest cave in the world and a hub of speleological exploration and research. Through cavers and employees, the NPS has developed partnerships with the NSS and the National Cave and Karst Research Institute (NCKRI) to study the geology, hydrology, biology, and climatology of Jewel Cave, as well as the effects of human use on the resource. These organizations form far-flung communities of cavers and cave researchers who share knowledge to improve protection of cave resources.

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[1] Jan Conn, "Informal Panel Session," talk, Jewel Cave 200-mile Reunion, June 30, 2019, Custer, SD.

[2] Jan Conn, "Jewel Cave Exploration from 1959–1979," talk, Jewel Cave 200-mile Reunion, June 29, 2019, Custer, SD.

Exploration of Jewel Cave has affected every aspect of management at the monument. For many years, Jewel Cave was considered a small cave, and federal agencies managed it under that assumption. The Forest Service invested almost nothing in its management and contracted out guide service. When the NPS took over in 1933, it continued to contract guide service when it could and, after that, sent over seasonal rangers from Wind Cave to give tours at Jewel Cave. The NPS only started staffing the site with full-time, year-round employees after Herb and Jan Conn's initial explorations revealed that Jewel Cave was something more than "typical" and "small."

The Wind Cave superintendent oversaw Jewel Cave managers for decades, but the Jewel Cave manager position slowly gained more autonomy as the size of the known cave increased. For some time, the NPS used the senior position at Jewel Cave as a training superintendency for promising managers. As the size of Jewel Cave was found to be longer and longer, management became ever more complex, and Jewel Cave finally received an independent superintendency in the 2000s.

Beyond the superintendent, Jewel Cave's administrative structure remains lean. There are now division chiefs for interpretation, resource management, maintenance, and law enforcement, but the staffing of those divisions remains mostly seasonal. Because of this, volunteers and interns have performed significant roles for the monument. All of the cave exploration is carried out by volunteers: even staff who go caving log those hours as volunteer time. Interpreters and fee collectors are supplemented by Volunteers In Parks (VIPs) and Student Conservation Association (SCA) interns, and Youth Conservation Corps (YCC) crews have assisted with many maintenance projects over the years.

Partnerships also fill gaps in staffing. There is a long history of shared administrative services among Black Hills area parks, starting with the Black Hills Area Office in the 1950s, the Black Hills Administrative Group (BHAG) and the NEKOTA group in the 1990s and 2000s, and shared IT staff and regional administrative groupings that remain in 2020. Cooperative agreements with the Forest Service, Custer County Sheriff's Office, and Mount Rushmore National Memorial provide law enforcement support for the cave. Wind Cave and Mount Rushmore maintenance crews assist Jewel Cave crews with large projects and lend expensive equipment, and Jewel Cave's archival and museum collections are stored at the Mount Rushmore Curatorial Facility. Jewel Cave fire management is carried out through cooperative agreements with other NPS sites and the Forest Service.

Tours and visitor facilities changed markedly after the Conns' initial discoveries. Tours through the Michauds' entrance to the cave, led first by the Jewel Cave Corporation (JCC) and then by the NPS, traversed dim, small passageways on old wooden staircases. The Conns' explorations led to skyrocketing visitation and miles of new cave that could potentially be opened up to the public. These discoveries prompted the NPS to scrap its plans for delisting the monument. Instead, the NPS initiated a land exchange with the Forest Service, drilled an elevator and a tunnel into the cave near Lithograph Canyon, built a state of the art, Mission-66-era visitor center on top of the shaft, and created a new cave tour. The new tour had metal platforms and stairs, lighting to illuminate cave features, an elevator to bring visitors down in comfort, and room to stand upright the entire length of the tour. Interpreters continued to offer what they now called the "Lantern Tour" from the historic entrance, a new caving tour to emulate exploration, and accessible tours for those not physically able to go deep in the cave. Exploration became an increasingly important interpretive theme, one that visitors could experience whether on one of the cave tours, reading the exhibits, or watching the park film.

Managing a cave resource is a unique challenge that requires innovative solutions, because accepted methods of resource management rarely work in a cave environment. When cavers found more and more passageways under Forest Service land, NPS managers at Jewel Cave worked with the Forest Service to initiate mineral withdrawals and establish cooperative agreements. Some of the cave was under private land, so the NPS worked with the Forest Service and TNC on land exchanges in the Pass Creek area. To address issues of rockfall in the Target Room, accumulated lint from people entering the cave, algae from the cave lighting system, cave airflow from the artificial entrances, and mold growing from candle wax drippings, resource management staff at Jewel Cave experimented with different fixes until they found one that worked, and if that stopped working, they tried others. Managers in the 1980s and 1990s prioritized baseline studies of cave geology and biology to improve future management of cave resources by having historic data to compare to future findings. Resource management staff continue to explore novel solutions to problems and to communicate with other cave specialists to share best practices.



Figure 163. Much of Jewel Cave remains unexplored. Here, an NPS employee inside of the cave.

Source: NPS, Jewel Cave NM.

Exploration has always been an integral part of Jewel Cave, but it is now a formal part of its management and interpretive goals (see Figure 163). Mike Wiles explained:

> Going back thirty years, it was thought of as "those guys going in and exploring and it's fun and it's exciting," but now it is formally what we do. [When the] next superintendent comes in, I mean, they might have different opinions. They have the capacity to do different things. But they'll look at the management, that Foundation Document [and realize,] "oh, yeah, exploration's what you do. It's not an optional thing, and it's not just for fun. . . . it is just fundamental to knowing what Jewel Cave is and how to manage it.[3]

[3] Mike Wiles, interview by Jackie Gonzales, June 26 and 27, 2019, Custer, SD.

NPS managers and cavers will be ready to meet challenges as they come, having learned from many years of exploration to embrace the unknown. That ethos is part of the culture of Jewel Cave and stays with people who work, explore, or visit the cave. As Herb and Jan Conn put it,

> All in all, our Jewel Cave adventure has taught us much more than where the passages go and how to refuel a carbide lamp. It has reached out to change our lives, our outlook, and our goals. Hiding in a tiny cranny from a tour one day, we overheard a question that convulsed us in silent giggles. "Is all of the cave underground?" But as we thought about it later and pondered the far-reaching effect that Jewel Cave has had upon us, we feel almost as if all of the cave is *not* underground. Surely there is a part of it that we take with us wherever we go.[4]

[4] Herb and Jan Conn, *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota* (St. Louis: Cave Books, 1977), 277.

Appendix A: Legislation and Executive Orders Related to Establishment of Jewel Cave National Monument and its Boundaries

CHAP. 3060.—An Act For the preservation of American antiquities.

June 8, 1906.
[S. 4698.]
[Public, No. 209.]

American antiquities.
Penalty for unauthorized excavations, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person who shall appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall, upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

Setting apart of historic, etc., public lands.

SEC. 2. That the President of the United States is hereby authorized, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and may reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected: *Provided*, That when such objects are situated upon a tract covered by a bona fide unperfected claim or held in private ownership, the tract, or so much thereof as may be necessary for the proper care and management of the object, may be relinquished to the Government, and the Secretary of the Interior is hereby authorized to accept the relinquishment of such tracts in behalf of the Government of the United States.

Proviso.
Relinquishment of private claims.

Permits for excavations, etc.

SEC. 3. That permits for the examination of ruins, the excavation of archæological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdictions may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe: *Provided*, That the examinations, excavations, and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

Proviso.
Preservation in museums.

Regulations.

SEC. 4. That the Secretaries of the Departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this Act.

Approved, June 8, 1906.

CHAP. 3061.—An Act To appropriate the sum of forty thousand dollars as a part contribution toward the erection of a monument at Provincetown, Massachusetts, in commemoration of the landing of the Pilgrims and the signing of the Mayflower compact.

June 8, 1906.
[S. 4370.]
[Public, No. 210.]

Provincetown, Mass.
Appropriation to aid in erecting monument of landing of Pilgrims.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of forty thousand dollars, to aid in erecting a monument at Provincetown, Massachusetts, in commemoration of the first landing of the Pilgrims on Cape Cod and the signing of the compact in the cabin of the Mayflower in the harbor of said Provincetown: *Provided*, That the said sum of forty thousand dollars shall not be payable until there shall have been raised and made available for the erection of said monument an additional sum of at least forty thousand dollars: *Provided further*, That the design of said monument shall be approved by the Secretary of War, the governor of the Commonwealth of Mas-

Provisos.
Condition.

Approval of design etc.

February 7, 1908.

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

Jewel Cave National Monument, S. Dak. Preamble. Vol. 30, p. 1783.

WHEREAS, the natural formation, known as the Jewel Cave, which is situated upon the public land, within the Black Hills National Forest, in the State of South Dakota, is of scientific interest, and it appears that the public interests would be promoted by reserving this formation as a National Monument, with as much land as may be necessary for the proper protection thereof;

National monument, South Dakota. Vol. 34, p. 225.

Now, therefore, I, Theodore Roosevelt, President of the United States of America, by virtue of the power in me vested by section two of the Act of Congress, approved June eighth, nineteen hundred and six, entitled, "An Act For the preservation of American antiquities," do proclaim that there are hereby reserved from settlement, entry, and all forms of appropriation under the public land laws, subject to all prior valid adverse claims, and set apart as a National Monument, all the tracts of land, in the State of South Dakota, shown as the Jewel Cave National Monument on the diagram forming a part hereof.

Forest uses not affected. Vol. 29, p. 902.

The reservation made by this proclamation is not intended to prevent the use of the lands for purposes consistent with the withdrawal made by this proclamation, or for forest purposes under the proclamation establishing the Black Hills National Forest, but the two reservations shall both be effective on the land withdrawn, but the National Monument hereby established shall be the dominant reservation.

Reserved from settlement, etc.

Warning is hereby given to all unauthorized persons not to appropriate, injure, or destroy any feature of this National Monument or to locate or settle upon any of the lands reserved by this proclamation.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington this 7th day of February, in the year of our Lord one thousand nine hundred and eight, [SEAL.] and of the Independence of the United States the one hundred and thirty-second.

THEODORE ROOSEVELT

By the President:
ELIHU ROOT
Secretary of State.

February 13, 1908.

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

Modoc National Forest, Cal. Preamble. Vol. 33, p. 2380.

WHEREAS, it appears that the public good would be promoted by adding to the Modoc National Forest certain lands, within the State of California, which are in part covered with timber;

Boundaries enlarged. Vol. 30, p. 36.

Now, therefore, I, Theodore Roosevelt, President of the United States of America, by virtue of the power in me vested by the Act of Congress, approved June fourth, eighteen hundred and ninety-seven, entitled, "An Act Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and ninety-eight, and for other purposes," do proclaim that the Modoc National Forest is hereby enlarged to include the said additional lands, and that the boundaries of the aforesaid National Forest are now as shown on the diagram forming a part hereof;

Post, p. 2232.

Executive Order 6166 of June 10, 1933: Organization of Executive Agencies

WHEREAS section 16 of the act of March 3, 1933 (Public, No. 428, 47 Stat. 1517), provides for reorganizations within the executive branch of the Government; requires the President to investigate and determine what reorganizations are necessary to effectuate the purposes of the statute; and authorizes the President to make such reorganizations by Executive order; and

WHEREAS I have investigated the organization of all executive and administrative agencies of the Government and have determined that certain regroupings, consolidations, transfers, and abolitions of executive agencies and functions thereof are necessary to accomplish the purposes of section 16;

NOW, THEREFORE, by virtue of the aforesaid authority, I do hereby order that:

Section 1.--*Procurement*

The function of determination of policies and methods of procurement, warehousing, and distribution of property, facilities, structures, improvements, machinery, equipment, stores, and supplies exercised by any agency is transferred to a Procurement Division in the Treasury Department, at the head of which shall be a Director of Procurement.

The Office of the Supervising Architect of the Treasury Department is transferred to the Procurement Division, except that the buildings of the Treasury Department shall be administered by the Treasury Department and the administration of post office buildings is transferred to the Post Office Department. The General Supply Committee of the Treasury Department is abolished.

In respect of any kind of procurement, warehousing, or distribution for any agency the Procurement Division may, with the approval of the President, (a) undertake the performance of such procurement, warehousing, or distribution itself, or (b) permit such agency to perform such procurement, warehousing, or distribution, or (c) entrust such performance to some other agency, or (d) avail itself in part of any of these recourses, according as it may deem desirable in the interest of economy and efficiency. When the Procurement Division has prescribed the manner of procurement, warehousing, or distribution of any thing, no agency shall thereafter procure, warehouse, or distribute such thing in any manner other than so prescribed.

The execution of work now performed by the Corps of Engineers of the Army shall remain with said corps, subject to the responsibilities herein vested in the Procurement Division.

The Procurement Division shall also have control of all property, facilities, structures, machinery, equipment, stores, and supplies not necessary to the work of any agency; may have custody thereof or entrust custody to any other agency; and shall furnish the same to agencies as need therefore may arise.

The Fuel Yards of the Bureau of Mines of the Department of Commerce are transferred to the Procurement Office.

[Sec. 1 amended by EO 6623 of Mar. 1, 1934]

Section 2.--*National Parks, Buildings, and Reservations*

All functions of administration of public buildings, reservations, national parks, national monuments, and national cemeteries are consolidated in an Office of National Parks, Buildings, and Reservations in the Department of the Interior, at the head of which shall be a Director of National Parks, Buildings, and Reservations; except that where deemed desirable there may be excluded from this provision any public building or reservation which is chiefly employed as a facility in the work of a particular agency. This transfer and consolidation of functions shall include, among others, those of the National Park Service of the Department of the Interior and the National Cemeteries and Parks of the War Department which are located within the continental limits of the United States. National cemeteries located in foreign countries shall be transferred to the Department of State, and those located in insular possessions under the jurisdiction of the War Department shall be administered by the Bureau of Insular Affairs of the War Department.

The functions of the following agencies are transferred to the Office of National Parks, Buildings, and Reservations of the Department of the Interior, and the agencies are abolished:
Arlington Memorial Bridge Commission
Public Buildings Commission
Public Buildings and Public Parks of the National Capital
National Memorial Commission
Rock Creek and Potomac Parkway Commission

Expenditures by the Federal Government for the purposes of the Commission of Fine Arts, the George Rogers Clark Sesquicentennial Commission, and the Rushmore National Commission shall be administered by the Department of the Interior.

Section 3.--*Investigations*

All functions now exercised by the Bureau of Prohibition of the Department of Justice with respect to the granting of permits under the national prohibition laws are transferred to the Division of Internal Revenue in the Treasury Department.

All functions now exercised by the Bureau of Prohibition with respect to investigations and all the functions now performed by the Bureau of Investigation of the Department of Justice are transferred to and consolidated in a Division of Investigation in the Department of Justice, at the head of which shall be a Director of Investigation.

All other functions now performed by the Bureau of Prohibition are transferred to such divisions in the Department of Justice as in the judgment of the Attorney General may be desirable.

Section 4.--[Repealed]

[Sec. 4 repealed by Pub. L. 97-258 of Sept. 13, 1982 (96 Stat. 1086)]

Section 5.--*Claims by or against the United States*

The functions of prosecuting in the courts of the United States claims and demands by, and offenses against, the Government of the United States, and of defending claims and demands against the Government, and of supervising the work of United States attorneys, marshals, and clerks in connection therewith, now exercised by any agency or officer, are transferred to the Department of Justice.

As to any case referred to the Department of Justice for prosecution or defense in the courts, the function of decision whether and in what manner to prosecute, or to defend, or to compromise, or to appeal, or to abandon prosecution or defense, now exercised by any agency or officer, is transferred to the Department of Justice.

For the exercise of such of his functions as are not transferred to the Department of Justice by the foregoing two paragraphs, the Solicitor of the Treasury is transferred from the Department of Justice to the Treasury Department.

Nothing in this section shall be construed to affect the function of any agency or officer with respect to cases at any stage prior to reference to the Department of Justice for prosecution or defense.

Section 6.--*Insular Courts*

The United States Court for China, the District Court of the United States for the Panama Canal Zone, and the District Court of the Virgin Islands of the United States are transferred to the Department of Justice.

Section 7.--*Solicitors*

The Solicitor for the Department of Commerce is transferred from the Department of Justice to the Department of Commerce.

The Solicitor for the Department of Labor is transferred from the Department of Justice to the Department of Labor.

Section 8.--*Internal Revenue*

The Bureaus of Internal Revenue and of Industrial Alcohol of the Treasury Department are consolidated in a Division of Internal Revenue, at the head of which shall be a Commissioner of Internal Revenue.

Section 9.--*Assistant Secretary of Commerce*

The Assistant Secretary of Commerce for Aeronautics shall be an Assistant Secretary of Commerce and shall perform such functions as the Secretary of Commerce may designate.

Editorial note: The functions of all officials of the Department of Commerce were transferred to the Secretary of Commerce by Reorganization Plan No. 5 of 1950, 15 FR 3174, 3 CFR, 1949-1953 Comp., p. 1004, effective May 24, 1950.

Section 10.--*Official Register*

The function of preparation of the Official Register is transferred from the Bureau of the Census to the Civil Service Commission.

Section 11.--*Statistics of Cities*

The function of the Bureau of the Census of the Department of Commerce of compiling statistics of cities under 100,000 population is abolished for the period ending June 30, 1935.

Section 12.--*Shipping Board*

The functions of the United States Shipping Board including those over and in respect to the United States Shipping Board Merchant Fleet Corporation are transferred to the Department of Commerce, and the United States Shipping Board is abolished.

Section 13.--*National Screw Thread Commission*

The National Screw Thread Commission is abolished, and its records, property, facilities, equipment, and supplies are transferred to the Department of Commerce.

Section 14.--*Immigration and Naturalization*

The Bureaus of Immigration and of Naturalization of the Department of Labor are consolidated as an Immigration and Naturalization Service of the Department of Labor, at the head of which shall be a Commissioner of Immigration and Naturalization.

Section 15.--*Vocational Education*

The functions of the Federal Board for Vocational Education are transferred to the Department of the Interior, and the Board shall act in an advisory capacity without compensation.

Section 16.--*Apportionment of Appropriations*

The functions of making, waiving, and modifying apportionments of appropriations are transferred to the Director of the Office of Management and Budget.

[Sec. 16 amended by EO 12608 of Sept. 9, 1987, 52 FR 34617, 3 CFR, 1987 Comp., p. 245]

Section 17.--*Coordinating Service*

The Federal Coordinating Service is abolished.

Section 18.--[Revoked]

[Sec. 18 revoked by EO 6586 of Feb. 6, 1934]

Section 19.--*General Provisions*

Each agency, all the functions of which are transferred to or consolidated with another agency, is abolished.

The records pertaining to an abolished agency or a function disposed of, disposition of which is not elsewhere herein provided for, shall be transferred to the successor. If there be no successor agency, and such abolished agency be within a department, said records shall be disposed of as the head of such department may direct.

The property, facilities, equipment, and supplies employed in the work of an abolished agency or the exercise of a function disposed of, disposition of which is not elsewhere herein provided for, shall, to the extent required, be transferred to the successor agency. Other such property, facilities, equipment, and supplies shall be transferred to the Procurement Division.

All personnel employed in connection with the work of an abolished agency or function disposed of shall be separated from the service of the United States, except that the head of any successor agency, subject to my approval, may, within a period of four months after transfer or consolidation, reappoint any of such personnel required for the work of the successor agency without reexamination or loss of civil-service status.

Section 20.--*Appropriations*

Such portions of the unexpended balances of appropriations for any abolished agency or function disposed of shall be transferred to the successor agency as the Director of the Budget shall deem necessary.

Unexpended balances of appropriations for an abolished agency or function disposed of, not so transferred by the Director of the Budget, shall, in accordance with law, be impounded and returned to the Treasury.

Section 21.--*Definitions*

As used in this order--
"Agency" means any commission, independent establishment, board, bureau, division, service, or office in the executive branch of the Government.
"Abolished agency" means any agency which is abolished, transferred, or consolidated.
"Successor agency" means any agency to which is transferred some other agency or function, or which results from the consolidation of other agencies or functions.
"Function disposed of" means any function eliminated or transferred.

Section 22.--*Effective Date*

In accordance with law, this order shall become effective 61 days from its date; *Provided,* That in case it shall appear to the President that the interests of economy require that any transfer, consolidation,

or elimination be delayed beyond the date this order becomes effective, he may, in his discretion, fix a later date therefore, and he may for like cause further defer such date from time to time.[1]

[1] According to the National Archives and Records Administration (NARA), "The provisions of Executive Order 6166 of June 10, 1933, do not appear in the Federal Register system." The next above is from the NARA website, at https://www.archives.gov/federal-register/codification/executive-order/06166.html.

prospective serviceability in comparison with a new unit of like kind, but not to exceed fair market value. The provisions of this section shall not apply to concessioners whose current contracts do not include recognition of a possessory interest, unless in a particular case the Secretary determines that equitable considerations warrant recognition of such interest.

SEC. 7. The provisions of section 321 of the Act of June 30, 1932 (47 Stat. 412; 40 U.S.C. 303(b)), relating to the leasing of buildings and properties of the United States, shall not apply to privileges, leases, permits, and contracts granted by the Secretary of the Interior for the use of lands and improvements thereon, in areas administered by the National Park Service, for the purpose of providing accommodations, facilities, and services for visitors thereto, pursuant to the Act of August 25, 1916 (39 Stat. 535), as amended, or the Act of August 21, 1935, chapter 593 (49 Stat. 666; 16 U.S.C. 461–467), as amended. 16 USC 1.

SEC. 8. Subsection (h) of section 2 of the Act of August 21, 1935, the Historical Sites, Buildings, and Antiquities Act (49 Stat. 666; 16 U.S.C. 462(h)), is amended by changing the proviso therein to read as follows: "*Provided*, That the Secretary may grant such concessions, leases, or permits and enter into contracts relating to the same with responsible persons, firms, or corporations without advertising and without securing competitive bids."

Records.

SEC. 9. Each concessioner shall keep such records as the Secretary may prescribe to enable the Secretary to determine that all terms of the concession contract have been and are being faithfully performed, and the Secretary and his duly authorized representatives shall, for the purpose of audit and examination, have access to said records and to other books, documents, and papers of the concessioner pertinent to the contract and all the terms and conditions thereof.

Availability.

The Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of five (5) calendar years after the close of the business year of each concessioner or subconcessioner have access to and the right to examine any pertinent books, documents, papers, and records of the concessioner or subconcessioner related to the negotiated contract or contracts involved.

Approved October 9, 1965, 6:35 a.m.

Public Law 89-250

AN ACT

October 9, 1965
[H. R. 9417]

To revise the boundary of Jewel Cave National Monument in the State of South Dakota, and for other purposes.

Jewel Cave National Monument, S. Dak.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, for the purpose of including within the Jewel Cave National Monument significant caverns and other geological features beneath lands within the Black Hills National Forest adjacent to the national monument, the boundary of said monument is hereby revised in accordance with drawing numbered N.M.–J.C.–7100, dated June 10, 1964, prepared by the National Park Service of the Department of the Interior. Lands within the revised monument shall hereafter be administered in accordance with the Act of Congress entitled "An Act to establish a National Park Service, and for other purposes," approved August 25, 1916 (39 Stat. 535), as amended and supplemented. Lands excluded from the monument pursuant to this Act shall remain and be administered as a part of the Black Hills National Forest. 16 USC 1 *et seq.*

Approved October 9, 1965, 6:35 a.m.

WHEREAS, the increased authority of the secretary would result in a commensurate reduction in the administrative authority and control of the citizen lay boards including the state board of education, the state board of vocational education, the board of regents, the board of cultural preservation, the fine arts council, the state board of educational television and the state library commission; and

WHEREAS, the transfer of administrative control from citizen lay boards to appointed officeholders is contrary to legislative intent expressed since statehood through the establishment of citizen lay boards with administrative authority over the educational systems of our state; and

WHEREAS, the educational television board is the licensee of public television in South Dakota under the Communications Act of 1934, as amended, and any unauthorized transfer of control of the licensee would be in contravention of section 301(d) of the Communications Act and the rules and regulations promulgated thereunder by the Federal Communications Commission would result in the revocation of their license:

NOW, THEREFORE, BE IT RESOLVED, by the Senate of the Fifty-fifth Legislature of the state of South Dakota, that Executive Order 80-2, presented to the Fifty-fifth Legislature, as the same appears in the Senate Journal on pages 140 to 143, inclusive, is hereby disapproved pursuant to section 8 of Article IV of the Constitution of the state of South Dakota.

CHAPTER 8

(S.B. 116)

JURISDICTION OVER CERTAIN LANDS CEDED AND ACCEPTED FROM FEDERAL GOVERNMENT

AN ACT

ENTITLED, An Act to cede concurrent jurisdiction to the United States over national park and monument land and to accept such jurisdiction over certain federal lands used for park and monument purposes.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. Concurrent jurisdiction over crimes and offenses under the laws of the state of South Dakota is hereby ceded to the United States over and within all the territory dedicated to national park, national memorial and national monument purposes included in the tracts of land in South Dakota designated as:

(1) Mount rushmore national memorial;

(2) Badlands national park;

(3) Wind cave national park;

(4) Jewel cave national monument.

Section 2. The concurrent jurisdiction ceded by section 1 of this Act shall be vested upon acceptance by the United States by and through its appropriate officials and shall continue so long as the lands within the designated areas are dedicated to park purposes.

Section 3. The consent of the state is hereby given to the retrocession of exclusive jurisdiction by the United States over lands owned by the United States within the boundaries of badlands national park. The Governor may accept retrocession of jurisdiction for the state.

Section 4. Upon the establishment of concurrent jurisdiction, the appropriate county sheriffs with the approval of the appropriate state's attorneys will develop memoranda of agreement with the park superintendents of the national park service areas in South Dakota.

Signed February 27, 1980

CHAPTER 9

(H.B. 1098)

SALARIES OF STATE CONSTITUTIONAL AND ELECTED OFFICERS INCREASED

AN ACT

ENTITLED, An Act to raise the compensation of certain state constitutional and elected officers.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. That § 1-7-5 be amended to read as follows:

1-7-5. The annual salary of the Governor of the state of South Dakota is forty-five thousand dollars.

Section 2. That § 1-11-2 be amended to read as follows:

1-11-2. The annual salary of the attorney general is thirty-eight thousand dollars.

Section 3. That § 1-8-3 be amended to read as follows:

1-8-3. The annual salary of the secretary of state is thirty thousand dollars.

Section 4. That § 1-9-2 be amended to read as follows:

1-9-2. The annual salary of the state auditor is thirty thousand dollars.

Section 5. That § 1-10-3 be amended to read as follows:

1-10-3. The annual salary of the state treasurer is thirty thousand dollars.

Appendix B: Withdrawal from Mineral Entry of Forest Service Lands Above Jewel Cave

Copies of these diagrams are for sale at one dollar ($1.00) per sheet by the Cadastral Engineering Office, Bureau of Land Management, 1245 North 29th Street, Billings, Montana.

GEORGE L. TURCOTT,
Acting State Director.

[F.R. Doc. 61-4328; Filed, May 10, 1961; 8:47 a.m.]

MONTANA

Notice of Proposed Withdrawal and Reservation of Lands

MAY 3, 1961.

The Bureau of Reclamation, United States Department of the Interior has filed an application, Serial Number M-043471 for the withdrawal of the lands described below, from all forms of appropriation under the public land laws including the general mining laws and mineral leasing laws subject to valid existing rights.

The applicant desires the land for a material site for the construction of the Clark Canyon Dam, East Bench Unit, Three Forks Division, Missouri River Basin Project, Montana.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 1245 North 29th Street, Billings, Montana.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

The lands involved in the application are:

PRINCIPAL MERIDIAN, MONTANA

T. 9 S., R. 10 W.,
Sec. 31, Lot 6, N½SE¼.

The land described above contains an area of 119.27 acres.

GEORGE L. TURCOTT,
Acting State Director.

[F.R. Doc. 61-4327; Filed, May 10, 1961; 8:47 a.m.]

MONTANA

Notice of Proposed Withdrawal and Reservation of Lands

MAY 3, 1961.

The Forest Service, U.S. Department of Agriculture has filed an application, Serial Number M-037720 for the withdrawal of the lands described below, from all forms of appropriation under the General Mining Laws, but not the mineral leasing laws and subject to valid existing rights.

The applicant desires the land for the Madison River Canyon Earthquake Area to provide campgrounds, public service areas and an area of geologic interest to the public.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 1245 North 29th Street, Billings, Montana.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

The lands involved in the application are:

PRINCIPAL MERIDIAN MONTANA

GALLATIN NATIONAL FOREST

Potomageton Park Campground

T. 10 S., R. 3 E., Unsurveyed but when surveyed probably will be:
Sec. 33, NW¼NE¼.
Total area 40 acres.

Landslide Area

T. 11 S., R. 2 E.,
Sec. 35, Lots 1, 2, 3, 4, 5, 6, 7, 8, N½S½;
Sec. 36, Lots 5, 6, 7, 8, 9, 10, 11, 12, NW¼SW¼, SE¼SE¼.
T. 12 S., R. 2 E.,
Sec. 1, Lots 1, 2, 3, 4, S½N½.
Total area 900.56 acres.

West Fork Beaver Creek Campground

T. 11 S., R. 3 E.,
Sec. 4, S½NE¼, N½SE¼.
Total area 160 acres.

Red Canyon Campground and Fault Area

T. 11 S., R. 4 E.,
Sec. 26, All.
Total area 640 acres.

Cabin Creek-Hebgen Lake Faults and Beaver Creek Campground Administrative and Public Service Area

T. 11 S., R. 3 E.,
Sec. 13, S½;
Sec. 14, S½;
Sec. 15, Lots 1, 2, 3, 4, 5, N½S½, SW¼SW¼;
Sec. 20, SE¼;
Sec. 21, All;
Sec. 22, Lots 1, 3, 4, 5, 6, 8, 9, 10, 11, SW¼SW¼;
Sec. 23, Lots 1, 3, 4, 7, NE¼, E½SE¼, NW¼SE¼, NE¼NW¼;
Sec. 24, All;
Sec. 25, Lots 1, 2, 3, 4, 5, 7, N½N½;
Sec. 26, Lots 1 and 2;
Sec. 27, Lot 3;
Sec. 28, Lots 1, 3, 5, 6;
Sec. 29, Lots 1, 4, 7, NE¼NE¼.
Total Area 3,664.88 acres.

The land described above contains an area of 5,405.44 acres.

GEORGE L. TURCOTT,
Acting State Director.

[F.R. Doc. 61-4325; Filed, May 10, 1961; 8:46 a.m.]

SOUTH DAKOTA

Notice of Proposed Withdrawal and Reservation of Lands

MAY 3, 1961.

The National Park Service has filed an application, Serial Number M-043423 (SD) for the withdrawal of the lands described below, from all forms of appropriation under the public land laws including the general mining laws and the mineral leasing laws, subject to valid existing rights.

The applicant desires the land for protection of extensive caverns and underground passages originating within the Jewel Cave National Monument.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 1245 North 29th Street, Billings, Montana.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

The lands involved in the application are:

BLACK HILLS MERIDIAN, SOUTH DAKOTA

T. 3 S., R. 2 E.,
Sec. 36: S½.
T. 4 S., R. 2 E.,
Sec. 1: All; Sec. 2: SE¼.

The land described above contains an area of 1,119.84 acres.

GEORGE L. TURCOTT,
Acting State Director.

[F.R. Doc. 61-4324; Filed, May 10, 1961; 8:46 a.m.]

SOUTH DAKOTA

Notice of Proposed Withdrawal and Reservation of Lands

MAY 3, 1961.

The South Dakota National Guard has filed an application, Serial Number M-034355(SD) for the withdrawal of the lands described below, from all forms of appropriation including the general mining laws but not the mineral leasing laws, subject to valid existing rights.

The applicant desires the land for a field training site and emergency assembly area for combat engineers.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 1245 North 29th Street, Billings, Montana.

If circumstances warrant it, a public hearing will be held at a convenient time and place which will be announced.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

The lands involved in the application are:

BLACK HILLS MERIDIAN, SOUTH DAKOTA

T. 5 N., R. 5 E.,
Sec. 1: Lots 2, 3, 4;
Sec. 2: Lots 1, 2, 3, 4, 5, 6, 7, S½N½, W½SW¼;
Sec. 3: Lots 1, 8, 9, 10.
T. 6 N., R. 5 E.,
Sec. 26: Lots 5, 6, 7, 8, S½;
Sec. 27: Lots 4, 5, and 6;
Sec. 34: Lots 5, 6, 7, and 8;
Sec. 35: All;
Sec. 36: Lots 5, 6, 7, 8, W½.

Total acres 2,113.13.

GEORGE L. TURCOTT,
Acting State Director.

[F.R. Doc. 61-4326; Filed, May 10, 1961; 8:47 a.m.]

Fish and Wildlife Service

BUREAU OF COMMERCIAL FISHERIES

Delegations of Authority

The regulations issued herein are based on the authority of the Director, Bureau of Commercial Fisheries, to issue such regulations. The requirements herein set forth apply as a portion of the directives system of the Bureau of Commercial Fisheries. Such material follows the format of the Bureau's manual, and is to be included therein. Material that relates solely to internal management has not been included.

SERIES 2000—ADMINISTRATION

TITLE 2500—PROPERTY UTILIZATION

Chapter 2510—Delegations of Authority

2511.2 *General delegation.* The Assistant Director, Chief, Division of Administration, and Chief, Branch of Property Management, of the Washington Office, and Regional and Area Directors, and such others as are specified in this delegation are severally authorized, unless specifically excepted to the extent stated in each case, to exercise the authority of the Director with respect to administrative matters listed herein.

A. *Disaster assistance.* Authorize and be responsible for the utilization of materials, supplies, and equipment which are available so as to provide the maximum assistance in major disasters upon the request and authorization of the Office of Civil and Defense Mobilization. (205DM4).

B. *Evacuation of employees' families.* Designate or approve the zones from which the immediate families of civilian employees should be evacuated for military or other causes, which create imminent danger to life or property, or adverse living conditions seriously affecting the health, safety, or accommodations of such families; and the payment of travel and transportation expenses to locations designated by the said employees or, if such be impossible or impracticable, to locations designated by their immediate families, pursuant to subsection (d) of section 1 of the Act of August 2, 1946, as amended (5 U.S.C. 73b-1d), (Secretary's Order No. 2634, dated May 17, 1951): *Provided,* That no evacuation shall be authorized or approved for military purposes without orders from the military authorities in charge of the area or place where the families are living; *Provided further,* That no evacuation shall be authorized or approved for non-military purposes unless such action is fully justified by the circumstances including, but not limited to, fires, floods, epidemics, earthquakes, or circumstances considered acts of God.

C. *Excess personal property.* Exercise the authority of the Director to dispose and/or transfer personal property excess to the needs of the Department of the Interior, including the donation and execution of transfers and deliveries of donable property, in accordance with the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 471 et seq.) and regulations issued thereunder by the Administrator of General Services. (Secretary's Order No. 2642, dated June 19, 1951, and Secretary's Order No. 2830, dated September 8, 1958.)

D. *Scientific research equipment.* (1) Exercise the authority of the Director to vest title to equipment purchased with funds provided in a contract for basic or applied research to nonprofit institutions of higher education or nonprofit organizations whose primary purpose is the conduct of scientific research; (2) exercise the same authority for equipment purchased with funds provided in a grant for basic research to nonprofit institutions of higher education or nonprofit organizations whose primary purpose is the conduct of scientific research. (42 U.S.C. 1892; 205 DM 9.1; and 418 DM 4).

E. *Excess real property improvements.* Dispose of real property improvements, except industrial improvements, having a fair market value of $1,000 or less located on government-owned land or on land leased to the Government, which government-owned land or leasehold interest is not excess and is not expected to become excess, pursuant to regulations of the Administrator of the General Services. (Secretary's Order No. 2830, dated September 8, 1958.)

F. *Quarters, subsistence, and services.* Require employees to occupy Government quarters, in accordance with 5 U.S.C. 75a-1 and 424 DM 3.2. (205 DM 10.1.) Fix rates to be charged for all quarters, subsistence, and services furnished to Bureau employees, to other Government employees, or to non-government employees.

G. *Records inspection.* Make determinations with respect to the availability of official records for inspection or copying as authorized by Part 2, Title 43, Code of Federal Regulations: *Provided,* That inspection or copying of records shall be denied in all cases when it is determined that the disclosure would be prejudicial to the interests of the Government and when the person making the request is not properly and directly concerned with the subject matter.

H. *Issuance of permits.* The Assistant Director, Chief, Division of Administration, Chief, Division of Resource Development, and the Regional Director, Region 1, may issue permits to Federal or State organizations, common carriers and individuals for landing and remaining on the Pribilof Islands and to individuals to kill, capture, transport, import, offer for sale, or possess fur seals or fur seal skins in accordance with the Fur Seal Act of February 26, 1944 (58 Stat. 100, 16 U.S.C. secs. 631, et seq.).

2511.3 *Redelegation.* A. With the exception of the authority included in section 2511.2C, General Delegation, Excess Personal Property, section 2511.2G, General Delegation, Records Inspection, and 2511.2H, General Delegation, Issuance of permits, the foregoing authorities may not be redelegated.

B. The authority granted in section 2511.2C—Excess Personal Property, may be redelegated to:

1. *Regional Offices.* Assistant Regional Directors, Chiefs, Division of Administrative Services and Property Management Officers.

2. *Other Offices.* Chief and Assistant Chief, Division of Administrative Services, Hawaii Area; and Administrative Officer, California Area.

C. The authority granted in section 2511.2G—Records Inspection, may be redelegated to:

1. *Regional Offices.* Assistant Regional Directors, Chiefs, Division of Administrative Services and Property Management Officers.

2. *Other Offices.* Chief and Assistant Chief, Division of Administrative Services, Hawaii Area; Administrative Officer, California Area; and all Station Chiefs.

D. The authority granted in section 2511.2H—Issuances of Permits, may be redelegated to the Assistant Regional Director, the Chief Division of Administrative Services and the Program Director, Marine Mammal Resources, Region 1.

2511.4 *Limitations.* The foregoing authorizations shall be exercised in strict conformity with applicable regulations, statutory requirements, policies, and administrative procedures and subject to the availability of funds.

2511.5 *Revocation.* All prior delegations and redelegations of authorities of the types contained herein are hereby revoked. (Commissioner's Order No. 3 (22 F.R. 8126).)

DONALD L. MCKERNAN,
Director.

MAY 8, 1961.

[F.R. Doc. 61-4343; Filed, May 10, 1961; 8:48 a.m.]

CIVIL AERONAUTICS BOARD

[Docket 12367]

ALL NIPPON AIRWAYS CO., LTD.

Notice of Prehearing Conference

Notice is hereby given that a prehearing conference is assigned to be held on the above-entitled application on May 16, 1961, at 10:00 a.m., e.d.s.t., in Room 701, Universal Building, Connecticut and Florida Avenues NW., Washington, D.C., before Examiner Franklin M. Stone.

Dated at Washington, D.C., May 8, 1961.

[SEAL] FRANCIS W. BROWN,
Chief Examiner.

[F.R. Doc. 61-4346; Filed, May 10, 1961; 8:48 a.m.]

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

43 CFR Public Land Order

[MT-930-00-4214-10; SDM 76798]

Withdrawal of National Forest System Lands Near Jewel Cave National Monument; South Dakota

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order withdraws 2,387.22 acres of National Forest System lands from mining for 20 years for the protection of the unique cave resources in the area surrounding Jewel Cave National Monument. The lands have been and remain open to such other forms of disposition as may by law be made of National Forest System lands and to mineral leasing.

EFFECTIVE DATE: May 18, 1990.

FOR FURTHER INFORMATION CONTACT: James Binando, BLM Montana State Office, P.O. Box 36800, Billings, Montana 59107, 406-255-2935.

By virtue of the authority vested in the Secretary of the Interior by Section 204 of the Federal Land Policy and Mangement Act of 1976, 90 Stat. 2751; 43 U.S.C. 1714, it is ordered as follows:

1. Subject to valid existing rights, the following described National Forest System lands are hereby withdrawn from location and entry under the mining laws (30 U.S.C., ch. 2), but not from leasing under the mineral leasing laws, to provide additional protection to cave resources surrounding Jewel Cave National Monument:

Black Hills Meridian

Black Hills National Forest

T. 3 S., R. 2 E.,
Sec. 34, S½S½.
T. 4 S., R. 2 E.,
Sec. 2, lot 4, SW¼NW¼, SW¼ excluding that portion of the NE¼NE¼SW¼ east of U.S. Highway 16, and those portions of lot 3, SW¼NE¼, and SE¼NW¼ west of U.S. Highway 16;
Sec. 3, lots to 1 to 4, inclusive, S½N½, and S½;
Sec. 10, N½;
Sec. 11, N½;
Sec. 12, S½N½.
T. 4 S., R 3 E.,
Sec. 6, lots 6 and 7, E½SW¼, and W½ SE¼;
Sec. 7, lots 1 and 2, W½NE¼, and E½ NW¼.

The areas described aggregate 2,387.22 acres, more or less, in Custer County.

2. The withdrawal made by this order does not alter the applicability of those public land laws governing the use of the lands under lease, license, or permit, or governing the disposal of their mineral or vegetative resources other than under the mining laws.

3. This withdrawal will expire 20 years from the effective date of this order unless, as a result of a review conducted before the expiration date pursuant to section 204(f) of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714(f), the Secretary determines that the withdrawal shall be extended.

Dated: May 16, 1990.

Dave O'Neal,

Assistant Secretary of the Interior.

[FR Doc. 90-11813 Filed 5-17-90; 11:06 am]

BILLING CODE 4310-DN-M

Dated: January 22, 2008.

Carl J. Artman,

Assistant Secretary—Indian Affairs.

[FR Doc. E8–8334 Filed 4–17–08; 8:45 am]

BILLING CODE 4310–W7–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NM–030–1220–NLCS]

Emergency Closure to Unpermitted Collection of Petrified Wood and Plant Fossils in the Robledo Mountains on Federal Land, Dona Ana County, NM.

AGENCY: Bureau of Land Management (BLM), Interior.

ACTION: Notice.

SUMMARY: Notice is hereby given that certain public land located in the southern Robledo Mountains, Dona Ana County, New Mexico, is subject to an emergency closure to unpermitted collection (free use) of fossilized wood and plant fossils. This closure is necessary in order to prevent further adverse impacts to paleontological resources in the area while the formal conservation status of the region is under determination. Closure will remain in effect for 2 years and may be renewed upon the completion of the Tri-County Resource Management Plan. Closure signs will be posted at main entry points to this area. Maps of the closure area, as well as documents associated with environmental review of this closure may be obtained at the Las Cruces District Office.

DATES: This closure is effective upon publication in the **Federal Register**, and will remain in effect for two years from April 18, 2008. This closure may be renewed upon the completion of the Tri-County Resource Management Plan.

FOR FURTHER INFORMATION CONTACT: Tim Sanders, Assistant District Manager, Multi-Resources, 1800 Marquess Street, Las Cruces, New Mexico 88005, Telephone (575) 525–4393.

SUPPLEMENTARY INFORMATION: The area has been proposed as an Area of Critical Environmental Concern and also is under Congressional consideration for National Monument status. A management plan to address the long-term management of paleontological resources would be initiated upon designation. Resource damage has already taken place and the potential for additional adverse effects occurring as a result of unrestricted collection within this area is substantial and significant. The authorities for this closure may be found at 43 CFR Subpart 3622, and 43 CFR Subpart 8364. This order applies to all forms of collection of fossilized plant and petrified wood materials; all unpermitted collection or free use of fossilized plant and petrified wood materials in the location identified in this closure order is prohibited.

On all public land, under section 303(a) of the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. 1733(a), 43 CFR 8360.0–7, and 43 CFR 9262.1, any person who violates any closures or restriction on public land as announced in this order may be tried before a United States Magistrate and fined no more than $1,000.00 or imprisoned for no more that 12 months, or both. Such violations may also be subject to enhanced fines provided for by 18 U.S.C. 3571 (not to exceed $100,000.00 and/or imprisonment not to exceed 12 months).

The public land affected by the closure order is located northwest of Las Cruces, New Mexico, and west of Interstate–25, in Dona Ana County, New Mexico and is described as follows:

New Mexico Principal Meridian

T., 22 S., R. 1 W.,
Section 24
Section 25 and
Portions of Sections 13, 14, 15, 22, 23, 26, 35, 36.
T. 22 S., R. 1 E.,
Portions of Sections 19, 30, 31.

The area described contains approximately 5,240 acres, more or less, of the Robledo Mountain Range. Maps of the land affected by this closure, as well as documents associated with environmental review of the closure are available in the Las Cruces District Office, 1800 Marquess Street, Las Cruces, New Mexico. The area affected by this order will be posted with appropriate signs announcing this closure.

Authority: 43 CFR 3622.3(a), and 43 CFR 8364.1.

Bill Childress,

District Manager, Las Cruces.

[FR Doc. E8–8384 Filed 4–17–08; 8:45 am]

BILLING CODE 4310–FB–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[MT–924–1430–FQ; SDM 034316]

Public Land Order No. 7702; Partial Revocation of Public Land Order No. 1446; South Dakota

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order revokes a Public Land Order insofar as it affects 20 acres of public land within the Black Hills National Forest withdrawn from surface entry and mining and reserved for use of the Forest Service as the Pactola Administrative Site. The land is no longer needed for administrative purposes. This order opens the land for sale.

EFFECTIVE DATE: May 19, 2008.

FOR FURTHER INFORMATION CONTACT: Sandra Ward, BLM Montana State Office, 5001 Southgate Drive, Billings, Montana 59101–4669, 406–896–5052.

SUPPLEMENTARY INFORMATION: The revocation is needed to facilitate a Forest Service land sale conducted in accordance with Public Laws 106–329 and 109–54.

Order

By virtue of the authority vested in the Secretary of the Interior by Section 204 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714 (2000), it is ordered as follows:

1. Public Land Order No. 1446 (22 FR 5873 (1957)), which withdrew public land from surface entry and mining and reserved it for use of the Forest Service as the Pactola Administrative Site, is hereby revoked insofar as it affects the following described land:

Black Hills Meridian

Black Hills National Forest

T. 2 N., R. 5 E.,
Sec. 26, E½NE¼SE¼.

The area described contains 20 acres in Pennington County.

2. The above-described land is hereby made available for sale in accordance with Public Law 106–329 and Public Law 109–54.

Authority: 43 CFR 2370.

Dated: April 3, 2008.

C. Stephen Allred,

Assistant Secretary—Land and Minerals Management.

[FR Doc. E8–8409 Filed 4–17–08; 8:45 am]

BILLING CODE 3419–11–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[SDM 94312]

Public Land Order No. 7705; Withdrawal of National Forest System Land To Preserve Cave Resources Adjacent to Jewel Cave National Monument; South Dakota

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order withdraws 4,595.78 acres of National Forest System

land from mining for a period of 20 years to preserve unique cave resources adjacent to Jewel Cave National Monument. The land has been and will remain open to such forms of disposition as may by law be made of National Forest System land and to mineral leasing.

EFFECTIVE DATE: April 18, 2008.

FOR FURTHER INFORMATION CONTACT: Valerie Hunt, U.S. Forest Service, Rocky Mountain Region, 303–275–5122 or Sandra Ward, BLM Montana State Office, 5001 Southgate Drive, Billings, Montana 59101–4669, 406–896–5052.

SUPPLEMENTARY INFORMATION: Geological formations nearby indicate that continued exploration may result in discovery of additional passageways and caverns beyond the known extent of Jewel Cave. This order protects the passageway and caverns extending beyond the exterior boundaries of the Jewel Cave National Monument.

Order

By virtue of the authority vested in the Secretary of the Interior by Section 204 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714 (2000), it is ordered as follows:

1. Subject to valid existing rights, the following described National Forest System land is hereby withdrawn from settlement, sale, location or entry under the United States mining laws (30 U.S.C. Ch. 2 (2000)), to preserve unique cave resources adjacent to the Jewel Cave National Monument:

Black Hills National Forest

Black Hills Meridian

T. 4 S., R. 2 E.,
Sec. 12, E½SW¼ and SE¼;
Sec. 13, E½ and E½NW¼.
T. 4 S., R. 3 E.,
Sec. 5, lot 6 and lots 10 to 16, inclusive;
Sec. 6, lots 1 to 5, inclusive, S½NE¼, SE¼NW¼, and E½SE¼;
Sec. 7, lots 3 and 4, E½NE¼, E½SW¼, and SE¼;
Sec. 8, lots 1 to 16, inclusive;
Sec. 9, lots 4 to 8, inclusive, and lots 11 to 14, inclusive;
Sec. 16, lots 4, 5, 8, and 9, NW¼NW¼ and SE¼SW¼;
Sec. 17, lots 1 to 14, inclusive;
Sec. 18, lots 1 to 4, inclusive, E½, and E½W½;
Sec. 19, lots 1 and 2, NE¼, and E½NW¼;
Sec. 20, lots 1 to 9, inclusive, S½NE¼, SW¼NW¼, NW¼SW¼, S½SW¼, and N½SE¼;
Sec. 21, lots 1 to 9 inclusive, and NW¼SW¼.

The area described contains 4,595.78 acres in Custer County.

3. The withdrawal made by this order does not alter the applicability of those public land laws governing the use of National Forest System land under lease, license, or permit, or governing the disposal of their mineral or vegetative resources other than under the mining laws.

4. This withdrawal will expire 20 years from the effective date of this order unless, as a result of a review conducted before the expiration date pursuant to Section 204(f) of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714(f) (2000), the Secretary determines that the withdrawal shall be extended.

Authority: 43 CFR 2310.3–3.

Dated: April 7, 2008.

C. Stephen Allred,

Assistant Secretary—Land and Minerals Management.

[FR Doc. E8–8410 Filed 4–17–08; 8:45 am]

BILLING CODE 3410–11–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[CO–923–1430–ET; COC–69155]

Public Land Order No. 7700; Transfer of Public Land for the Maybell West Uranium Repository; Colorado

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order permanently transfers 160 acres of public land to the Department of Energy for its Maybell West Uranium Repository, in accordance with the terms of the Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95–604), as amended.

EFFECTIVE DATE: April 18, 2008.

FOR FURTHER INFORMATION CONTACT: Andy Senti, BLM Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215–7093, 303–239–3713.

SUPPLEMENTARY INFORMATION: The Umetco Maybell Uranium Mill Site has been stabilized and the Department of Energy plans to convert the site to a uranium mill tailings repository. Under Public Law 95–604, the Department of Energy is legally obligated to become the long-term custodian of the stabilized Umetco Maybell Uranium Mill Site. The long-term custodial responsibility is perpetual and is administered by the DOE under a Nuclear Regulatory Commission license. The land must be transferred in order for the Department of Energy to execute its responsibilities under Public Law 95–604.

Order

By virtue of the authority vested in the Secretary of the Interior by the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. 7916 (2000)), as amended, it is ordered as follows:

1. Subject to valid existing right, the following described public land is hereby permanently transferred to the Department of Energy, and as a result of this transfer, the land is no longer subject to the operation of the general land laws, including the mining and mineral leasing laws, for the Maybell West Uranium Repository:

Sixth Principal Meridian

T. 7 N., R. 95 W.,
Sec. 24, S½NW¼ and N½SW¼.

The area described contains 160 acres in Moffat County.

2. The transfer of the above-described land to the Department of Energy vests in that Department, full management, jurisdiction, responsibility, and liability for such land and all activities conducted thereon, except as provided in Paragraph 3.

3. The Secretary of the Interior shall retain the authority to administer any existing claims, rights, and interests in this land that were established before the effective date of the transfer.

Dated: March 27, 2008.

C. Stephen Allred,

Assistant Secretary—Land and Minerals Management.

[FR Doc. E8–8418 Filed 4–17–08; 8:45 am]

BILLING CODE 4310–JB–P

DEPARTMENT OF THE INTERIOR

Minerals Management Service

[Docket No. MMS–2008–OMM–0020]

Notice of Nominations Received and Proposed Limited Alternative Energy Leases on the Outer Continental Shelf (OCS) and Initiation of Coordination and Consultation

AGENCY: Minerals Management Service (MMS), Interior.

ACTION: Announcement of nominations and processing priorities, inquiry on competing nominations for proposed limited alternative energy leases, and request for comments from interested and affected parties.

SUMMARY: On November 6, 2007, the Minerals Management Service (MMS) published in the **Federal Register** (72 FR 214, pp. 62673–62675) a request for information and nominations of areas for leases authorizing alternative energy

Education, Office of the Director, Washington, DC 20240, (202) 208–5810.

SUPPLEMENTARY INFORMATION:

A. Background

In 2013, Secretary of the Interior and Secretary of Education convened an American Indian Education Study Group (Study Group) to diagnose the systemic challenges facing the Bureau of Indian Education (BIE) and to propose a comprehensive plan for reform to ensure all students attending BIE-funded schools receive a world-class education. The Study Group drafted a framework for reform based on several listening sessions in the fall of 2013 with tribal leaders, Indian educators and others throughout Indian Country on how to facilitate tribal sovereignty in American Indian education and how to improve educational outcomes for students at BIE-funded schools. Overall, the Study Group met with nearly 400 individuals and received nearly 200 comments that helped it prepare the draft framework for educational reform that became the subject of four tribal consultation sessions held in April and May of 2014. These efforts resulted in ''Findings and Recommendations Prepared by the Bureau of Indian Education Study Group, dated June 27, 2014'' (*Blueprint for Reform*).

Acting on the recommendations in the *Blueprint*, BIE will award enhancement funds to tribes and their tribal education agencies to promote tribal control and operation of BIE-funded schools on their Indian reservations. The purpose of these funds is to support the tribe's capacity to manage and operate tribally controlled schools as defined in the Tribally Controlled Schools Act of 1988 (Pub. L. 100–297). These funds will (a) support development of a school-reform plan to improve educational outcomes for students and (b) improve efficiencies and effectiveness in the operation of BIE-funded schools within a reservation.

Enhancement funding will range from $100,000 to $200,000 per fiscal year depending on the number of schools involved, number of students, complexity of creating a new tribally managed school system and the tribe's technical approach. These funds will provide funds for the tribe to:

- Research and develop an alternative definition of adequate yearly progress (AYP);
- Develop an implementation plan that will reform a tribe's current organizational structure towards an expert and independent tribal education agency that will support schools and students; and
- Cover the execution of the implementation plan with identified staffing, projected timelines, proposed budgets, and activities.

BIE is seeking proposals from tribes that support efforts to take control and operate BIE-funded schools located on the tribe's reservation. Each proposal must include a project narrative, a budget narrative, a work plan outline, and a Project Director to manage the execution of the grant. The Project Directors will participate in monthly collaboration meetings, submit quarterly budget updates, ensure an annual report is submitted at the end of each project year, and ultimately ensure that the tribal education agency fulfills the obligations of the grant. Complete details on requirements for proposals and the evaluation and selection process can be found on the BIE Web site at the address in the **ADDRESSES** section of this notice. In addition, BIE will hold pre-grant proposal training as noted below:

BIE Pre-Grant Proposal Training

Date	Time	Location
Tuesday, September 1, 2015	4:00 p.m. Eastern Time	Webinar Session (Washington, DC): To register, go to: *https://dcma100.webex.com/dcma100/k2/j.php?MTID=t000e99c4e0d9f65d3114d32015e04a74*
Thursday, September 8, 2015	11:00 a.m. Eastern Time	Webinar Session (Washington, DC) To register, got to: *https://dcma100.webex.com/dcma100/k2/j.php?MTID=tf2b8f596b10eb0d91240198a49afcf89*
Monday, September 21, 2015	4:00 p.m. Eastern Time	Deadline for grant proposal submission.

The grant proposal is due *September 21, 2015, at 4:00 p.m. Eastern Time.* The proposal should be packaged for delivery to permit timely arrival. The proposal package should be sent or hand delivered address in the **ADDRESSES** section of this notice.

Fax applications will NOT be accepted. Email submissions will be accepted at the address in the **ADDRESSES** section of this notice. Email submissions are limited to attachments compatible with Microsoft Office Word 2007 or later or files with a .pdf file extension. Emailed submissions shall not exceed 3MB total in size.

Proposals submitted by Federal Express or Express Mail should be sent two or more days prior to the closing date. The proposal package should be sent to the address shown in the **ADDRESSES** section of this notice. The tribe is solely responsible for ensuring its proposal arrives in a timely manner.

Dated: August 24, 2015.

Kevin K. Washburn,

Assistant Secretary—Indian Affairs.

[FR Doc. 2015–21338 Filed 8–27–15; 8:45 am]

BILLING CODE 4337–15–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[SDM 100347]

Public Land Order No. 7838; Withdrawal of National Forest System Land Adjacent to Jewel Cave National Monument; South Dakota

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order withdraws 2,387.22 acres of National Forest System land from location and entry under the United States mining laws for a period of 20 years on behalf of the United States Forest Service to protect the unique cave resources in the area adjacent to the Jewel Cave National Monument.

DATES: *Effective Date:* August 28, 2015.

FOR FURTHER INFORMATION CONTACT: Valerie Hunt, U.S. Forest Service, Region 2, 740 Simms Street, Golden, Colorado 80401, 303–275–5071, *vbhunt@fs.fed.us,* or Deborah Sorg, Bureau of Land Management, Montana State Office, 5001 Southgate Drive, Billings, Montana 59101, 406–896–5045, *dsorg@blm.gov.* Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339 to contact either of the above individuals. The FIRS is available 24 hours a day, 7 days a week, to leave a message or question with either of the

above individuals. You will receive a reply during normal business hours.

SUPPLEMENTARY INFORMATION: The United States Forest Service is managing the land to protect the significant cave ecosystems located within the Black Hills National Forest adjacent to Jewel Cave National Monument.

Order

By virtue of the authority vested in the Secretary of the Interior by Section 204 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714, it is ordered as follows:

1. Subject to valid existing rights, the following described National Forest System land is hereby withdrawn from location and entry under the United States mining laws, but not from leasing under the mineral leasing laws, to protect the unique cave resources in the land adjacent to Jewel Cave National Monument:

Black Hills National Forest

Black Hills Meridian

T. 3 S., R. 2 E.,
Sec. 34, S½SW¼ and S½SE¼.
T. 4 S., R. 2 E.,
Sec. 2, lot 4, SW¼NW¼, SW¼ excluding that portion of the NE¼NE¼SW¼ east of U.S. Highway 16, and those portions of lot 3, SW¼NE¼, and SE¼NW¼ west of U.S. Highway 16;
Sec. 3, lots 1 to 4, inclusive, S½NE¼, S½NW¼, and S½;
Sec. 10, N½;
Sec. 11, N½;
Sec. 12, S½NE¼ and S½NW¼.
T. 4 S., R. 3 E.,
Sec. 6, lots 6 and 7, E½SW¼, and W½SE¼;
Sec. 7, lots 1 and 2, W½NE¼, and E½NW¼.

The area described contains 2,387.22 acres in Custer County.

2. The withdrawal made by this order does not alter the applicability of the public land laws other than the mining laws.

3. This withdrawal will expire 20 years from the effective date of this order, unless, as a result of a review conducted before the expiration date pursuant to Section 204(f) of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714(f), the Secretary determines that the withdrawal shall be extended.

Dated: August 8, 2015.

Janice M. Schneider,

Assistant Secretary, Land and Minerals Management.

[FR Doc. 2015–21327 Filed 8–27–15; 8:45 am]

BILLING CODE 3411–15–P

DEPARTMENT OF THE INTERIOR

National Park Service

[NPS–WASO–NRNHL–19066; PPWOCRADI0, PCU00RP14.R50000]

National Register of Historic Places; Notification of Pending Nominations and Related Actions

Nominations for the following properties being considered for listing or related actions in the National Register were received by the National Park Service before August 8, 2015. Pursuant to section 60.13 of 36 CFR part 60, written comments are being accepted concerning the significance of the nominated properties under the National Register criteria for evaluation. Comments may be forwarded by United States Postal Service, to the National Register of Historic Places, National Park Service, 1849 C St. NW., MS 2280, Washington, DC 20240; by all other carriers, National Register of Historic Places, National Park Service,1201 Eye St. NW., 8th floor, Washington, DC 20005; or by fax, 202–371–6447. Written or faxed comments should be submitted by September 14, 2015. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: August 13, 2015.

J. Paul Loether,

Chief, National Register of Historic Places/ National Historic Landmarks Program.

COLORADO

El Paso County

Old North End Historic District (Boundary Increase), Bounded by Monument Valley Park, alley between Nevada Ave. & Weber St., Lilac, & Uintah Sts.,Colorado Springs, 15000585

CONNECTICUT

New Haven County

United States Post Office and Court House, 145 Church St.,New Haven, 15000586

FLORIDA

Alachua County

Weil—Cassisi House, (Sarasota School of Architecture MPS)3105 SW. 5th Ct., Gainesville, 15000587

Palm Beach County

Royal Poinciana Way Historic District, Bounded by 207–283 Royal Poinciana Way, 95–118 N. Cty. Rd. 184–280, Palm Beach, 15000588

GEORGIA

Troup County

Riverside Club—Magnolia Club, 802 1st Ave.,West Point, 15000589

ILLINOIS

McLean County

Van Dolah, David Hyatt, House, 10 N. Spencer St.,Lexington, 15000590

INDIANA

Boone County

Ulen Historic District, (Historic Residential Suburbs in the United States, 1830–1960 MPS) Roughly Ulen Country Club & Golf Course & houses along Ulen Blvd. & East Dr., Ulen, 15000591

Carroll County

Delphi Methodist Episcopal Church,118 N. Union St., Delphi, 15000592

Fountain County

Covington Courthouse Square Historic District,Roughly bounded by 3rd St. & alleys N. of Washington, E. of 4th & S. of Liberty Sts., Covington, 15000593
Covington Residential Historic District, Roughly bounded by Pearl, Liberty, 4th & 7th Sts., Covington, 15000594

Hancock County

Browne—Rafert House, 534 N. Merrill St., Fortville, 15000595

Madison County

Lauter, H., Company Complex,35–101 S. Harding St., Indianapolis, 15000596

Noble County

Cromwell Historic District,Jefferson between 2nd & Orange Sts.,Cromwell, 15000597

Putnam County

Forest Hill Cemetery, 2181 S. Cty. Rd. 50 W.,Greencastle, 15000598

Tippecanoe County

Archeological Sites 12T59 and 12T530,Address Restricted, West Lafayette, 15000599

Wabash County

Hopewell Methodist Episcopal Church and Cemetery, 5031 E. 300 N.,Urbana, 15000600

Warren County

Van Reed Farmstead, 5322 Old US 41,Williamsport, 15000601

Wayne County

Richmond High School, 380 Hub Etchison Pkwy.,Richmond, 15000602

MARYLAND

Baltimore Independent city

Auchentoroly Terrace Historic District,Roughly bounded by Auchentoroly Terrace, Reisterstown Rd., Liberty Heights & Fulton Aves., Baltimore (Independent City), 15000604

Appendix C: Legislation Pertaining to Cave Resource Management

Public Law 100-691
100th Congress

An Act

Nov. 18, 1988
[H.R. 1975]

To protect cave resources on Federal lands, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Federal Cave Resources Protection Act of 1988.
Minerals and mining.
Conservation.
16 USC 4301 note.

SECTION 1. SHORT TITLE.

This Act may be referred to as the "Federal Cave Resources Protection Act of 1988".

16 USC 4301.

SEC. 2. FINDINGS, PURPOSES, AND POLICY.

(a) FINDINGS.—The Congress finds and declares that—

(1) significant caves on Federal lands are an invaluable and irreplaceable part of the Nation's natural heritage; and

(2) in some instances, these significant caves are threatened due to improper use, increased recreational demand, urban spread, and a lack of specific statutory protection.

(b) PURPOSES.—The purposes of this Act are—

(1) to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and

(2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes.

(c) POLICY.—It is the policy of the United States that Federal lands be managed in a manner which protects and maintains, to the extent practical, significant caves.

16 USC 4302.

SEC. 3. DEFINITIONS.

For purposes of this Act:

(1) CAVE.—The term "cave" means any naturally occurring void, cavity, recess, or system of interconnected passages which occurs beneath the surface of the earth or within a cliff or ledge (including any cave resource therein, but not including any vug, mine, tunnel, aqueduct, or other manmade excavation) and which is large enough to permit an individual to enter, whether or not the entrance is naturally formed or manmade. Such term shall include any natural pit, sinkhole, or other feature which is an extension of the entrance.

(2) FEDERAL LANDS.—The term "Federal lands" means lands the fee title to which is owned by the United States and administered by the Secretary of Agriculture or the Secretary of the Interior.

(3) INDIAN LANDS.—The term "Indian lands" means lands of Indian tribes or Indian individuals which are either held in trust by the United States for the benefit of an Indian tribe or subject to a restriction against alienation imposed by the United States.

(4) INDIAN TRIBE.—The term "Indian tribe" means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native village or regional or village corporation as defined in, or established pursuant to, the Alaska Native Claims settlement Act (43 U.S.C. 1601 et seq.).

(5) CAVE RESOURCE.—The term "cave resource" includes any material or substance occurring naturally in caves on Federal lands, such as animal life, plant life, paleontological deposits, sediments, minerals, speleogens, and speleothems.

(6) SECRETARY.—The term "Secretary" means the Secretary of Agriculture or the Secretary of the Interior, as appropriate.

(7) SPELEOTHEM.—The term "speleothem" means any natural mineral formation or deposit occurring in a cave or lava tube, including but not limited to any stalactite, stalagmite, helictite, cave flower, flowstone, concretion, drapery, rimstone, or formation of clay or mud.

(8) SPELEOGEN.—The term "speleogen" means relief features on the walls, ceiling, and floor of any cave or lava tube which are part of the surrounding bedrock, including but not limited to anastomoses, scallops, meander niches, petromorphs and rock pendants in solution caves and similar features unique to volcanic caves.

SEC. 4. MANAGEMENT ACTIONS. 16 USC 4303.

(a) REGULATIONS.—Not later than nine months after the date of the enactment of this Act, the Secretary shall issue such regulations as he deems necessary to achieve the purposes of this Act. Regulations shall include, but not be limited to, criteria for the identification of significant caves. The Secretaries shall cooperate and consult with one another in preparation of the regulations. To the extent practical, regulations promulgated by the respective Secretaries should be similar.

(b) IN GENERAL.—The Secretary shall take such actions as may be necessary to further the purposes of this Act. Those actions shall include (but need not be limited to)—

(1) identification of significant caves on Federal lands:

(A) The Secretary shall prepare an initial list of significant caves for lands under his jurisdiction not later than one year after the publication of final regulations using the significance criteria defined in such regulations. Such a list shall be developed after consultation with appropriate private sector interests, including cavers. Records.

(B) The initial list of significant caves shall be updated periodically, after consultation with appropriate private sector interests, including cavers. The Secretary shall prescribe by policy or regulation the requirements and process by which the initial list will be updated, including management measures to assure that caves under consideration for the list are protected during the period of consideration. Each cave recommended to the Secretary by interested groups for possible inclusion on the list of significant caves shall be considered by the Secretary according to the requirements prescribed pursuant to this paragraph, and shall be added to the list if the Secretary determines that the cave meets the criteria for significance as defined by the regulations. Regulations.

(2) regulation or restriction of use of significant caves, as appropriate;

Contracts.

(3) entering into volunteer management agreements with persons of the scientific and recreational caving community; and

(4) appointment of appropriate advisory committees.

(c) PLANNING AND PUBLIC PARTICIPATION.—The Secretary shall—

(1) ensure that significant caves are considered in the preparation or implementation of any land management plan if the preparation or revision of the plan began after the enactment of this Act; and

(2) foster communication, cooperation, and exchange of information between land managers, those who utilize caves, and the public.

16 USC 4304.

SEC. 5. COFIDENTIALITY OF INFORMATION CONCERNING NATURE AND LOCATION OF SIGNIFICANT CAVES.

(a) IN GENERAL.—Information concerning the specific location of any significant cave may not be made available to the public under section 552 of title 5, United States Code, unless the Secretary determines that disclosure of such information would further the purposes of this Act and would not create a substantial risk of harm, theft, or destruction of such cave.

State and local governments. Schools and colleges.

(b) EXCEPTIONS.—Notwithstanding subsection (a), the Secretary may make available information regarding significant caves upon the written request by Federal and State governmental agencies or bona fide educational and research institutions. Any such written request shall, at a minimum—

(1) describe the specific site or area for which information is sought;

(2) explain the purpose for which such information is sought; and

(3) include assurances satisfactory to the Secretary that adequate measures are being taken to protect the confidentiality of such information and to ensure the protection of the significant cave from destruction by vandalism and unauthorized use.

16 USC 4305.

SEC. 6. COLLECTION AND REMOVAL FROM FEDERAL CAVES.

(a) PERMIT.—The Secretary is authorized to issue permits for the collection and removal of cave resources under such terms and conditions as the Secretary may impose, including the posting of bonds to insure compliance with the provisions of any permit:

(1) Any permit issued pursuant to this section shall include information concerning the time, scope, location, and specific purpose of the proposed collection, removal or associated activity, and the manner in which such collection, removal, or associated activity is to be performed must be provided.

(2) The Secretary may issue a permit pursuant to this subsection only if he determines that the proposed collection or removal activities are consistent with the purposes of this Act, and with other applicable provisions of law.

(b) REVOCATION OF PERMIT.—Any permit issued under this section shall be revoked by the Secretary upon a determination by the Secretary that the permittee has violated any provision of this Act, or has failed to comply with any other condition upon which the permit was issued. Any such permit shall be revoked by the Secretary upon assessment of a civil penalty against the permittee

pursuant to section 8 or upon the permittee's conviction under section 7 of this Act. The Secretary may refuse to issue a permit under this section to any person who has violated any provision of this Act or who has failed to comply with any condition of a prior permit.

(c) TRANSFERABILITY OF PERMITS.—Permits issued under this Act are not transferable.

(d) CAVE RESOURCES LOCATED ON INDIAN LANDS.—(1)(A) Upon application by an Indian tribe, the Secretary is authorized to delegate to the tribe all authority of the Secretary under this section with respect to issuing and enforcing permits for the collection or removal of any cave resource, or to carrying out activities associated with such collection or removal, from any cave resource located on the affected Indian lands.

(B) In the case of any permit issued by the Secretary for the collection or removal of any cave resource, or to carry out activities associated with such collection or removal, from any cave resource located on Indian lands (other than permits issued pursuant to subparagraph (A)), the permit may be issued only after obtaining the consent of the Indian or Indian tribe owning or having jurisdiction over such lands. The permit shall include such reasonable terms and conditions as may be requested by such Indian or Indian tribe.

(2) If the Secretary determines that issuance of a permit pursuant to this section may result in harm to, or destruction of, any religious or cultural site, the Secretary, prior to issuing such permit, shall notify any Indian tribe which may consider the site as having significant religious or cultural importance. Such notice shall not be deemed a disclosure to the public for purposes of section 5. Religion.

(3) A permit shall not be required under this section for the collection or removal of any cave resource located on Indian lands or activities associated with such collection, by the Indian or Indian tribe owning or having jurisdiction over such lands.

(e) EFFECT OF PERMIT.—No action specifically authorized by a permit under this section shall be treated as a violation of section 7.

SEC. 7. PROHIBITED ACTS AND CRIMINAL PENALTIES. 16 USC 4306.

(a) PROHIBITED ACTS.—

(1) Any person who, without prior authorization from the Secretary knowingly destroys, disturbs, defaces, mars, alters, removes or harms any significant cave or alters the free movement of any animal or plant life into or out of any significant cave located on Federal lands, or enters a significant cave with the intention of committing any act described in this paragraph shall be punished in accordance with subsection (b). Animals. Plants.

(2) Any person who possesses, consumes, sells, barters or exchanges, or offers for sale, barter or exchange, any cave resource from a significant cave with knowledge or reason to know that such resource was removed from a significant cave located on Federal lands shall be punished in accordance with subsection (b).

(3) Any person who counsels, procures, solicits, or employs any other person to violate any provisions of this subsection shall be punished in accordance with section (b).

(4) Nothing in this section shall be deemed applicable to any person who was in lawful possession of a cave resource from a significant cave prior to the date of enactment of this Act.

(b) PUNISHMENT.—The punishment for violating any provision of subsection (a) shall be imprisonment of not more than one year or a fine in accordance with the applicable provisions of title 18 of the United States Code, or both. In the case of a second or subsequent violation, the punishment shall be imprisonment of not more than 3 years or a fine in accordance with the applicable provisions of title 18 of the United States Code, or both.

16 USC 4307.

SEC. 8. CIVIL PENALTIES.

(a) ASSESSMENT.—(1) The Secretary may issue an order assessing a civil penalty against any person who violates any prohibition contained in this Act, any regulation promulgated pursuant to this act, or any permit issued under this Act. Before issuing such an order, the Secretary shall provide such person written notice and the opportunity to request a hearing on the record within 30 days. Each violation shall be a separate offense, even if such violations occurred at the same time.

(2) The amount of such civil penalty shall be determined by the Secretary taking into account appropriate factors, including (A) the seriousness of the violation; (B) the economic benefit (if any) resulting from the violation; (C) any history of such violations; and (D) such other matters as the Secretary deems appropriate. The maximum fine permissible under this section is $10,000.

District of Columbia.

(b) JUDICIAL REVIEW.—Any person aggrieved by an assessment of a civil penalty under this section may file a petition for judicial review of such assessment with the United States District Court for the District of Columbia or for the district in which the violation occurred. Such a petition shall be filed within the 30-day period beginning on the date the order assessing the civil penalty was issued.

(c) COLLECTION.—If any person fails to pay an assessment of a civil penalty—

(1) within 30 days after the order was issued under subsection (a), or

(2) if the order is appealed within such 30-day period, within 10 days after court has entered a final judgment in favor of the Secretary under subsection (b),

the Secretary shall notify the Attorney General and the Attorney General shall bring a civil action in an appropriate United States district court to recover the amount of penalty assessed (plus costs, attorney's fees, and interest at currently prevailing rates from the date the order was issued or the date of such final judgment, as the case may be). In such an action, the validity, amount, and appropriateness of such penalty shall not be subject to review.

(d) SUBPOENAS.—The Secretary may issue subpoenas in connection with proceedings under this subsection compelling the attendance and testimony of witnesses and subpoenas duces tecum, and may request the Attorney General to bring an action to enforce any subpoena under this section. The district courts shall have jurisdiction to enforce such subpoenas and impose sanctions.

Courts, U.S.

16 USC 4308.

SEC. 9. MISCELLANEOUS PROVISIONS.

(a) AUTHORIZATION.—There are authorized to be appropriated $100,000 to carry out the purposes of this Act.

(b) EFFECT ON LAND MANAGEMENT PLANS.—Nothing in this Act shall require the amendment or revision of any land management

plan the preparation of which began prior to the enactment of this Act.

(c) FUND.—Any money collected by the United States as permit fees for collection and removal of cave resources; received by the United States as a result of the forfeiture of a bond or other security by a permittee who does not comply with the requirements of such permit issued under section 7; or collected by the United States by way of civil penalties or criminal fines for violations of this Act shall be placed in a special fund in the Treasury. Such moneys shall be available for obligation or expenditure (to the extent provided for in advance in appropriation Acts) as determined by the Secretary for the improved management, benefit, repair, or restoration of significant caves located on Federal lands.

(d) Nothing in this Act shall be deemed to affect the full operation of the mining and mineral leasing laws of the United States, or otherwise affect valid existing rights.

SEC. 10. SAVINGS PROVISIONS. 16 USC 4309.

(a) WATER.—Nothing in this Act shall be construed as authorizing the appropriation of water by any Federal, State, or local agency, Indian tribe, or any other entity or individual. Nor shall any provision of this Act—

(1) affect the rights or jurisdiction of the United States, the States, Indian tribes, or other entities over waters of any river or stream or over any ground water resource;

(2) alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by the States; or

(3) alter or establish the respective rights of States, the United States, Indian tribes, or any person with respect to any water or water-related right.

(b) FISH AND WILDLIFE.—Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the States with respect to fish and wildlife.

Approved November 18, 1988.

LEGISLATIVE HISTORY—H.R. 1975:

HOUSE REPORTS: No. 100-534 (Comm. on Interior and Insular Affairs).
SENATE REPORTS: No. 100-559 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 134 (1988):
Mar. 28, considered and passed House.
Oct. 21, considered and passed Senate, amended. House concurred in Senate amendment.

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

Public Law 105–325
105th Congress

An Act

Oct. 30, 1998
[S. 231]

To establish the National Cave and Karst Research Institute in the State of New Mexico, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

National Cave and Karst Research Institute Act of 1998.
16 USC 4310 note.

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Cave and Karst Research Institute Act of 1998".

SEC. 2. PURPOSES.

The purposes of this Act are—

(1) to further the science of speleology;

(2) to centralize and standardize speleological information;

(3) to foster interdisciplinary cooperation in cave and karst research programs;

(4) to promote public education;

(5) to promote national and international cooperation in protecting the environment for the benefit of cave and karst landforms; and

(6) to promote and develop environmentally sound and sustainable resource management practices.

SEC. 3. ESTABLISHMENT OF THE INSTITUTE.

(a) IN GENERAL.—The Secretary of the Interior (referred to in this Act as the "Secretary"), acting through the Director of the National Park Service, shall establish the National Cave and Karst Research Institute (referred to in this Act as the "Institute").

(b) PURPOSES.—The Institute shall, to the extent practicable, further the purposes of this Act.

(c) LOCATION.—The Institute shall be located in the vicinity of Carlsbad Caverns National Park, in the State of New Mexico. The Institute shall not be located inside the boundaries of Carlsbad Caverns National Park.

SEC. 4. ADMINISTRATION OF THE INSTITUTE.

(a) MANAGEMENT.—The Institute shall be jointly administered by the National Park Service and a public or private agency, organization, or institution, as determined by the Secretary.

(b) GUIDELINES.—The Institute shall be operated and managed in accordance with the study prepared by the National Park Service pursuant to section 203 of the Act entitled "An Act to conduct certain studies in the State of New Mexico", approved November 15, 1990 (Public Law 101–578; 16 U.S.C. 4310 note).

(c) CONTRACTS AND COOPERATIVE AGREEMENTS.—The Secretary may enter into a contract or cooperative agreement with a public

or private agency, organization, or institution to carry out this Act.

(d) FACILITY.—

(1) LEASING OR ACQUIRING A FACILITY.—The Secretary may lease or acquire a facility for the Institute.

(2) CONSTRUCTION OF A FACILITY.—If the Secretary determines that a suitable facility is not available for a lease or acquisition under paragraph (1), the Secretary may construct a facility for the Institute.

(e) ACCEPTANCE OF GRANTS AND TRANSFERS.—To carry out this Act, the Secretary may accept—

(1) a grant or donation from a private person; or

(2) a transfer of funds from another Federal agency.

SEC. 5. FUNDING.

(a) MATCHING FUNDS.—The Secretary may spend only such amount of Federal funds to carry out this Act as is matched by an equal amount of funds from non-Federal sources.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as may be necessary to carry out this Act.

Approved October 30, 1998.

LEGISLATIVE HISTORY—S. 231:

HOUSE REPORTS: No. 105–496 (Comm. on Resources).
SENATE REPORTS: No. 105–37 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD:
Vol. 143 (1997): July 11, considered and passed Senate.
Vol. 144 (1998): Oct. 10, considered and passed House.

○

Appendix D: Personnel

Wind Cave National Park Superintendents

Superintendent	Years Served
William A. Rankin	1903–1909
Joseph E. Pilcher	1909–1910
Rufus J. Pilcher	1910–1911
A. C. Boland	1911–1912
William M. Boland (Acting)	1912–1913
Fred Merle (Custodian)	1913–1913
Frederick N. Dille (Acting)	1913–1914
Thomas W. Brazell	1914–1919
Roy W. Brazell	1919–1928
Anton J. Snyder	1928–1931
Edward D. Freeland*	1931–1939
Harry J. Liek	1939–1950
William J. Watson (Acting)**	1950–1951
Earl M. Semingsen**	1951–1960
Jess H. Lombard	1960–1965
Warren D. Hotchkiss	1966–1969
Lester F. McClanahan	1969–1983
James A. Randall	1983–1985
Ernest W. Ortega	1985–1990
Martin C. Ott	1990–1992
Jimmy Taylor	1992–1999
Linda Stoll***	2000–2010
Vidal Davila	2010–2019

* First Wind Cave superintendent to also manage Jewel Cave National Monument.

** Supervised by Black Hills Area General Superintendent, 1950–1954.

*** Last Wind Cave superintendent to also manage Jewel Cave National Monument.

Source: http://npshistory.com/publications/tolson/histlist7.htm, Jewel Cave National Monument Central Files, Jewel Cave National Monument Digital Files.

Jewel Cave National Monument Personnel

BHAG = Black Hills Administrative Group, covering budgeting, IT, and general administrative support for Jewel Cave National Monument, Wind Cave National Park, and Mount Rushmore National Memorial.

NEKOTA = Administrative group covering human resources, contracting, and purchasing for NPS units in Nebraska and the Dakotas.

Employee	Title	Years Served
Elwood K. Wolfe Jr.*	Park Ranger	1941–1944
Lyle K. Linch*	Park Ranger	1946–1948
Harold Jones*	Park Ranger	1951–1951
Joseph L. Orr*	Park Naturalist	1952–1952
Richard T. Hart*	Ranger-in-Charge	1953–1955
John S. Shepherd*	Ranger-in-Charge	1956–1957
Walter L. Lienau*	Ranger-in-Charge	1958–1959
Keith E. Miller	Ranger-in-Charge	1959–1961
Homer A. (Pete) Robinson	Ranger-in-Charge	1962–1963
Wallace B. (Wally) Elms	Management Assistant	1963–1965
James B. Thompson	Management Assistant	1965–1966
William H. Sherman	Maintenance Foreman	1966 -1968?
Donald F. Gillespie	Management Assistant	1966–1969
Leonard A. Krueger	Maintenance Foreman	1969–?
Dave Todd	Management Assistant / Park Manager	1970–1972
Steve Hurd	Unit Manager	1973–1976
Larry Dilts	Chief Ranger	1974–1977
Al Hendricks	Unit Manager	1976–1981
Bob Appling	Chief Ranger	1977–1980?
Steve Riley	Maintenance Leader	?–1983
Dennis Ditmanson	Unit Manager	1981–1986
Don Lytle	Maintenance Leader (acting)	1983–1984
Larry Dilts	Maintenance Leader /Maintenance Mechanic Foreman	1984–2002?
Herschel Schulz	Chief of Interpretation and Resource Management	1984–1986
Brian Adams	Chief of Interpretation and Resource Management	1986–1991

Employee	Title	Years Served
Joanne Bornong	Clerk-Typist	1986–1988
Steve Holder	Unit Manager	1987–1989
Don Lytle	Maintenance Worker (permanent, subject-to-furlough)	1988–1999?
Kate Cannon	Superintendent	1990–1997
Tom Casey	Chief of Interpretation and Resource Management	1992–1998
Mike Wiles	Cave Specialist / Chief of Resource Management	1993–present
Donna Bentley	Interpretive Park Ranger	1993–?
Karen Rosga	Interpretive Park Ranger / Chief of Interpretation	1996–2009?
Jill Hart	Administrative Officer / BHAG Budget Specialist	1996–2008
Paul Menard	Administrative Officer (BHAG and NEKOTA)	1996–2000
Marie Curtain	Administrative Office Clerk	1996–2000?
Kimberley Weisser	Interpretive Park Ranger (Interpretation)	1998–?
Peggy O'Dell	Superintendent	1998–1999
Jayne Weiss	IT Specialist (BHAG, then shared)	2000–2014
Miriam Gola	Administrative Office Clerk	2000?–2004?
Todd Suess	Superintendent**	2000–2010
Rene Ohms	Physical Science Technician	2001?–2012?
Merrith Baughman	Supervisory Park Ranger (Interpretation) and Assistant Chief of Interpretation	2001–2005
Phil Heckman	Administrative Officer (BHAG and NEKOTA)	2001–2006
Bob King	Chief of Maintenance	2002?–2009?
Beckie Carder	Administrative Office Clerk	2005?–present
Paul Menard	Administrative Officer (BHAG and NEKOTA)	2007–2008
Katie Atkins (Keil)	Administrative Officer	2009–present
Dan Austin	Physical Science Technician	2009–present
Bradley Block	Chief of Interpretation	2009–present
Dave Tashner	Chief of Facilities Management (Acting)	2010–2012
Don Morrison	Chief of Facilities Management (Acting)	?–2010
John Black	Chief of Facilities Management	2015–present?
Larry Johnson	Superintendent	2010–2014

Employee	Title	Years Served
David Yim	Chief of Law Enforcement	2013–2016
Bruce Baird	IT Specialist (shared)	2014–2017
Bonnie Schwartz	Superintendent	2015–2017
Nancy Martinz	Chief of Law Enforcement	2016–2019
Michelle Wheatley	Superintendent	2018–present

*Wind Cave employee who staffed Jewel Cave during the summer months.

**Partway through his tenure, Suess became the first Jewel Cave Superintendent to report directly to the regional office, rather than to the Wind Cave superintendent.

Source: Jewel Cave National Monument Central Files, Jewel Cave National Monument Digital Files.

Appendix E: Visitation Numbers

Year	Recreation Visitors
1934	1,952
1935	1,468
1936	1,353
1937	2,067
1938	2,797
1939	5,203
1940	3,744
1941	4,953
1942	1,148
1943	102
1944	0
1945	409
1946	7,430
1947	17,018
1948	9,365
1949	8,301
1950	5,943
1951	8,344
1952	16,458
1953	15,731
1954	13,400
1955	21,400
1956	20,200
1957	29,500
1958	29,100
1959	32,000
1960	31,700
1961	31,400
1962	41,200
1963	44,000

Year	Recreation Visitors
1964	54,900
1965	57,400
1966	74,500
1967	75,000
1968	68,200
1969	75,100
1970	75,500
1971	65,800
1972	79,570
1973	80,500
1974	81,600
1975	77,900
1976	84,200
1977	105,000
1978	101,107
1979	76,921
1980	90,198
1981	105,448
1982	87,417
1983	89,412
1984	101,578
1985	128,650
1986	134,767
1987	141,749
1988	126,635
1989	130,950
1990	137,316
1991	152,329
1992	154,782
1993	132,277

Year	Recreation Visitors
1994	148,372
1995	154,688
1996	144,634
1997	133,115
1998	131,058
1999	134,834
2000	128,960
2001	125,330
2002	131,215
2003	126,363
2004	108,948
2005	102,318
2006	97,395

Year	Recreation Visitors
2007	105,321
2008	100,481
2009	129,595
2010	103,462
2011	77,146
2012	109,300
2013	98,259
2014	104,348
2015	116,444
2016	137,275
2017	144,537
2018	142,356

Source: National Park Service, Integrated Resource Management Applications Portal, Recreation Visitation, Jewel Cave National Monument, accessed February 12, 2020, https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=JECA.

Appendix F: Annual Park Budgets

Year	Congressional Appropriations (ONPS Funds)
1900	$ 0
1901	$ 0
1902	$ 0
1903	$ 0
1904	$ 0
1905	$ 0
1906	$ 0
1907	$ 0
1908	$ 0
1909	$ 0
1910	$ 0
1911	$ 0
1912	$ 0
1913	$ 0
1914	$ 0
1915	$ 0
1916	$ 0
1917	$ 0
1918	$ 0
1919	$ 0
1920	$ 0
1921	$ 0
1922	$ 0
1923	$ 0
1924	$ 0

Year	Congressional Appropriations (ONPS Funds)
1925	$ 0
1926	$ 0
1927	$ 0
1928	$ 0
1929	$ 0
1930	$ 0
1931	$ 0
1932	$ 0
1933	$ 0
1934	$ 0
1935	$ 0
1936	$ 0
1937	$ 0
1938	$ 0
1939	Not available
1940	Not available
1941	Not available
1942	Not available
1943	$2,370.00
1944	$ 0
1945	$ 0
1946	$2,740.00
1947	$4,199.00
1948	$3,498.00
1949	Not available

Year	Congressional Appropriations (ONPS Funds)
1950	Not available
1951	Not available
1952	$3,978.00
1953	Not available
1954	$3,818.00
1955	$5,475.00
1956	$8,449.00
1957	$8,700.00
1958	$15,308.79
1959	$27,134.00
1960	$26,048.00
1961	$22,032.00
1962	$27,764.00
1963	$25,820.00
1964	Not available
1965	Not available
1966	Not available
1967	Not available
1968	Not available
1969	Not available
1970	Not available
1971	Not available
1972	Not available
1973	Not available
1974	Not available
1975	Not available
1976	Not available
1977	Not available
1978	Not available

Year	Congressional Appropriations (ONPS Funds)
1979	Not available
1980	Not available
1981	Not available
1982	Not available
1983	$205,500.00
1984	$229,700.00
1985	Not available
1986	$240,700.00
1987	Not available
1988	Not available
1989	$279,100.00
1990	$237,800.00
1991	$240,500.00
1992	$ 228,100.00
1993	$264,500.00
1994	Not available
1995	Not available
1996	$392,800.00
1997	$438,000.00
1998	$633,000.00
1999	$684,000.00
2000	$783,000.00
2001	$858,000.00
2002	$865,740.00
2003	$862,420.00
2004	$843,674.00
2005	$885,000.00
2006	$897,140.00
2007	$904,647.00

Year	Congressional Appropriations (ONPS Funds)
2008	$1,002,870.00
2009	$1,138,261.00
2010	$1,229,382.00
2011	$1,179,319.00
2012	$1,174,14.00
2013	$1,100,390.00

Year	Congressional Appropriations (ONPS Funds)
2014	$1,183,387.00
2015	$1,169,190.00
2016	$1,182,060.00
2017	$1,187,010.00
2018	$1,220,670.00
2019	$1,191,425.00

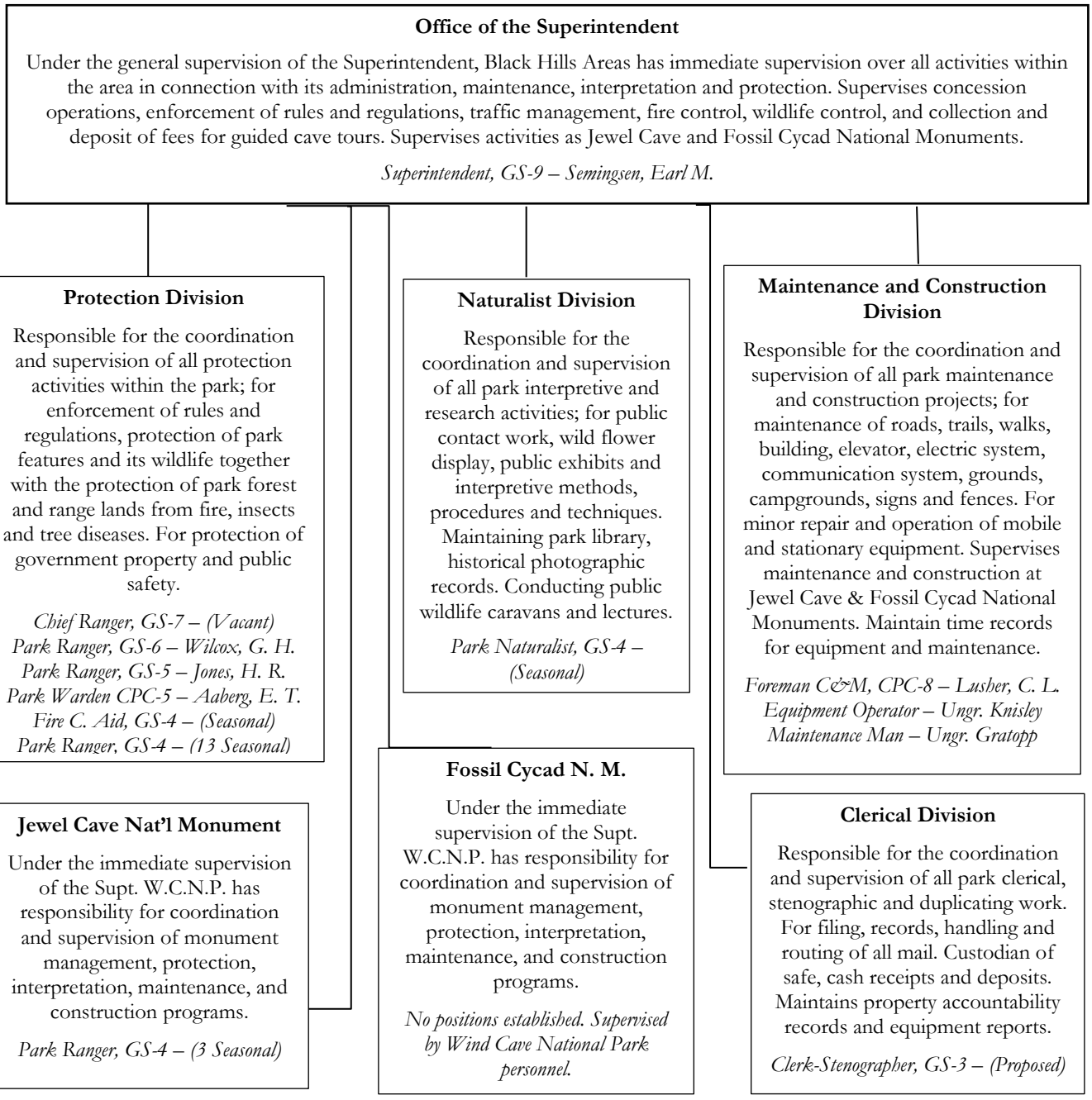
Source: Jewel Cave NM CF, Jewel Cave NM DF, Midwest Regional Office Files, NARA KC.

Appendix G: Organizational Charts

Wind Cave National Park Organizations and Functions as of February 1, 1952

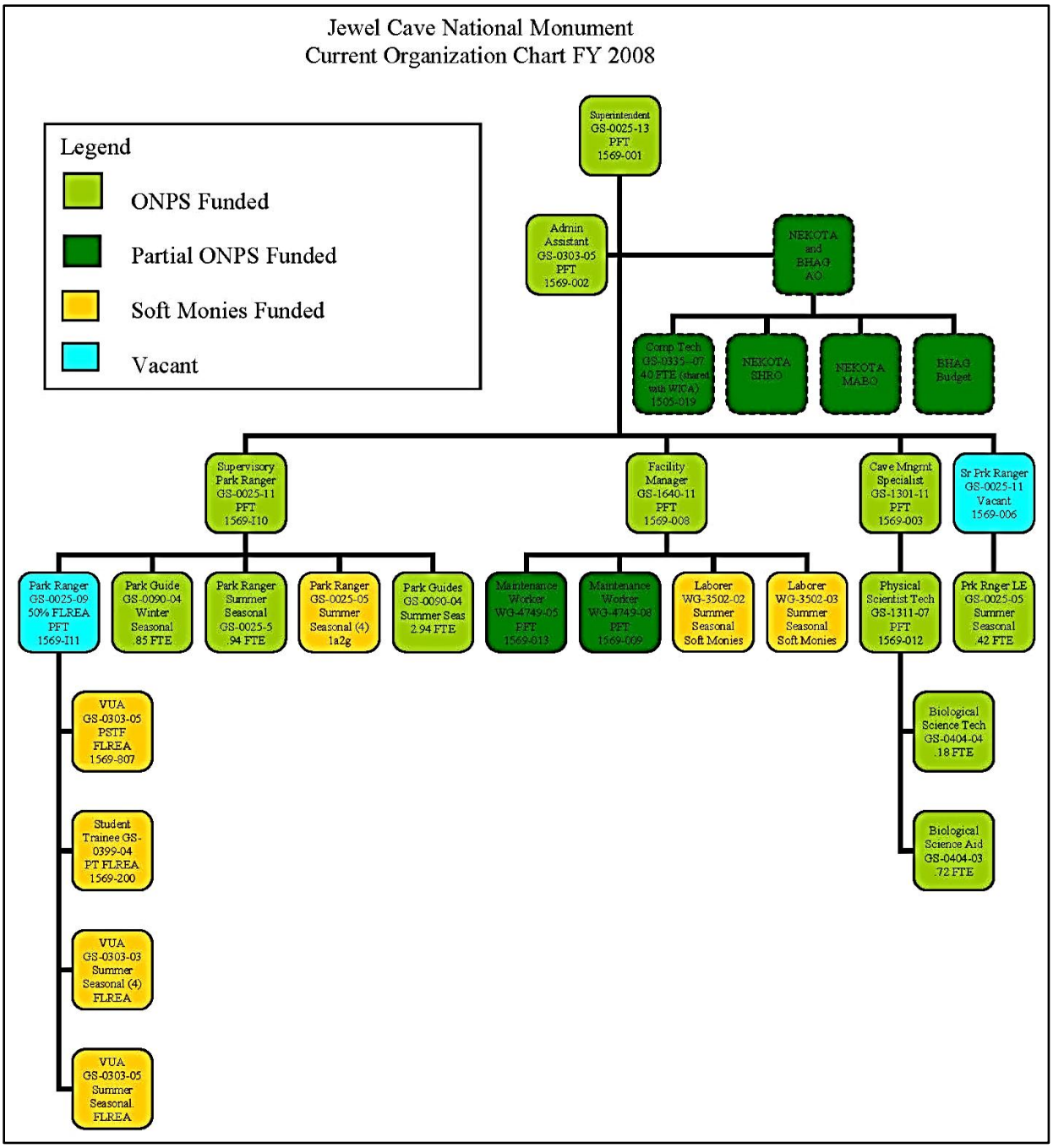
Completed by Earl M. Semingsen,

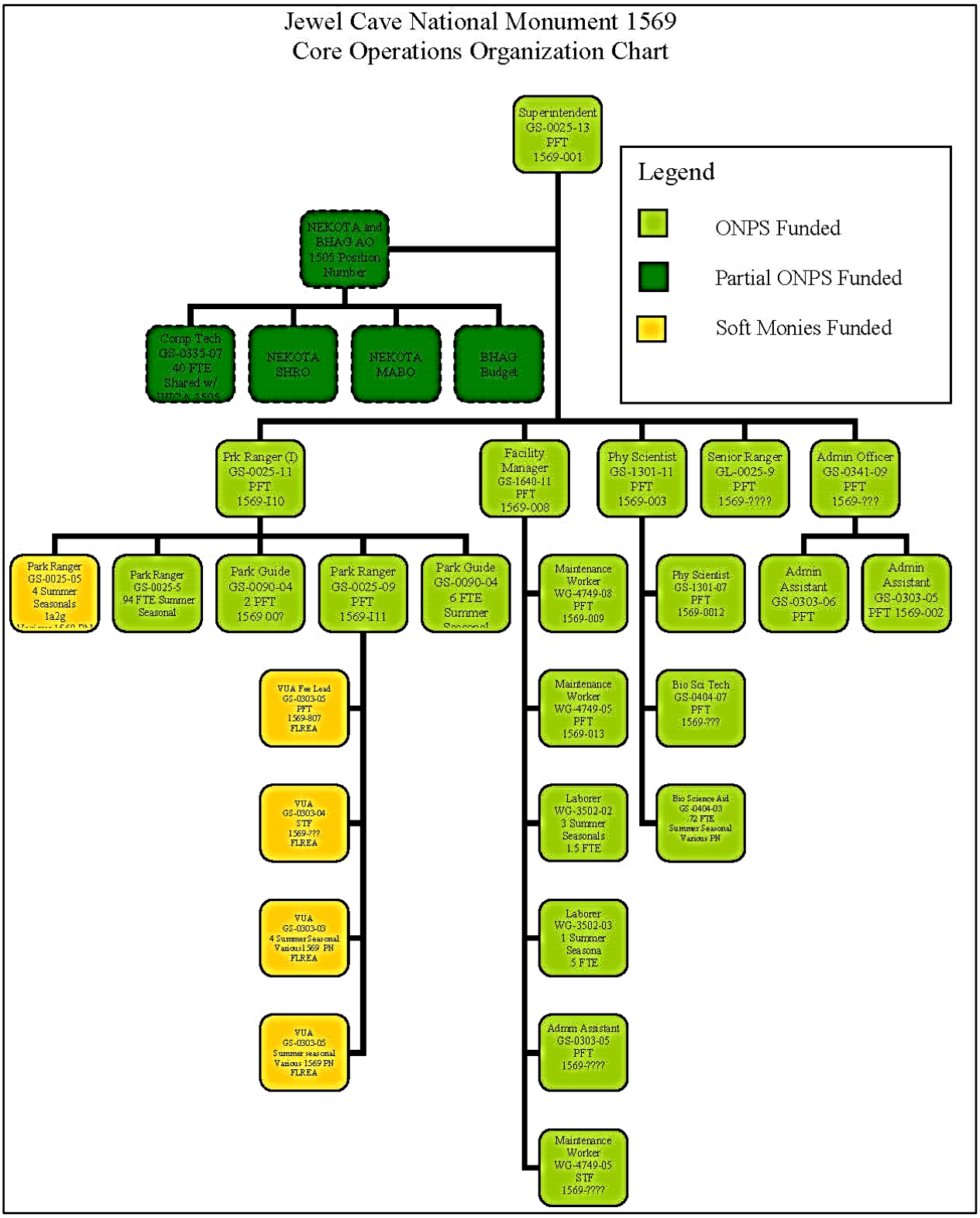
Approved by Black Hills Area Superintendent Harry J. Liek, March 12, 1952



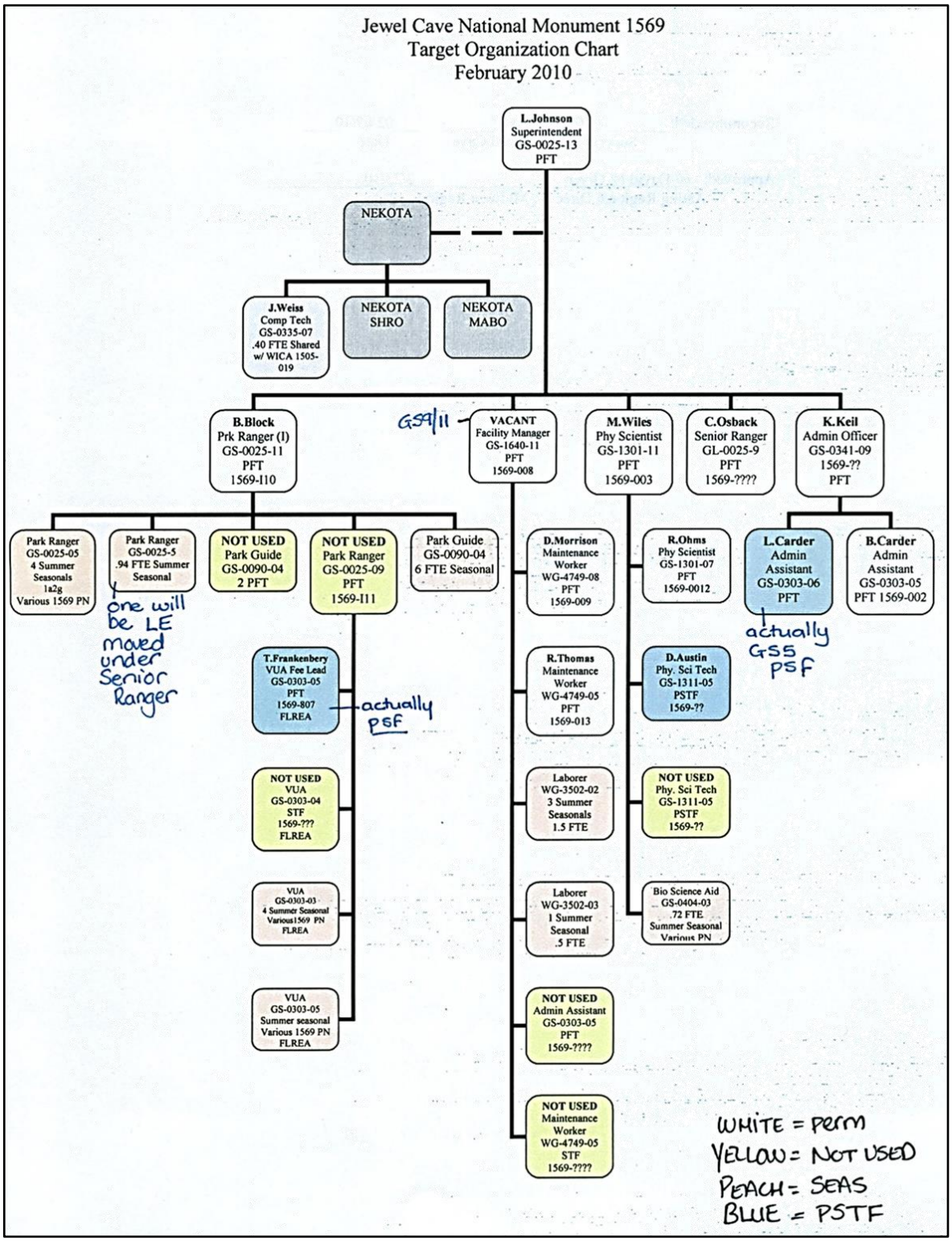
Source: National Parks and Monuments Central Classified Files (1936–52), Box 125, Folder 201-13.1 Organization Charts, Records of the National Park Service Region II (Midwest Region), NARA KC, 1952.

Source: Cabinet 3, Drawer 2, Folder D18 Master Plan, Jewel Cave NM CF, 1969.


Jewel Cave National Monument
Current Organization Chart FY 2008
Legend
ONPS Funded
Partial ONPS Funded
Soft Monies Funded
Vacant
Superintendent GS-0025-13 PFT 1569-001
Admin Assistant GS-0303-05 PFT 1569-002
NEKOTA and BHAG AO
Comp Tech GS-0335--07 .40 FTE (shared with WICA) 1505-019
NEKOTA SHRO
NEKOTA MABO
BHAG Budget
Supervisory Park Ranger GS-0025-11 PFT 1569-I10
Facility Manager GS-1640-11 PFT 1569-008
Cave Mngmt Specialist GS-1301-11 PFT 1569-003
Sr Prk Ranger GS-0025-11 Vacant 1569-006
Park Ranger GS-0025-09 50% FLREA PFT 1569-I11
Park Guide GS-0090-04 Winter Seasonal .85 FTE
Park Ranger Summer Seasonal GS-0025-5 .94 FTE
Park Ranger GS-0025-05 Summer Seasonal (4) 1a2g
Park Guides GS-0090-04 Summer Seas 2.94 FTE
Maintenance Worker WG-4749-05 PFT 1569-013
Maintenance Worker WG-4749-08 PFT 1569-009
Laborer WG-3502-02 Summer Seasonal Soft Monies
Laborer WG-3502-03 Summer Seasonal Soft Monies
Physical Scientist Tech GS-1311-07 PFT 1569-012
Prk Rnger LE GS-0025-05 Summer Seasonal .42 FTE
VUA GS-0303-05 PSTF FLREA 1569-807
Student Trainee GS-0399-04 PT FLREA 1569-200
VUA GS-0303-03 Summer Seasonal (4) FLREA
VUA GS-0303-05 Summer Seasonal FLREA
Biological Science Tech GS-0404-04 .18 FTE
Biological Science Aid GS-0404-03 .72 FTE

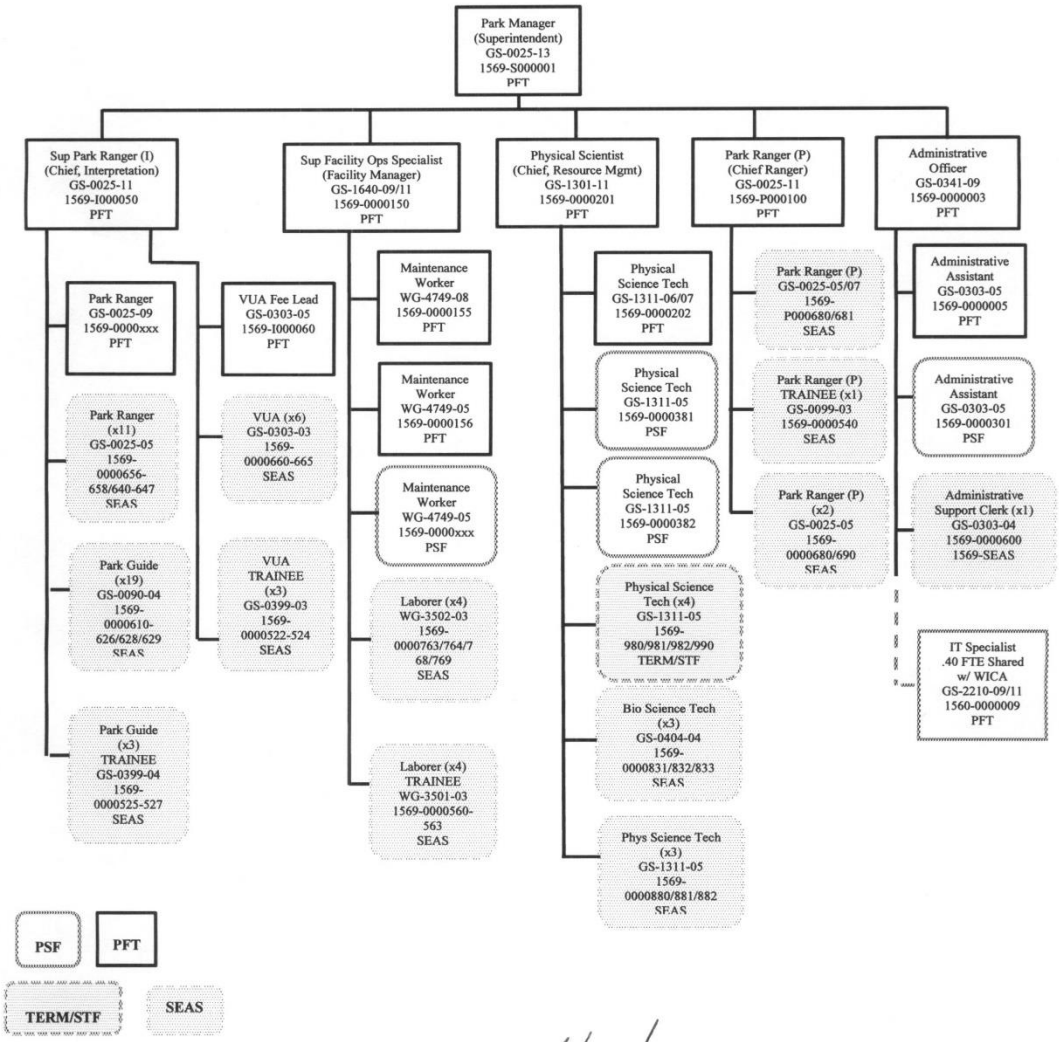


Source: Jewel Cave NM DF, 2008.



Source: Jewel Cave NM DF, 2010.

Jewel Cave National Monument
Organizational Chart
May 2014



Recommended: _____ 6-3-2014
Acting Superintendent, Jewel Cave N.M. Date

Approved: _____ _____
Regional Director, Midwest Region Date

Jewel Cave National Monument
Organizational Chart
May 2014

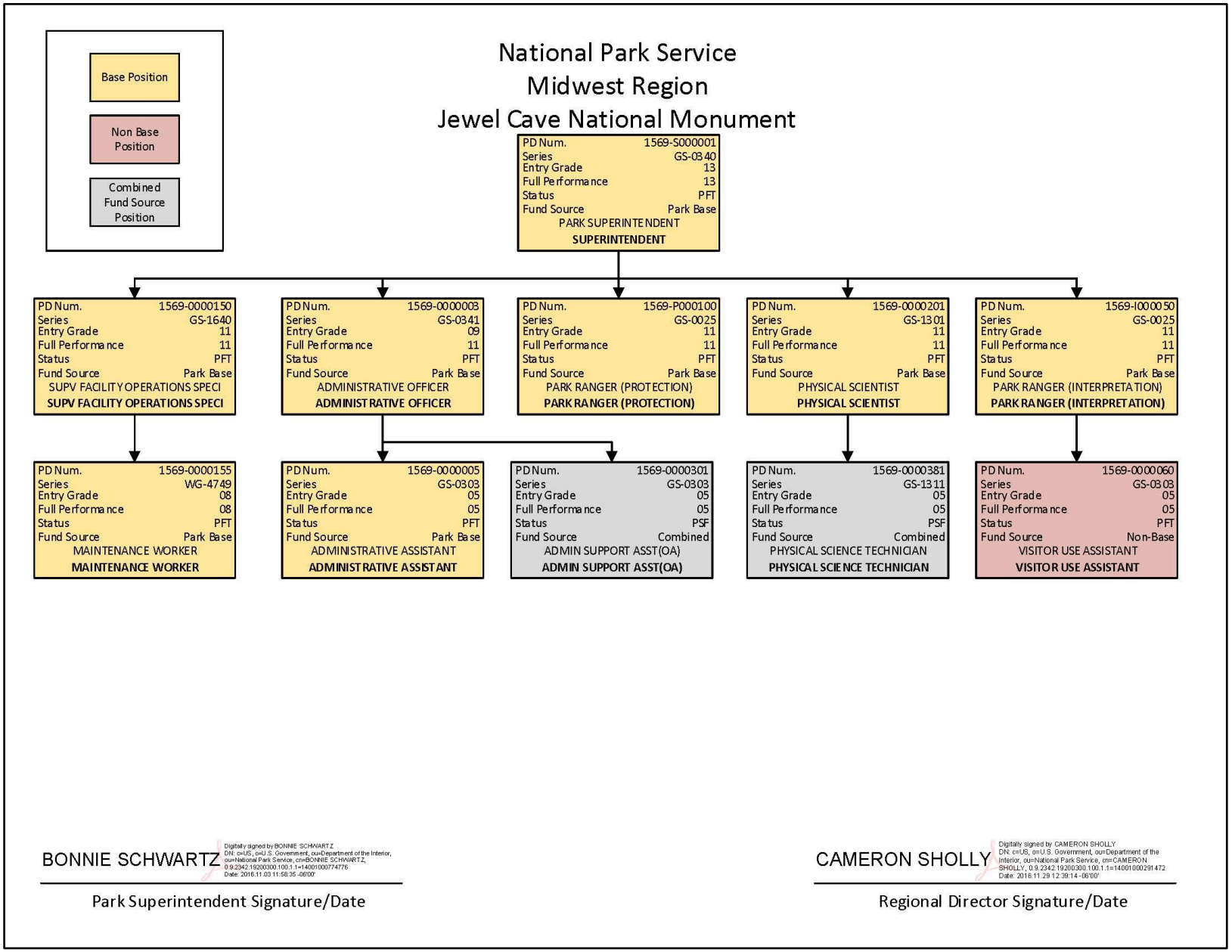
Changes Made January 2013 (changes from current region approved chart):

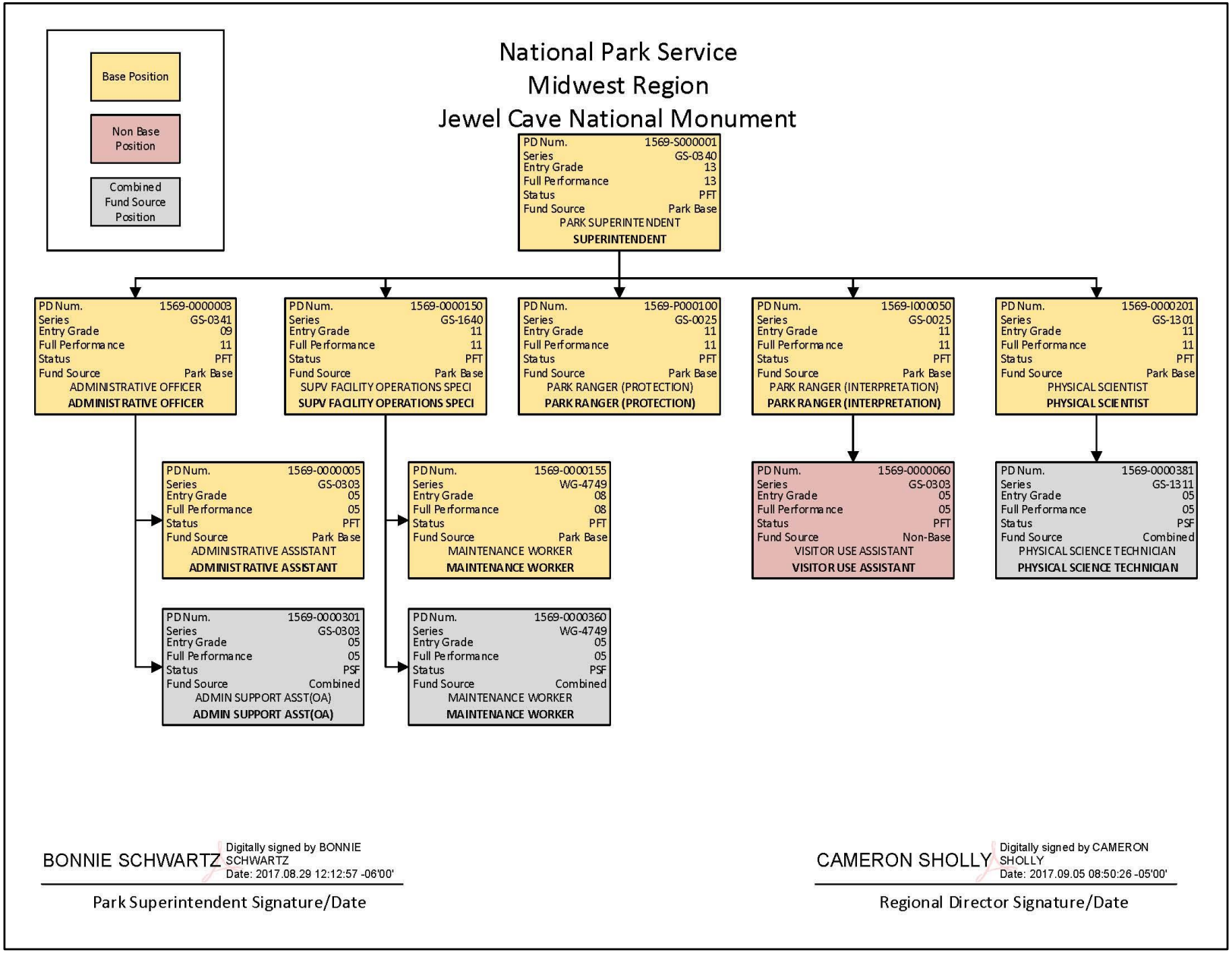
- Removed Nekota SHRO / MABO (this was part of the old Black Hills Administrative Group that was dissolved in 2009).
- Changed one Admin Assistant to GS05 from GS06 (position was upgraded on Org Chart prior to the creation of a dedicated Administrative Officer for the park when there was a need for higher graded functions to be performed in the Park, higher graded duties are now performed by the park's Administrative Officer).
- Changed second Admin Assistant to Permanent Subject to Furlough from permanent as this is how this position has been filled since its creation and there are no plans to change this.
- Added 3 TERM Subject to Furlough Physical Science Tech positions (these were created in 2009 for a multi-year Rec Fee project but never added to the Org Chart) These positions will be retained for future project use.
- Remove Permanent Full Time Administrative Assistant position from the Maintenance Division (position was added to the Org Chart prior to the reorganization of the Park's Administrative Division, these duties are now performed by the PSF Admin Assistant).
- Updated the number of seasonal VUA's to 6 GS03's from 4 GS03's and 2GS05's.
- Removed Permanent Subject to Furlough VUA GS04 position (with the conversion of the VUA GS05 Lead position to Perm Full Time from Perm Subject to Furlough, this position is no longer needed).
- Updated number of seasonal Park Ranger, Park Guide, VUA and Laborer positions based on up to date position numbers assigned by SHRO.
- Removed 2 Permanent Subject to Furlough Park Guide GS04 positions (these have not been filled in the past).

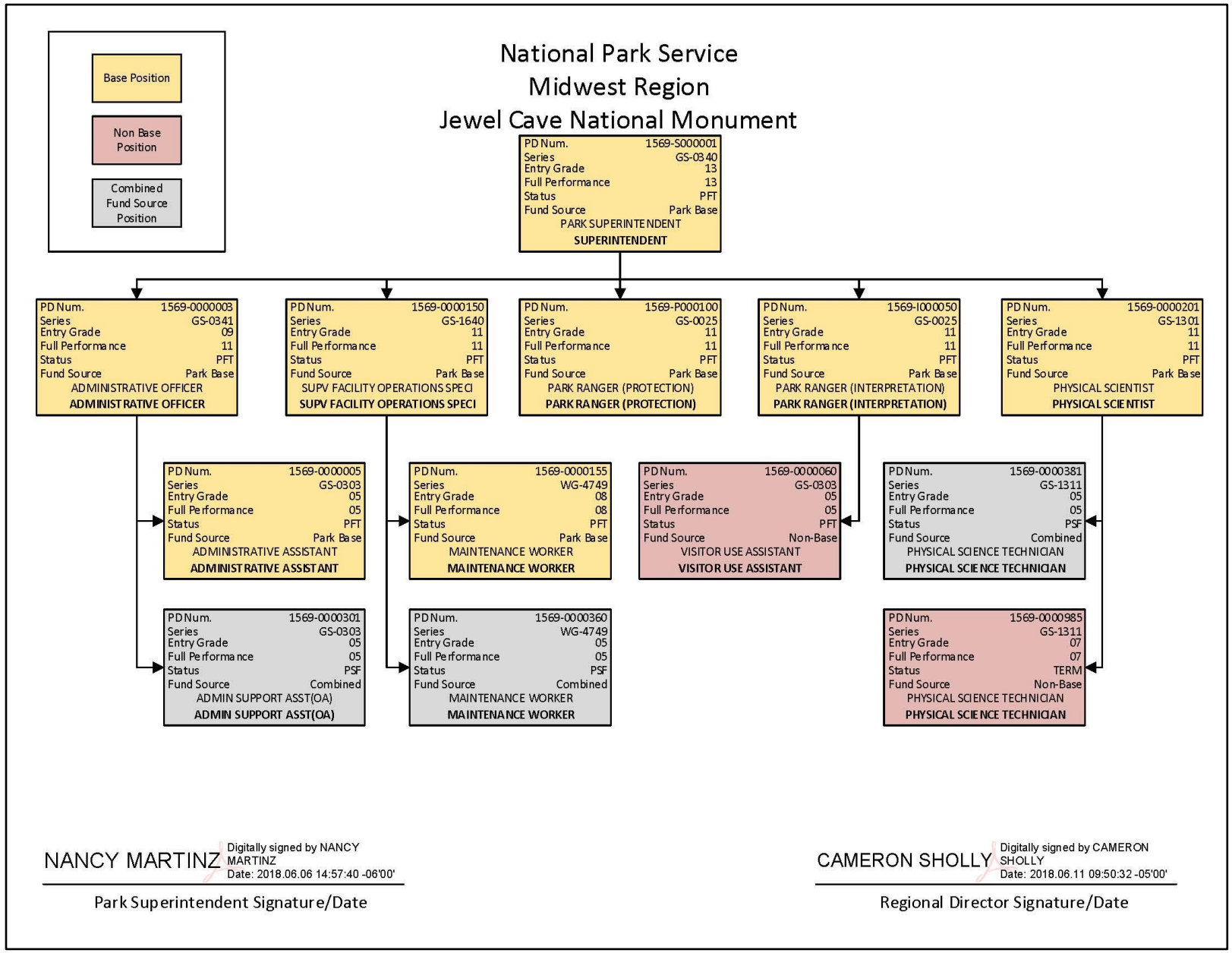
Changes Made March 2014

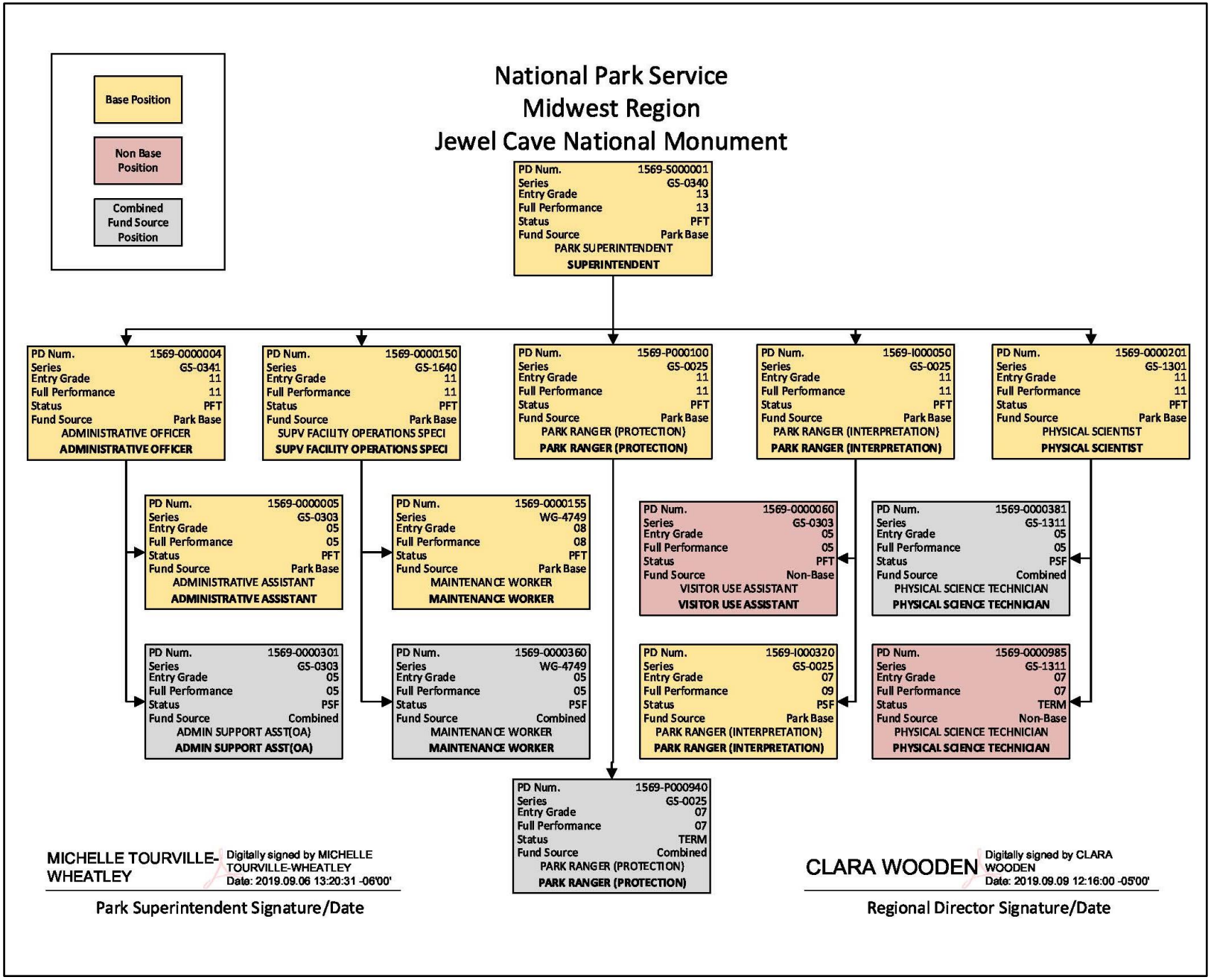
- Added 3 Park Guide TRAINEE position #'s (already in FPPS)
- Added 3 VUA TRAINEE position #'s (already in FPPS)
- Updated WG03 laborer positions #'s to reflect those replaced by TRAINEE positions (already in FPPS)
- Added 4 Laborer TRAINEE position #'s (2already in FPPS, 2 being requested Mar 2014)
- Added 1 LE Park Ranger TRAINEE position (already in FPPS)
- Added 1 Seasonal GS04 Admin Support Clerk position (already in FPPS)
- Updated IT position grade to 9/11 (WICA position)

Source: Jewel Cave NM DF, 2014.


Base Position
Non Base Position
Combined Fund Source Position
National Park Service
Midwest Region
Jewel Cave National Monument
PD Num. 1569-S000001
Series GS-0340
Entry Grade 13
Full Performance 13
Status PFT
Fund Source Park Base
PARK SUPERINTENDENT
SUPERINTENDENT
PD Num. 1569-0000150
Series GS-1640
Entry Grade 11
Full Performance 11
Status PFT
Fund Source Park Base
SUPV FACILITY OPERATIONS SPECI
SUPV FACILITY OPERATIONS SPECI
PD Num. 1569-0000003
Series GS-0341
Entry Grade 09
Full Performance 11
Status PFT
Fund Source Park Base
ADMINISTRATIVE OFFICER
ADMINISTRATIVE OFFICER
PD Num. 1569-P000100
Series GS-0025
Entry Grade 11
Full Performance 11
Status PFT
Fund Source Park Base
PARK RANGER (PROTECTION)
PARK RANGER (PROTECTION)
PD Num. 1569-0000201
Series GS-1301
Entry Grade 11
Full Performance 11
Status PFT
Fund Source Park Base
PHYSICAL SCIENTIST
PHYSICAL SCIENTIST
PD Num. 1569-I000050
Series GS-0025
Entry Grade 11
Full Performance 11
Status PFT
Fund Source Park Base
PARK RANGER (INTERPRETATION)
PARK RANGER (INTERPRETATION)
PD Num. 1569-0000155
Series WG-4749
Entry Grade 08
Full Performance 08
Status PFT
Fund Source Park Base
MAINTENANCE WORKER
MAINTENANCE WORKER
PD Num. 1569-0000005
Series GS-0303
Entry Grade 05
Full Performance 05
Status PFT
Fund Source Park Base
ADMINISTRATIVE ASSISTANT
ADMINISTRATIVE ASSISTANT
PD Num. 1569-0000301
Series GS-0303
Entry Grade 05
Full Performance 05
Status PSF
Fund Source Combined
ADMIN SUPPORT ASST(OA)
ADMIN SUPPORT ASST(OA)
PD Num. 1569-0000381
Series GS-1311
Entry Grade 05
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Fund Source Combined
PHYSICAL SCIENCE TECHNICIAN
PHYSICAL SCIENCE TECHNICIAN
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Series GS-0303
Entry Grade 05
Full Performance 05
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VISITOR USE ASSISTANT
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ADMINISTRATIVE OFFICER
PD Num. 1569-0000150
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SUPV FACILITY OPERATIONS SPECI
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VISITOR USE ASSISTANT
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Combined Fund Source Position
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CAMERON SHOLLY
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PARK RANGER (PROTECTION)
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Park Superintendent Signature/Date
CLARA WOODEN
Digitally signed by CLARA WOODEN
Date: 2019.09.09 12:16:00 -05'00'
Regional Director Signature/Date

Bibliography

Archives

Al Hendricks, personal files.

Central Files, Jewel Cave National Monument, Custer, South Dakota.

Digital Files, Jewel Cave National Monument, Custer, South Dakota.

Jewel Cave Museum Collection, Keystone, South Dakota.

Record Group 75, Records of the National Park Service National Archives and Records Administration, Kansas City, Missouri.

Government Documents and Contracted Studies

Albers, Patricia. *The Home of the Bison: An Ethnographic and Ethnohistorical Study of Traditional Cultural Affiliations to Wind Cave National Park, Volume One*. National Park Service, September 29, 2003.

Alexander, E. Calvin and Marsha Davis. "Hydrogeologic Study of Jewel Cave/Wind Cave: Final Report – Year 2." August 1987.

Bogan, Michael A., and Cynthia A. Ramotinik. "Baseline Surveys for Mammals at Jewel Cave National Monument South Dakota." March 1, 1994.

Bohi, John W. "75 Years at Wind Cave: A History of the National Park." National Park Service, 1962.

Booth, H. M. USDA, USFS. Rapid City Land District. Black Hills National Forest. Custer (Unorganized) Mining District. "Report on the Jewel et al Lode Mining Claims and the Jewel Cave." June 1911.

Brown, Peter M. "Fire History of the Southern Black Hills, South Dakota." June 13, 1994.

Burzynski, Kathleen M. "The Biological Control of Leafy Spurge at Jewel Cave National Monument." July 30, 1995.

Cockrell, Ron. *Amidst Ancient Monument: The Administrative History of Mound City Group National Monument/Hopewell Culture National Historical Park Ohio*. Omaha: Division of Cultural Resources, Midwest Support Office, NPS, DOI, 1999, 343.

Evans-Hatch, Gail and Michael Evans-Hatch, *Place of Passages: Jewel Cave National Monument Historic Resource Study*. Omaha: National Park Service Midwest Regional Office, 2006.

Graves, Henry S. *Black Hills Forest Reserve*. Washington, DC: US Government Printing Office, 1899.

Hill, W. F. Report on Mining Claim, Jewel Lode. February 19, 1908.

Jablonsky, Pat, et al. "Report: Develop Preventive Measures For Future Accumulations Of Cave

Lint, Wind Cave National Park." June 1, 1994.

Jenney, Walter P. "Report of Geological Survey of the Black Hills." In *Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior* (1875).

John Milner Associates, Inc., and Rivanna Archaeological Consulting. "Wind Cave National Park Cultural Landscape Report." May 2005.

Jones, Bruce. "Archeological Investigations at Jewel Cave National Monument Custer County, South Dakota 2000–2003." National Park Service, Midwest Archeological Center, Technical Report 94a, 2006.

Kappler, Charles J. ed. *Indian Affairs: Laws and Treaties*, volume II. Washington, DC: Government Printing Office, 1904.

Kellerlyn, Katie. NPS, Natural Resource Program Center. "Jewel Cave National Monument Geologic Resources Inventory Report." March 2009.

Montes, Geoff. "Sacred Native American Sites: Bear Butte and Wind Cave." National Trust for Historic Preservation, June 16, 2015.

Moore, John C. Survey of the Biota and Trophic Interactions Within Wind Cave and Jewel Cave,

South Dakota. August 15, 1996.

Mora, Dave. "Bats of Jewel Cave." Undated [1988?].

Neel, H. C., and C. W. Fitzgerald, United States Forest Service. "Report on the Proposed Jewel Cave

Game Preserve." September 1907.

O'Bright, Alan E. "Rugged Charm: Ranger Cabin (HS-1) Historic Structure Report, Jewel Cave National Monument, Custer, South Dakota." 1999.

Oshier, Edwin H. "Report on Proposed Underground Development of Jewel Cave National Monument." June 17, 1965.

Quinn Evans Architects. *Cultural Landscape Report and Environmental Assessment: Jewel Cave Historic Area, Jewel Cave National Monument*. National Park Service, March 2005.

Rom, Lance W. "A Level III Cultural Resource Inventory of the Jewel Cave Dugouts." June 1984.

Ronscavage, John A. Master Plan: Jewel Cave National Monument, General Development Narrative. 1965.

Schrader, F. C. USGS. "Report on the Jewel and Four Other Lode Claims." April 15, 1909.

Sheveland, Glenna J. "An Intensive Cultural Resources Survey of Jewel Cave National Monument: Preliminary Report." National Park Service, July 10, 1993.

Strobel, Michael L., et al. U.S. Geological Survey. "Potentiometric Surface of the Madison Aquifer in the Black Hills Area, South Dakota." 1999.

Trexler, Keith A. *Lehman Caves . . . its Human Story*. Baker, NV: NPS, 1966, updated through 1975 by NPS staff.

Unrau, Harlan D., and G. Frank Williss. *Expansion of the National Park Service in the 1930s: Administrative History*. Denver: NPS, 1983.

US Congress. House. *Department of the Interior and Related Agencies: Appropriations for 1975*: *Hearings on H.R. 16027*. 93rd Cong. 2d sess., 1974.

US Congress. Senate. *Federal Cave Resources Protection Act and Restriction of Dams in Parks and Monuments: Hearings on S. 927/H.R. 1975 and H.R. 1173, Before the Senate Subcommittee on Public Lands, National Parks and Forests of the Committee on Energy and Natural Resources*, 100th Cong. 2d sess., 1988.

US Department of Agriculture. *List of Workers in Subjects Pertaining to Agriculture, 1920–1921*. Washington, DC: U.S. Government Printing Office, 1921.

"The USDA Forest Service—The First Century," U.S. Forest Service, April 2005.

US Department of the Interior. National Park Service. *Foundation Document, Jewel Cave National Monument, South Dakota*. February 2016.

_____. Jewel Cave National Monument: Mission 66 Prospectus (revised). October 1, 1958.

_____. The Master Plan for Jewel Cave National Monument. 1942.

_____. Bryant. Mission 66 Prospectus for Jewel Cave National Monument. July 15, 1955.

_____. Bryant and Alberts. Master Plan Development Outline Jewel Cave National Monument, South Dakota. August 1958.

_____. Jewel Cave National Monument. "Cave Search and Rescue Plan: Jewel Cave National Monument." February 1999.

_____. Core Operations Report. 2008.

_____. "Final General Management Plan/Environmental Impact Statement. Jewel Cave National Monument, South Dakota." June 1994.

_____. "Geologic Resources Inventory Report." March 2009.

_____. "Housing Management Plan." 1988.

_____. "Housing Management Plan." 1990.

_____. "Housing Management Plan." 1995.

_____. Master Plan Development Outline, Jewel Cave National Monument, South Dakota. April 1952.

_____. "Natural and Cultural Resource Management Plan and Environmental Assessment for Jewel Cave National Monument." 1983.

_____. Resource Management Plan. Jewel Cave National Monument. 1999.

_____. Wildland Fire Prevention Plan. August 1992.

_____. Rocky Mountain Regional Office. Long, Barbara Bevin. "Jewel Cave National Monument Historic Resource Study: Historic Contexts and National Register Guidelines." 1992.

_____. Wind Cave National Park. "Cave and Karst Resources Management Plan, Wind Cave National Park." 2007.

US Government Accountability Office. "National Park Service Needs a Maintenance Management System." June 1, 1984.

Wiles, Michael W. "Microclimate Monitoring of the Scenic Tour Area at Jewel Cave." undated [1987?].

_____, and Rene Ohms. "Jewel Cave National Monument Cave and Karst Management Plan," 2007.

Worthington, David J., and Michael A. Bogan. Cave Entrance Modification and Potential Impact on Bat Populations at Jewel Cave National Monument, South Dakota. February 19, 1993.

Yeh and Associates, Inc. Geotechnical Engineering Report, Jewel Cave National Monument, Visitor Center Parking Lot. August 31, 2012.

Oral History Interviews

Transcriptions of the following interviews, conducted by Historical Research Associates, Inc., as part of this administrative history contract, are in the archives of Jewel Cave National Monument, Custer, South Dakota.

Kate Cannon, interview by Emily Greenwald, June 13, 2019, Moab, Utah.

Dwight Deal, interview by Jackie Gonzales, June 30, 2019, Custer, South Dakota.

Larry Dilts, interview by Jackie Gonzales, April 17, 2019, Colby, Kansas.

Dennis Ditmanson, interview by Jackie Gonzales, April 19, 2019, Santa Fe, New Mexico.

David Given, interview by Jackie Gonzales, April 9, 2019, Port Hadlock, Washington.

Jill Hart, interview by Jackie Gonzales, June 27, 2019, Custer, South Dakota.

Phil Heckman, interview by Jackie Gonzales, June 27, 2019, Custer, South Dakota.

Al Hendricks, interview by Emily Greenwald, May 16, 2019, Ennis, Montana.

Paul Menard, interview by Jackie Gonzales, April 9, 2019, Sequim, Washington.

Marc Ohms, interview by Jackie Gonzales, June 30, 2019, Custer, South Dakota.

Rene Ohms, interview by Jackie Gonzales, June 28, 2019, Custer, South Dakota.

Ernest Ortega, interview by Jackie Gonzales, April 22, 2019, Santa Fe, New Mexico.

Marty Ott, interview by Jackie Gonzales, April 24, 2019, Kanab, Utah.

Bob Paulson and Corissa Busse, interview by Jackie Gonzales, June 26, 2019, Rapid City, South Dakota.

Linda Stoll, interview by Jackie Gonzales, July 22, 2019, The Villages, Florida.

James B. Thompson, interview by Jackie Gonzales, April 18, 2019, Estes Park, Colorado.

Paul Wightman, interview by Jackie Gonzales, June 30, 2019, Custer, South Dakota.

Mike Wiles, interview by Jackie Gonzales, June 26 and 27, 2019, Custer, South Dakota.

Books and Articles

Allaback, Sarah. *Mission 66 Visitor Centers: The History of a Building Type*. Washington, DC: Government Printing Office, 2000.

Baker, Howard. "The Early Days." *Courier* 34, no. 3 (March 1989): 18–20.

Beck, Warren A., and Ynez D. Haase. *Historical Atlas of the American West*. Norman: University of Oklahoma Press, 1989.

Binkerd, A. D. *The Mammoth Cave and its denizens; a complete descriptive guide*. Cincinnati: R. Clarke & Co., 1869.

Buel, J. W. *America's Wonderlands: A Pictorial and Descriptive History of our Country's Scenic Marvels*. New York: John Williams, 1893.

Cassell, E. Steve. *Prehistoric Hunters of the Black Hills*. Boulder: Johnson Books, 1986.

Conn, Herbert W. "Barometric Wind in Wind and Jewel Caves, South Dakota." *National Speleological Society Bulletin* 28, no. 2 (April 1966): 55–69.

Conn, Herb, and Jan Conn. *The Jewel Cave Adventure: Fifty Miles of Discovery Under South Dakota*. St. Louis: Cave Books, 1977.

Croghan, John. *Rambles in the Mammoth Cave: During the Year 1844, by a Visiter*. Louisville: Morton & Griswold, 1845.

The Cumberland Valley Railroad Company. *Rural resorts and summer retreats along the line of the Cumberland Valley Railroad, Including Picnic Parks and Pleasure Places*. Philadelphia: Allen, Lane & Scott, 1881.

Davidson, Rev. R. *The Mammoth Cave and the Barrens of Kentucky, with Some Notices of the Early Settlement of the State*. Lexington, KY: A. T. Skillman & Son, 1840.

Freeman, John F. *Black Hills Forestry: A History*. Boulder: University Press of Colorado, 2014.

Halliday, William R. *Depths of the Earth: Caves and Cavers of the United States*. New York and London: Harper & Row, Publishers, 1966.

Hirt, Jen. *Under Glass: The Girl with a Thousand Christmas Trees*. Akron, OH: University of Akron Press, 2010.

Hovey, Horace C. *Celebrated American caverns, especially Mammoth, Wyandot, and Luray. Together with historical, scientific, and descriptive notices of caves and grottoes in other lands*. Cincinnati: The Robert Clarke Company, 1896.

Hovey, Edmund Otis. "The Wind Cave of South Dakota." *Scientific American* 49 (June 16, 1900): 20458–59.

Ingersoll, Ernest. *Through the Shenandoah Valley: The chronicle of a journey through the uplands of Virginia*. New York: Liberty Printing Company, 1886.

Lewis, James G. *The Forest Service and the Greatest Good: A Centennial History*. Durham, NC: Forest History Society, 2005.

Love, Judy. *Jewel Cave National Monument*. Mount Pleasant, SC: Arcadia Publishing, 2008.

Mason, Kathy S. "Adapting to Endure: The Early History of Wind Cave National Park, 1903–1916." *South Dakota History* 32, no. 2 (Summer 2002): 149–164.

Mayer, Carl J. "The 1872 Mining Law: Historical Origins of the Discovery Rule." *University of Chicago Law Review* 53, no. 2 (Spring 1986): 624–653.

Norfolk and Western Railway. "Luray Caverns." 1898.

Owen, Luella Agnes. *Cave Regions of the Ozarks and Black Hills*. Cincinnati: Editor Publishing Co., 1898.

Palmer, Arthur N. *Jewel Cave: A Gift from the Past*. Hot Springs, SD: Wind Cave/Jewel Cave Natural History Association, 1984.

Palmer, Arthur N. and Margaret V. Palmer. "Geologic History of the Black Hills Caves, South Dakota." *National Speleological Society Bulletin* (December 1989): 74.

Rothman, Hal. *America's National Monuments: The Politics of Preservation*. Lawrence: University Press of Kansas, 1994.

Sanford, John I. *The Black Hills Souvenir: A Pictorial and Historic Description of the Black Hills*. Denver: The Williamson-Haffner Engraving Co., 1902.

Sellars, Richard West. *Preserving Nature in the National Parks: A History*. New Haven and London: Yale University Press, 1997.

Shaler, N. S. "Caverns and Cavern Life." *Scribner's Magazine* II (July–December): 452–53.

Sundstrom, Linea. *Storied Stone: Indian Rock Art of the Black Hills Country*. Norman: University of Oklahoma Press, 2004.

Thompson, James B. *The Geology of Jewel Cave*. Wind Cave Natural History Association, 1965.

The Virginia Midland Railway. *Excursion Guide of the Virginia Midland Railway, the Short-Line ThroughCar Route Between the North and South, The Virginia Springs, Western North Carolina and North Georgia Summer Resorts*. New York: The Aldine Press, 1882.

West, Thomas D. *A guide to the lakes in Cumberland, Westmorland and Lancashire*. London: B. Shaw, Richardson, and Urquhart, 1784.

Wiles, Michael E. "The Origin Of Jewel Cave And Its Relationship To Landscape-Scale Processes – Part 1." *Proceedings of the 17th International Congress of Speleology, Sydney, New South Wales, Australia* 2, ed. 2 (July 23–29, 2017): 315–317.

Wiles, Michael E. "The Origin Of Jewel Cave And Its Relationship To Landscape-Scale Processes – Part 2." *Proceedings of the 17th International Congress of Speleology, Sydney, New South Wales, Australia* 2, ed. 2 (July 23–29, 2017): 318–320.

Williams, Gerald W., and Char Miller. "At the Creation: the National Forest Commission of 1896–97." *Forest History Today* (Spring–Fall 2005): 32–41.

Theses and Dissertations

Nelson, Elaine Marie. "Dreams and Dust in the Black Hills: Race, Place, and National Identity in America's 'Land of Promise.'" PhD dissertation, University of New Mexico, 2011.

Tratebas, Alice M. "Black Hills Settlement Patterns: Based on Functional Approach." PhD dissertation, Indiana University, 1986.

Wiles, Michael E. "Infiltration [of groundwater] at Wind and Jewel Caves, Black Hills, South Dakota." MS thesis, South Dakota School of Mines and Technology, 1992.

Newspapers and Periodicals

Argus-Leader (Sioux Falls, SD)

Black Hills Weekly Journal (Rapid City, SD)

Caving News

Custer Chronicle

Deadwood Pioneer-Times (Deadwood, SD)

High Country News

Mitchell Capital (Mitchell, SD)

New York Times

Queen City Mall (Spearfish, SD)

Rapid City Journal

South Dakota Highway Magazine

Utah Law Review

Index

A

Abourezk, James (US Representative), 177, 229
AbTech Technologies, 310
A. C. Nelson Company, 169
Adams, Brian, 184, 185, 204, 221, 233, 237, 255, 392
Adams, James B., 42
agriculture, 16, 18
Ainslie, S. E., 70
Alaska, 185
Albers, Patricia, 9, 10, 11
Alberts, Edwin, 135
Alcatraz Island, 219, 220
Alexander, Calvin, 200, 234
Alexander, Scott, 200, 234
Aley, Tom, 189
Allen, Bruce, 79
Allgier, Ken, 192, 193, 194, 255
Allison, Stan, 262
American Cave Conservation Association, 203
American Cyanamid Company, 166
American Indians: Apache, 12; Arapaho, 12, 13, 14; Arikara, 14; Assiniboine, 14; and bison, 10, 11, 14, 15; in Black Hills, 5, 9, 10, 12–14, 29, 338; Cheyenne, 12, 13, 14; Cheyenne River Sioux, 201; Chippewa, 11; Comanche, 10, 12; Cree, 11; Crow, 12, 14; Crow Creek Sioux, 201, 339; Dakota, 11, 201; equestrian lifeway of, 11; in Great Lakes region, 11; Great Plains culture, 14; Great Sioux Reserve/Reservation, 14, 201; Gros Ventre, 14; Iroquois, 11; at Jewel Cave, 10, 11, 272, 341; Kiowa, 12; Kiowa-Apache, 12; Lakota, 5, 11, 12–13, 14, 15, 18, 29, 201, 272; Lower Brule Sioux, 201; Mandan, 14; Mandan, Hidatsa, and Arikara, 11, 12; Missouri River culture, 11, 12; Nakota, 11, 201; Northwest Plains culture, 10; as NPS employees, 238; Oglala Sioux, 201; Padouca, 12; Plains Woodland culture, 10; Ponca, 12; relationships with, 338, 339; Rosebud Sioux, 201; Santee, 11; Santee Sioux of Nebraska, 201; Seven Council Fires, 201; Shoshone, 10, 14; Sioux, 11, 14, 16; Sioux Nation, 201; Sioux Tribe of the Fort Peck Reservation, 201; Standing Rock Sioux, 201; Suhtai, 12; Teton, 11; Yankton-Yanktonai, 11
Americans with Disabilities Act (ADA), 274, 280, 298
Ancient Order of United Workmen, 25
Anderson, John, 198
Anderson, Vernon M., 152
Antenna Theater, 219
Antiquities Act, 31, 33, 35, 36, 43, 46, 50
Aperture Films, 347
Appling, Bob, 181, 392
Arcadia Publishing, 302
Archaeological Resources Protection Act of 1979 (ARPA), 203

archeology, 5, 9, 10, 11, 29, 108, 201, 203, 210, 263, 272–73, 276, 286, 337, 339
Argus-Leader (Sioux Falls, SD), 52
Arlton, Stan, 8, 119, 140
Armstrong, Andy, 327
Arnold, Jay, 187
Atkins, Katie (Keil), 1, 295, 320, 393
Austin, Dan, 305, 323, 330, 331, 353, 393
AutoDesk, Inc., 194
Automated National Catalogue System (ANCS), 212

B

Badlands National Monument (later Badlands National Park), 74, 75, 77, 78, 88, 90, 147, 181–82, 212, 243, 294, 296, 298
Baggley, George E., 128, 136, 140
Bailey, Zelda, 263
Baird, Bruce, 296, 321, 394
Baker, Howard W., 69, 74, 76–77, 78, 79, 96, 106, 108, 114–15, 115–16, 123, 125, 126–27, 132, 133
Baker, Robert M., 245
Baldwin, Steve, 193, 194, 262, 301
Barrett, Frank A. (US Representative), 86
Basinger, Jim, 196, 197, 215
Baughman, Merrith, 290, 344, 393
Bear Butte State Park, 188
Bear Mountain, 47
Beatty, M. E., 123, 124, 128, 147–48
Belleville, IL, 138
Bentley, Donna, 237, 238, 251, 276, 393
Berry, Ellis Y. (US Representative), 144, 177
Bethlehem Cave, 21, 194
Biffle, Earl C., 138, 141
Big Bend National Park, 308
Bighorn Cave, 197
Biospherics, Incorporated, 346
Bismarck, ND, 86, 265
bison, 10, 11, 14, 15, 182
Bison State Telephone Company, 155, 235
Bitz, Bruce, 214, 215
Black, John, 294, 302, 315, 316, 321, 393
Black & Veatch, 248
Black Elk Peak, 5, 13
Black Hills: American Indians in, 5, 9, 10, 11, 12–14, 29, 338; archeology of, 5, 9, 10, 29; attempts of United States to acquire, 16; caves in, 6, 18, 21, 82, 83, 87, 96, 97, 98, 102, 104, 120, 130, 178, 189, 198, 304; fire protection in, 88–89, 207, 267, 269, 270; flora and fauna in, 33, 206; French Creek area, 15; geology of, 5; gold in, 15; history of, 217, 218; and Jasper Fire, 281, 282; mining in, 12, 15, 16, 28, 29; NPS units in, 237, 243, 295, 296, 307, 308, 354; park proposed in, 201; rock

climbing in, 120; settlement in, 12, 15, 17, 29; significance to Lakota, 13; survey of, 15, 18; timber in, 16, 17, 56, 91–92, 218, 222; topography of, 312; tourism in, 16, 23, 27, 31, 47, 49, 58, 84, 108, 222, 241, 273, 302; mentioned, 19, 42, 89, 192, 272
Black Hills Administrative Group, 239–40, 280, 294–96, 354
Black Hills Area Association (BHAA), 87. *See also* Black Hills Natural History Association.
Black Hills and Badlands Association, 303
Black Hills, Badlands, and Lakes Association Information Exchange, 188, 303
Black Hills Central Reservations, 346, 347
Black Hills Cooperative Fire Control Agreement, 150
Black Hills Discovered, 303
Black Hills Electric Cooperative, Inc., 155, 234
Black Hills Interagency Fire Group, 208
Black Hills National Forest, 16–18, 26, 29, 32, 33, 38, 123, 133, 144, 151, 188, 205, 207, 208, 221, 222, 243, 261, 264, 269, 270, 271, 275, 282, 301, 348
Black Hills National Forest Reserve, 18, 20
Black Hills Natural History Association, 88, 119, 147–48. *See also* Wind Cave Natural History Association.
Black Hills Parks and Forest Association (BHPFA), 2, 187–88, 198, 221, 240–41, 242, 281, 301–2, 305, 306, 317, 340, 344, 347, 348, 349, 353
Black Hills Souvenir, 23
Black Hills Sport and Travel Show, 188
Black Hills Weekly Journal, 23–24
Black Hills Wind Cave Company, 25
Blake, Bill, 306
Block, Bradley, 1, 294, 296, 297, 299, 302, 332, 340, 341, 393
Bogan, Michael A., 259–60, 276
Boland, A. C., 391
Boland, William M., 391
Booth, H. M., 39–40, 41
Bornong, Joanne, 183, 184, 393
Boucher, Rick (US Representative), 201
Bowling Green University, 198
Boy Scouts, 348
Bozeman Trail, 14
Bradley, Bill (US Senator), 201
Brady Engineering Company, 154
Brazell, Thomas W., 391
British Columbia, Canada, 28, 41, 50
Brookings, SD, 192
Brooks, John, 297
Brooks, Karen, 297
Brown, Delmer, 119, 122
Brown, Larry, 146
Brown, Peter M., 269
Bryan, William Jennings, 25
Bryant, Wayne, 88, 104–5

Buffalo Gap National Grassland, 301
Burlington Northern Railroad, 218
Burma, Ben, 83
Bush, Charles, 18, 19, 22–24, 29
Bushfield, Harlan J. (SD Governor), 75
Busse, Corissa, 266, 267, 334, 353

C

Cache la Poudre River Valley, CO, 18
Cain, Bertha, 28, 31, 36, 37, 38, 39, 54
Cair, Stanley A., 162
California, 12, 14, 289
Cannon, Kate, 237, 238, 239, 240, 241, 243–44, 246, 249, 252, 257, 260, 264, 265, 267, 271, 272, 275, 276, 277, 278, 279, 280, 290, 393
Canyonlands National Park, 144
Carder, Beckie, 1, 290, 295, 393
Carlsbad, NM, 264
Carlsbad Cave National Monument, 54
Carlsbad Caverns, 54, 135, 194, 203, 257, 258
Carlsbad Caverns National Park, 54, 83, 196, 256, 262, 327, 346
Carnes, William G., 75, 76
Casey, Tom, 237, 238, 251, 267, 271, 273, 277, 278, 288, 308, 393
Castro, E. J., 104
Caucasus Mountains, 271
Cave Research Foundation, 262, 263
caves: bats in, 88, 145–46, 171, 172, 196, 198, 207, 217, 259–60, 261, 263, 276, 299, 304, 313, 330, 333, 347; in Black Hills, 6, 18, 21, 82, 83, 87, 96, 97, 98, 102, 104, 120, 130, 178, 189, 198, 304; books about, 87; caving community, 254, 304; discovery of, 22; exploration of, 2, 18–20, 21, 22, 70–71, 110, 113, 117–45, 158, 159, 171, 185, 190–94, 195, 202, 211, 217, 254, 255–57, 281, 292, 296, 299, 304, 323–24, 328–30, 347, 350, 354, 355, 356; geology of, 5–9, 120; mystique of, 22; protection of, 53–54, 201–4; safety, 193, 195; tourism at, 20, 53; vandalism at, 203
Centennial Development Co., 163
Center for Biological Diversity, 332
Chicago, IL, 25, 96
Childs, Frank, 69, 76, 77, 89, 92
Chittum, Harold J., 152
Choate, Jerry, 198
Chokecherry Spring, 143
Civilian Conservation Corps (CCC): abandons Jewel Cave side camp, 72; camps, 274; and forest management, 69; historic document collection, 340; infrastructure improvements at Jewel Cave, 3, 55–58, 59–60, 62–69, 94, 95, 98, 99, 143, 170, 172, 208–9, 210, 249, 273, 313, 337, 344; installs elevator at Wind Cave National Park, 83; pictured, 62; surveys of Jewel Cave, 120
Clark, Bill, 219
Clark Drilling Company, 141
Cleveland, Grover (US President), 16

Climate Friendly Parks Workshop, 298
Clinton, Bill (US President), 239
Cockrell, Ron, 1
Coe, S. V., 8, 32
Coe, Samuel U., 51
Coe, Vance I., 8, 32
Colorado, 14, 18
Conn, Herb: assists with determining Jewel Cave's surface footprint, 138, 139, 141; assists with lighting system for Jewel Cave NM, 164, 166; attends ribbon-cutting at new visitor center at Jewel Cave NM, 177; caving equipment displayed at Jewel Cave, NM, 172; exploration of Jasper Cave, 124–25; exploration of Jewel Cave, 3–4, 113, 116, 121–22, 123, 124–30, 131, 133–37, 144, 157–58, 159, 178, 185, 190–94, 255, 354, 356; and NSS, 262; opposes self-guided tours at Jewel Cave NM, 200–21; pictured, 121, 122, 124, 125, 129, 178, 184, 214; plans tour routes, 157–58, 179; publishes book on Jewel Cave, 210–11, 223; retired, 323; reviews Jewel Cave NM brochure, 223; rock climbing, 120–21; studies airflow at Jasper Cave, 125; studies airflow at Jewel Cave, 8–9, 140, 172, 190, 332; mentioned, 181, 219, 329
Conn, Jan: assists with determining Jewel Cave's surface footprint, 141; attends ribbon-cutting at new visitor center at Jewel Cave NM, 177; caving equipment displayed at Jewel Cave NM, 172; celebrates 200th mile at Jewel Cave, 353; exploration of Jasper Cave, 124–25; exploration of Jewel Cave, 3–4, 113, 116, 121–22, 123, 124–30, 131, 133–37, 144, 157–58, 159, 178, 185, 190–94, 255, 354, 356; and NSS, 262; opposes closure of Jewel Cave exploration to volunteers, 329; opposes self-guided tours at Jewel Cave NM, 220–21; pictured, 121, 122, 124, 126, 131, 178, 345, 350, 353; plans tour routes, 157–58, 179; publishes book on Jewel Cave, 210–11, 223; records film audio for Jewel Cave NM, 347; retired, 323; reviews Jewel Cave NM brochure, 223; rock climbing, 120–21; studies airflow at Jewel Cave, 190; mentioned, 181, 219
Conner, James F., 44, 45, 46, 47, 48, 49, 50, 51, 52
Coolidge, Calvin (US President), 54
Corner Construction Company, 174
Crazy Horse Memorial, 303
Creative Act, 16
Cronenberger, Richard, 274
Crook County, WY, 267
Cross, Frank, 205, 271
Cross, W. R., 25
Crystal Cave. *See* Bethlehem Cave.
Cub Scouts, 348–49
Cumberland Gap Caves, 194
Cumberland Valley Railroad Company, 21
Curry, Diana, 297
Curry, Patrick, 297
Curtain, Marie, 239, 240, 244, 271, 276, 277, 393
Custer, George (Gen.), 15
Custer, SD, 1, 2, 15, 16, 18, 22, 25, 31, 48, 50, 51, 54, 58, 60, 61, 64, 70, 84, 86, 90, 115, 123, 130, 141, 142, 148, 152, 153, 181, 188, 190, 199, 229, 243, 244, 252, 253, 265, 266, 283, 319, 325, 348, 353
Custer 4-H, 153

Custer Bank, 188
Custer Chamber of Commerce, 153, 188, 241, 254, 303
Custer Christmas Parade, 303
Custer Christmas for Kids, 303
Custer Chronicle, 23, 27, 86, 189, 193
Custer Commercial Club, 48, 50, 51
Custer Community Hospital, 188
Custer County, SD, 19, 32, 36, 41, 271
Custer County Commission, 265
Custer County Emergency Services Office, 307
Custer County Environmental Education Coordinating Committee, 221
Custer County School System, 221
Custer County Sheriff's Office, 235, 236, 243, 307, 354
Custer County Weed Inspector, 271
Custer Housing Authority, 265–66
Custer Regional Hospital, 303
Custer Rotary Club, 86, 188, 303
Custer School District, 347
Custer Sportsmen Association, 153
Custer State Game Sanctuaries, 75
Custer State Park, 75, 91, 188, 229, 294, 301, 348, 349

D

Dance, Harold, 182–83
Danielson, W. C., 43–44, 45
Daschle, Tom (US Senator), 201, 202–3
Daughters of the American Revolution (DAR), 25
Dave, Dennis, 304
Davies, William, 120
Davila, Vidal, 391
Davis, Marsha, 200, 234, 259
Davis, Will E., 52
Deadwood, SD, 23, 26, 27
Deal, Dwight, 120, 121, 122, 130, 220, 262, 353
de Coursey, Wesley, 84, 88
Demaray, A. E., 86
Denver, CO, 42, 180, 237
Dersch, Rusty, 205
Despain, Joel, 256, 305
Devenport, J. F., 138
Devils Tower National Monument, 75, 77, 78, 87, 88, 147, 151–52, 208, 243, 269, 270, 288, 340, 348
Dille, Frederick N., 391
Dilts, Karen, 126
Dilts, Larry, 180, 184, 206, 216, 237, 244, 246, 247, 248, 249, 250, 274, 279, 285, 290, 344, 392

Ditmanson, Dennis, 181, 182, 183, 185, 187, 188, 192, 193, 196, 197, 205–6, 210, 218, 219, 224–25, 226, 228, 392
Dobberstein, Paul, 41, 43
Doerr, John, 120
Dolinich, Peggy, 219
Donnell, Jean, 183

E

Eastern Star, 25
Eggers, Myron, 243
Eibert, Bill, 119–20, 122
Eilefson, Ron, 295
Electronic Solutions, 346
Elks, 25
El Morro National Monument, 182
Elms, Wallace B. (Walter, Wally), 116, 117, 124, 138, 141, 392
Emergency Relief and Construction Act, 59, 60
Engelbert, Bill, 62
Environmental Education Association of South Dakota, 188
Epworth League, 25
Equal Employment Opportunity (EEO), 298
Eubank, John, 138
Evans-Hatch, Gail, 9, 337
Evans-Hatch, Michael, 9, 337
Evans-Hatch and Associates, 337
Evans, Mike, 339
Everglades National Park, 77
Executive Order 6166, 56

F

Fagnan, Brian, 323
Fahrenbach, Mark, 259
Farrell, Don, 83
Farrell, Jane, 186
Farrell, Tom, 317
Fay, Dick, 189
Federal Cave Resources Protection Act, 201–4, 261, 264, 324
Federal Lands Recreation Enhancement Act (FLREA), 292
Federal Leadership in Environmental, Energy, and Economic Performance, 298
Federal Register, 142
Federal Wildland Fire Management Policy and Program Review Report, 269
Fellbaum, Keith, 166, 167
Fenton, MO, 138
Field, Ernest, 149–50
Fitzgerald, C. W., 19, 32–33

Florissant Fossil Beds, 294
Forest Reserve Act, 16–18, 35
forest reserve system, 17, 53
Forest Service. *See* US Forest Service.
Ford, Derek, 198
Fort Collins, CO, 91
Fort Hays State University, 198, 276
Ft. Morgan, CO, 232
Fossil Cycad National Monument, 79, 90–91
Four Mile Creek, 58
Freedom of Information Act (FOIA), 324
Freeland, Edward D., 57, 391
Frontier Constructors, Inc., 160, 162, 163, 164
fur trade, 13–14

G

Garfield, James R., 33
General Land Office (GLO), 20, 26, 35, 40, 42
Geneva, NY, 120
geology: of Black Hills, 5; boxwork, 40, 42, 43, 132, 147; calcite crystals, 7, 40, 41, 43, 80, 95, 104, 108, 127, 128, 130, 131, 137, 299; of caves, 5–9, 120; Deadwood Formation, 233; frostwork, 19, 40, 42, 127, 147, 330; geodes, 42, 96, 132; of Jewel Cave, 5–9, 32, 69, 80, 83, 102, 104, 120, 128, 130, 133, 137, 149, 158, 163, 187, 190, 211, 217, 237, 254, 259, 261, 276, 331, 353, 355; Laramide Orogeny, 5; Limestone Plateau, 108; Minnelusa formation, 5–6; Mississippian Period, 5; Pahasapa limestone, 5, 6; stalactites, 42, 80, 130; stalagmites, 42, 43, 130, 133, 134, 136, 137, 157; studied, 158, 187; surface, 149
Germany, 332, 353
Gillespie, Donald F., 117, 151, 153, 158, 164, 170, 392
Girl Scouts, 348
Given, Dave, 289
Glacier National Park, 115
Glass, Carl, 152
Gleicher, Michelle, 279
Glen Canyon National Recreation Area, 237
Gola, Miriam, 290, 295, 393
Golden Gate National Recreation Area, 183
Gore, Al (US Vice President), 239
Government Accountability Office (GAO), 225
Graves, Henry, 18
grazing, 16, 18, 32, 68
Grand Army of the Republic, 25
Grand Canyon, 33
Gratten, Weldon, 106
Great Basin National Monument, 305
Great Dakota Bust, 16

Great Depression, 59
Great Plains, 14
Great Sioux Reserve, 14
Greene, C. W., 26
Gregg, H. Raymond, 105
Gries, John Paul, 120
Grotto of the Redemption (West Bend, IA), 41

H

Hall, Robert G., 104
Hannan, John, 119–20
Hanson, Harold S., 79
Harding, Warren G., 53
Harney National Forest, 38, 44, 51, 54, 59, 75, 90, 92, 149
Harney Peak. *See* Black Elk Peak.
Harpers Ferry Center (HFC), 170, 172, 219, 222, 223, 288, 347, 350
Harrison, Benjamin (US President), 16
Hart, Jill, 239, 240, 252, 295, 393
Hart, Richard T. (Dick), 79, 80, 88, 108, 118, 147, 392
Hartzog, George, 137, 142, 170
Harvard University, 130
Hatton, John, 45, 46
Hayes, Willett Martin, 33
Hays, KS, 276
Hays, William, 40
HDR, 316
Heckman, Phil, 295, 393
Heideman, Eric, 86
Hell Canyon, 2, 18, 19, 22, 23, 28, 29, 43, 44, 50, 60, 61, 62, 70, 73, 90, 95, 100, 105, 106, 128, 143, 153, 169, 170, 178, 190, 191, 206, 218, 233, 249, 252, 253, 254, 282, 286, 288, 312, 337
Hell Canyon Stream Channel, 286
Hendricks, Al, 2, 180, 181, 185, 187, 191, 212, 214, 215, 217, 226, 392
Henley, Lyn, 350
Hermann, Binger, 26
Highway 16: accidents on, 236; advertised, 86; Association, 153; centerline of, 142; fencing alongside, 207, 253; fire management near, 270; improvements to, 244, 252–54, 311–13; intersection with Jewel Cave NM road, 67, 100, 133, 154, 236, 253, 337; and Jasper Fire, 281, 282, 283, 286; pictured, 60; plans to reroute, 105, 106, 253; portion adopted by Paha Sapa Grotto, 304; realigned, 58–61, 253; right-of-way, 68; side work for, 64; signage on, 95, 155; vegetation along, 206; water runoff from as potential source of pollutants, 200; mentioned, 50, 219, 331
Highway 85, 58
Hill, W. F., 35–36
Hill City, SD, 151
Hill Spring. *See* Jewel Cave Spring.

Hipschman, Don, 135–36, 157
Hitchcock, Ethan A., 26
Hockelberg, Cindy, 267
Holder, Steve, 183, 185, 205, 220, 221, 226, 227, 255, 393
Holmes, Clyde, 18
Holmes, Mark, 18
Hoover, Herbert (US President), 54
Horrocks, Rod, 304
Hosback, Lea, 64
Hotchkiss, Warren D., 149, 153, 171, 391
Hot Springs, SD, 16, 23, 25, 31, 174
Hot Springs Gem and Mineral Society, 153
Housing Corporation, 232
Hovey, Horace Carter, 22
Howard, Alan D., 130–32
Howe Investments and Northwestern Engineering Company (HINEC), 152, 156
Howe's Cavern, 22
Hunt, Naomi, 181
Hunt, Wilson, 13
hunting, 31
Hurd, Steve, 180, 198, 216, 222, 392
Hylton, Jimmie D., 118

I

Ikeda, Noby, 181
Indiana, 22
Ingalls, George F., 76, 98
International Congress of Speleology (ICS), 262
Iowa, 41

J

Jablonski, Pat, 257–58
Janklow, William J. (SD Governor), 235
Jasper Cave: airflow at, 125; entrance excluded from Jewel Cave NM, 133, 144–45; explored, 124–25; improvements suggested, 102, 103; included as a part of Jewel Cave NM, 33, 35, 48; interpretive statement ignores, 80; not to be developed, 104, 107, 125, 126; signs at, 110; tours not given, 52; vandalism at, 152; work not performed by CCC, 58; mentioned, 8, 32, 281
Jasper Fire (2002), 206, 281–88, 309, 311, 321, 334, 335, 351
Jennings, Ted, 259
Jewel Cave:
American Indians at, 10, 11, 272, 341;
areas within: Big Duh, 256; Blue Heaven, 100; Brain Drain, 215; Broken Chamber, 70; Bye-Bye Canyon, 96; Corrigan Passage, 236; Cracker Barrel, 128; Curio Shop, 327; Deep Camp, 329; Deep Canyon, 100; Dingo Pass, 323; Dungeon Room, 82, 214; Eerie Boulevard, 127; Flat Top Room 70; Frosty Grotto, 127, 128; Formation Room, 157, 158, 197; Gothic Dome, 43,

70, 71; Haunted Loft, 128; Heavenly Room, 82; Hell Canyon Camp, 329; Hell's Half Acre, 329; historic area, 242, 250, 254, 279, 313, 343, 344; Hourglass Lake, 329; Hurricane Corner, 9, 255; Junction Chamber, 43–44, 70; King Kong's Cage, 131; Kittycombs, 66, 67; Long-Winded Passage, 130; Mezzanine, 157; Milk River, 19, 43, 44, 70, 71, 80, 82, 83, 118, 123, 126; New Wet Room 200; Onyx Hall, 44, 80; Penn Station, 123; Ragged Top Room, 70; Rambling Loft, 330; Rum Runners Road, 157; Seventh Heaven, 255, 256; Spooky Hollow, 157; Station 108, 44; Target Room, 138, 139, 140, 141, 142, 143, 158, 159–60, 162, 163, 165, 166, 167, 168, 179, 190, 220, 278, 315, 316, 342; Torture Room (formerly Chinese Torture Chamber), 157, 213; Very Important Shortcut (VISC), 191, 193; Victory After Continuous Contortions (VACC), 194, 328; West Camp, 329
Dance Club, 23;
estimated volume of, 8, 119, 139;
exploration of, 2, 18–20, 22, 70–71, 110, 113, 117–45, 158, 159, 171, 185, 190–94, 195, 211, 217, 254, 281, 292, 296, 299, 304, 323–24, 328–30, 347, 350, 354, 355, 356;
features of: airflow within, 7–9, 18, 32, 71, 119, 140, 147, 149, 158, 159, 171, 190, 227, 261, 299, 331, 332, 350; alcoves, 96; aragonite, 127, 132, 330; bacon rind, 129, 137; boxwork, 40, 43, 132, 147; calcite crystals, 7, 40, 41, 43, 80, 95, 104, 108, 127, 128, 130, 131, 137, 299; cave pearls, 132, 137; chert layers, 132; chiclet, 137; columns, 130; Cracker Jack, 44, 71; dogtooth spar, 124, 130, 215; draperies, 130; drip formations, 128, 130, 137; druses, 96, 131; flowstone, 130, 131, 132, 137; frostwork, 19, 127, 129, 147, 330; geodes, 96, 132; globulites, 147; gypsum flowers, 147; helictites, 130, 147; hydrology, 158, 196, 263, 287, 331; hydromagnesite bubbles/balloons, 130, 131, 132, 147, 157, 199; limestone, 158, 160; logomites, 133, 134, 136, 137, 157; manganese, 40, 131, 132; polished peppers, 132; popcorn, 131, 133, 137; red cave earth, 132; ribbon calcite, 96; rimstone, 132; sandstone intrusions, 131; scintillites, 130, 131, 132, 137, 157; soda straws, 132; speleothems, 158, 192, 197, 278, 299, 350; stalactites, 80, 130; stalagmites, 43, 130, 133, 134, 136, 137, 157; water pools, 132; wet rooms, 130
federal protection of, 53;
Game Preserve suggested, 31, 32, 54;
geology of, 5–9, 32, 69, 80, 83, 102, 104, 120, 128, 130, 133, 137, 149, 158, 163, 187, 190, 211, 217, 237, 254, 259, 261, 276, 331, 353, 355;
local support for, 48;
location of, 5;
mining at, 19–20, 22, 27–28, 33–34, 35–41, 43, 47, 50, 51, 52, 54, 122–23, 211, 279;
modifications to, 22–24;
national monument status suggested, 32;
national park status suggested, 27;
promotion of, 22–24, 135–36;
protection against vandalism, 35, 41–47, 48;
purchase proposed, 27;
routes through, 23, 43;
specimens removed from, 23, 41, 42, 43, 45, 46, 48–49, 95, 104, 108;
topographical survey of, 43–44;
tourism at, 20–24, 27, 28, 29, 31, 37, 38, 39, 40, 47–52, 54, 56, 70
Jewel Cave Corporation: disbanded, 72; formation, 50–52, 54; management of Jewel Cave, 55–58, 66, 67; offers tours of Jewel Cave, 57, 58, 63, 70, 73, 80, 354; road construction, 64
Jewel Cave Employee Association, 303

Jewel Cave Employee's Recreation Association, 188
Jewel Cave National Monument:
75th anniversary, 188, 210;
100th anniversary, 302;
75th mile surveyed, 193, 236;
100th mile surveyed, 255;
200th mile surveyed, 281, 324, 329–30, 351, 353;
200-mile reunion, 1, 2, 302, 330;
Accident Review Committee, 298;
administrative history (proposed), 210–11;
appropriations for, 47, 48, 57, 69, 73, 80, 101, 140, 162, 225, 229, 259, 279, 292, 293;
archeology at, 9, 10, 11, 108, 263, 272–73, 276, 286, 337, 339;
and Black Hills Administrative Group, 239–40, 280, 294–96, 321;
Black Hills Natural History Association at, 88; Boneyard, 250–51;
boundaries of, 68, 95, 103, 113, 142, 144–45, 149, 237, 242;
brochure, 85–86, 147, 222–23, 347;
climatology, 353;
consideration of de-establishment, 40, 46, 72, 93–105;
cultural landscape, 272, 337;
cultural resource management, 184, 195, 208–12, 261, 272–77, 290, 292, 309, 337–40, 347;
development of, 47, 49, 57, 108, 109, 131, 132–37, 153, 211;
entrances to: additional considered, 99–100, 113, 127, 128, 129, 132, 137, 158; historic (created), 22, 23, 45, 61, 64, 65, 70, 74, 94, 133, 143, 178, 179, 209, 213, 228, 243, 260, 273, 276, 279, 306, 313, 331, 337, 344, 354; modern (created), 113, 178; original (natural), 22, 299;
established, 31–35, 54, 211;
ethnographic resources, 272;
exhibits at, 172;
Green Team, 298;
historic resources, 272, 274, 276, 337;
improvements to: campground, 58, 68–69, 94, 95, 98, 99, 102, 104, 105, 106–7, 108, 229; Canyons Trail, 254, 309, 321, 343; cave trails, 66–67, 99, 101, 102, 104, 107, 108, 109, 155, 164–66, 198, 224, 227–28; by CCC, 3, 55–58, 59–60, 62–69, 94, 95, 98, 99, 143, 170, 172, 208–9, 210, 249, 273, 313, 337, 344; communications systems, 100, 103, 166, 220, 234–35; concessions, 84, 99, 148, 242–43, 306; electricity, 103, 107, 111, 155, 164, 165, 220, 232–35; elevator, 102, 103, 104, 111, 132, 133, 143, 144, 155, 157–68, 172, 176, 177, 178, 179, 186, 225, 226, 227, 229, 236, 237, 244–47, 258, 259, 278, 310, 313–15, 345, 354; historic log hotel, 19, 23, 24, 33, 40, 45, 228, 273, 312; housing, 94, 99, 101, 102, 107, 132, 133, 144, 155, 162, 172–74, 225, 229–32, 244, 251–52, 267, 285, 319–20; internet, 244, 321, 346; museum, 107–8, 211–12, 272, 275–77, 350; ranger cabin, 63, 64, 94, 95, 98, 99, 100, 143, 170, 172, 208–9, 272, 273–75, 306, 308, 313, 337, 343; roads, 59, 60, 64, 103, 105–6, 144, 154–56, 164; signs, 67, 95, 100, 103, 109, 110, 145, 155, 170, 178, 224, 279; surface trails, 64–65, 94, 95, 101, 102, 107, 217–18, 224, 228–29, 254, 343; underground lighting, 143, 144, 155, 164–66, 197, 213, 228, 257, 261, 314, 354; visitor center, 102, 105, 107, 113, 124, 133, 138, 140, 143, 144, 147, 152–77, 178, 181, 186, 187, 198, 212, 216, 218, 225, 226–27, 229, 236, 242, 244, 247–48, 249, 250, 253, 254, 267, 280, 283, 287, 290, 291, 297, 301, 302, 310, 317–18, 321, 328, 343,

350, 354; Walk on the Roof trail, 254, 321, 343; water and sewage system, 62–63, 94, 98, 99, 100–101, 103, 156, 169, 210, 230, 232–35, 242, 244, 249–50, 270, 271, 287, 320–21;
inclusion in Black Hills National Forest suggested, 32, 33;
interpretation at, 72, 79, 80–86, 88, 93–94, 99, 102, 107, 130, 167, 168–72, 179, 180, 183, 184, 187, 190, 195, 196, 211–23, 228–29, 236, 237, 238, 241, 243, 244, 246, 247, 257, 262, 277–80, 281, 287, 288, 290, 291, 293, 296, 301–2, 304, 305, 326, 338, 340–50, 351, 354;
and Jasper Fire, 281–88;
Junior Ranger program, 222, 301, 340, 347–49;
land leased to JCC, 52;
land removed from settlement, 35;
law enforcement at, 73, 152, 235–36, 238, 243–44, 306–9, 354;
location of, 50;
maintenance at, 72, 73, 74, 79, 101, 113, 172–74, 223–36, 242, 244–54, 267, 291, 293, 294, 296, 309–21, 326, 354;
Maintenance Management System (MMS), 225–26;
management by: Forest Service, 31, 35–52, 54, 72, 86, 354; NPS, 3, 4, 55–58, 67, 68, 69, 70, 71, 72–93, 99, 100, 101, 110, 111, 123, 124, 126, 134, 136, 138, 144, 149, 150, 154, 164, 165, 173, 177, 178, 179, 189, 190, 193, 194–98, 200, 208, 209, 210, 226, 228, 229, 232, 233, 239, 242, 248, 249, 251, 254, 256, 264, 266, 269, 280, 288, 354, 355; Wind Cave National Park, 55, 57, 59, 66, 68, 69, 70, 72, 74, 75, 77, 78, 79, 83, 84, 85, 90, 93, 96, 99, 101, 102, 104, 105, 107, 109, 110, 113, 114–15, 116, 118, 121, 123, 145–46, 151, 167, 171, 172, 179, 181–82, 185, 196, 197, 200, 216, 222, 223, 229, 230, 231, 235, 238, 247, 256, 281;
map of, 34, 35, 223, 237, 239, 275, 289, 294, 354;
mapping, 118–20, 131, 168, 194, 258–59, 324;
natural resources: aboveground, 89–92, 149–52, 171, 196, 205–7, 217, 228–29, 271–72, 322; bats, 88, 145–46, 171, 172, 196, 198, 207, 217, 259–60, 261, 263, 276, 299, 304, 313, 330, 333, 347; belowground, 88–89, 142, 179, 196, 205, 237, 238, 261, 322; biological, 237, 254, 258, 261, 290, 353, 355; cave lakes, 299; cave management, 195, 196, 197, 198, 200–205, 237, 238, 241, 254, 257–61, 281, 290, 301, 304, 326, 351; conservation, 198; fire management, 89–90, 99, 103, 143, 150–52, 207–8, 211, 224, 229, 235, 241, 251, 267–70, 280, 281, 285, 288, 297, 333, 335–37, 351, 354; Fire Management Unit, 335; Fire Use Module, 269, 281, 336; grazing, 92, 143, 149, 154, 204, 205, 206, 207, 271; hydrology, 158, 196, 200, 226, 234, 259, 321, 351, 353; and insect infestations, 69, 91, 92, 98, 149–50, 206; invasive species, 206, 271, 281, 286, 321, 334–35, 351; mammals, 88, 258, 276; management of, 180, 184, 190–208, 224, 236, 238, 243, 244, 246, 249, 253, 254–72, 281, 288, 290, 291, 292, 296, 297, 304, 309, 316, 321–37, 345, 347, 349, 350, 351, 354, 355; mineral deposits, 88–89, 122–23, 333; mineral specimens displayed, 84, 137, 171, 172; Natural Resource Program Review, 197, 204–5; photo-monitoring program, 198; soil and moisture conservation, 149; surface geology, 149; timber, 17, 32, 40, 56, 69, 80, 89, 91–92, 98, 99, 107, 128, 147, 149, 204, 211, 269, 270, 285, 286, 288, 333; vegetation surveyed, 200, 206; weed control, 205, 206; withdrawal of land from mineral entry, 123, 143, 205;
and NEKOTA, 240, 280, 295–96;
Park Safety Committee, 298;
as part of Harney National Forest, 38;
as part of potential Sioux National Park, 201;
partnerships, 86–88, 188–189, 200–205, 222, 240–41, 262–64, 267, 280, 303–6, 336;

planning, 297–300;
planning documents: Cave and Karst Management Plan (CKMP), 324, 325–27, 328, 351; Cave Rescue and Emergency Operations Plan, 193; Cave Rescue Pre-Planning, 257; Climate Friendly Parks Plan, 298; Continuation of Operations Plan, 298; Core Operations Report, 291–92, 305, 341; Cultural Landscape Report (CLR), 337, 344; Draft Comprehensive Interpretive Plan (CIP), 343; Draft Human Use Document, 260; Environmental Assessment, 288, 325–27, 337; Environmental Impact Statement (EIS), 242; Fire Management Plans, 208, 268, 288, 337; First Master Plan (1942), 93–96; Foundation Document, 299, 300, 355; General Development Narrative, 142–43, 152; General Management Plans, 185–86, 204, 241–42, 245, 249, 251, 257, 264, 273, 279, 297, 299; Geologic Resources Inventory Report, 331; Hazard Fuel Reduction Program, 267, 268; Historic Furnishing Report (HFR), 344; Historic Resource Studies (HRS), 209, 273, 337–38; Historic Structure Report, 274; Housing Management Plans, 231, 251, 319; Interpretive Prospectuses, 186, 279; Jurisdictional Inventory, 308; Law Enforcement Needs Assessment (LENA), 306; Long Range Interpretive Plan, 341; Master Plan (1965), 143; Mission 66 Prospectus, 102–5, 107, 108, 111, 117; Modified Environmental Management System (MEMS) plan, 298; Natural and Cultural Resource Management Plan (RMP), 195–96, 205, 206, 207, 209; Natural Resources Condition Assessment, 322; Operations Evaluation Report, 297, 302, 308, 309, 314, 319, 328, 335, 338, 341; Park Safety Program Statement of Purpose, 244; Policy on the Distribution of Cave Data, 324, 326; Resource Management Plans (RMP), 253, 257, 261, 272; Revised Master Plan and Prospectus (1957–1985), 105–10; Scope of Collections statement, 339, 340; Search and Rescue (SAR) Plans, 256, 327; Standard Operations Procedures (SOPs), 297; Superintendent's Compendium, 298–99; Updated Master Plan (1952), 98–101; Visitor Management-Resource Protection Assessment Program (VRAP), 244, 307; Wildland Fire Prevention Plan, 268;
primitive nature of, 82–83, 96, 98, 102, 104, 107, 111, 124, 131;
promotion of, 82, 83, 87, 135–36, 219;
proposed as part of Black Hills-Great Plains National Park, 75;
protection of, 72, 73, 74, 79, 88, 180, 183, 190;
radiation in, 194, 226–27, 232, 331;
radiolocation at, 138–41, 330;
recommended as a national forest, 46;
recommended as a national monument, 33;
recommended as a national park, 137;
recommended as separate superintendency, 78, 114, 115–16;
recycling at, 233;
rockfall at, 166–67;
safety at, 193, 194, 195, 245, 248, 278, 281, 298, 309, 346;
search and rescue at, 304, 308, 327;
solid waste disposal, 233, 250–51;
significance of, 96–98;
staffing at, 103, 107, 113–17, 145, 179–85, 186–87, 218, 220, 237–42, 288–94, 341, 345;
Student Conservation Association (SCA) at, 185, 187, 218, 238, 290, 301, 354;
Student Temporary Employment Program (STEP), 293;
surveys of, 67, 70–71, 102, 120, 205;
trespass on, 68, 95, 149, 152, 154, 205, 206;

tours: capacity of, 171, 214, 219, 220, 221, 228, 244–46, 277, 278, 343; costumed, 279, 344; demand, 212, 213–14, 217, 218, 219, 220, 221, 277, 278, 342; Discovery Tour, 345; fees for, 171, 221, 236, 278, 340, 345–47; Heaven (Heavenly Room) tour, 82, 83, 109, 249; Hell (Dungeon Room) tour, 82, 109, 249, 313; from historic entrance, 179; in "historic" portion, 169; Historic/Candlelight Tour, 213, 215, 278, 279, 330, 341, 343, 344, 345; incorporating elevator, 143, 157–68, 179, 236, 244, 245, 278, 354; Lantern Tour, 344, 354; Long Spelunking Tour, 213, 214, 216; loop tour, 123, 124, 126–27, 128, 159, 220; Milk River tour, 82, 123; P.E.O. tour, 82; routes, 70, 71, 80, 82, 107, 123–28, 131, 157–68, 222, 248–49, 274; Scenic Tour, 197, 198, 213, 214, 227, 228, 248, 257, 278, 296, 297, 315–17, 331, 342, 343, 344, 345; self-guided proposed, 219–21; Short Spelunking Tour, 213, 214; Spelunking Tour, 189, 200, 214, 215, 216, 278, 341; for students, 348; Target Tours, 278, 345; Temple Dome tour, 82; Wild Caving Tour, 308, 341, 343; mentioned, 52, 55, 57, 58, 70–71, 72, 73, 74, 79, 80–86, 88, 89, 107, 119, 168, 169, 177, 242, 263, 326, 340, 341–44, 354
vandalism at, 72, 73, 95, 152, 219, 229, 243, 251, 263, 308, 330;
visitors, 58, 70, 80, 83, 84, 95, 98, 99, 107, 113, 117, 127, 136, 144, 148, 161, 168, 169, 171, 179, 189, 190, 197, 211, 212, 214, 217, 220, 245, 247, 249, 251, 273, 277, 292, 302, 341–44;
volunteers at, 185, 187, 193, 197–98, 218, 238, 255, 272, 290, 296–97, 301, 303, 309, 323, 324, 326, 328, 329, 341, 347, 354;
Volunteers in Parks (VIP) at, 185, 296–97, 303, 326, 354;
water rights at, 93;
WCNHA at, 148, 169–70, 186–88; mentioned, 1
Jewel Cave Spring, 33, 62
Johnson, Larry, 289, 294, 298, 303, 308, 314, 329, 333, 339, 393
Johnson, Laura, 274
Johnson, Lyndon B. (US President), 144
Johnson, Tim (US Congressman), 254
Jones, Bruce, 9, 338
Jones, Harold, 78, 392
Jones, Knox, 146
Journal of Cave and Karst Studies, 330

K

Kaas, Fred, 167
Kelsey, Clarence, 109
Kentucky, 20, 53
Kerbo, Ron, 305
Kerney, O. C., 50–51
KEVN, 189
Keyser, Willett, 86
King, Bob, 290, 319, 393
King, John, 245
Kinzer, Clarence, 118–19, 123
Kirbo, Ronald, 196
Kit Manufacturing Company
Kittredge, Frank A., 67

Kneipp, Leon F., 48
Knights of Pythias, 25
Kocer, Jerry, 146
Krueger, Leonard A., 392
Kruse, D., 259
Kyler, George R., 166

L

Lacey, John F. (US Representative), 26
Lakota College, 238
Larry Klein Design/Point Zero Design, 247
Lasala, Blase, 328
Layne Consultants, Inc., 275
Lee, Andrew E. (SD Governor), 25
Lehman Caves National Monument, 52, 53, 181, 194
Leonard, George M., 202
Lerch, Bates & Associates, Inc., 246
Lesley, A. F., 50, 51
Lewis, J. Volney, 66, 67, 69, 104
Lewis and Clark Cavern National Monument, 53
Liek, Harry J., 57, 72, 73, 74, 76, 77, 78, 80, 84, 91, 93, 94, 98, 391
Lienau, Walter L. (Walt), 88, 113, 115, 119, 392
Lightning Creek, 58, 59
Linch, Lyle K., 18, 74, 75, 82, 83, 84, 86, 87, 90, 95, 96, 97, 120, 392
Lincoln, NE, 140
Lithograph Canyon, 2, 22, 50, 58, 105, 128, 130, 132, 153, 158, 159, 164, 174, 218, 254, 286, 309, 310, 335, 354
Lloyd, Mike, 252
Lloyd, James V., 99
Logan, Wilfred D., 140
Lombard, Jess H., 115, 116, 117, 121, 122, 123, 126, 127, 128, 132, 133, 134, 136, 137, 138, 140, 146, 151, 153, 172, 391
Long, Barbara Bevin, 273
Look, Hal, 152, 157
Loucks, Dean W., 93
Love, Judy, 302
Lujan, Manuel, Jr. (US Representative), 201–2
Luray Caverns, 21, 22
Lutheran Brotherhood, 188
Lytle, Don, 181, 184, 223, 393

M

MAC Construction, 232, 317
MacMillan, Nancy, 274
Madison Aquifer, 2

Mammoth Cave, 20, 21, 22, 26, 53, 54, 194, 248
Mammoth Cave National Park, 54, 196, 262, 263, 304, 346
Mammoth Cave National Park Association, 54
Martin, Eben Wever (US Representative), 26, 38
Martin, Robert, 146
Martin, Zane, 2, 339–40
Martin and Martin, 310
Martinz, Nancy, 294, 299, 308, 394
Maryland, 120
Masons, 25
Mather, Steven, 53–54, 55
Mattes, Merrill J., 140
Maxwell, James C., 138
McCarty, Ken, 198
McClanahan, Lester F. (Les), 179, 181, 182, 185, 191, 214, 215, 216, 391
McClean, James, 330
McCurdy, Chuck, 158
McDonald, Jesse, 24, 25, 26
McDougall, Roberta, 241–42
McGovern, George (US Senator), 137, 140, 142, 144
McKinley, William (US President), 17, 35
McLaughlin, John S., 103
McLean, Dave, 172
McMaster University, 198
Meinecke, E. P., 68
Menard, Paul, 239–40, 290, 295, 393
Merle, Fred, 391
Merriam, Lawrence C., 92
Michaud, Albert: complains about Forest Service, 55; develops Jewel Cave, 22–24, 44, 45, 47, 52, 179, 249, 273, 303, 354; exploration of Jewel Cave, 2, 18–19, 22, 29; mining claim to Jewel Cave, 19, 20, 22, 27–28, 29, 31, 35, 40, 41, 54; moves to British Columbia, Canada, 28, 41; other mining claims, 28, 36, 39, 51; pictured, 19, 24; promotion of Jewel Cave, 24; reimbursement for Jewel Cave development, 27, 33; reimbursement for Jewel Cave mining claim, 37, 38, 40–41, 50, 51; relinquishment of Jewel Cave mining claim, 38, 39, 51; studies airflow at Jewel Cave, 8, 32
Michaud, Felix, 16, 18
Michaud, Frank: asks Forest Service to take over Jewel Cave, 47; death, 50; develops Jewel Cave, 22–24, 44, 45, 47, 52, 179, 249, 273, 303, 354; exploration of Jewel Cave, 2, 18–19, 22, 29; mining claim to Jewel Cave, 19, 20, 22, 27–28, 29, 31, 35, 40, 41, 54; offers assistance to Forest Service, 45; other mining claims, 28, 36, 39, 51; pictured, 19, 24; promotion of Jewel Cave, 24, 28; reimbursement for Jewel Cave development, 27, 33; reimbursement for Jewel Cave mining claim, 37, 38, 40–41, 50, 51; relinquishment of Jewel Cave mining claim, 38, 39, 51; removes materials from Jewel Cave, 41–43, 45, 46; studies airflow at Jewel Cave, 8, 32; works for Forest Service, 47
Michaud, Ira, 24, 27, 47, 48–49, 51, 52
Michaud, Mamie (Riley): 28, 48–49, 50, 51, 52, 54
Miller, Keith E., 108, 115, 116, 123, 126, 127, 128, 152, 392

Mineral Palace, 23
mining: in Black Hills, 12, 15, 16, 18, 29; gold, 14, 15–16, 28, 29; iron, 28, 37; jasper, 37, 40; at Jewel Cave, 19–20, 22, 27–28, 33–34, 35–41, 43, 47, 50, 51, 52, 122–23, 211, 279; laws regarding, 202, 203; lithographic limestone, 37; manganese, 28, 32, 37, 40; mica, 39; rights, 203; silver, 28; value of minerals, 25, 39, 40, 42, 46
Minneapolis, MN, 60
Minnesota, 117
Minuteman Missile National Historic Site, 298
Missouri River, 11, 12
Mitchell, SD, 27
Mitchell Capital, 27
Modern Woodmen of America, 25
Mojave National Preserve, 289
Montana, 14, 53
Moore, John, 258
Mora, Dave, 198
Morrell, Fred W., 38, 41, 42
Morrison, Don, 294, 320, 393
Mossman, Rick, 306
Motion Control Engineering (MCE), 314
Mott, William Penn, Jr., 225
Mount Rushmore, 5
Mount Rushmore National Memorial: BHAA at, 87, 88; and Black Hills Administrative Group, 240, 294–96, 321; Black Hills Natural History Association at, 88, 147; attends Climate Friendly Parks Workshop, 298; Collection Management Plan, 339–40; creates signs for Jewel Cave NM, 110; curatorial facility, 1, 276–77, 280, 339–40, 350; fire protection at, 90, 151–52, 208, 269, 270; law enforcement at, 243, 306, 354; maintenance at, 309; and NEKOTA, 240; as part of Wind Cave National Park, 77; proposed as part of Black Hills-Great Plains National Park, 75; superintendency of, 78; mentioned, 87, 166, 181–82, 239, 280, 308
Mountain Sawmill Company, 92
Mud Springs Road, 50
Muir Woods, 33
Mundt, Karl E. (US Senator), 137, 144

N

National Cave and Karst Management Symposiums, 305
National Cave and Karst Research Institute (NCKRI), 263, 264, 305, 353
National Cave Rescue Commission, 193
National Environmental Policy Act (NEPA), 333
National Forest Commission, 16
National Geographic, 347
National Historic Preservation Act (Section 106, Section 110), 210, 231, 313, 338
National Institute for Occupational Safety and Health (NIOSH), 194
National Park Foundation, 348
National Park Reservation Service (NPRS), 346

National Park Service (NPS): acquires water rights at Jewel Cave from Forest Service, 63; administers Carlsbad Caverns National Park, 54; appropriations for, 74, 292; appropriations for Jewel Cave, 162, 259, 292, 293; Area Investigation Branch, 104–5; and Black Hills Administrative Group, 240, 354; Black Hills Area Office, 75, 77, 78, 87, 354; and Black Hills Parks and Forest Association, 301; Branch of Plans and Design, 63, 67, 68; Cave Radiation Safety and Occupational Health Guideline, 194–95; and CCC work at Jewel Cave, 64, 65; celebrates 200th mile at Jewel Cave, 353; Centennial, 292–93; centralization, 76, 77; Climate Change Response Strategy, 298; Climate Friendly Parks Program, 298; consideration of de-establishment of Jewel Cave NM, 72, 93–110; cooperating associations, 301; *Courier*, 181; curation standards, 211–12, 276; Denver Service Center (DSC), 222, 229, 241, 248, 257, 310, 317; Directive 14, 227; Division of Museums, 172; Division of Natural History, 127, 135; Division of Publications, 223; forest management by, 89, 91, 269, 270, 281, 285, 286; Green Environmental Management System (GEMS), 298; Green Park Plan, 298; Headquarters (Washington Office), 96, 102, 103, 104, 117, 120, 121, 218, 346; and Jewel Cave water rights, 93; land exchanges, 98, 113, 129, 133, 137, 138, 142–45, 207, 265, 266; Major Acquisition Buying Offices (MABOs), 295–96, 315; management of Jewel Cave, 3, 4, 55–58, 67, 68, 69, 70, 71, 72–93, 99, 100, 101, 110, 111, 123, 124, 126, 134, 136, 138, 144, 149, 150, 154, 164, 165, 173, 177, 178, 179, 189, 190, 193, 194–98, 200, 205, 208, 209, 210, 226, 228, 229, 232, 233, 242, 248, 249, 252, 254, 256, 264, 266, 269, 280, 288, 354, 355; Midwest Archeological Center (MWAC), 9, 140, 338; Midwest Regional Office, 1, 132, 134, 136, 137, 138, 140, 142, 143, 171, 180, 237, 238, 239, 240, 244, 251, 252, 269, 274, 289, 294, 297, 298, 299, 300, 301, 303, 305, 306, 312, 317, 318, 338; Midwest Systems Support Office, 274; Mineral Entry Withdrawal and Mineral Assessment Report (1988), 205; Mission 66, 72, 102, 105, 107, 108, 111, 174, 177, 178; National Cave and Karst Coordinator, 305; and National Park Approach Road, 59, 60, 61; and NEKOTA, 240, 295, 354; Northern Great Plains Inventory & Monitoring Network (NGPN), 334–35, 337; Park Prescription Program, 303; Park Restoration and Improvement Program (PRIP), 227, 233; partnerships, 222, 236, 252, 262–67, 319, 332–24; proposes Black Hills-Great Plains National Park, 75, 76; and protection of caves, 204, 261; Recreation Planning Division (Region Two), 76; Region Two, 70, 72, 74, 75, 76, 77, 78, 79, 82, 85, 92, 93, 95, 96, 98, 103, 104, 105, 106, 107, 108, 114, 116, 117, 119, 122, 123, 124, 126, 127, 128, 132; reorganization of, 239; replaced by Office of National Parks, Buildings, and Reservations, 56; Research Center, 200, 210; resource preservation, 256; Rocky Mountain Regional Office, 180, 181, 182–83, 186, 189, 191, 197, 206, 208–9, 211, 219, 220, 225, 226, 229, 231, 237, 239, 241, 242, 245, 246, 248, 257, 274, 275; Servicing Human Resources Offices (SHROs), 295–96; studies hypothetical Black Hills National Park, 75; Volunteers in Parks (VIP), 185, 296–97, 303, 326, 354; Western Office of Design and Construction (WODC), 104, 105, 106, 107, 108, 117, 138–39, 141, 142, 143, 152, 154, 158, 160, 165, 166, 167–68; and withdrawal of Forest Service land from mineral entry (involvement in), 123, 143, 205, 264, 325, 332, 355; mentioned, 1
National Park System, 3, 72, 93–111 *passim*, 178, 235, 262, 291, 343, 350
National Parks Association, 86–87
National Partnership for Reinventing Government, 239
National Register of Historic Places, 209, 273, 337, 338
National Speleological Society (NSS): consulted on managing cave resources, 197, 325; conventions, 130, 199, 305, 325, 330; exploration of caves, 130, 180, 262; formation of Black Hills Grotto encouraged, 87; insurance for cavers discussed with, 121; memorandum of understanding with

Forest Service, 204; *News*, 120, 187; Paha Sapa Grotto, 189, 190, 304, 353; protection of caves, 180, 203; mentioned, 119, 120, 202
Navajo Lands Group, 182
Nebraska, 14, 240, 295
Nebraska National Forests and Grasslands, 188, 243
Neel, H. C., 19, 32–33
Neighbor, Frank, 120
NEKOTA group, 240, 280, 295–96, 354
Nepstad, Jim, 194, 196
Nevada, 52
Nevada National Forest, 53
Nevin, William A., 50, 51, 70, 72
Newcastle, WY, 22, 50, 51, 52, 54, 58, 60, 61, 64, 84, 86, 115, 117, 139, 153, 188, 253, 325, 348
Newcastle Chamber of Commerce, 153, 188, 241, 303
Newcastle Lions Club, 50, 51, 188
New Jersey, 119
New Mexico, 54, 264
New Mexico Institute of Mining and Technology, 264
Norbeck, Peter (US Senator), 47, 48, 50, 60, 253
Norfolk and Western Railway, 21
North Dakota, 240, 265, 295
Northern Pacific Railway, 53
Northwest Cave Research Institute (NCRI), 197–98
Northwestern Bell Telephone Company, 155
Nyberg, Philip C., 226

O

O'Bright, Alan, 274
Occupational Safety and Health Administration (OSHA), 194
Odd Fellows, 25
O'Dell, Peggy, 238, 250, 252, 261, 262, 266, 274, 288, 289
Ohms, Marc, 262, 328
Ohms, Rene, 2, 262, 290, 305, 322, 323, 325, 327, 330, 348, 353, 393
Ohmstede, Richard, 248
Olson, Rick, 199, 262–63
Olympic National Park, 294, 295
Olympic Peninsula, 33
Omaha, NE, 57, 75, 132, 237, 239
Onyx Cave, 53
Operation of the National Park System (ONPS) funds, 291–92, 397–99
Orcutt, Tina, 288
Oregon, 12, 53
Oregon Caves National Monument, 53, 97, 189, 194
Organic Act, 17
Orr, Joseph L., 78, 84, 99, 392

Ortega, Ernest W., 182–83, 185, 187, 190, 194, 197, 232, 237, 253, 325, 391
Osage, WY, 50, 51
Osback, Casey, 308
Oshier, Edward H., 158, 159, 160, 161, 163, 167
Ott, Martin C. (Marty), 237, 391
Ozark National Scenic Riverways, 194, 289

P

Pacific Coast, 14
Paha Sapa. *See* Black Hills.
Paha Sapa Grotto. *See* National Speleological Society.
Palmer, Art, 187, 193, 198–99, 219, 220–21, 262, 353
Palmer, Peg, 187, 193, 198–99, 219, 220–21, 262
Parker, William H. (US Representative), 31, 32, 33, 36
Pass Creek, 259, 264–67, 271, 355
Pate, Dave, 305
Paulson, Bob, 265, 266, 267
Peck, A. S., 47
Pederson Excavating, 318
Pelczarski, Chris, 304
Pennington County Search and Rescue Team, 193
Perrin, C. E., 51
Peterson, Dave, 52
Pettigrew Amendment, 17
Pflitsch, Andreas, 332, 353
Pierre, SD, 192
Pilcher, Joseph E., 27, 391
Pilcher, Rufus J., 27, 391
Pilger, Henry, 28
Pinchot, Gifford, 32, 33, 35
Platte River, 13
Prairie Dog Spring, 28, 52, 143, 207, 273, 312
Pressler, Larry (US Senator), 245
Price, Overton, 33, 36, 37

Q

Quebec, Canada, 18
Quinn Evans | Architects, 337
Quintana, Ernest, 301

R

radiolocation, 138–41, 330
railroad, 16, 20, 25, 26
Ramotnik, Cynthia A., 260, 276

Randall, James A., 182, 206, 391
Randolph-Sheppard Act of 1936, 242–43
Rankin, William A., 391
Rapid City, SD, 75, 76, 77, 78, 152, 174, 232, 233, 251, 317, 325
Rapid City Convention and Visitor's Bureau, 303
Rapid City Journal, 188, 189
Rapid City Rotary Club, 153
Rapid City Visitors Guide, 303
Raver, Buck, 18
Reagan, Ronald (US President), 202
Reder, Theodore, 16
Renz, Larry, 243, 306
Ressler, Patty, 2, 301, 302
Richter, Tom, 301
Riley, Joseph, 18
Riley, Martin, 18
Riley, Smith, 33
Riley, Steve, 183, 392
Robinson, Homer A. (Pete), 116, 392
Rocky Mountain National Park, 180
Rocky Mountains, 33
Ronscavage, John A., 142, 143, 152, 156
Roosevelt, Franklin D. (US President), 56
Roosevelt, Theodore (US President), 26, 31, 33, 34, 35, 37, 53, 54
Rosga, Karen, 238, 241, 274, 278, 279, 287, 290, 296, 341, 344, 346, 393
Round Spring Cave, 194
Ruhr-Universität Bochum, 332
Rural Electrification Administration, 155
Ryan, Patrick J. (P. J.), 118–19, 120, 123

S

Saint Mary's University of Minnesota, 322
Sanford, John, 18–19, 23, 24
Satrom, Joe, 265, 266
Sausalito, CA, 194
Scheltens, John, 202
Schenk, Gretchen, 305
Schlumberger Well Surveying Corporation, 139
Schnute, Dave, 121, 122, 126, 220
Schoharie County, NY, 22
Schoolhouse Cave, 120
Schrader, F. C., 37, 38, 40
Schulz, Herschel, 183, 184, 188, 192, 218, 229, 392
Schwartz, Bonnie, 294, 299, 394
Schwartz, Margaret, 184

Scientific American, 22
Scotts Bluff National Monument, 298
Scoyen, E. T., 104, 107
Sears Roebuck, 122
Semingsen, Earl M., 77, 78, 79, 80, 82, 86, 99, 104, 105, 106, 107, 108, 109, 113, 114–15, 117, 119, 120, 122, 123, 129, 391
Sequoia National Park, 194
settlement, 12, 15, 17, 26, 29, 31, 32, 35
Sheie, Myrna, 126
Shenandoah Valley, 22
Shenandoah Valley Railroad Company, 21
Shepherd, John S., 79, 392
Sherman, William H., 392
Sheveland, Glenna, 272–73
Sholly, Cameron, 294
Shoshone Cavern National Monument, 53, 97
Sideley, Ray, 18
Sioux National Park (proposed), 201
Siuslaw National Forest, 53
S. J. Groves and Sons Company, 60, 61, 62
Smith, C. E., 31, 36
Smith, Jedediah, 13
Snyder, Anton J., 391
Snyder, Dan, 193
South Dakota, 17, 58, 60, 86, 120, 132, 136, 137, 144, 147, 180, 184, 202, 206, 214, 235, 237, 239, 240, 241, 249, 265, 266, 267, 271, 295, 313, 327
South Dakota Department of Agriculture, 271
South Dakota Department of Environment and Natural Resources, 250, 320
South Dakota Department of Game, Fish and Parks, 150
South Dakota Department of Human Services, 306
South Dakota Department of Transportation, 236, 252, 279, 311
South Dakota Department of Tourism, 219, 303, 340
South Dakota Federation of Women's Clubs, 25
South Dakota Highway Magazine, 135
South Dakota Magazine, 303
South Dakota Mining Company, 24, 25
South Dakota Mining Company v. McDonald, 42, 46, 49
South Dakota Public Broadcasting, 347
South Dakota School of Mines and Technology, 26, 88, 119, 120, 146, 158, 189, 323
South Dakota State Highway Commission, 60
South Dakota State Highway Department, 58, 106, 125, 129, 135, 153, 154–55, 244
South Dakota State Historic Preservation Office (SHPO), 231, 338, 339
South Dakota State Legislature, 75
South Dakota Teacher's Association, 25
Southern Black Hills Tourism Magazine, 302
South Hell Canyon, 95

Spearfish, SD, 44, 154, 318
Split Rock Studios, 318, 350
St. Henry's Seminary, 138
St. Louis, MO, 27, 28
Stabler, John, 25, 26
Stahl, C. J., 43, 46, 48, 49
State of South Dakota Archeological Research Center, 272
Stellmack, John A., 130
Sternberg Museum of Natural History, 276
Stevens, Edward H., 88
Stevenson, Janice, 281, 283
Stokes, James, 145–46
Stoll, Linda, 282, 288, 289, 295, 391
Story, Isabelle F., 86
Strahan Construction Company, 174
Stratton, A. Clark, 133
Strengthening Federal Environmental, Energy, and Transportation Management, 298
Stricklin, Howard B., 57, 70, 72, 96, 97
Student Conservation Association (SCA), 185, 187, 218, 238, 290, 301, 354
Student Temporary Employment Program (STEP), 293
Suess, Todd, 288, 289, 290, 294, 303, 306, 307, 308, 312, 324, 326, 344, 346, 393
Summit Construction Company, 152, 154
Sundance, Wyoming, Commercial Club, 86
Sundry Act, 17, 35
Sundstrom, Linea, 9
Svatos, Lynn, 126
Swartzlow, Carl, 96–97, 98
Swift, Bill, 188
Switzer, Ronald R., 262
Sylvan Lake, 16, 27, 44
Sylvan Lake Hotel, 16

T

Taft, William H., 36, 38, 53
Tashner, Dave, 294, 315, 393
Taylor, Jimmy, 237, 238, 239, 391
The Nature Conservancy (TNC), 265–67, 304, 353, 355
Theodore Roosevelt National Park, 75
Thompson, James B. (Jim), 117, 120, 146, 148, 152, 153, 156, 157, 158, 159, 168–69, 171, 187, 209, 392
Thompson, Lynn H., 229
Thornton, Jer, 203
Thyssen-Krupp Elevator (TKE), 313, 314, 315
timber: in the Black Hills, 16, 17, 56, 91–92, 218, 222; commercial, 207, 272, 333; forest reserves, 16–18; and insect infestations, 69, 91, 92, 98, 149–50, 206; at Jewel Cave, 17, 32, 40, 56, 69, 80,

89, 91–92, 98, 99, 107, 128, 147, 204, 211, 269, 270, 285, 286, 288, 333; logging, 91–92; managed by Forest Service, 56; ponderosa pine, 16, 17, 56, 69, 80, 89, 98, 99, 107, 147, 207, 269, 270, 285, 286, 288; protection of, 16, 69, 89, 272; salvage, 286
Timpanogos Cave, 194, 304
Tinker, E. W., 49
Todd, Dave, 117, 171, 172, 176, 179, 180, 392
Toll, Roger W., 55–56
Toomey, Rick, 304
tourism: in Black Hills, 16, 23, 27, 31, 47, 49, 58, 84, 108, 222, 241, 273, 302; at caves, 20, 53; for Custer, SD, 51; at Jewel Cave, 20–24, 27, 28, 29, 31, 37, 38, 39, 40, 47–52, 54, 56, 58, 70, 80, 83, 84, 95, 98, 99, 107, 113, 117, 127, 136, 144, 148, 161, 168, 169, 171, 179, 189, 190, 197, 211, 212, 214, 217, 220, 245, 247, 249, 251, 273, 277, 292, 302, 341–44; at national parks, 72; for Newcastle, WY, 51; at Wind Cave, 21, 24, 25, 26, 27, 29, 31, 32, 44, 48
Treaties: of Fort Laramie (1851), 14; of Fort Laramie (1868), 14, 15; Sioux (1877), 15–16
Trexler, Keith, 172
Tucholke, A. E., 62
Twiss, John, 251
Tyers, John, 146

U

University of California, Berkeley, 276
University of California Museum of Vertebrate Zoology, 88
University of Colorado, 120
University of Kansas, 146
University of Missouri School of Mines, 138
University of Nebraska, 83
University of Northern Colorado, 258
University of Wyoming, 120, 146, 200, 210
Upton, Robert F., 87, 88
US Army, 15
US Army Corps of Engineers, 166
US Biological Survey, 230, 231
US Bureau of Indian Affairs (BIA), 243, 270
US Bureau of Land Management (BLM), 123, 150, 200–201, 205, 238, 243, 266, 270, 332–33
US Bureau of Mines, 166
US Bureau of Reclamation (BOR), 101
US Congress: allows NPS to fund roads leading to national parks, 59; appropriations for Jewel Cave, 47, 48, 57, 69, 73, 80, 101, 162, 225, 229; appropriations for NPS, 74, 292; and changes to Jewel Cave NM boundaries, 144–45, 264; changes name of Office of National Parks, Buildings, and Reservations back to NPS, 56; Congressional Research Service (CRS), 201; does not establish Sioux National Park, 201; establishes Carlsbad Caverns National Park, 54; establishes Mammoth Cave National Park, 54; establishes National Cave and Karst Research Institute (NCKRI), 263; establishes Wind Cave National Park, 29; formalizes land exchange between NPS and Forest Service, 143, 144–45; grants Secretary of the Interior jurisdiction in units of National Park System, 235; House of Representatives, 144; House Subcommittee on Surface Transportation,

254; passes Federal Cave Resource Protection Act (FCRPA), 201–4, 324; passes Forest Reserve Act, 16, 35; passes Sundry Act, 17; petitioned regarding remuneration to Michauds and Cain, 36; Senate, 144; Senate Committee on Interior and Insular Affairs, 144; South Dakota delegation, 50, 51, 136, 144; mentioned, 26, 33, 265
US Department of Agriculture: Bureau of Entomology, 69; Bureau of Entomology and Plant Quarantine, 91; Bureau of Forestry, 35; Bureau of Public Roads, 58, 59, 60, 61; Division of Forestry, 35; and Federal Wildland Fire Management Policy and Program Review Report, 269; and law enforcement, 243; and protection of caves, 202
US Department of the Interior: appropriations for Jewel Cave visitor center, 140; approves Custer-Wind Cave Approach Road, 59, 60; authorized to establish VIP program, 185; and Federal Wildland Fire Management Policy and Program Review Report, 269; manages law enforcement for NPS, 243; and National Park System, 235; Office of National Parks, Buildings, and Reservations, 56; and protection of caves, 202, 203–4; receives report on Wind Cave, 26; regulates forests, 17; rewards Jewel Cave NM employee, 223; secretary of, 36; standards for cultural resource management specialists, 338; surveys Black Hills, 18; updates mineral regulations, 42
US Department of Labor, Mine Safety and Health Administration (MSHA), 194
US Department of War, 35
US Environmental Protection Agency (EPA), 194, 226
US Fish and Wildlife Service, 145, 146, 243, 270
US Forest Service: barograph borrowed from, 140; Burned Area Emergency Rehabilitation (BAER), 285
campgrounds, 106; considers inclusion of Jewel Cave in Black Hills National Forest, 32; coordination with, 195, 200, 236, 249, 250, 277, 307; consulted on development in Custer area, 153; Denver Office, 205; develops Jewel Cave NM, 47, 49; establishes Jewel Cave NM, 31–35; forest management by, 69, 90, 91, 150, 151–52, 207, 208, 268, 270, 285; impact of Executive Order 6166, 56; and insect infestations, 150; and interpretation, 287, 288; and Jasper Fire, 282, 283, 285; Jewel Cave master plan discussed with, 105; and Jewel Cave water rights, 93; land exchanges, 98, 113, 129, 133, 137, 138, 142–45, 207, 265, 266; land ownership, 3, 92, 128, 136, 155, 201, 205, 206, 210, 254, 257, 272, 355; and law enforcement, 243; leases land at Jewel Cave to JCC, 52; manages Jewel Cave NM, 31, 35–52, 54, 72, 86, 354; manages other caves as national monuments, 53, 56; map of Jewel Cave NM, 34, 35; memorandum of understanding with NSS, 204; and Michaud family, 19, 28, 33, 48–49, 51; and mining, 37, 39, 40, 41, 51, 52, 122–23, 204; negotiations with, 98; Operation Outdoors, 107; origins of, 35; partnerships, 222, 229, 237, 244, 252, 264–67, 271, 304, 319, 332–34, 336; and protection of caves, 202, 204; protection of Jewel Cave from vandalism, 35, 41–47, 48; relinquishes water rights at Jewel Cave to NPS, 63; report on Jewel Cave, 8; roads, 58; Rocky Mountain Forest and Range Experiment Station, 269; withdrawal of land from mineral entry, 123, 128, 143, 205, 255, 264, 325, 332, 355
US Geological Survey (USGS), 37, 120, 138, 259, 265, 266, 286, 304, 323
US National Guard, 252
U.S. Oil and Refining Co., 50
US Public Health Service, 57, 63, 232, 233
US Supreme Court, 16
Utah, 12, 144

V

Vemco, 250
Vento, Bruce (US Representative), 201
Virginia, 20, 21, 22
Virginia Midland Railway, 21
Volunteers in Parks (VIP). *See* Jewel Cave National Monument; National Park Service.

W

Wakeman, E. E., 51
Warner, J. W., 114
Warren-Lamb Lumber Company, 92
Washington, George (US President), 20
Washington, DC, 27, 56, 87, 93, 140, 346
Washington's Birthday Reserves, 16–17
Watson, William J., 391
Way, Fred L., 207
Weaver, Adam, 304
Weber, Duane, 271–72
Wegemann, Caroll H., 76, 93
Weichler, Chuck, 295
Weisman, Bruce, 277, 339
Weiss, Jayne, 295, 296, 321, 393
Wells, Wanda, 339
Wergadal, Gerald, 119–20
West Bend, IA, 41
Weston County, WY, 267
West Virginia, 120
westward migration, 12, 14, 279
Westworld Hospital Management, 188
Wheatley, Michelle, 1, 294, 394
White, Will, 130
Wieland, Paul, 192
Wightman, Paul, 138, 139, 141, 190, 191, 330
Wiles, Mike, 1, 192, 193, 194, 196, 197, 205, 220, 238, 239, 251, 252, 255, 256, 257, 258, 260, 261, 262–63, 264, 266, 274, 277, 278, 285, 286, 290, 304, 305, 306, 316, 317, 322, 323, 324, 325, 327, 328, 329, 330, 332, 333, 334, 337, 338, 339, 340, 344, 353, 355, 393
Williamson, William (US Representative), 48
Wilson, James, 38
Wilson, Matt, 275
Wind Cave: airflow of, 8; exploration of, 130, 202; features of, 131; federal protection of, 53; improved, 31; minerals in, 25, 42; Odd Fellows' Hall, 25; pictured, 25; promotion of, 26–27; recommended as national park, 26; significance to Lakota, 5, 12–13, 18, 29; studied, 22, 26, 194; tourism at, 21, 24, 25, 27, 29, 31, 32, 44
Wind Cave Library Association, 87

Wind Cave National Park: BHAA at, 87, 88; and Black Hills Administrative Group, 240, 294–96, 321; Black Hills Natural History Association at, 88, 147; Black Hills Parks and Forest Association at, 301; CCC improvements at, 3, 62, 83; elevators at, 83, 245, 315; established, 24–27, 29; fire management at, 90, 91, 151–52, 208, 269, 270, 282, 285, 336; hosts Cub Scouts, 348; and insect infestations, 149–50; interpretation at, 279; law enforcement at, 243, 306, 307; maintenance at, 309; manages Jewel Cave NM, 55, 57, 59, 66, 68, 69, 70, 72, 74, 75, 77, 78, 79, 83, 84, 85, 90, 93, 96, 99, 101, 102, 104, 105, 107, 109, 110, 113, 114–15, 116, 118, 121, 123, 145–46, 151, 167, 171, 172, 179, 181–82, 185, 196, 197, 200, 216, 222, 223, 229, 230, 231, 235, 237, 238, 239, 247, 256, 275, 281, 289, 294, 354; and NEKOTA, 240; NSS at, 304; partnerships, 336; planning at, 241; proposed as part of Black Hills-Great Plains National Park, 75; proposed as part of Black Hills National Forest, 26; proposed as part of hypothetical Black Hills National Park, 75; resource management at, 258; search and rescue at, 304; tourism at, 31, 48; wildlife at, 89; mentioned, 1, 54, 73, 83, 87, 108, 111, 117, 119, 221, 242, 271, 288
Wind Cave/Jewel Cave Natural History Association. *See* Wind Cave Natural History Association.
Wind Cave Natural History Association (WCNHA), 148, 169–70, 186–88, 196, 198, 218, 259, 274
Wirth, Conrad, 114, 123
Wolfe, Elwood K., Jr., 73–74, 80, 88, 89, 95, 392
Wolfe, Shirley, 73–74
Women's Christian Temperance Union, 25
Wonderful Wind Cave Improvement Company, 25
Woolpert, LLC, 337
World's Fair, 25, 27
World War II, 72, 74, 81, 82, 95
Worthington, David J., 259–60
Wyoming, 14, 53, 58, 197, 267, 271, 332
Wyoming State Highway Department, 58

Y

Yale University, 130
Yeh and Associates, 310
Yellowstone Fire School, 90
Yellowstone National Park, 26, 33, 55, 73, 144, 180, 211, 219, 239, 294
Yim, David, 294, 299, 308, 394
YMCA, 25
Yosemite Ranger School, 114–15
Youth Conservation Corps (YCC), 218, 223–24, 228, 238, 254, 309, 354

Z

Ziemann, Denny, 285
Zonge International, 310