

PEREGRINE FALCON MONITORING PROGRAM
BIG BEND NATIONAL PARK & RIO GRANDE WILD AND SCENIC RIVER
1991 SEASON

National Park Service
Big Bend National Park, Texas 79834

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PROPERTY OF
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CONTRIBUTORS

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Beginning with this report, consistency in naming will be implemented. When previously undocumented territories are located, they are assigned a number and name. Numbers are between one and 999, selected randomly. Previously, some names were derived from nearby geographic features and others named after persons responsible for first location of the site. Beginning with this report, all new territory names will be based upon the nearest prominent geographic feature (canyon, bluff arroyo, etc.). In the case of river sites, this will be done without regard to which side of the river the eyrie site or geographic feature falls upon.

A mean average of 33 incubation days (Porter and White, 1973) and 42-45 days (Hogan, 1988) from hatching to fledging was employed to calculate nesting chronology.

Field monitoring was conducted from January 31, 1991, through July 15, 1991. River territories were reached by raft or canoe. At river sites, observations were for several hours prior to dusk, resuming at daylight to total a minimum six hours per monitoring period. Mountain eyries were reached by hiking, and commonly did not include overnight trips. Zeiss 10X25 binoculars, and 15x40 tripod-mounted Bushnell spotting scopes were used. Each eyrie was visited a minimum of 4 times during the season, with an average of 28 hours spent monitoring each site.

METHODS

Big Bend National Park is situated in the southern part of Brewster County, Texas. The park encompasses 801,146 acres of Chihuahuan desert and mountain ecosystems, with its southern border formed by the Rio Grande. Elevations within the park range from 592 m. (1,945 ft) along the river to 2,385 m. (7,825 ft) atop Emory Peak, in the Chisos Mountains. The designated Wild and Scenic River portion of the Rio Grande begins at river mile 853.2 (the Coahuila/Chihuahua border), and extends to river mile 657.5, below Dryden, Texas.

STUDY AREA

This report summarizes the 1991 productivity survey of peregrine falcon (*Falco peregrinus anatum*) territories in Big Bend National Park, and along the Rio Grande Wild and Scenic River. The program purpose was to document falcon presence, nesting chronology, and breeding success at each location.

INTRODUCTION

In arriving at productivity figures, offspring are presumed to have successfully fledged in order to be counted. In cases where observations revealed eyasses on the verge of fledging, and follow-up observations were not possible, the young were presumed to have fledged. If observations were made shortly after fledging, only those fledglings seen by observers were counted, even though more eyasses may have been observed prior to fledging.

In cases where observers saw only evidence of offspring, or heard but did not see the young, whether fledged or otherwise, they were not added to the reproduction total. This provides a standard for reporting, and in no way judges the validity of such observations.

RESULTS

RIVER TERRITORIES

No. 99: Santa Elena Rockslide

For the fourth consecutive year, this territory was unoccupied (Hogan, 1988 and Moore, 1989, 1990). It was last occupied in 1987 (McKinney, 1987), and has not been productive since 1985. In 1987, there was a falcon reportedly found dead 1 mile upstream from the eyrie site. The following year, another dead falcon was found near the same location and turned over to the National Park Service. Due to advanced decay, cause of death could not be determined. On March 27 and 28, 1991, Humphreys observed two falcons soaring and perching on both cliff faces. He also observed several falcon stoops into a large flock of swallows. Subsequent observations revealed no further peregrine activity at this location.

No. 99 was visited five times, for a total of 44 observation hours.

No. 44: Santa Elena Downstream

Inhabited by peregrines as early as the 1950's (Hunt and Johnson, 1982), this territory has been continuously inhabited since studies began in 1974 (Hunt and Johnson, 1982, Moore, 1990). A falcon was first seen in the area on January 30 and again on February 20, favoring the traditional eyrie site. On June 3, after many observations and no sightings, Humphreys reported two falcons upstream from the historic eyrie, which by their behavior appeared to be feeding young. On subsequent observations by Paredes and Humphreys, only one falcon was observed.

No. 44 was visited 17 times, for a total of 57.5 observation hours.

No. 11: Martschal

A pair of peregrines was exhibiting courtship behavior when first seen at this territory on March 13. On the following visit (March 31), the falcons had selected an eyrie site and incubation appeared to be underway. On May 23, a fledgling was observed.

No. 11 produced one fledgling and was visited four times, for a total of 30.5 observation hours.

No. 66: Boquillas Upstream

On March 15, the first visit to the territory, a pair of falcons was favoring an eyrie site, and copulation was observed. On April 28, two falcons were observed flying in the vicinity of the

eyrie. A prey exchange and defensive territorial behavior were observed. On May 25, one fledgling along with two eyasses, for whom flight was imminent, were observed at the eyrie. The following day, three young and two adults were seen at the eyrie. No. 66 produced three offspring and was visited four times, for a total of 23 observation hours.

Figure 1. Maps, Territory 99 (Santa Elena Rockslide) and Territory 44 (Santa Elena Downstream)

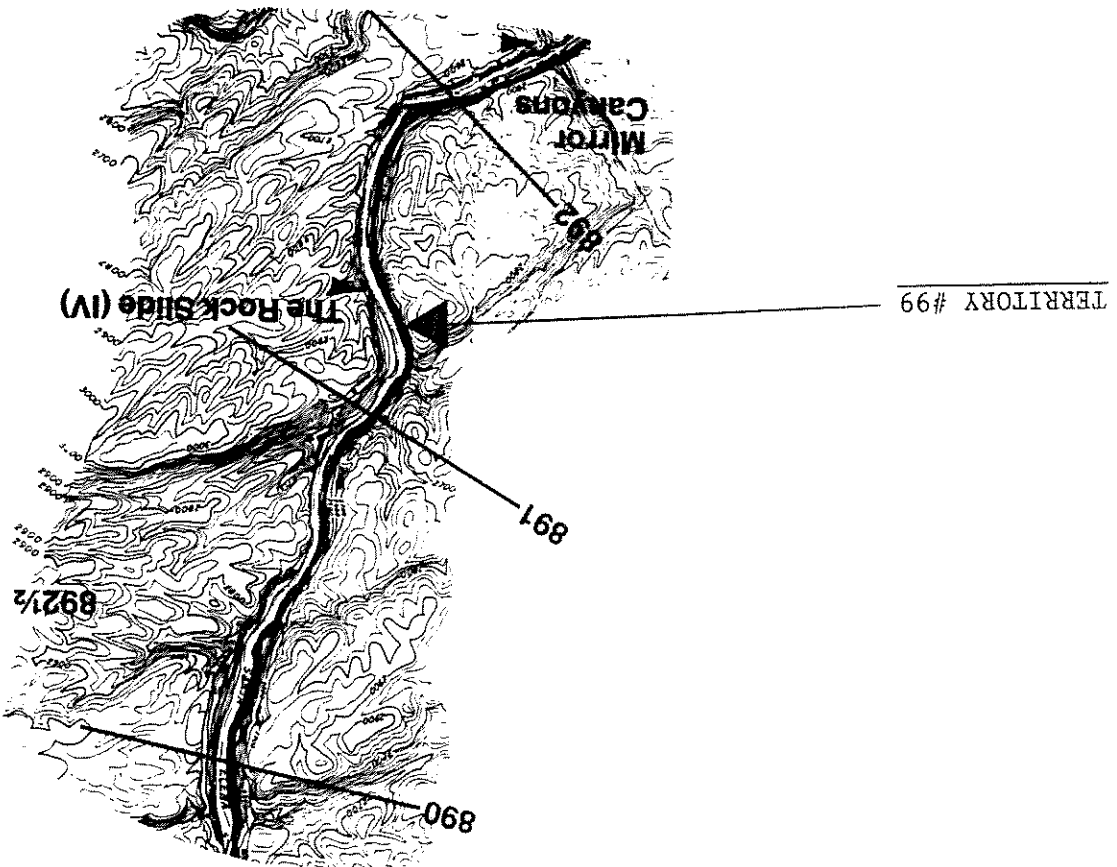
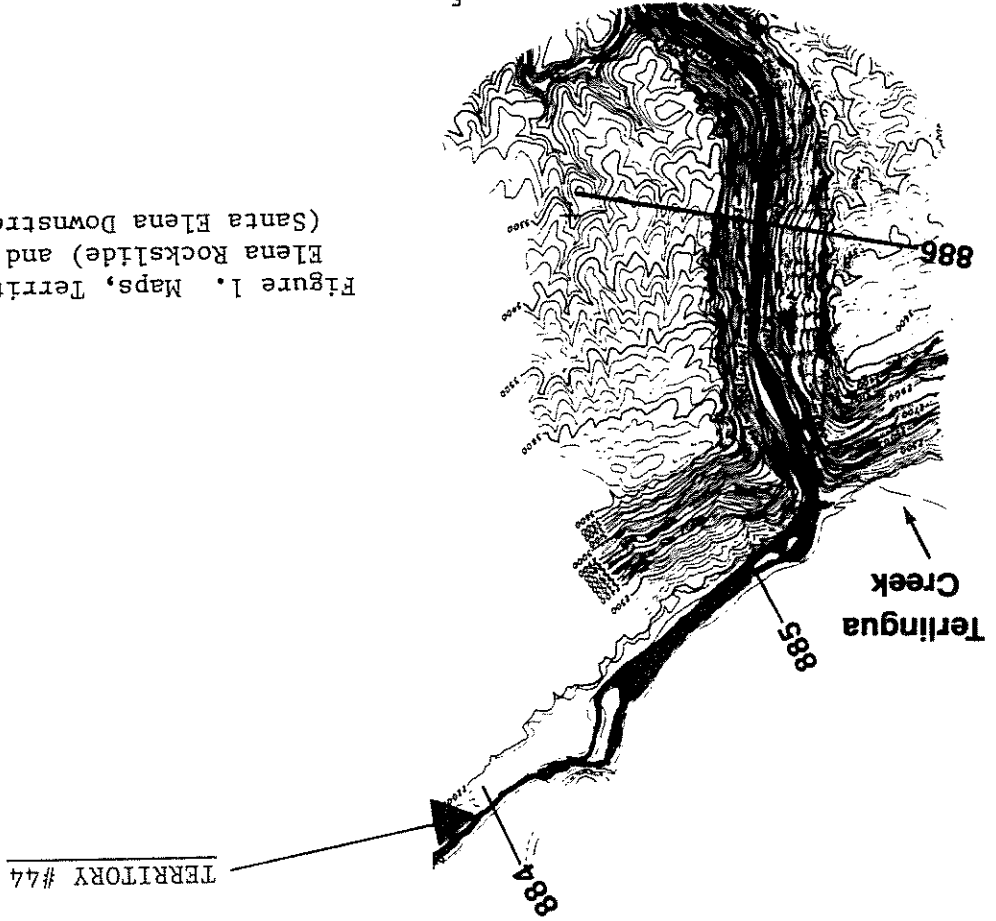
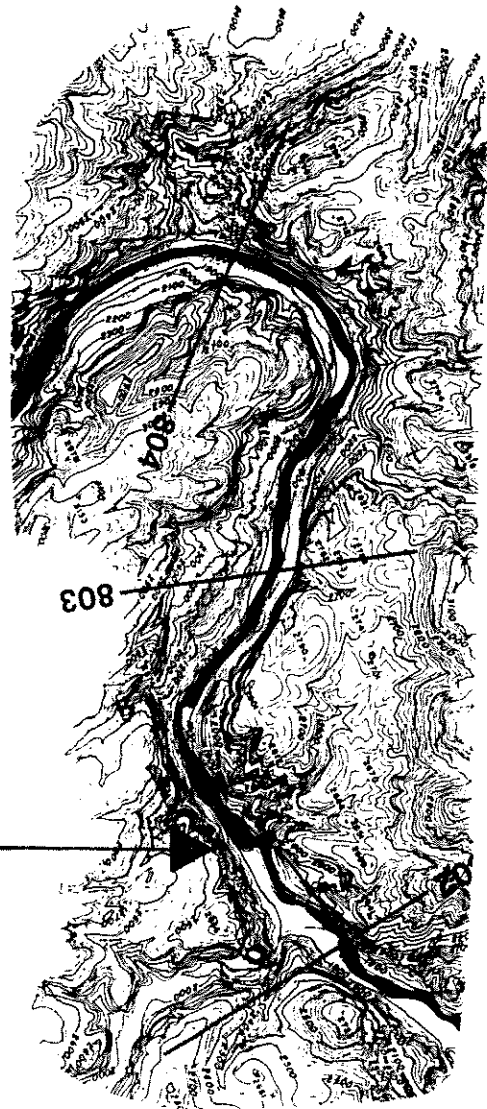
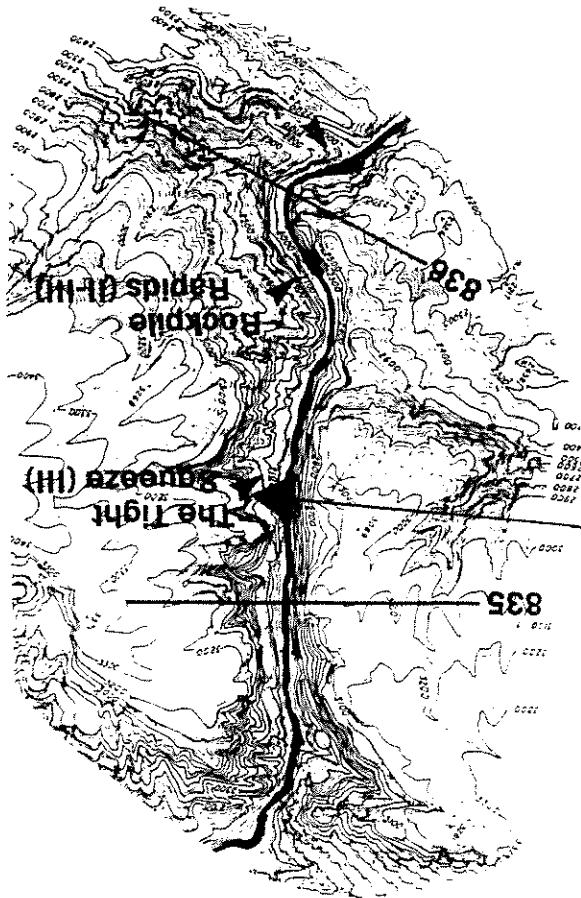


Figure 2. Maps, Territory 11 (Mariscal Canyon) and Territory 66 (Boquillas Upstream)



_____ TERRITORY # 66



_____ TERRITORY # 11

Figure 3. Photo, Eyrle 66 (Boquillas Upstream)

No. 69: Boquilla's Downstream

Eyre locations in this territory have been consistently difficult to find. After having moved from the river, where they were found in 1988, to Hubert ridge, where the eyrie subsequently failed in 1990, birds appear to have again returned to the river's edge. Although falcons were seen in the area on March 29, this eyrie was not located until May 26. Paredes, on May 26, observed movement and wing flaps of a bird in the eyrie (which may have been an eyass). Walls heard the next day also indicated young. However, as with territory 19, due to the lack of clear visual observation of offspring, young will not be recorded for the purpose of this report.

No. 69 was visited 5 times, for a total of 34 observation hours.

No. 19: Bonnie's

The first observation at this eyrie was on February 28 by Wagner, Humphreys, and Paredes. At this time, peregrines were present and copulations observed. On the following visit, a brief one on April 7, Humphreys observed an active pair not exhibiting incubation or feeding behavior. On May 9 and 10, several incubation switches and prey exchanges were observed by Humphreys and Neighbor. Bonnie McKinney reported hearing young birds in the vicinity of the eyrie during an observation the last week of May. On June 2, Paredes and Skiles only observed two adult falcons near the eyrie, with the birds entering the eyrie only in the evening. While one or more young apparently fledged here, visual observations are required for inclusion in this report. It should be noted that a significant amount of motorboat use occurs in this area. Several motorboats came by while observers were present, eliciting no apparent reaction by the birds. No. 19 was visited four times, for a total of 32 observation hours.

Figure 4. Maps, Territory 69 (Boquillas Downstream) and Territory 19 (Bonnie's)

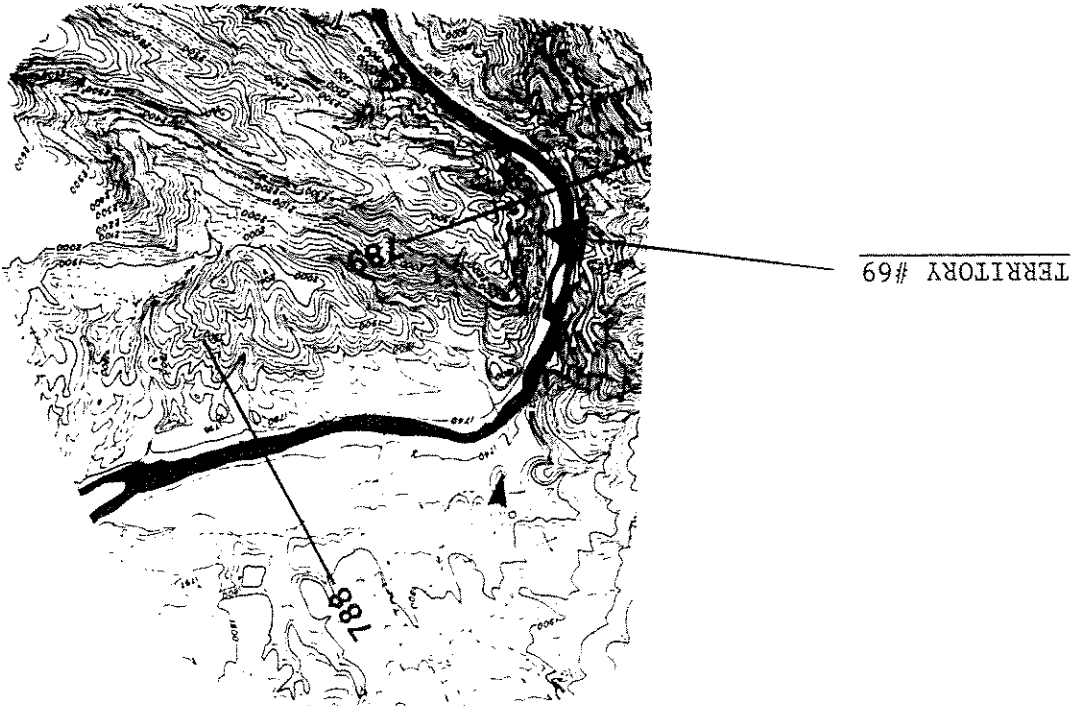
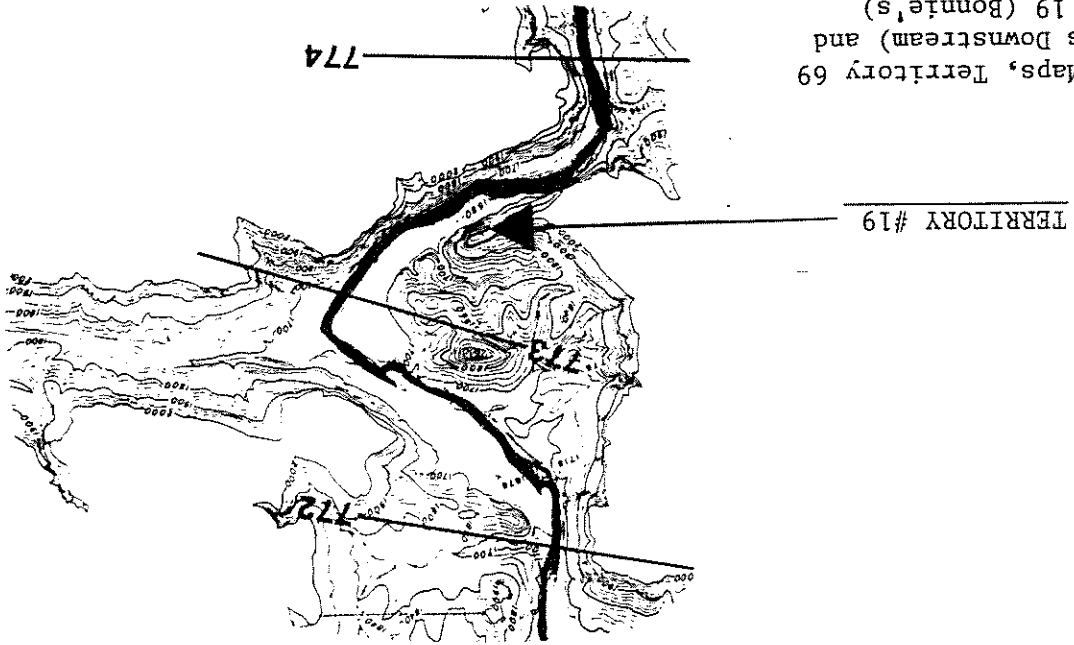


Figure 5. Photo, Eyrie 19 (Bonnie's)

No. 55: John's

Falcons were first observed March 1 by Humphreys, Wagner, and Paredes, and were exhibiting courtship behavior. Incubation behavior was observed on April 9. On May 11, eyasses were determined to be in the eyrie. On June 5, two adults and 1 fledgling were observed. This was confirmed on June 19 by Neighbor and Humphreys.

No. 55 was visited four times for a total of 33 observation hours.

As an addition to the 1990 report, on September 11, 1990, a post-season observation was made by J. Carrico and M. Paredes. Three peregrine falcons were observed flying at the eyrie site. Without optical equipment, age or sex determination was impossible. In light of the other 1990 observations, this one raises the possibility of a late clutch and subsequent fledgling of one young in 1990.

No. 59: Bullis Fold

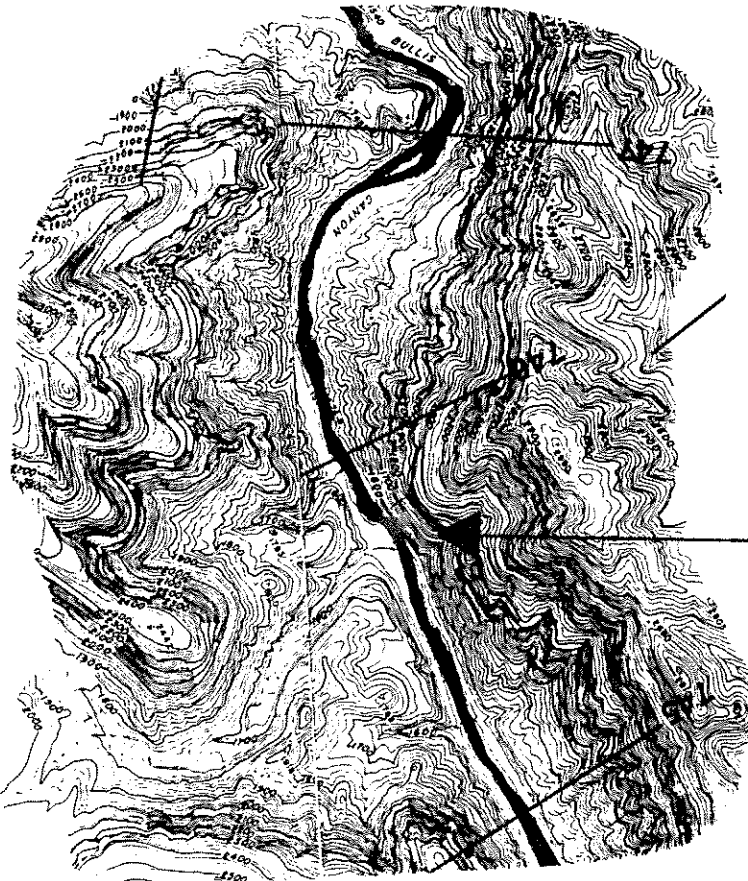
This territory was discovered in 1990. The first visit to this site was on March 2, when two adult falcons were seen, one of which made use of last year's eyrie. On April 9 they appeared to be favoring a different hole, and did not appear to be incubating. An incubation switch was noted on May 12. On June 6, a lone adult was seen, and on June 21 an adult and an immature falcon were observed by Neighbor and Humphreys.

No. 59 produced one fledgling this year, and was visited four times for a total of 28.5 observation hours.

Figure 6. Maps, Territory 55
(John's) and Territory 59
(Bulls Fold)



TERRITORY #59



TERRITORY #55

Figure 7. Photo, Eyrie 55 (John's)

Figure 8. Photo, Eyrie 59 (Bullis Fold)

Since this territory and territory 98 (Burro Bluff) are so near, they are considered one territory. Observations were made at both locations until it was determined which area would be favored. On March 3, for the third consecutive year, falcons were located at the upstream end of the territory (no. 79), and other than casual observations were discontinued at 98. On April 10, it appeared incubation was underway. On May 13, three eyasses were observed in the eyrie. On June 6, two fledglings were confirmed by Flanders, Skiles, and Paredes. Neighbor and Humphreys again saw two fledglings on June 21.

No. 79 produced two fledglings this year, and was visited four times for a total of 26.5 observation hours.

No. 398: Burro Bluff

The only falcon activity noted at this territory was a lone bird flying over the river on March 4. Although the territory seems to offer excellent habitat and is a historic eyrie site, it has been abandoned since 1984. No. 79, a short distance upstream, has been occupied since 1989. Because of the proximity of these territories, it is not expected they will be occupied simultaneously. Neither site should be neglected during initial observations, however.

No. 398 was visited two times, for a total of 11 observation hours.

No. 40: Juan Botas Canyon

Occupation of this territory represents use of the final high cliffs of the Lower Canyons. Subsequent walls diminish to a height not generally regarded as suitable falcon habitat. Observations of a lone adult were recorded in 1990. The first observation this year was on March 2, by Paredes, Wagner, and Humphreys, when one adult falcon was seen. More observations were made, and the territory narrowed on April 11, when Humphreys and Wagner observed one or two adults and one immature bird. On May 14, three falcons were seen here. At 16:48, Neighbor observed an immature and an adult falcon perched on the cliff. Both falcons were vocalizing and flew upriver a few minutes later. An adult falcon circled, perched, and began echupping and wailing. Momentarily, a second adult falcon joined the first for an apparent copulation.

On June 6, a lone adult was observed by Flanders, Skiles, and Paredes. No falcons were sighted by Neighbor and Humphreys on June 11. These observations can result in two interpretations. One young could have been produced, fledging prior to April 11.

Secondly, an unpaired immature falcon, possibly fledged in 1990, could have, at least temporarily, attempted to inhabit the territory. Since the earliest fledging date recorded for Big Bend is April 16, the former is possible but improbable. Since an eyrie was not located, and neither incubation, hatching, nor fledging data recorded, there is insufficient evidence to determine success of this territory.

No. 40 was visited four times, for 22.5 observation hours.

Figure 9. Maps, Territory 79
 (Roy's Crater), Territory 398
 (Burro Bluff) and Territory 40
 (Juan Bolas Canyon)

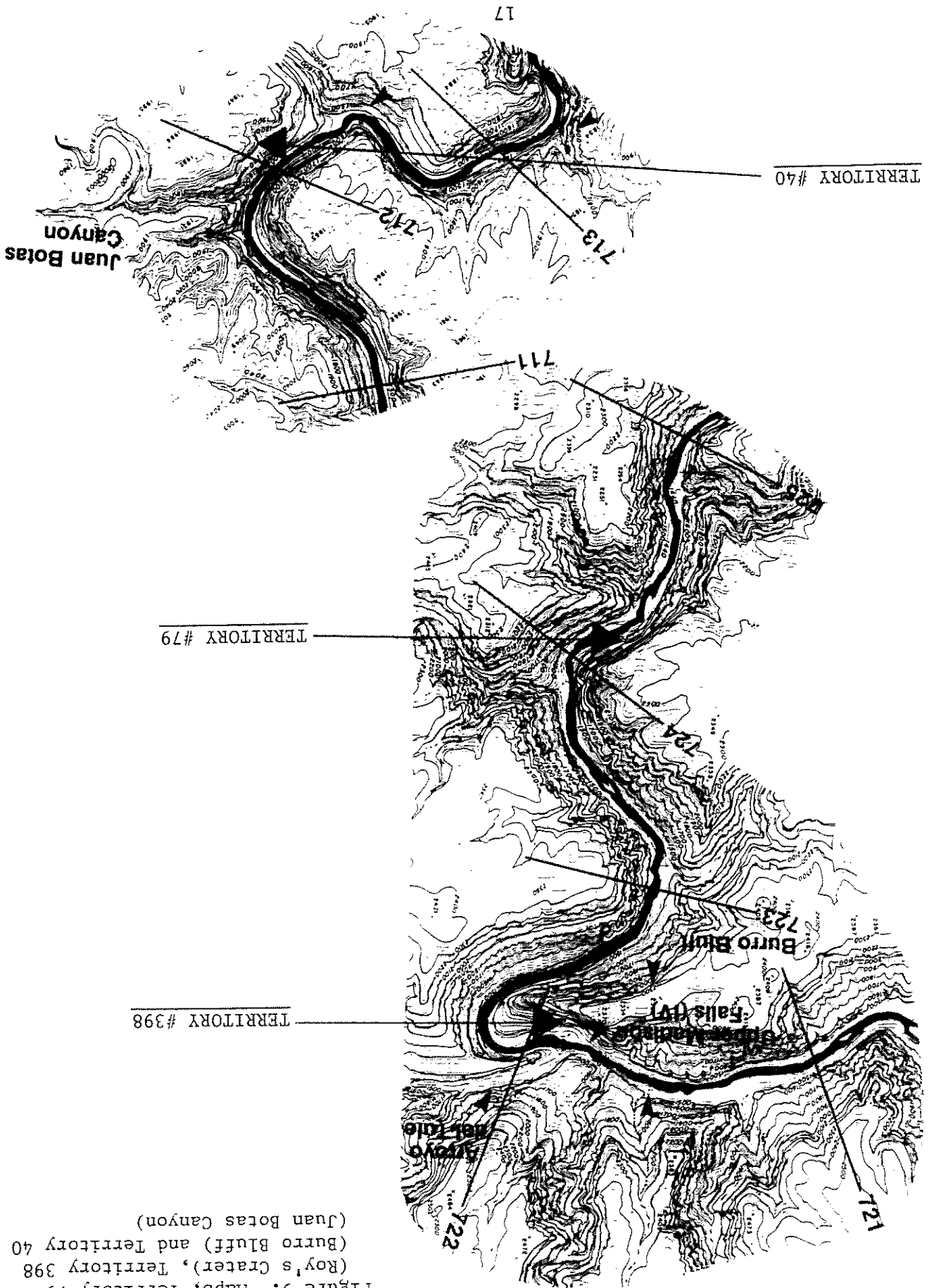


Figure 10. Photo, Eyrje 79 (Roy's Crater)

MOUNTAIN TERRITORIES

No. 33b: Crown Mountain

This territory is assumed to encompass Crown Mountain and Lost Mine peak. Investigations began at the historic site on Lost Mine Peak (33a), when during a training session March 1, a falcon was seen. Walls were heard on March 12 and 21, but by March 27 the site was determined unoccupied and survey efforts were begun on Crown Mountain.

Surveys of Crown Mountain on April 4 and 5 revealed no falcons. On May 23, falcons were heard by Skiles, but not visually located. On May 30, Skiles located the eyrie, which contained three eyasses very near fledging. Neighbor observed three fledglings on June 14.

No. 33a was visited six times, for a total of 22 observation hours. No. 33b produced three fledglings this year, and was visited four times for a total of 19.5 hours.

No. 111: Casa Grande, Toll, Pinnacles

Falcons were located on Toll Mountain by Wagner on April 25. She reported two adults and one immature. The immature was similar in size to the larger adult, indicating a female. Wagner reported the immature probably fledged last year. On May 13, Paredes saw no activity. On May 23, Humphreys reported the adult pair's behavior indicated incubation or tending of young. On June 3, two fledglings and one adult were reported. On June 13, Neighbor observed 2 adults and 2 fledglings. No further observations were made of the immature falcon Wagner reported.

No. 111 produced 2 fledglings this year and was visited eight times, for a total of 27 observation hours.

No. 88: South Rim

The first report of the year from this territory was by a park visitor who reported a pair of falcons on January 2, 1991. Perhaps this indicates monitoring should begin earlier. The 1991 eyrie was not directly visible from observation points on the Rim, which presented some difficulty. Ziebell observed a pair on January 9 and again on March 1. On March 20, activity indicated eyrie selection was in process. A short May 14 observation revealed an adult with prey, and defending territory. Observations on May 23 and 30 indicated the falcons were still active around the eyrie. On June 10, Elkovitz saw an immature perched below the Rim, and on June 15 and 16 Humphreys observed two fledglings.

No. 88 produced two fledglings this year and was visited eight times, for a total of 35 observation hours.

Figure 11. Maps, Territory 33b (Crown Mountain), Territory 111c (Toll Mountain) and Territory 88 (South Rim)

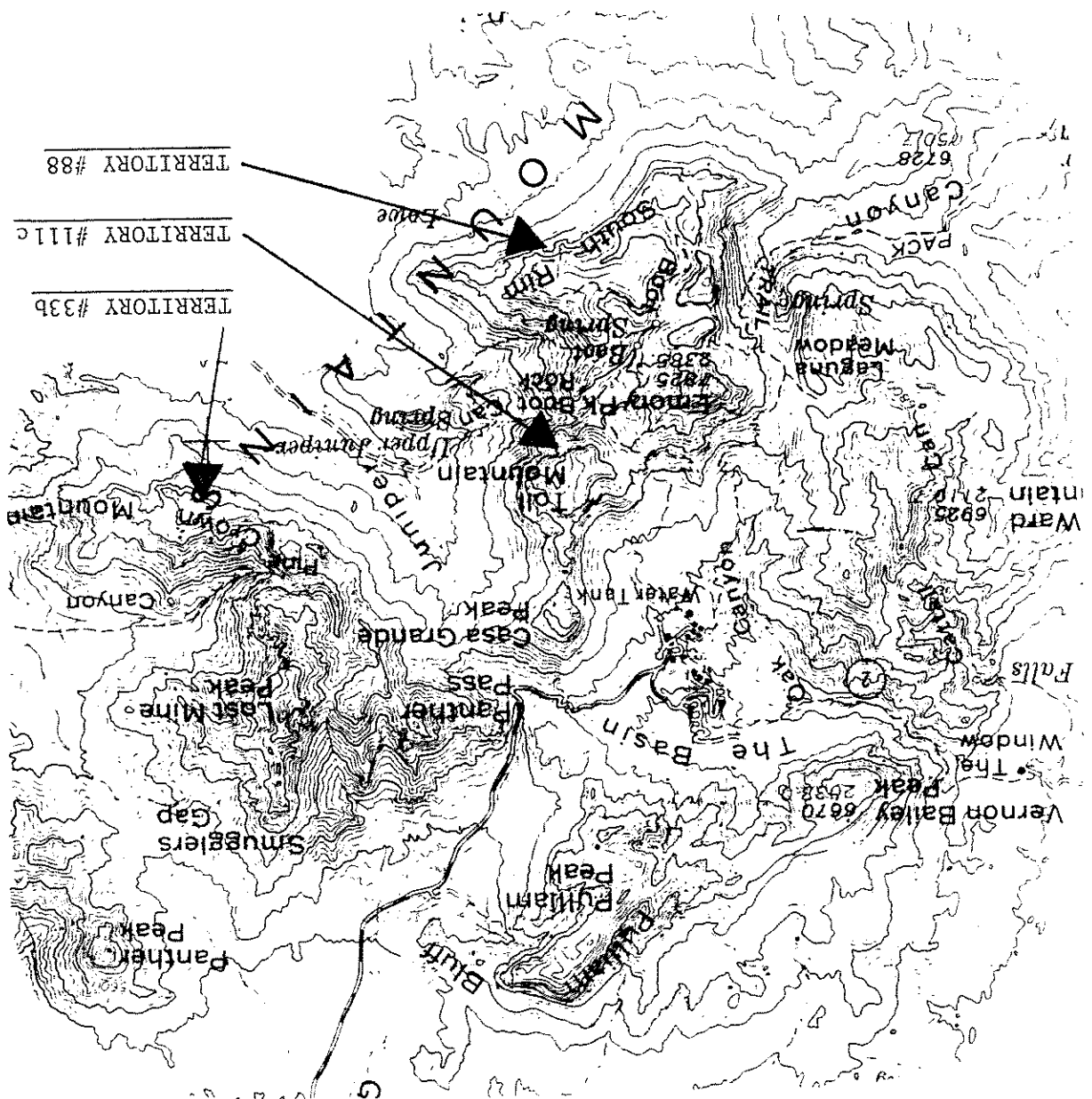


Figure 12. Photo, Eyrie 33b (Crown Mountain)

Figure 13. Photo, Eyrje 111c (Toll Mountain)

Figure 14. Photo, Eyrie 88 (South Rim)

SUMMARY AND DISCUSSION

Once again, a record number of falcons were recorded, and a new territory was identified. It is still unclear whether population growth has brought territory numbers to a level approaching capacity along the Rio Grande or in the Mountains. Active mountain territories have remained at 3 since 1986, while river territory numbers continue to grow (table 1).

While there remain many suitable, yet uninhabited cliffs along the river, the narrow, linear nature of prey-producing habitat may require lengthy intervals between eyrie sites. Existing data indicates great capacity variance among river-zone peregrine populations (Ratcliffe, 1980). Future monitoring of the river population should produce valuable data regarding capacities in desert riparian zones.

Mountain territories also did well this year, with 3 active, productive eyries in the high chisos. Over the course of these yearly studies, considerable movement of eyrie sites within territories has been observed. Remarkably, all three chisos eyries were located within only 2.25 miles of one another this year. It is unknown if such proximity could indicate other, unidentified nesting pairs in the chisos. The number of known, active territories in the chisos has consistently held at 3 since 1986. Though the reproductive rate this year is still low at 1.25 per active eyrie, it is above the 1.25 required for population maintenance (Enderson, 1985). Descriptions of Big Bend's 1991 nesting adult falcons indicate a number of them to be younger birds, which as yet may not be subject to cumulative organo-chlorine pesticide effects which come with age. The last eggshell measured for thickness from Big Bend was collected by Hogan in 1988 and found to be 21% thinner than pre-1947 shells. To help us determine whether eyrie success or failure is due to eggshell thickness, we should be prepared to test shells as the opportunity presents itself in 1992.

The Big Bend peregrine population is, of course, not aware of such creations as international borders. If we wish to accurately assess status of peregrines in the area, including offspring recruitment, territory dynamics, prey partitioning, and other factors, those nesting south of the border must be taken into account. Overall productivity rates could be significantly affected if such adjacent areas as the Sierra del Carmen and Maderas del Carmen ranges were included. With an area 5 times that of the Chisos, the Mexican ranges promise numerous potential territories. At least two territories are currently known from the area.

Thanks goes to Chief Ranger Phil Koepf and Resource Management Specialist Mike Fleming for the vote of confidence in supporting development of staff monitoring expertise and responsibility. Congratulation goes to the staff who enthusiastically endured the long hours, heat, cold, sore muscles and eyes, and all the rest required of them. Also thanks for the patience demonstrated in making this truly a team effort, even through the inevitable growing-pains of handling the program ourselves.

Betty Moore's contribution of shared knowledge and experience as staff trainer was invaluable as the lessons were applied in 1991. Inspiration continues to come from non-staff individuals like Hal Flinders and Terri Thate, whose personal concern for Big Bend's resources leads them to contribute.

Thankfully, there are still peregrines in Big Bend to make this work necessary, yet we look forward to the day when it is no longer needed.

ACKNOWLEDGMENTS

1. Develop monitoring programs to resolve questions of whether migration occurs in Big Bend populations.
2. Continue current use visitor restriction strategy.
3. Continue to develop and use NPS staff monitoring capability.
4. Develop a joint monitoring program with Mexico.
5. Collect eggshells for thickshells testing.
6. Intensify efforts to locate previously unidentified territories during courtship season.
7. Through one of the Cooperative Park Study Units associated with Big Bend, retain a consulting raptor biologist to assist staff with behavioral interpretation.

MANAGEMENT RECOMMENDATIONS

Although the transition began last year, the 1991 program was the first conducted entirely by NPS staff. Along with providing more total site visits and monitoring hours, field staff have gained expertise and experience which enhances their ability to understand and protect important biological resources. To date, cost/benefit analyses have not been completed for comparison with previous contract-monitoring methods.

TABLES

TABLE 1. REPRODUCTIVE HISTORY OF PEREGRINES IN THE BIG BEND
1975-1991

TERRITORY	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
99 Rockslide	-	-	-	-	-	-	-	-	-	-	2Y	Apr	Apr	D	D	D	D
44 St. Elena	Apr	Apr	3Y	3Y	1Y	Apr	I/D	2Y	Apr	Apr	2Y	1Y	2Y	1Y	Apr	2Y	Apr
11 Mariscal	Apr	Apr	2Y	1Y	Im	1Y	I/D	3Y	Apr	Apr	Apr	1Y	2Y	1Y	Apr	Apr	1Y
66 Boquillas	Am	2Y	Apr	3Y	1Y	3Y	I/D	2Y	1Y	Apr	2Y	2Y	1Y	2Y	D	Apr	3Y
69 Boquillas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2Y	Apr	Apr
19 Bonnie's	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2Y	Apr	Apr
55 John's	-	-	-	-	-	-	-	-	-	3Y	2Yx	2Y	Af	D	Im	ImPr	1Y
59 Bullis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2Y	1Y
79 Roy's	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2Y	Apr	2Y
398 Burro Blf	-	-	-	-	1Y	I/D	I/D	Apr	Apr	Apr	D	D	D	D	D	D	D
40 Juan Botas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Apr
n/s V. Bailey	-	-	-	-	2Y	Apr	I/D	Apr	D	D	D	D	D	D	D	D	D
111a Casa Grde	-	-	-	-	-	-	-	-	Apr	Apr	1Y	2Y	1Y	D	1Y	D	D
111b Pinnacles	-	-	-	-	-	-	-	-	-	-	-	-	-	Apr	D	D	D
111c Toll	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Apr	2Y
33a Lost Mine	-	-	-	-	-	-	-	-	-	-	-	2Y	D	D	-	2Y	D
33b Crown	-	-	-	-	-	-	-	-	-	-	-	-	1Y	D	1Y	D	3Y
88 South Rim	-	-	-	-	-	-	-	-	-	-	3Y	Apr	Apr	2Y	3Y	3Y	2Y
TOTAL YOUNG	0	2	5	7	5	4	0	7	1	3	11	9	8	8	8	9	15

KEY:

Apr - Adult pair
Am - Adult male
Af - Adult female
Im Pr - Immature pair
Im - Immature
I/D - Insufficient data
Y - Number of young
D - Deserted
x - Hatched at Peregrine Fund
- - Undiscovered

REFERENCES:

Hill and Schaetzel, 1977
Hogan, 1988
Hunt, 1975
Hunt and Johnson, 1982
Johnson and Hunt, 1976
Key, 1978, 1980
Lawson and Falxa, 1979
McKinney, 1985, 1986, 1987
Moore, 1989, 1990
Netherton et. al., 1978
Sharp, 1983, 1984

Swepton, 1981
Wesson et. al., 1978

TABLE 2. EYRIE PRODUCTIVITY SUMMARY
1976 - 1991

YEAR	Avg. No. Young Per Active Pair
1991	1.25
1990	0.90
1989	1.13
1988	1.17
1987	0.77
1986	1.25
1985	1.70
1984	0.50
1983	0.20
1982	1.40
1981	I/D
1980	1.00
1979	1.25
1978	2.33
1977	1.67
1976	0.67

REFERENCES:
Hill and Schaezel, 1977
Hogan, 1988
Hunt, 1975
Hunt and Johnson, 1982
Johnson and Hunt, 1976
Key, 1978, 1980
Lawson and Faxla, 1979
McKinney, 1985, 1986, 1987
Moore, 1989, 1990
Netherton et. al., 1978
Sharp, 1983, 1984
Swebston, 1981
Wesson et. al., 1978

TABLE 3. HISTORIC INCUBATION INITIATION DATES
1982 - 1991

TERRITORY	82	83	84	85	86	87	88	89	90	91
99	--	--	--	3/20	F	F	D	D	D	D
44	3/20	F	F	3/08	4/04	3/05	2/22	F	3/16	F
11	3/17	F	F	F	4/01	3/05	3/01	F	F	3/31
66	ID	4/07	F	3/24	3/15	3/07	3/24	F	F	3/12
69	--	--	--	--	--	--	3/27	D	F	ID
19	--	--	--	--	--	--	--	3/14	F	ID
55	--	--	2/09	3/09	3/10	LF	D	LF	FP	3/26
59	--	--	--	--	--	--	--	--	3/30	ID
79	--	--	--	--	--	--	--	3/21	F	3/13
398	FP	FP	FP	D	D	D	D	D	D	D
40	--	--	--	--	--	--	--	--	--	ID
111a	--	FP	FP	5/09	4/03	4/07	D	5/05	D	D
111b	--	--	--	--	--	--	5/09	D	D	D
111c	--	--	--	--	--	--	--	--	F	3/12
33A	--	--	--	--	4/12	D	D	4/16	4/10	D
33b	--	--	--	--	--	4/12	D	D	D	3/23
88	--	--	--	3/30	F	F	5/08	4/13	4/07	3/28

REFERENCES:

Hogan, 1988
Hunt and Johnson, 1982
Moore, 1989, 1990
McKinney, 1985, 1986, 1987
Sharp, 1983, 1984
Swebston, 1981

Failed eyrie
Deserted
Falcons present
Insufficient data
Lone falcon
Undiscovered

TABLE 4. HISTORIC HATCHING DATES
1982 - 1991

TRITORY	82	83	84	85	86	87	88	89	90	91
99	--	--	--	4/21	F	F	D	D	D	D
44	4/21	F	F	4/09	5/08	4/06	3/21	F	4/18	F
11	4/19	F	F	F	5/02	4/06	4/02	F	F	4/11
66	ID	5/10	F	4/26	4/15	4/09	4/26	F	F	4/14
69	--	--	--	--	--	--	4/29	D	F	ID
19	--	--	--	--	--	--	--	4/16	F	ID
55	--	--	3/13	4/12	4/11	LF	--	LF	FP	4/16
59	--	--	--	--	--	--	--	--	5/02	ID
79	--	--	--	--	--	--	4/23	F	F	4/15
398	FP	FP	FP	D	D	D	D	D	D	D
40	--	--	--	--	--	--	--	--	--	ID
111a	--	FP	FP	6/05	5/05	5/08	6/07	D	D	D
111b	--	--	--	--	--	--	F	D	D	D
111c	--	--	--	--	--	--	--	--	F	4/15
33a	--	--	--	--	5/13	D	--	5/19	4/13	D
33b	--	--	--	--	--	5/01	D	D	D	4/25
88	--	--	--	5/02	F	F	6/11	5/16	5/10	4/30

REFERENCE:

Hogan, 1988
Hunt and Johnson, 1982
Moore, 1989, 1990
McKinney, 1985, 1986, 1987
Sharp, 1983, 1984
Swebston, 1981

Failed eyrie
Deserted
Falcons present
Insufficient data
Lone falcon
Undiscovered

TABLE 5. HISTORIC FLEDGING DATES
1982 - 1991

PRIORITY	82	83	84	85	86	87	88	89	90	91
.99	--	--	--	6/03	F	D	D	D	D	D
.44	6/04	F	F	5/27	6/23	5/19	5/09	F	5/30	F
.11	5/24	F	F	F	6/15	5/02	5/17	F	F	5/23
.66	ID	6/23	F	6/09	5/29	5/24	6/07	F	F	5/26
.69	--	--	--	--	--	6/11	--	D	F	ID
.19	--	--	--	--	--	--	5/28	F	F	ID
.55	--	--	4/26	--	5/23	LF	--	LF	FP	6/04
.59	--	--	--	--	--	--	--	6/13	--	ID
.79	--	--	--	--	--	--	6/04	F	F	5/27
.398	FP	FP	FP	D	D	D	D	D	D	D
.40	--	--	--	--	--	--	--	--	--	ID
.11a	--	FP	FP	7/21	6/17	6/24	F	7/19	D	D
.11b	--	--	--	--	--	--	F	D	D	D
.11c	--	--	--	--	--	--	--	--	F	6/03
.33a	--	--	--	--	6/25	D	D	6/30	6/24	D
.33b	--	--	--	--	--	6/14	D	D	D	6/06
.88	--	--	--	6/19	F	F	7/23	6/27	6/21	6/15

REFERENCE:

Hogan, 1988
Hunt and Johnson, 1982
Moore, 1989, 1990
McKinney, 1985, 1986, 1987
Sharp, 1983, 1984
Swepton, 1981

Failed eyrie
Deserted
Falcons present
Insufficient data
Lone falcon
Undiscovered

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