National Park Service
U.S. Department of the Interior

Science Report NPS/SR—2026/523
https://doi.org/10.36967/2306923

LeConte's Thrasher Monitoring at Tule Springs Fossil Beds National Monument

A Three-Year Report (2022–2024)



A breeding *Toxostoma lecontei* pair in 2023, perched atop a cattle saltbush at TUSK.
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LeConte's Thrasher Monitoring at Tule Springs Fossil Beds National Monument: A Three-Year Report (2022–2024)

Science Report NPS/SR—2026/523

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Please cite this publication as:

Simmons, J.M. 2026. LeConte's Thrasher Monitoring at Tule Springs Fossil Beds National Monument: A Three-Year Report (2022–2024). Science Report NPS/SR—2026/523. National Park Service, Fort Collins, Colorado. https://doi.org/10.36967/2306923

NPS 236/268217, October 2026

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Contents

Page

Figures....iv

Tables....iv

Abstract....v

Acknowledgments....vi

Executive Summary....vii

Conservation Status of Desert Thrashers....vii

Actions Taken....vii

Brief Results Summary....vii

List of Acronyms....viii

Study Area....1

Methods....4

Sample Design....4

Results....5

2022 Field Season Summary....5

2023 Field Season Summary....5

2024 Field Season Summary....5

Overall Summary....5

Other Sensitive Species Detected....12

Discussion....13

Literature Cited....21

Appendix: Plot Locations....22

Figures

Page

Figure 1. National Park Unit TUSK participating in the GBBO Desert Thrasher Surveys. 1

Figure 2. Survey locations in the South Unit of TUSK. 2

Figure 3. Survey locations in the North Unit of TUSK, where all LCTH detections occurred 3

Figure 4. The total number of species detected at each survey plot, with color fill indicating the habitat type of that plot. 6

Figure 5. Year on X-axis, species number on Y-axis. 7

Figure 6. *Atriplex* dominated habitat (saltbush). 13

Figure 7. One example of Mojave Desert Scrub habitat featuring rocky soils and more cacti and yucca species. 14

Figure 8. Example photo of Barren/Badlands dominated habitat (BRN). 15

Figure 9. The habitat on plot 25 featuring a heavy density of invasives, including fairly tall tamarisk trees in the back. 16

Figure 10. A thrasher nesting location, within 600 meters of US-95 in DMO habitat. 18

Figure 11. LeConte's Thrasher nestlings in the nest referenced above. 19

Tables

Page

Table 1. All species recorded on TUSK during protocol surveys. 7

Table 2. LeConte's Thrashers detected on plots (specifically within the 90,000 m^2 area). 10

Table 3. LeConte's Thrashers detected off plot and/or outside of the 40-minute survey window 11

Table 4. Plot coordinates. 22

Abstract

LeConte's and Bendire's Thrashers (LCTH and BETH, respectively) are recognized as some of the most rapidly declining bird species in the American southwest. Tule Springs Fossil Beds National Monument (TUSK) contains a mosaic of different habitats favored by LeConte's Thrashers (LCTH). At the same time, Bendire's Thrasher has never been recorded on TUSK. These habitats exist in a spectrum of disturbance regimes, from pristine habitats (found in the northeastern parts of the park) to more disturbed habitats (found along the entire southern border near the urban interface). The precipitous decline of thrashers has called the Desert Thrasher Working Group (DTWG) into action across these species' ranges to collect distribution data and create habitat suitability models. Area search surveys have been implemented on TUSK for three seasons, beginning in 2022. Following the protocol outlined by the DTWG and Great Basin Bird Observatory (GBBO) (DTWG 2018), 33 plots, sized at 300 × 300 meters, were visited a total of 8 times each. Vegetation data were also collected at each plot using the point-centered quarter method to determine dominant cover species, percentage of bare ground (important for ground-foraging arthropod hunters like LCTH), vegetation height, wash coverage, and presence of invasives. A total of 88 bird species were recorded. Survey data reveals that LCTH, which were detected on 20 out of 33 plots, prefer nesting sites in or near saltbush dominated habitats while occurrence differed across areas experiencing different levels and types of human disturbance. Human disturbance refers to anthropogenic activities and infrastructure that may negatively affect habitat and LCTH. At the same time, distance from human disturbance does not appear to play as significant a role as the type and intensity of disturbance, as thrashers inhabited quality habitat in close proximity to humans while disregarding poor quality habitat at similar distances. Areas with a mosaic of saltbush, soft alkaline soils with a moderate number of rocks, and creosote bush also usually indicated thrasher presence.

Acknowledgments

I thank the team at TUSK for their continued support of this work. Erin Eichenberg and Lauren Parry were crucial in securing funding for the surveys to be completed and conducted pilot surveys early on. Dawn Fletcher and Lauren Harter from GBBO trained and set me up for success with desert thrasher work and have continued to support the project in many ways. Other important collaborations include the U.S. Fish and Wildlife team at DNWR, Becky Lausch and Kevin DesRoberts. I also thank Point Blue Conservation Science and the use of their Avian Knowledge Network (AKN) as a data repository and a means to format it appropriately for analysis.

Executive Summary

Conservation Status of Desert Thrashers

LeConte's and Bendire's Thrashers (LCTH and BETH, respectively) are recognized as some of the most rapidly declining bird species in the southwest. BETH have declined 87 percent and LCTH have declined 67 percent over the last 45 years (Rosenberg et al. 2016), and the "population half-life" (i.e., time to a further 50 percent population decline) is estimated to be only 14 years for Bendire's Thrasher and 29 years for LeConte's Thrasher (Rosenberg et al. 2016).

The main factor necessitating swift action to further study these species is that energy development and land conversion to agriculture are immediate threats to the pristine undisturbed habitat they rely on (Ammon et al. 2020). Other factors explain why obtaining data on these thrashers has been difficult: (1) birds are dispersed across large land areas in which they exhibit cryptic behaviors making detection probability low (Bear Sutton et al. 2017), (2) they are often missed on other typical bird surveys because of their tendency to breed early in the season (as early as January for LCTH), and (3) they use ephemeral food sources, alternating breeding sites from year to year which is also potentially driven by winter precipitation (Ammon et al. 2020; Sheppard 2018). Tule Springs Fossil Beds National Monument (TUSK) contains 27,000 acres of protected quality LCTH habitat. BETH was never detected and was not expected as their preferred habitat dissipates in this region, with the closest population being in the Wee Thump Joshua Tree Wilderness near Searchlight, NV. TUSK's habitat is being pressured by development on most borders and faces an uncertain future due to potential impacts from climate change.

Actions Taken

Upon identifying the myriad of issues facing desert thrashers, agency partners, non-profit groups, and researchers formed the Desert Thrasher Working Group (DTWG) to specifically focus on these two species and the threats to their conservation. TUSK wildlife staff conducted protocol surveys for LCTH and BETH within TUSK for three years (2022–2024). Following the DTWG (2018) protocol, 33 plots were visited a total of eight times each. Vegetation data were taken at each plot using the point-centered quarter method described in the DTWG protocol (DTWG 2018).

Brief Results Summary

A total of 88 species were recorded from 2022 to 2024. Bendire's Thrasher has not been recorded on TUSK to date. LeConte's Thrashers were detected on 20 out of 33 plots, in or near saltbush (*Atriplex* sp.)-dominated habitats with little or no human disturbance. Additional characteristics tied to LCTH presence included soft alkaline soils with a moderate number of rocks and creosote bush (*Larrea tridentata*). This three-year effort recorded a total of 76 LCTH detections over 264 plot visits and filled in knowledge gaps for this species on TUSK.

List of Acronyms

DNWR: Desert National Wildlife Refuge

DTWG: Desert Thrasher Working Group

GBBO: Great Basin Bird Observatory

GLWP: Green Link West Project

LCTH: LeConte's Thrasher

TUSK: Tule Springs Fossil Beds National Monument

Study Area

The study area for this project (Figure 1) occurs within TUSK boundaries, except for a small portion of a single plot on adjacent BLM land. TUSK is located just north of the city of Las Vegas, NV, and borders DNWR, Creech Airforce Base, private lands, and BLM land. Figures 2 and 3 show the distribution of the occupied versus unoccupied plots.

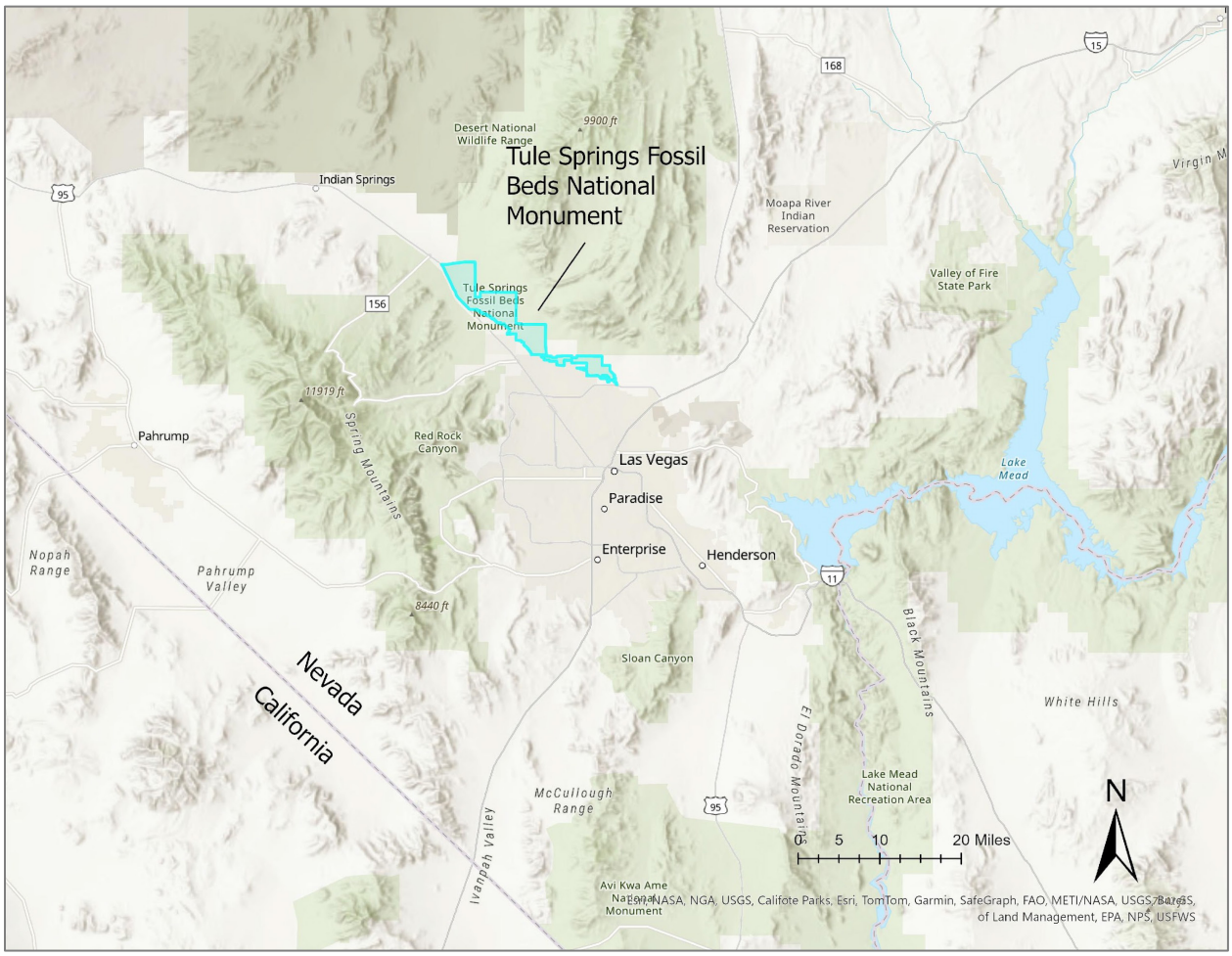


Figure 1. National Park Unit TUSK participating in the GBBO Desert Thrasher Surveys.
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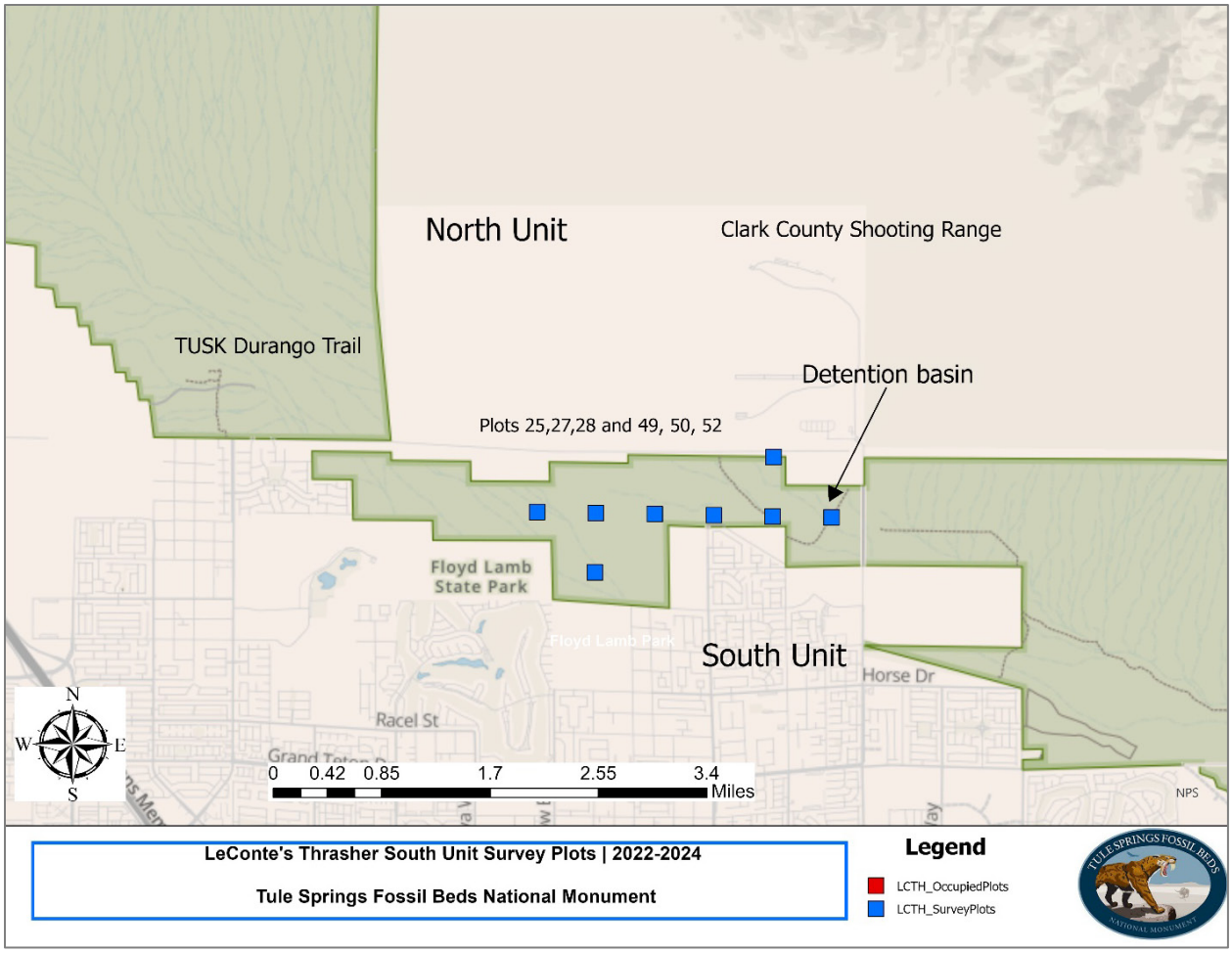


Figure 2. Survey locations in the South Unit of TUSK. These sites are situated in a detention basin where the largest amounts of water flow during rain events. Vegetation here includes invasive tamarisk, as well as native plants like willows, saltbush, and creosote. No detections occurred at these plots.

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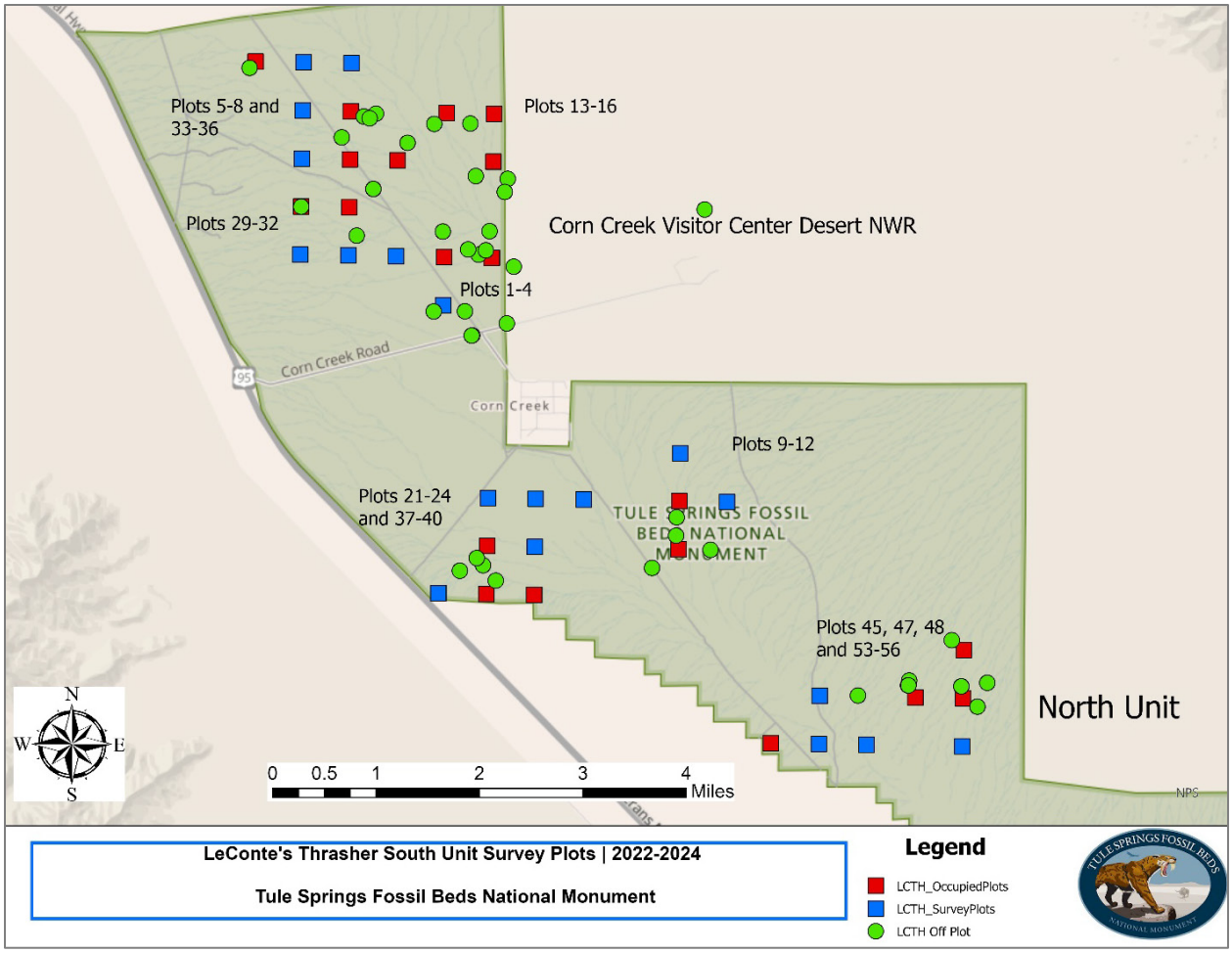


Figure 3. Survey locations in the North Unit of TUSK, where all LCTH detections occurred. This map shows all LCTH detections including incidental observations (recorded between surveys or during other tasks).

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Methods

Sample Design

Area search surveys follow the DTWG protocol (2018). A detailed description of the protocol, including requirements for vegetation surveys, can be found in the references and accessed via Borderlands Avian Data Center. In brief, each 300 × 300 m plot is surveyed three times each season, with a minimum period of ten days between each visit. Transects are walked from North to South (to help alleviate vision hindrance from the rising sun in the East) separated by 50 meters. The observer is allowed to deviate to investigate target species including Loggerhead Shrike and Bendire's and Leconte's thrashers, but must return to the line and finish the pattern. The duration is capped at 40 minutes and the observer must stay on the plot throughout the survey. Weather data is taken before starting a survey.

Every individual that was detected within the 300 × 300 m plot was recorded; interesting species outside of the plot were recorded in the notes section. For the TUSK surveys, every bird detected during a survey was reported via www.ebird.org for park records, but species which were observed off plot and were not a target species were recorded. For observations, the breeding code and detection method were recorded (singing, calling, visual only). If the target species was detected, more detailed information was concurrently recorded on a target species form. Details include the exact coordinates, or distance and bearing from exact coordinates, to the LCTH or shrike, its perching substrate species and height, behavior, and any other important information. Nests were not approached when found; the observer eventually returned post-fledging to record substrate species and height.

Results

2022 Field Season Summary

Plots were only visited twice in 2022. The 2022 surveys were conducted under notably dry conditions, with TUSK receiving no winter precipitation between December and February. Despite this, there were 20 LCTH detections, and breeding was confirmed on 2 out of 33 plots.

2023 Field Season Summary

All plots were visited three times in 2023. A total of 3.5 cm of precipitation was recorded at TUSK between December and February, and a large wildflower bloom was observed throughout TUSK in 2023. A total of 29 LCTH detections were made in 2023 and breeding was confirmed on 2 out of 33 plots.

2024 Field Season Summary

All plots were visited three times in 2024. A total of 5.79 cm of precipitation was recorded at TUSK between December and February. More invasive plant cover was noted in 2024, including London rocket, Russian star thistle, and Sahara mustard. A total of 28 LCTH detections were made in 2024, with breeding confirmed on 3 out of 33 plots.

Overall Summary

LCTH were detected on 20 out of the 33 plots over three years. This does not include incidental sightings of LCTH. No LCTH were detected on the South Unit plots for any of the years sampled. There is suitable habitat within the South Unit, but not as much as the North Unit, and the high level of disturbance from human activity likely keeps thrashers away. A total of 76 LCTH detections were recorded over the 264 plot visits.

Species richness by plot number is shown in Figure 4 and Figure 5 visualizes the number of LCTH detections each year, combined with the number of total species recorded on surveys each year. Table 1 lists all species detected over the three-year project. Table 2 lists the locations and dates of each LCTH detection occurring on a survey plot, while Table 3 shows all LCTH detections that occurred off of official plots.

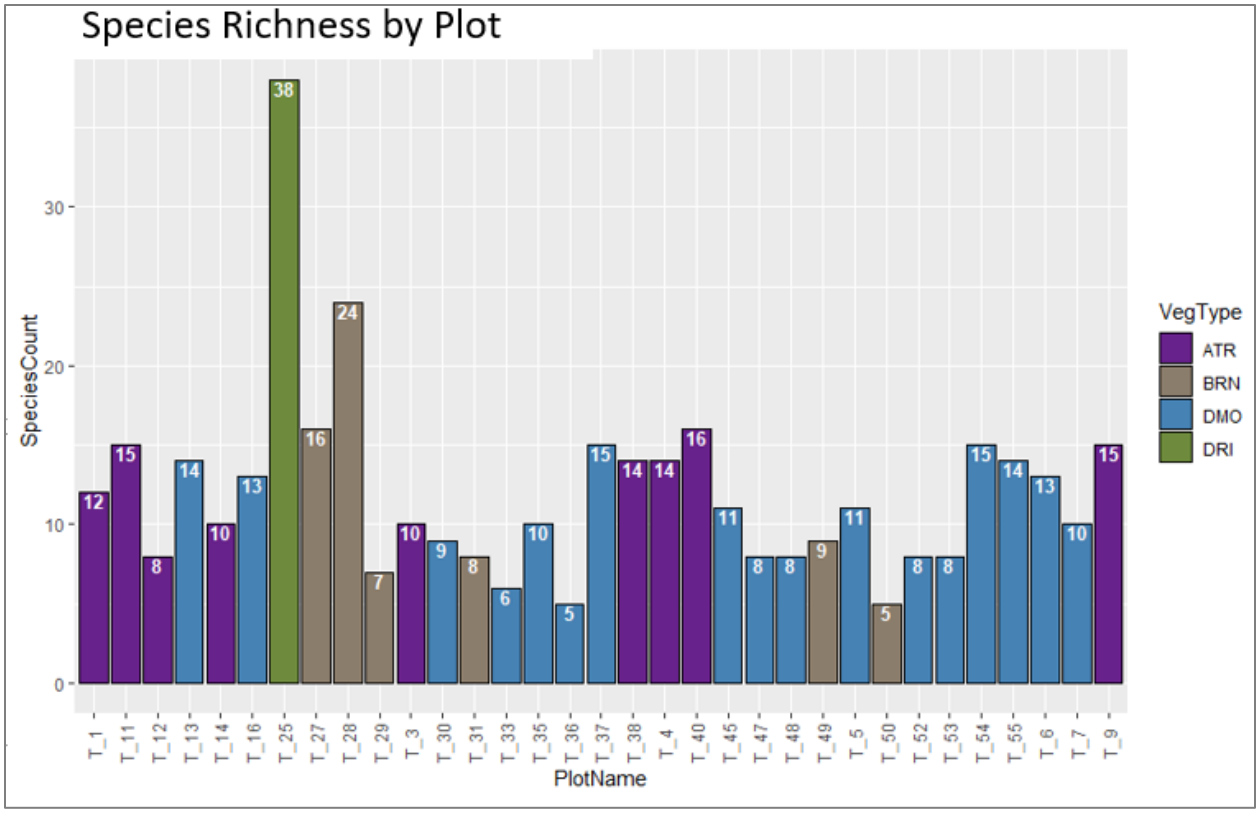


Figure 4. The total number of species detected at each survey plot, with color fill indicating the habitat type of that plot. ATR = *Atriplex* dominated habitat, BRN = barren/badlands dominated, DMO = Mojave Desert Scrub, DRI = Desert Riparian. In the case of TUSK, DRI plots often consisted of just a handful of native willows, catclaw acacia, and invasive tamarisk in a small wash.

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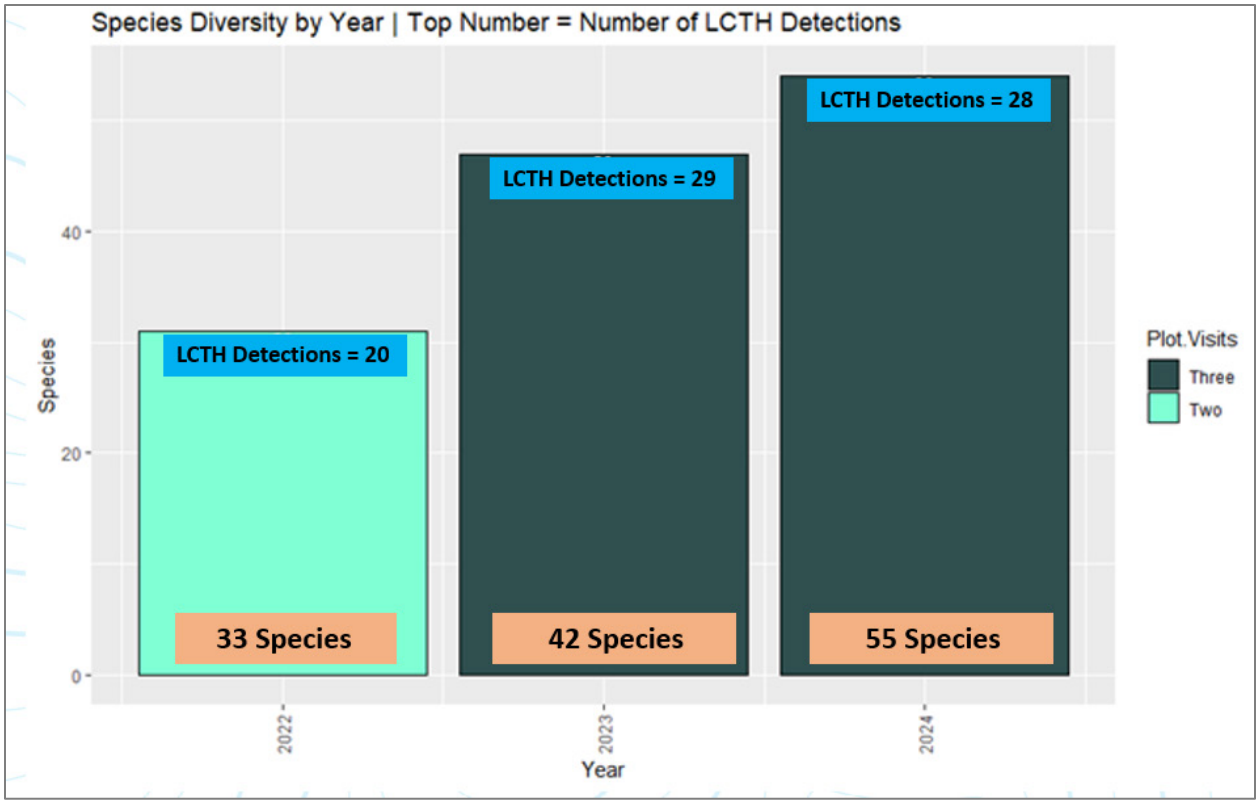


Figure 5. Year on X-axis, species number on Y-axis. The number of LCTH detections per year are listed in the blue box at the top of each bar, while the total bird species detections are listed in the orange box at the bottom. Color fill shows the difference in survey effort.

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Table 1. All species recorded on TUSK during protocol surveys. Total = 88 species.

Species	Scientific Name	Special Status Species BLM [A]
Gambel's Quail [B]	*Callipepla gambelli*	–
Rock Pigeon	*Columba livia*	–
Eurasian-collared Dove	*Streptopelia decaocto*	–
Mourning Dove	*Zenaida macroura*	–
Greater Roadrunner	*Geococcyx californianus*	–
Lesser Nighthawk	*Chordeiles acutipennis*	–
Anna's Hummingbird	*Calyptae anna*	–
Costa's Hummingbird	*Calyptae costa*	–
Herring Gull	*Larus argentatus*	–
California Gull	*Larus californicus*	–
Great Blue Heron	*Ardea herodias*	–

[A] PowerPoint Presentation (blm.gov) BLM Sensitive Species List for Nevada.

[B] Seen incidentally between surveys or during other work.

Table 1 (continued). All species recorded on TUSK during protocol surveys. Total = 88 species.

Species	Scientific Name	Special Status Species BLM [A]
Turkey Vulture	*Cathartes aura*	–
Osprey	*Pandion haliaetus*	–
Northern Harrier	*Circus hudsonius*	–
Sharp-shinned Hawk	*Accipiter striatus*	–
Cooper's Hawk [B]	*Accipiter cooperii*	–
Red-tailed Hawk	*Buteo jamaicensis*	–
Western Burrowing Owl [B]	*Athene cunicularia hypugea*	BLM Sensitive
American Kestrel	*Falco sparverius*	–
Peregrine Falcon	*Falco peregrinus*	BLM Sensitive
Prairie Falcon	*Falco mexicanus*	–
Gray Flycatcher	*Empidonax wrightii*	–
Dusky Flycatcher	*Empidonax oberholseri*	–
Say's Phoebe	*Sayornis saya*	–
Ash-throated Flycatcher	*Myiarchus cinerascens*	–
Western Kingbird	*Tyrannus verticallis*	–
Loggerhead Shrike	*Lanus ludovicianus*	BLM Sensitive
Pinyon Jay	*Gymnorhinus cyanocephalus*	BLM Sensitive
Woodhouse's Scrub-Jay	*Aphelocoma woodhouseii*	–
Common Raven	*Corvus corax*	–
Verdin	*Auriparus flaviceps*	–
Horned Lark	*Eremophila alpestris*	–
Bank Swallow	*Riparia riparia*	–
Tree Swallow	*Tachycineta bicolor*	–
Violet-green Swallow	*Tachycineta thalassina*	–
Northern Rough-winged Swallow	*Stelgidoperyx serripennis*	–
Barn Swallow	*Hirundo rustica*	–
Cliff Swallow	*Petrochelidon pyrrhonota*	–
Red-breasted Nuthatch	*Sitta canadensis*	–
Blue-gray Gnatcatcher	*Polioptila caerulea*	–
Black-tailed Gnatcatcher	*Polioptila melanura*	–
Rock Wren	*Salpinctes obsoletus*	–
Cactus Wren	*Campylorhynchus brunneicapillus*	–
LeConte's Thrasher	*Toxostoma lecontei*	BLM Sensitive
Crissal Thrasher	*Toxostoma crissale*	BLM Sensitive

[A] PowerPoint Presentation (blm.gov) BLM Sensitive Species List for Nevada.

[B] Seen incidentally between surveys or during other work.

Table 1 (continued). All species recorded on TUSK during protocol surveys. Total = 88 species.

Species	Scientific Name	Special Status Species BLM [A]
Sage Thrasher	*Oreoscoptes montanus*	–
Northern Mockingbird	*Mimus polyglottos*	–
Western Bluebird	*Silia mexicana*	–
Mountain Bluebird	*Silia currucoides*	–
Phainopepla	*Phainopepla nitens*	BLM Sensitive
American Pipit	*Anthus rubescens*	–
House Finch	*Haemorhous mexicanus*	–
Pine Siskin	*Spinus pinus*	–
Lesser Goldfinch	*Spinus psaltria*	–
Red Crossbill	*Loxia curvirostra*	–
Lapland Longspur	*Calcarius lapponicus*	–
Chipping Sparrow	*Spizella passerina*	–
Brewer's Sparrow	*Spizella breweri*	BLM Sensitive
Black-throated Sparrow	*Amphispiza bilineata*	–
Lark Sparrow	*Chondestes grammacus*	–
Lark Bunting	*Calamospiza melanocorys*	–
White-crowned Sparrow	*Zonotrichia leucophrys*	–
Sagebrush Sparrow	*Artemisiospiza nevadensis*	–
Bell's Sparrow	*Artemisiospiza belli*	–
Vesper Sparrow	*Pooecetes gramineus*	–
Savannah Sparrow	*Passerculus sandwichensis*	–
Lincoln's Sparrow	*Melospiza lincolnii*	–
Green-tailed Towhee	*Pipilo chlorurus*	–
Western Meadowlark	*Sturnella neglecta*	–
Hooded Oriole	*Icterus cucullatus*	–
Bullock's Oriole	*Icterus bullockii*	–
Red-winged Blackbird	*Agelaius phoeniceus*	–
Great-tailed Grackle	*Quiscalus mexicanus*	–
Brown-headed Cowbird	*Molothrus ater*	–
Orange-crowned Warbler	*Leiothlypis celata*	–
Lucy's Warbler	*Leiothylpis luciae*	–
Yellow Warbler	*Setophaga petechia*	–
Yellow-rumped Warbler (Audubon's)	*Setophaga coronata*	–
Common Yellowthroat	*Geothlypis trichas*	–

[A] PowerPoint Presentation (blm.gov) BLM Sensitive Species List for Nevada.

[B] Seen incidentally between surveys or during other work.

Table 1 (continued). All species recorded on TUSK during protocol surveys. Total = 88 species.

Species	Scientific Name	Special Status Species BLM [A]
Wilson's Warbler	*Cardellina pusilla*	–
Western Tanager	*Piranga ludoviciana*	–
Lazuli Bunting	*Passerina amoena*	–
Yellow-headed Blackbird [B]	*Xanthocephalus xanthocephalus*	–
Ruby-crowned Kinglet	*Corthylio calendula*	–
Mallard	*Anas platyrynchos*	–
Ladder-backed Woodpecker	*Dryobates scalaris*	–
Canada Goose	*Branta canadensis*	–
American Robin	*Turdus migratorius*	–

[A] PowerPoint Presentation (blm.gov) BLM Sensitive Species List for Nevada.

[B] Seen incidentally between surveys or during other work.

Table 2. LeConte's Thrashers detected on plots (specifically within the 90,000 m^2 area). The appendix includes thrashers detected off plot, which is a significant portion of the detections each season. Total detections = 31.

Plot Name	Number of Birds	Date
Nevada_TUSK_1	1	5/5/2023
Nevada_TUSK_1	2	5/5/2023
Nevada_TUSK_1	1	5/5/2023
Nevada_TUSK_1	1	3/4/2024
Nevada_TUSK_1	3	4/2/2024
Nevada_TUSK_1	3	5/15/2024
Nevada_TUSK_11	1	5/23/2022
Nevada_TUSK_11	1	5/31/2023
Nevada_TUSK_11	1	5/31/2023
Nevada_TUSK_11	1	5/31/2024
Nevada_TUSK_11	1	5/31/2024
Nevada_TUSK_13	1	7/15/2022
Nevada_TUSK_14	2	7/15/2022
Nevada_TUSK_14	1	5/16/2023
Nevada_TUSK_16	1	6/24/2022
Nevada_TUSK_37	1	6/29/2022
Nevada_TUSK_37	3	5/9/2023
Nevada_TUSK_38	1	6/29/2022
Nevada_TUSK_38	1	6/29/2022
Nevada_TUSK_38	1	3/22/2023

Table 2 (continued). LeConte's Thrashers detected on plots (specifically within the 90,000 m2 area). The appendix includes thrashers detected off plot, which is a significant portion of the detections each season. Total detections = 31.

Plot Name	Number of Birds	Date
Nevada_TUSK_38	1	5/30/2024
Nevada_TUSK_4	4	6/22/2023
Nevada_TUSK_4	2	5/5/2023
Nevada_TUSK_4	1	5/5/2023
Nevada_TUSK_4	1	3/4/2024
Nevada_TUSK_40	1	6/29/2022
Nevada_TUSK_45	3	6/8/2023
Nevada_TUSK_55	1	6/3/2024
Nevada_TUSK_6	2	5/5/2023
Nevada_TUSK_6	1	3/8/2023
Nevada_TUSK_9	3	5/31/2023

Table 3. LeConte's Thrashers detected off plot and/or outside of the 40-minute survey window. Plots are still listed as a central location because many thrashers were detected very close to a plot, even if it was not within the boundaries. N/A = detections far from plots. Total detections = 45.

Plot Name	Date	Number of Birds Detected	UTMs
NV_TUSK_30	7/12/2022	1	642700/4034600
NV_TUSK_14	7/15/2022	1	644580/4034890
NV_TUSK_7	5/10/2022	1	642766/4035639
N/A	5/23/2022	2	646471/4030062
N/A	3/30/2022	1	644600/4033084
N/A	4/5/2022	3	644168/4032929
N/A	5/3/2022	2	644545/4034727
N/A	4/4/2022	1	644161/4032926
N/A	4/4/2022	1	647055/4034550
N/A	6/24/2022	1	643650/4035560
N/A	5/13/2022	2	642837/4035616
NV_TUSK_37	6/23/2023	1	643780/4034220
NV_TUSK_4	6/22/2023	1	644675/4033796
NV_TUSK_6	6/14/2023	1	643318/4035320
NV_TUSK_13	5/16/2023	1	644100/4035573
NV_TUSK_1	5/5/2023	1	644100/4034000
NV_TUSK_1	5/5/2023	1	643780/4034220
NV_TUSK_45	5/4/2023	1	650580/4028400

Table 3 (continued). LeConte's Thrashers detected off plot and/or outside of the 40-minute survey window. Plots are still listed as a central location because many thrashers were detected very close to a plot, even if it was not specifically in the boundaries. N/A = detections far from plots. Total detections = 45.

Plot Name	Date	Number of Birds Detected	UTMs
NV_TUSK_45	5/4/2023	1	650700/4028700
NV_TUSK_36	4/7/2023	1	641324/4036221
NV_TUSK_45	3/24/2023	1	650375/4028650
NV_TUSK_48	3/24/2023	1	649710/4028650
NV_TUSK_9	3/22/2023	1	646770/4030700
NV_TUSK_11	3/22/2023	1	646767/4030471
NV_TUSK_3	3/9/2023	1	643682/4033220
TUSK_4	3/4/2024	2	644365/4034233
TUSK_30	3/5/2024	1	642700/4034150
TUSK_30	3/5/2024	1	642900/4034735
TUSK_14	3/7/2024	1	644181/4034918
TUSK_11	3/27/2024	1	647200/4030300
N/A	3/28/2024	1	644063/4029987
TUSK_4	4/2/2024	1	644231/4033938
TUSK_4	4/2/2024	1	644231/4033938
TUSK_5	4/18/2024	1	–
N/A	4/23/2024	4	644353/4030060
TUSK_48	4/24/2024	2	649720/4028711
TUSK_48	4/24/2024	1	649080/4028514
TUSK_4	5/15/2024	1	644321/4033992
TUSK_7	5/16/2024	1	642916/4035676
TUSK_5	5/16/2024	1	642493/4035373
N/A	5/21/2024	2	644073/4033227
TUSK_37	5/30/2024	1	644515/4029870
TUSK_11	5/31/2024	1	–
TUSK_48	6/4/2024	1	649706/4028650
TUSK_47	6/4/2024	1	650245/4029223

Other Sensitive Species Detected

Several species considered sensitive by the Bureau of Land Management in addition to LCTH were detected during surveys, including Pinyon Jay (*Gymnorhinus cyanocephalus)*, Western Burrowing Owl (*Athene cunicularia hypugaea)*, Peregrine Falcon (*Falco peregrinus)*, Brewer's Sparrow (*Spizella breweri)*, Loggerhead Shrike (*Lanius ludovicianus)*, Phainopepla (*Phainopepla nitens)*, and Crissal Thrasher (*Toxostoma crissale).*

Discussion

LeConte's Thrashers are closely associated with *Atriplex* dominated habitats (Figure 6) which provide suitable nesting and foraging structure. Mojave desert scrub (DMO) are areas dominated by creosote, and typically white bursage, without co-dominant blackbrush or saltbush found below 1400 meters of elevation (Figure 7). DMO habitat is used less often in what seems to be an alternating pattern, likely driven by annual rainfall amounts and the subsequent arthropod and flower response. Barren/Badlands dominated habitat (BRN) is secondary habitat, typically associated with foraging rather than breeding (Figure 8). At TUSK, nearly all survey plots were located within suitable habitat types, except for one unsuitable habitat plot located in the South Unit within desert riparian habitat characterized by native willows, catclaw acacia, and invasive tamarisk in a small wash (Figure 9).



Figure 6. *Atriplex* dominated habitat (saltbush).
NPS / JOHN MARK SIMMONS



Figure 7. One example of Mojave Desert Scrub habitat featuring rocky soils and more cacti and yucca species.

NPS / JOHN MARK SIMMONS



Figure 8. Example photo of Barren/Badlands dominated habitat (BRN).
NPS / JOHN MARK SIMMONS



Figure 9. The habitat on plot 25 featuring a heavy density of invasives, including fairly tall tamarisk trees in the back.

NPS / JOHN MARK SIMMONS

An important consideration when interpreting LCTH occurrence at TUSK is the degree and type of human disturbance associated with otherwise suitable habitat. Human disturbance in this study refers to anthropogenic activities and infrastructure that may affect habitat conditions or LCTH directly or indirectly, including recreation, development, roads, noise and artificial light. Suitable habitat near North Las Vegas in the South Unit of TUSK saw no detections of thrashers. The South Unit plots may not be representative enough of the entire unit to say thrashers never use it, but all South Unit plots were in areas with high levels of human activity, including hiking, biking, horseback riding and proximity to urban development with noise and light pollution. The areas closest to the TUSK border near subdivisions, dirt bike trails, and horse stables may experience human disturbance that differs from the less developed areas. In contrast, LCTH were detected in some locations with relative proximity to human disturbance. A total of 13 North Unit plots were located within 2,000 m of US-95, a major highway between Las Vegas and Reno, which borders a significant portion of TUSK to the west. Of these 13 plots, five plots were occupied by LCTH. Additionally, successful thrasher nests were found within 600 meters of US-95 (Figures 10 and 11). These clusters of plots are especially important because historically, thrasher surveys have been focused in areas where they are expected to be, with less surveys occurring in what is considered “unsuitable habitat” (Jongsomjit et al. 2014). The degree to which thrashers respond to disturbance is key for writing management recommendations because this species faces this in many forms, especially in Nevada.



Figure 10. A thrasher nesting location, within 600 meters of US-95 in DMO habitat.
NPS / JOHN MARK SIMMONS



Figure 11. LeConte's Thrasher nestlings in the nest referenced above.
NPS / JOHN MARK SIMMONS

Park managers at TUSK are concerned about the level of development that is occurring and planned for areas directly adjacent to the park (Davis and Hansen 2011). Concerns include a new housing development recently constructed in the southwest corner near Eglington plant preserve; planned development of suitable LCTH, Western Burrowing Owl (*Athene cunicularia hypugaea*), and Mojave Desert Tortoise *(Gopherus agassizii*) habitat in the central west portion; conversion and expansion of US-95 into I-11 along the western boundary including a new frontage road; the Greenlink West Transmission Project encroaching on TUSK land in the south; continuing issues with

illegal motorbike access, shooting, and dumping; and finally climate change effects. Successes in mitigating these issues have occurred, but the surrounding development will continue to constrain wildlife populations on TUSK (Davis and Hansen 2011).

LCTH are a regular, if infrequently encountered, species on TUSK, with LCTH noted on 20 out of 33 survey plots with 31 detections, and an additional 45 detections recorded incidentally beyond plot boundaries. Our TUSK findings will provide valuable baseline information for land managers tasked with mitigating expanding development pressures approaching TUSK's boundaries. We hope that this data provides insight into finding that threshold for the sake of preserving habitat across the range of thrashers and informing the mitigation efforts of energy developers.

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Appendix: Plot Locations

Table 4 includes name and locations of plots surveyed.

Table 4. Plot coordinates. Plot centers listed in UTM coordinates, zone 11N.

Plot Name	Easting	Northing
NV_TUSK_50	657600	4021900
NV_TUSK_52	658200	4021300
NV_TUSK_16	643800	4035700
NV_TUSK_38	644400	4030300
NV_TUSK_27	666000	4022500
NV_TUSK_28	659400	4021900
NV_TUSK_45	650400	4028500
NV_TUSK_36	641400	4036300
NV_TUSK_3	643800	4033300
NV_TUSK_55	648000	4027900
NV_TUSK_1	643800	4033900
NV_TUSK_11	646800	4030300
NV_TUSK_7	642600	4035700
NV_TUSK_9	646800	4030900
NV_TUSK_12	646800	4031500
NV_TUSK_14	644400	4035100
NV_TUSK_35	642000	4035700
NV_TUSK_33	642000	4036300
NV_TUSK_49	658200	4021900
NV_TUSK_30	642600	4034500
NV_TUSK_29	642000	4034500
NV_TUSK_31	642000	4033900
NV_TUSK_47	650400	4029100
NV_TUSK_45	650400	4028500
NV_TUSK_48	649800	4028500
NV_TUSK_5	642600	4035100
NV_TUSK_6	643200	4035100
NV_TUSK_25	660000	4021900
NV_TUSK_40	645000	4029700
NV_TUSK_37	644400	4029700
NV_TUSK_13	644400	4035700
NV_TUSK_53	648600	4027900
NV_TUSK_54	649200	4027900

National Park Service
U.S. Department of the Interior

Science Report NPS/SR—2026/523
https://doi.org/10.36967/2306923



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1201 Oakridge Drive, Suite 150
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NPS 236/268217, October 2026