Nongame Completion Report

2025 — 2026



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Front Cover: *Pygmy Owl. Photo by Frank Stetler.*

Back Cover: *Black-throated Gray Warbler. Photo by Ron Horn.*

Nongame Personnel 2025-2026

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The Wyoming Game and Fish Nongame Section would like to thank past technicians, volunteers, and wildlife professionals from this and other natural resource management agencies for their valuable contributions. We would also like to extend our gratitude to the landowners across the state that allow us access and the ability to perform fieldwork on private land. Without the generous contribution from these stakeholders, the work of the Nongame Section would not be possible.

The Nongame Section would additionally like to thank all funding sources that contribute to work on nongame species throughout the state.

The reports included in this document are the annual summaries of current work the Nongame Section has completed from April 15, 2025 - April 15, 2026. If additional information is needed for any of the projects listed in this report, please contact the Nongame Section at (307) 332 - 2688.

Monitoring American Goshawk Response to Changes in Forest Conditions in Southeastern Wyoming

The American Goshawk is a large forest raptor found throughout the Northern and Western United States, Canada, and parts of Mexico, and is an uncommon, year-round resident in Wyoming. The Wyoming Game and Fish Department (WGFD) classifies American Goshawk as Native Species Status Unknown (NSSU, Tier I), one of the highest priority rankings for Species of Greatest Conservation Need (SGCN), due to a lack of information about population trends and the threat of habitat loss. American Goshawk is also designated as a "Sensitive Species" by land management agencies in much of the U.S., including all BLM-administered lands in Wyoming and U.S. Forest Service (USFS) Regions 2 and 4, due to its potential sensitivity to habitat changes.

Despite being considered a forest habitat generalist, American Goshawks require specific vegetation structural conditions for nesting, including mature to old-growth forests composed primarily of large trees with relatively high canopy closure. In recent decades, much of the American Goshawk's habitat has experienced significant changes from both natural and anthropogenic influences. Since the late 1990s, several species of native bark beetle have infested millions of acres of forests in the Western U.S., resulting in widespread mortality of lodgepole pine. The Medicine Bow National Forest (MBNF) in Southeastern Wyoming was severely affected by the bark beetle outbreak, particularly in the early 2010s. Several large fires and timber harvest projects have added to the disturbance caused by the ongoing bark beetle epidemic, resulting in extensive and rapid changes to forest structure and composition in the MBNF.

The effects of changing forest structure on American Goshawks are still largely unknown. Goshawk habitat preferences are historically incompatible with disturbances that cause large-scale tree mortality and the recent deforestation in the MBNF may thus have impacted resident populations negatively. The objective of this study was to understand how extensive tree mortality caused by the Mountain Pine Beetle and other disturbances have affected use of historical American Goshawk breeding areas in southeastern Wyoming.

We used a grid-based sampling design to monitor occupancy of known American Goshawk breeding areas in the MBNF. In cooperation with USFS, we obtained current and historical nesting locations and used a spatially balanced sampling design to select 6-km^2 grid cells that overlaid the nest locations. We prioritized grid cells with more nest locations and recent activity, and ensured that our sample spanned a gradient of habitat quality and disturbance.

We used a multi-method approach to conduct surveys during the two most vocal stages in the breeding chronology of American Goshawks. For early-seasons surveys, we deployed autonomous recording units (ARUs) near historical nest locations from mid-March through April, corresponding to the courtship and nest building stage. In the late season, we conducted broadcast acoustical surveys in June and July during the nestling and fledging stage. The protocol for broadcast surveys was based on the "American Goshawk Inventory and Monitoring Technical Guide". Surveys consisted of walking transects placed throughout the grid while searching for signs of nesting (e.g., nests, whitewash, prey remains) and periodically stopping at designated points to broadcast American Goshawk calls and listen for responses. We searched for nests in areas surrounding detections of American Goshawks from either survey method.

American Goshawk on a nest. Photo by Donald Jones.



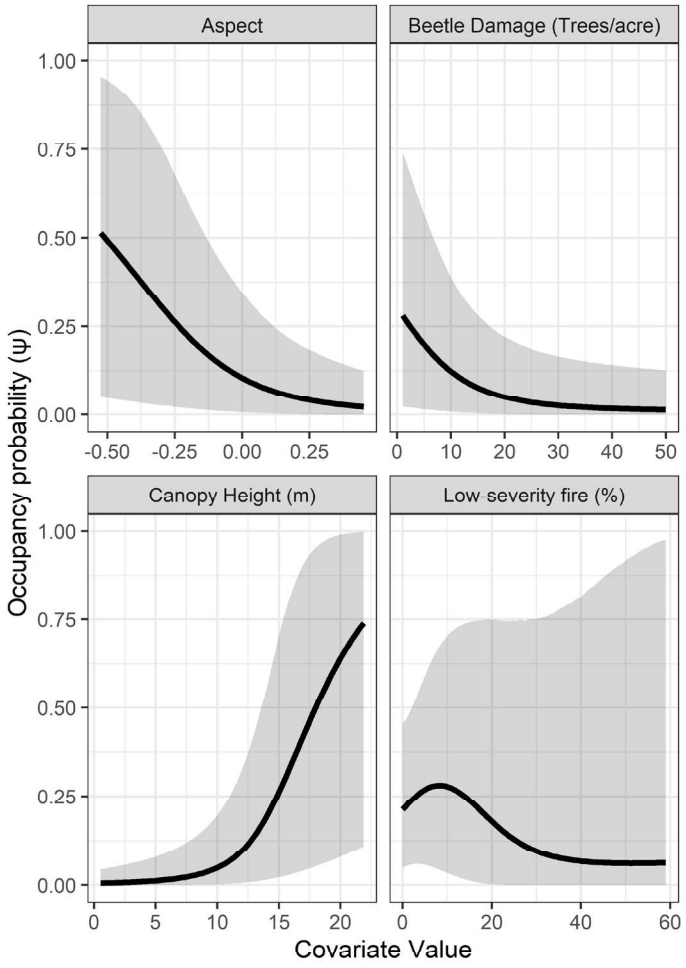
We modeled American Goshawk use of historically occupied areas relative to forest structure (canopy cover, canopy height, etc.), disturbance (beetle damage, fire, logging), and topography (aspect, elevation). We compared the significance of all occupancy covariates within 3 sizes of circular areas around survey points: a small, nest area scale (r = 195 m); medium, post-fledging family area (r = 736 m); and large, home range scale (r = 2.6 km). We used integrated occupancy models to estimate probability of use, while accounting for differing detection probabilities from the ARU and call playback survey datasets. We included covariates on detection probability related to the observation process, such as day of year and time of day, and accounted for spatial autocorrelation of our survey points by including random effects on both occupancy and detection.

We completed a total of 1,339 surveys at 1,307 unique points within 68 grids from 2024–2025. We completed 1,230 broadcast surveys between 18 June 2024 – 3 August 2024 (n = 278) and 10 June 2025 – 12 August 2025 (n = 953), and 205 ARU deployments from 21 March 2024 – 17 July 2024 (n = 95) and 11 March 2025 – 1 May 2025 (n = 110). We visited 370 points in 2024 and 969 points in 2025, with 32 points surveyed in both years. Of 76 total grid surveys, 10 were surveyed exclusively with ARUs (13.3%), 35 using broadcast surveys only (45.3%), and 31 with both methods (41.3%). We detected American Goshawks on 58 points (4.3%); 28 in 2024 and 30 in 2025.

We estimated that the 58 occupied points represented 13 unique breeding territories based on a 2.6-km² radius cluster analysis. The year these territories were first found ranged from 1984–2005; 4 were found between 1984–1988, 7 were found between 1991–1997, and the remaining 2 were found in 2004 and 2005. The majority (n = 10; 77%) were known to be occupied within the five years preceding our study; however, 2 of the occupied territories had not had any known activity since 2015.

We found that continued use of historically occupied breeding areas by American Goshawks was more likely at sites with greater canopy height and fewer beetle killed trees at the post-fledging area scale, and a limited extent of low-severity fire and more westerly aspects at the home range scale. Occupancy probability was approximately 70% when canopy height averaged 20 m or taller, but decreased to ~0% when trees averaged less than 5 m tall, and decreased from ~30% to 5% as beetle damage increased from 0 to 20 trees/acre. Fire had a non-linear effect on American Goshawk occupancy, which increased slightly as the extent of low-severity burned area within the home range increased from 0% to ~10%, but decreased when the burned area exceeded 30%.

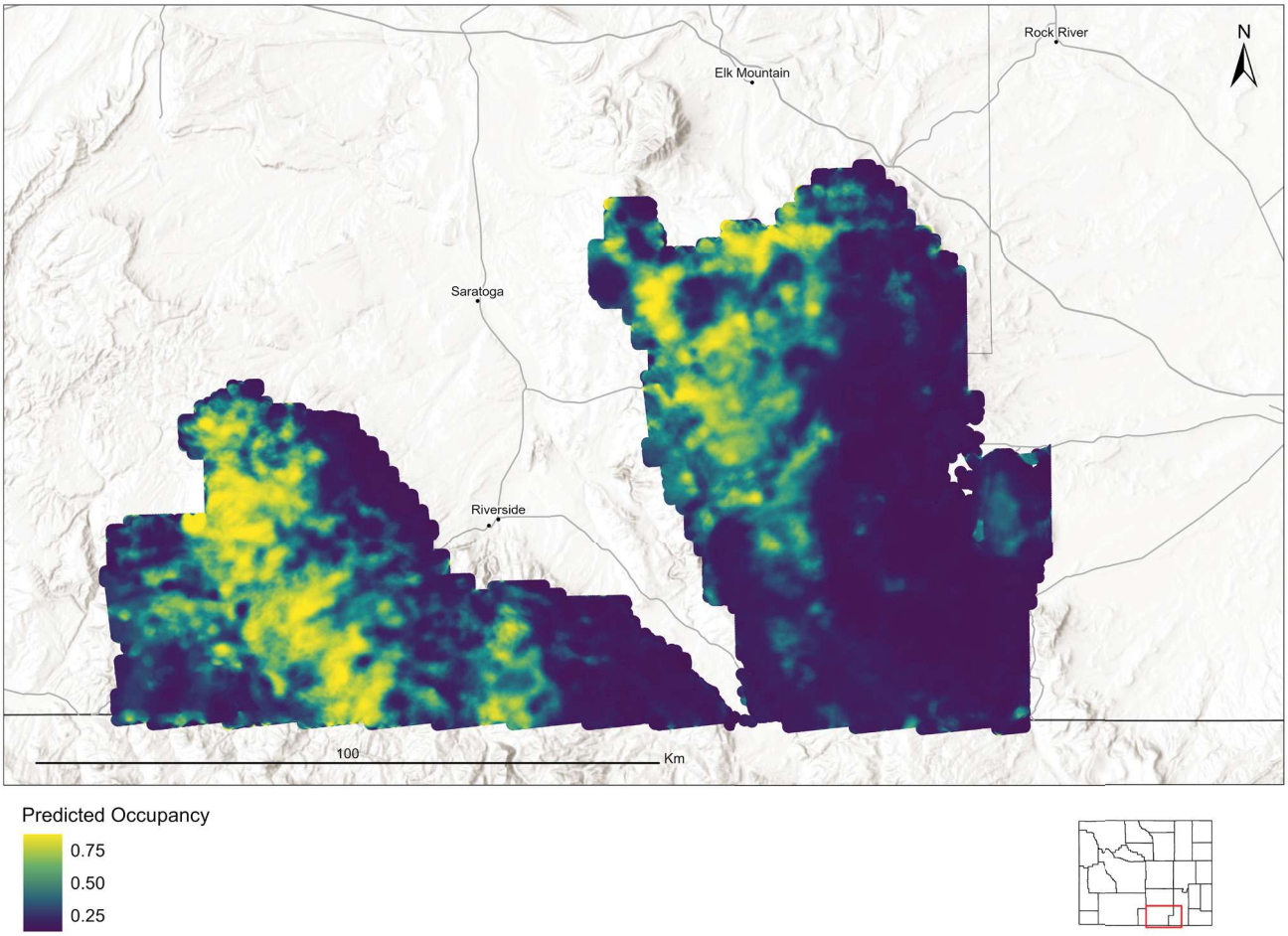
American Goshawk occupancy response (with 95% credible interval) to aspect (difference from east), beetle damage, canopy height, and low-severity fire in the Medicine Bow National Forest, Wyoming.



We found that the probability of detecting American Goshawks was substantially higher with ARUs than call playback surveys. Comparing our protocols for both methods, the average probability of detecting American Goshawks at a single occupied survey point was 76% for a 7-day continuous ARU deployment vs. 2% for a 4-minute call playback survey. Call playback is still a useful method because more points can be surveyed in the same amount of time; however, ARUs provide a much higher probability of detection per point. We used 7-day ARU deployments, but our results suggested that we could achieve detection rates of 90% with 13-day deployment and 99% with 37 days.

We found evidence of American Goshawk site fidelity over 40 years, with greater persistence of use in mature forests with tall canopies and less disturbance. In the MBNF, occupied sites occurred mostly on western aspects where lodgepole pine and aspen are dominant at mid-elevation zones (2,100– 3,500 m). Our results suggest that breeding American Goshawks in our study area will benefit from maintaining relatively large (≥1.7 km²) areas with tall (≥ 20 m) forest canopies, and fewer beetle damaged trees. We also found some evidence that using low-intensity prescribed fire within American Goshawk home ranges could improve the habitat; however, this should be investigated further. We recommend using ARUs to improve detection probability of American Goshawks and other rare species. Mapped predictions from our model can be used to prioritize areas for conservation, restoration, clearance surveys, and future monitoring.

Mean predicted American Goshawk occurrence probability in the Medicine Bow National Forest, Wyoming.



Prepared By: Katie Sauer, Nongame Biologist; Zach Wallace, Nongame Bird Biologist
Funding Source(s): U.S. Fish and Wildlife Service State Wildlife Grant, Wyoming Governor's Big Game License Coalition Grant, Wyoming Game and Fish Commission Funds

Bald Eagle Monitoring in Western Wyoming

The Wyoming Game and Fish Department (WGFD) initiated statewide monitoring for Bald Eagles in 1978. Although Bald Eagles nest along all major river systems in the state and increasingly in upland habitats near water bodies, the largest population is found in northwestern Wyoming along the Snake River and its tributaries. Following severe range-wide declines from effects of organochloride pesticides, recovery of the species in Wyoming began in the 1980s, centered on the Jackson area. As the distribution of the species continues to expand in the state, the numerous territories located along the Snake River may still serve as a source population for other parts of Wyoming and the Greater Yellowstone Area.

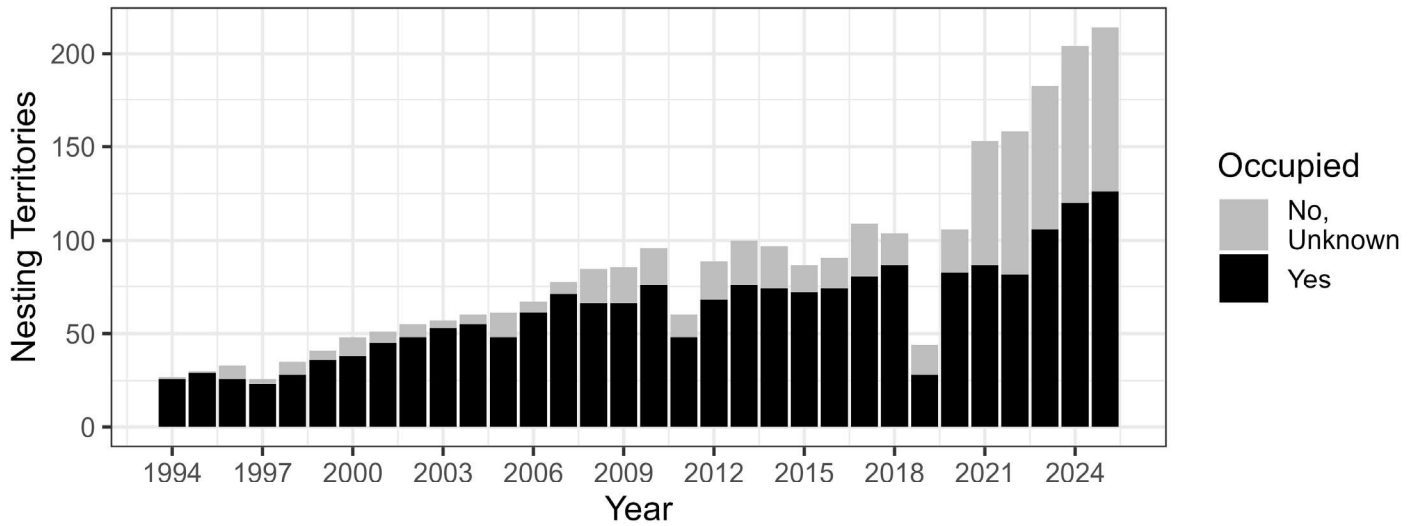
Annual fixed-wing aerial surveys are conducted by WGFD and Grand Teton National Park to monitor occupancy and productivity of known Bald Eagle nesting territories in portions of western Wyoming. Additional information on nest locations and status is provided by partners, including Seedskadee National Wildlife Refuge, Bridger-Teton National Forest, and Teton Raptor Center. Survey visits are conducted in late March to early April to document the number of occupied sites (defined as an incubating adult, eggs or young, or a pair perched at the nest site), and again in late May or early June to determine nesting success and count mature young (defined as approximately 80% of fledging age).

In 2025, we surveyed 214 Bald Eagle nesting territories for occupancy and productivity. Occupancy surveys were conducted by WGFD on April 7 and productivity surveys on May 29–30. Grand Teton National Park contributed data from surveys on April 16 and June 5. We checked a minimum of 266 nests within 214 territories, including 22 newly located nests, 13 of which were alternative nest locations within known territories and 9 of which were new or previously unknown territories. Of 214 territories checked, 126 (59%) were occupied and 88 (41%) were unoccupied or had undetermined status. Nesting attempts were initiated



Bald Eagle. Photo by Amy Anderson.

Occupancy of Bald Eagles in western Wyoming, 1994–2025. Plot shows annual counts of nests classified as occupied (black bars) and not occupied or unknown status (gray bars).

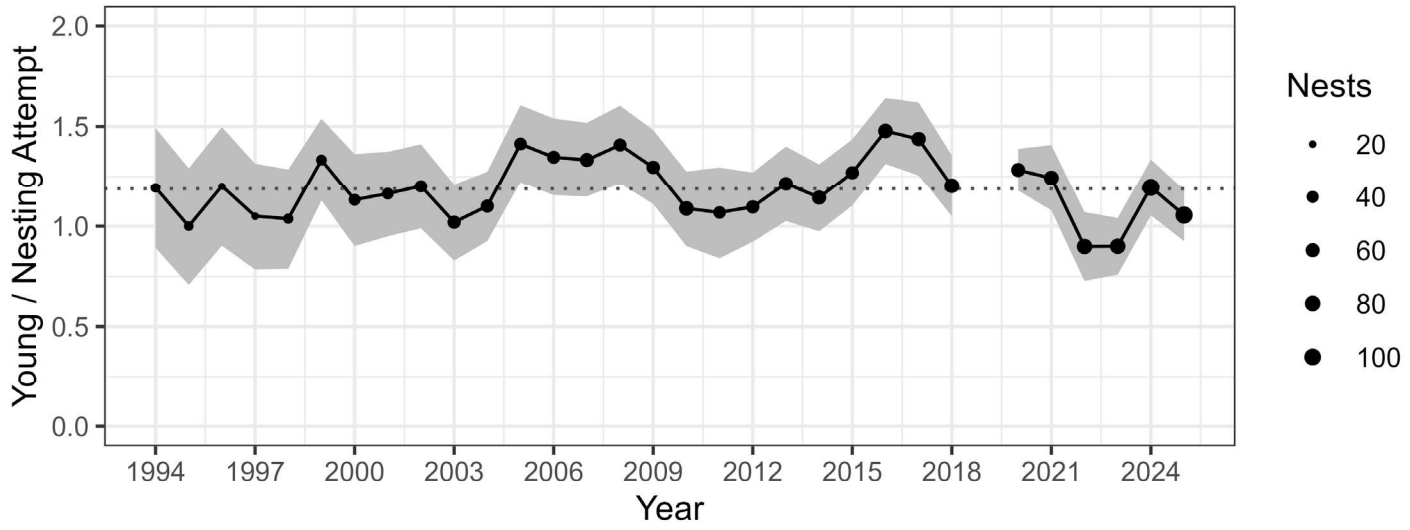


by 124 pairs (98%) occupying sites, of which 80 (65%) succeeded to produce at least one mature young, 29 (23%) apparently failed, and 15 (12%) had unknown outcomes. The 109 occupied nests with known outcomes produced a total of 115 young, or 1.06 young per occupied nest and average brood size at fledging of 1.44 young per successful nest.

The size of the population and the number of known occupied nesting territories has grown steadily since the 1980s, including a substantial increase since 2000 in the number of pairs nesting in the Green River Basin and adjacent areas of the Salt River and Bear River drainages. Although variable effort among years limited our ability to compare the proportion of occupied and unoccupied sites, the count of 126 known occupied territories in 2025 was the greatest since the start of monitoring in 1978.

Productivity in 2025 (1.06 young per nesting pair) was slightly lower than the long-term average (1.18 young per nesting pair), and lower than 2024 (1.13 young per nesting pair). Productivity rebounded in 2024 following the lowest two years of productivity documented during the last 30 years of monitoring in 2022 and 2023 (0.90 young per nesting pair). The return to near average productivity in 2024–2025 supports our previous interpretation that low productivity in 2022–2023 was driven by severe winter and spring weather that led to widespread nest failure.

Productivity of Bald Eagles in western Wyoming, 1994–2025. Plot shows the annual average number of mature young produced per nesting attempt with known outcome (points), with 90% confidence intervals (gray shading), point size indicating the number of nesting attempts monitored, and the long-term average (dotted line).



Despite high detection rates for occupancy, we were unable to locate a nest at approximately 30% of sites surveyed. Based on these results, we suggest efforts to clarify the status and locations of historical nests are needed. Additionally, we recommend analyzing occupancy and productivity relative to long-term patterns in weather, climate, habitat, and human development to inform management of this population and evaluate the need for continued annual monitoring.

Prepared By: Zach Wallace, Nongame Bird Biologist
Funding Source(s): Wyoming Game and Fish Commission Funds, U.S. Army Corps of Engineers Grant

North American Breeding Bird Survey in Wyoming

The North American Breeding Bird Survey (BBS) is a continental, multi-species avian monitoring program that has provided data on the distribution and status of birds in Wyoming since 1968. The BBS is run jointly by the United States Geological Survey Eastern Ecological Science Center and the Canadian Wildlife Service. The program was launched in 1966, with 600 roadside survey routes. Today over 4,600 routes are located across the continental U.S. and Canada, including 107 active routes in Wyoming. Routes are randomly located in order to sample habitats that are representative of the region and provide a continent-wide perspective on avian population trends. The Wyoming Game and Fish Department (WGFD) coordinates the implementation of the BBS in Wyoming. Surveys are conducted by trained volunteers, including natural resource agency biologists and members of the public.

For this report, we accessed preliminary results from the BBS Coordinators Database because the final 2025 dataset was not yet available. In 2025, a total of 58 observers surveyed 99 of 107 (93%) active routes in Wyoming. Seventeen volunteers surveyed two routes and nine volunteers conducted three or more routes. The number of routes surveyed in 2025 was the highest since the survey began and greater than the average of 66 routes surveyed from 1990–2023. This continued increase has been the result of a concerted effort by WGFD to recruit observers to join the program.

Available data included 94 of 97 routes due to delayed submittal of 7 surveys. Observers detected 47,402 individual birds representing 194 species, including 45 designated as Wyoming Species of Greatest Conservation Need. An average of 40 species (range: 10–68) and 504 individu-

Chipping Sparrow. Photo by Ron Horn.



Long-billed Curlew. Photo by Ron Horn.

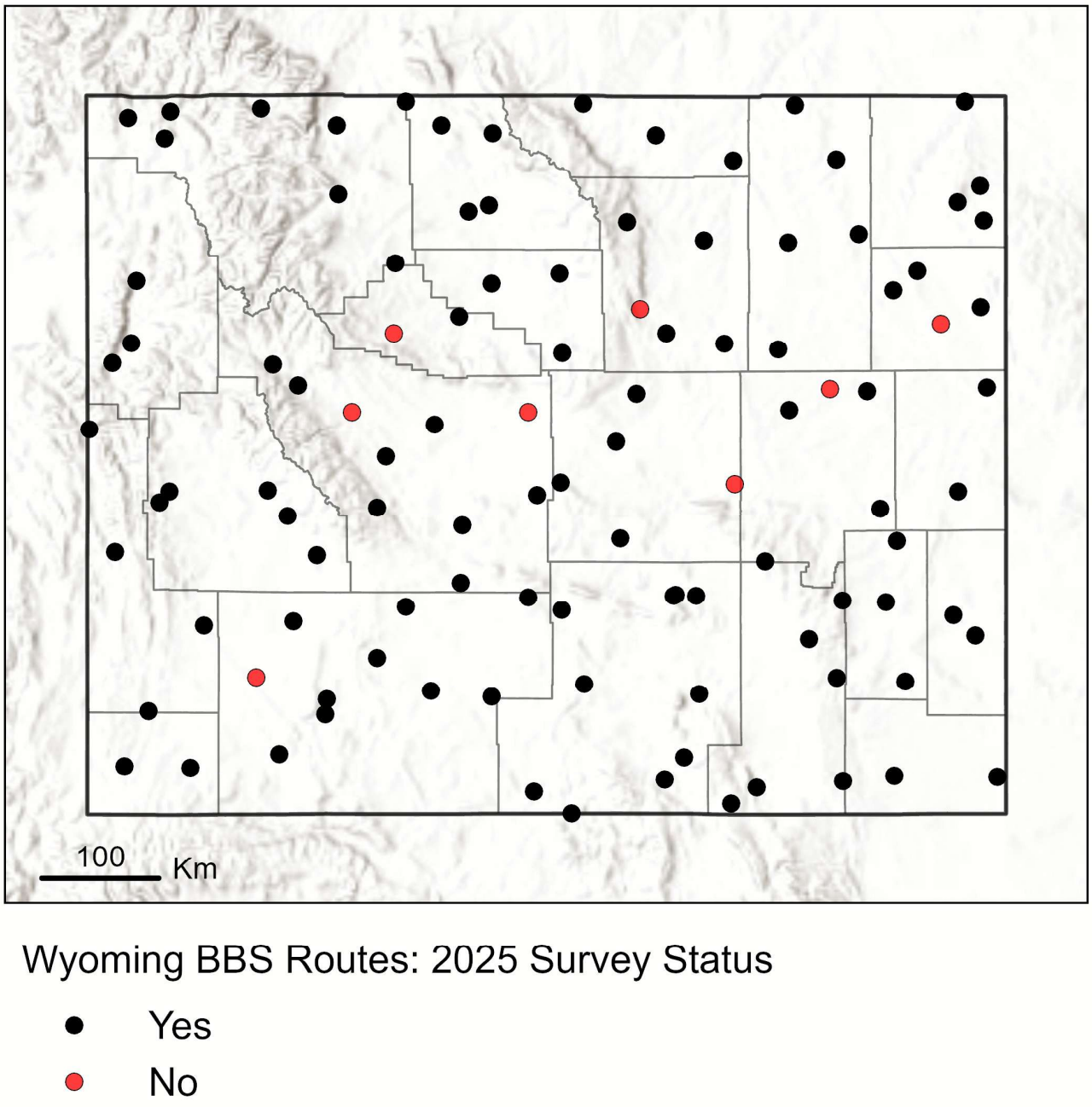


als (range: 148–2,015) were detected per route. The preliminary 2025 dataset and the most current final dataset with information for surveys conducted through 2024 are available at the BBS website (https://www.pwrc.usgs.gov/bbs/).

As part of our State Wildlife Action Plan revision, WGFD recently used BBS trend analyses in a systematic review of the status of all nongame bird species breeding in Wyoming. The long-term perspective on population trends of Wyoming's birds provided by BBS was essential to the assessment process and complemented the short-to-medium term trend information available from other avian monitoring efforts, including the Integrated Monitoring in Bird Conservation Regions program and eBird. We thank the numerous volunteers who donate their time and expertise to conduct the BBS in Wyoming.

Prepared By: Zach Wallace, Nongame Bird Biologist; Courtney Rudd, Migratory Game Bird and Wetland Biologist
Funding Source(s): Wyoming Game and Fish Commission Funds

Locations of North American Breeding Bird Survey (BBS) routes in Wyoming showing 99 of 107 active routes surveyed in 2025.



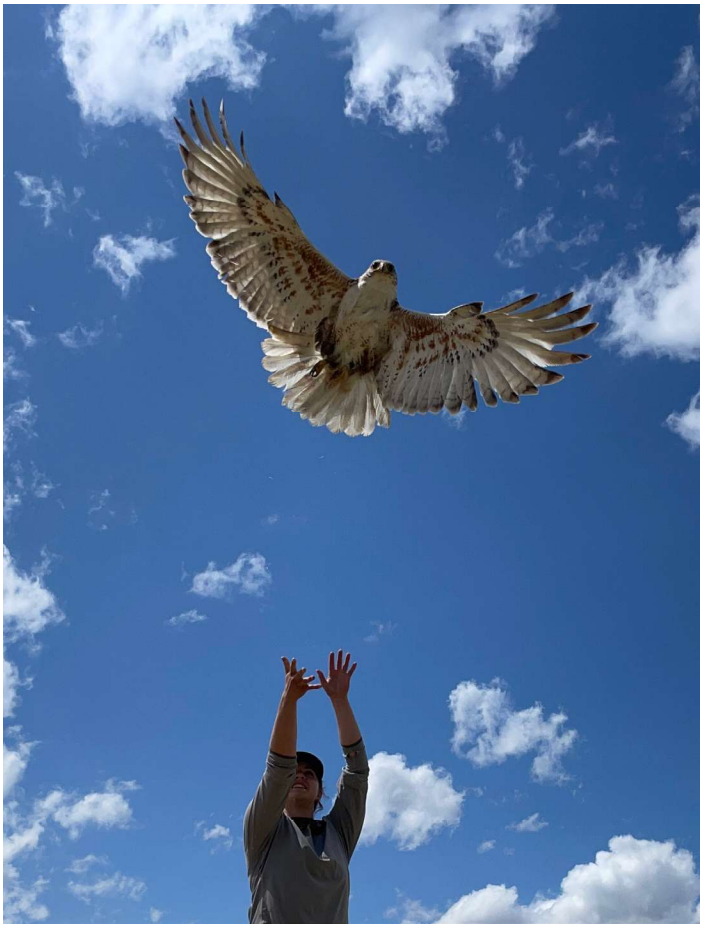
Wyoming Collaborative Ferruginous Hawk Movement Study

The Ferruginous Hawk is a raptor of conservation concern with habitat that strongly overlaps the prime areas for development of energy resources in Wyoming. Ferruginous Hawks are sensitive to disturbance while nesting and face disproportionate risk of mortality from human-caused factors. As such, Ferruginous Hawks are the focus of widespread conservation attention and substantial industrial compliance efforts. Although Golden Eagles have been the focus of most research and mitigation effort for wind energy development, Ferruginous Hawks have similar life history traits, habitat, and behaviors that make their populations vulnerable.

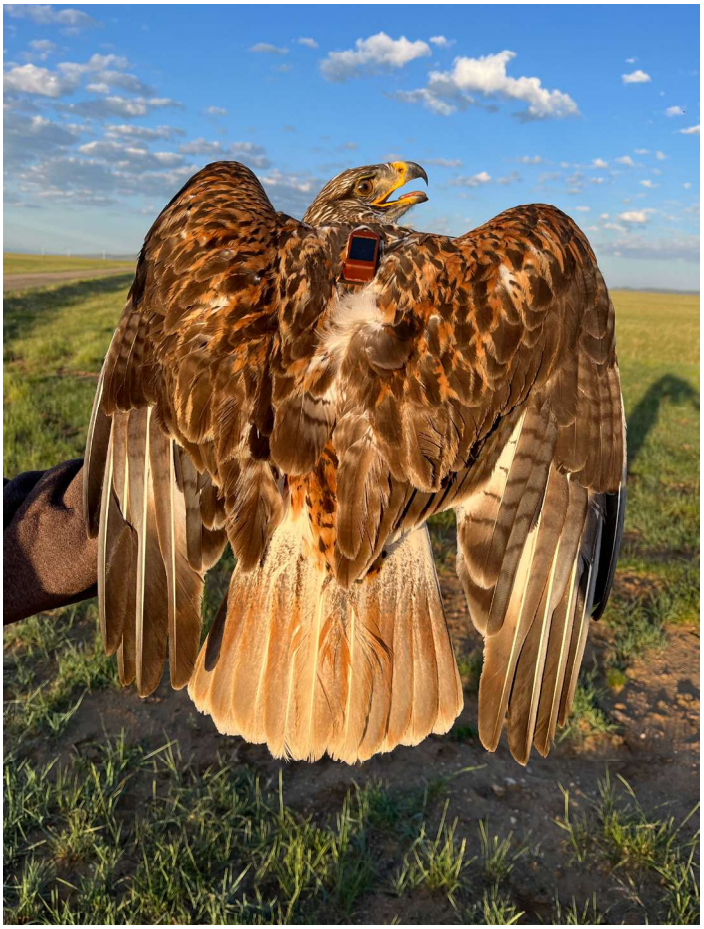
To determine the response of Ferruginous Hawks to wind energy development and inform science-based minimization measures, we are using GPS telemetry to study the fine-scale movement patterns, habitat-selection, and space use of this species. The Wyoming Game and Fish Department Nongame Bird Program, Teton Raptor Center, BLM Wyoming, and USFS Rocky Mountain Research Station are collaborating to deploy transmitters on Ferruginous Hawks in spring 2025–2027 in areas of current and proposed wind energy development to augment existing datasets held by collaborators in areas outside wind development.

Fine-scale movement data for Ferruginous Hawks in areas of wind energy development will allow us to assess potential avoidance of turbines; changes in space-use and habitat-selection during and after development; create maps of habitat conditions associated with low-altitude flight behavior likely to place hawks in the path of turbine blades; and seasonal distribution models for the region. These results will be useful to maximize conservation benefit to raptors in broad-scale siting of wind energy developments and project-level siting of turbines within developments. Our study will also provide basic information on space use of Ferruginous Hawks in undisturbed habitats and wind energy developments (e.g., size and shape of core areas and home ranges) that are essential to evaluate sizes of currently recommended nest disturbance buffers.

Ferruginous Hawk being released after tagging. Photo by Zach Wallace.



Ferruginous Hawk with GPS transmitter. Photo by Zach Wallace.



In June 2025, we tagged 10 adult Ferruginous Hawks, including 5 male and 5 female hawks from different breeding territories. We captured hawks using elevated dho-gaza nets with a remote-controlled mechanical Great Horned Owl lure and fitted them with backpack-style GPS-GSM transmitters weighing 15g or 20g. Transmitters had variable GPS collection cycles, but typically recorded locations at 15-minute intervals during daylight hours. Since deployment, we have collected >320,000 GPS locations, with an average of 32,094 locations per individual (range: 14,189–50,040).

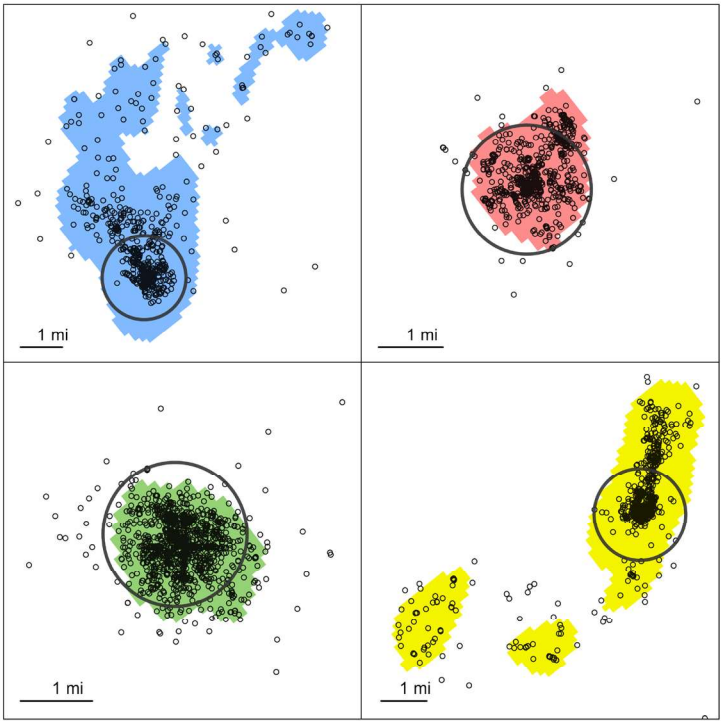
We mapped breeding season home ranges with autocorrelated kernel density estimation (AKDE) using locations from early June when birds were tagged, through late July or August when they departed for fall migration. The average size of breeding season 95% AKDE home ranges across the 10 individuals was 12 km² (SD ±13.7 km²) and ranged from 1.8–40.8 km². The average male home range size of 14.4 km² (± 17.1 km²) was larger than the average female home range size of 9.65 km2 (± 10.8 km²). Based on our preliminary results, an average of 71% (range: 19–99%) of the 95% AKDE home ranges fell within the 1-mile radius circular buffer commonly recommended to minimize disturbance of nesting Ferruginous Hawks. We will continue to track these individuals and update their average breeding home range estimates annually.

Following breeding, most individuals exhibited a "summer migration", consisting of large nomadic movements to the west, north, and east. The typical fall migration from summer ranges to winter (non-breeding) occurred as early as August, with most individuals beginning fall migration in September. Location of winter ranges varied widely among individuals, including 2 in Colorado, 2 in California, 1 in Utah, 2 in New Mexico, and 1 on the New Mexico-Texas border.

As of April 2026, 7 of 10 surviving hawks had migrated back to their 2025 breeding territories, with 5 using the same nest site, and 2 switching to new nest locations within the same territory. The transmitter of a female that moved to southeastern Alberta, Canada ceased transmitting in late August and the status of this individual is unknown. One male died in the central valley of California in November, approximately two weeks after completing its fall migration, with the cause of death unknown. Another male died in late January on its non-breeding range near La Junta, Colorado, with mammalian predation as the suspected cause.

In 2026, we will continue to monitor the movements of these individuals and tag approximately 15 additional Ferruginous Hawks in the Shirley Basin region and other areas of Wyoming.

Prepared By: Zach Wallace, Nongame Bird Biologist; Bryan Bedrosian and Julie Polasik, Teton Raptor Center
Funding Source(s): Wyoming Governor's Big Game License Coalition grant, Wyoming Game and Fish Commission Funds, Teton Raptor Center, U.S. Department of the Interior Bureau of Land Management



Examples of Ferruginous Hawk breeding home ranges in Wyoming, 2025. Maps show use locations from GPS telemetry (black points) and 95% AKDE home ranges (colored shading) at unique nesting territories for 2 males (left panels) and 2 females (right panels), with 1-mile radius buffers around nest sites (black circles). Time period was from tagging in early June through departure for fall migration in late July or August.

Integrated Monitoring in Bird Conservation Regions

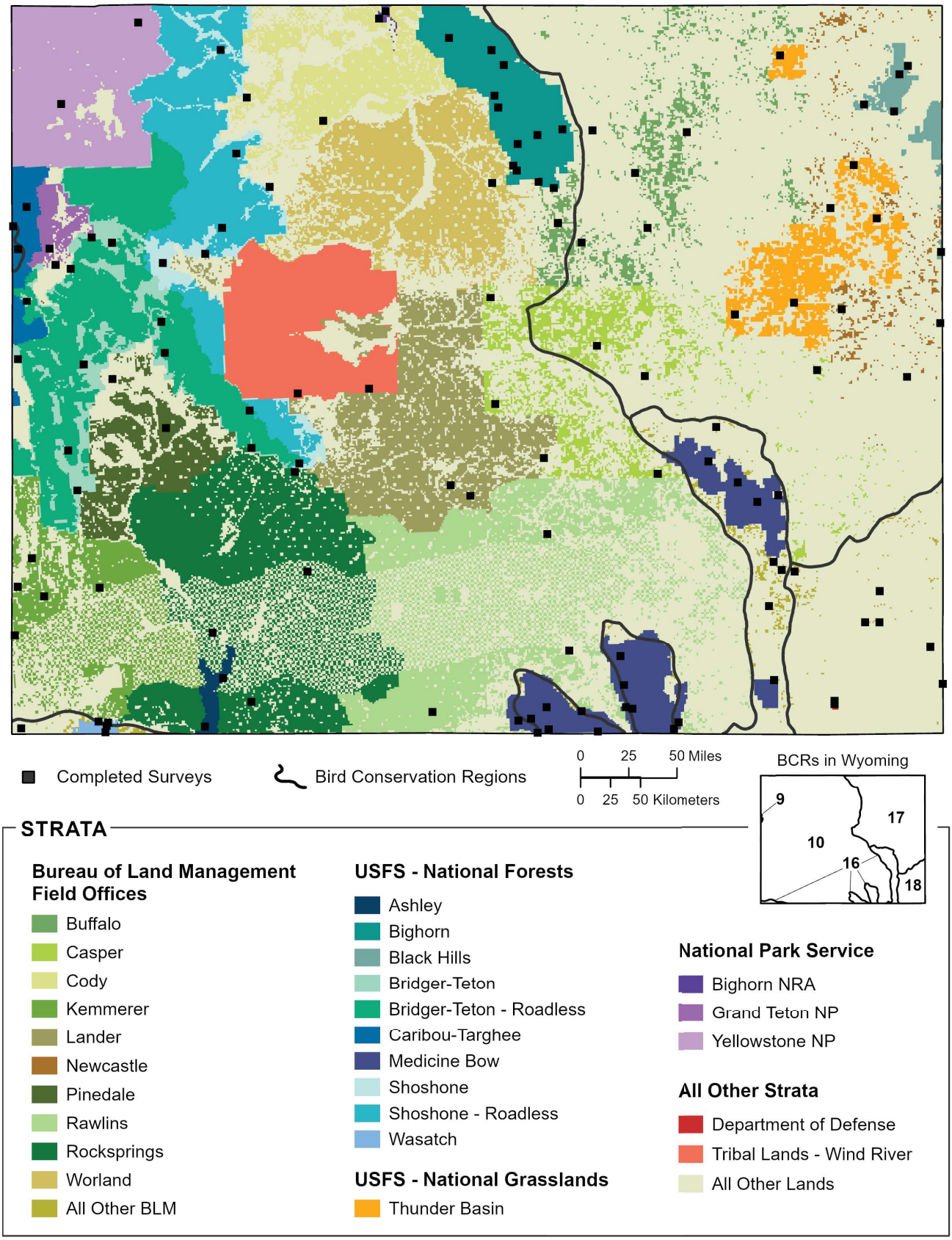
Population monitoring is an essential component of wildlife management and conservation. Besides improving understanding of species' distributions, monitoring allows us to determine the status of populations by tracking changes over time, identify species that are at risk, and evaluate their responses to management actions and changes in land-use and climate. Long-term populations of many species of North American birds have declined due to human influences, including habitat loss and disturbance. It is a key priority for the Wyoming Game and Fish Department (WGFD) to identify and implement programs to monitor the population status of avian Species of Greatest Conservation Need (SGCN) across the state. While some rare species require their own dedicated monitoring efforts, many of Wyoming's birds can be tracked efficiently and effectively through broad-scale, multi-species surveillance monitoring programs, such as the Integrated Monitoring in Bird Conservation Regions (IMBCR) program.

IMBCR is based on a spatially balanced sampling design that provides information on avian populations at multiple scales, from local management units to states or Bird Conservation Regions (BCRs) to inform conservation decisions from local to national levels. This nested design also provides a consistent and flexible framework for understanding the status of bird populations in local and regional contexts. Collaboration across organizations and spatial scales increases sample sizes and improves population estimates. The robust survey protocol and sampling design of the IMBCR program complements other less structured bird monitoring efforts in Wyoming, including the North American Breeding Bird Survey and eBird. For these reasons, the IMBCR program is well positioned to address conservation and management needs for a wide range of partners, encouraging an interdisciplinary approach to bird conservation that combines monitoring, research, and management. In Wyoming, IMBCR continues to provide information on the distribution and status of bird populations that is essential to implementing the State Wildlife Action Plan.

Yellow-breasted Chat. Photo by Amy Anderson.



Integrated Monitoring in Bird Conservation Regions survey locations and strata in Wyoming, 2024. Bird Conservation Regions (BCR) shown are Great Basin (9), Northern Rockies (10), Southern Rockies Colorado Plateau (16), Badlands and Prairies (17), and Shortgrass Prairie (18).



IMBCR surveys are conducted at a random sample of 1-km^2 grid cells, each consisting of 16 evenly spaced survey points. Birds are counted by sight and sound at each sampling point during the breeding season. The distance and time period of detection are recorded for each bird group, as well as additional data on habitat and vegetation. Wyoming contains 37 sampling strata and a minimum effort of two grids per stratum is required to estimate population parameters.

In 2025, Bird Conservancy of the Rockies (Bird Conservancy), in conjunction with WGFD and its other partners, conducted the 18th consecutive year of landbird monitoring with the IMBCR program. The survey effort covered all or parts of 10 BCRs and 16 states, including all of Wyoming. In Wyoming, field technicians completed all 125 planned surveys (100%), conducting 1,524 point counts between May 20 and July 20. Multiple partners provided funding for surveys, with 58 grids (46%) funded by WGFD.

A total of 224 bird species were detected, including 62 Wyoming SGCN. Bird Conservancy estimated densities and population sizes for 224 species that were detected in any year during which surveys were conducted, 62 of which were SGCN. The data yielded robust density estimates (CV < 50%) for 76 species. Bird Conservancy estimated the proportion of 1-km^2 grid cells occupied throughout Wyoming for 224 species that were detected in any year during which surveys were conducted, 62 of which were SGCN. The data yielded robust occupancy estimates (CV < 50%) for 95 species.

The complete 2025 IMBCR Field Season Report is available online (*https://bird-conservancy-of-the-rockies.github.io/IMBCR_AnnualReport_2025/*). Density tables and graphs, maps, and trend information are available from the recently updated Rocky Mountain Avian Data Center 2.0 website (*https://apps.birdconservancy.org/rmadc/*).

Prepared By: Zach Wallace, Nongame Bird Biologist; Matthew McLaren, Jennifer Timmer, Matt Smith, T.C. Walker, Chris White, Quresh Latif, David Pavlacky Jr., Rob Sparks, and Dave Sandahl, Bird Conservancy of the Rockie
Funding Source(s): Wyoming Game and Fish Commission Funds, U.S. Forest Service Grant, National Fish and Wildlife Foundation Grant

Peregrine Falcon Monitoring in Wyoming

The Peregrine Falcon is an uncommon summer resident bird of prey found throughout most of Wyoming. The species nests primarily on steep cliffs and ledges near open areas used for foraging. The Wyoming Game and Fish Department (WGFD) designates Peregrine Falcon as a Species of Greatest Conservation Need with Native Species Status 3 (NSS3) and moderate conservation priority (Tier II) due to limited distribution and ongoing recovery from historical declines.

Nesting Peregrine Falcons were nearly extirpated from Wyoming in the 1970s, primarily due to negative effects of organochlorine pesticides. Efforts to breed and release Peregrine Falcons throughout North America started in the late 1960s and regional recovery plans were developed after the species was federally listed as Endangered in 1970. Wyoming reported no known nesting pairs from 1978–1983, released 384 captive produced young from 1980–1995, and documented the first new nesting pair in the state in 1984. By 2015, there were at least 121 known nesting territories in Wyoming, primarily in the western and central portions of the state. The species was federally delisted in 1999.

WGFD, Yellowstone National Park, and Grand Teton National Park continued monitoring Peregrine Falcon occupancy and productivity through 2015 using methods based on the U.S. Fish and Wildlife Service (USFWS) post-delisting monitoring protocol. In 2016, WGFD selected a subset of five sites for ongoing annual surveys within each of four historical regional monitoring areas: Central Wyoming, Western Wyoming, Yellowstone National Park, and Grand Teton National Park. A variable number of additional sites in each area are also surveyed annually. Continued effort to monitor Peregrine Falcon nesting success in Wyoming is warranted due to the significant investment for recovery, ongoing public interest, and risk of disease and other factors impacting populations.

Productivity is calculated as the number of young per occupied territory with known outcome, based on surveys during mid-June to early-August, when young can reliably be observed. Sites are classified as occupied based on observations of two adults in the area, one adult incubating or delivering prey to a ledge, or observations of eggs or young. Classifying sites as unoccupied typically requires a minimum of 4 hours of survey effort by an experienced observer.

In 2025, WGFD and partners visited a total of 55 Peregrine Falcon nesting sites. Of those, 42 were occupied, 13 were unoccupied, and 2 had unknown status due to inadequate timing or duration of monitoring. Of 42 occupied sites, 35 sites with known outcomes produced a total of 40 young. Productivity across all sites of 1.18 young per occupied territory was slightly lower than the average of 1.33 young per occupied territory since the monitoring program began in

Peregrine Falcon. Photo By Ron Horn.

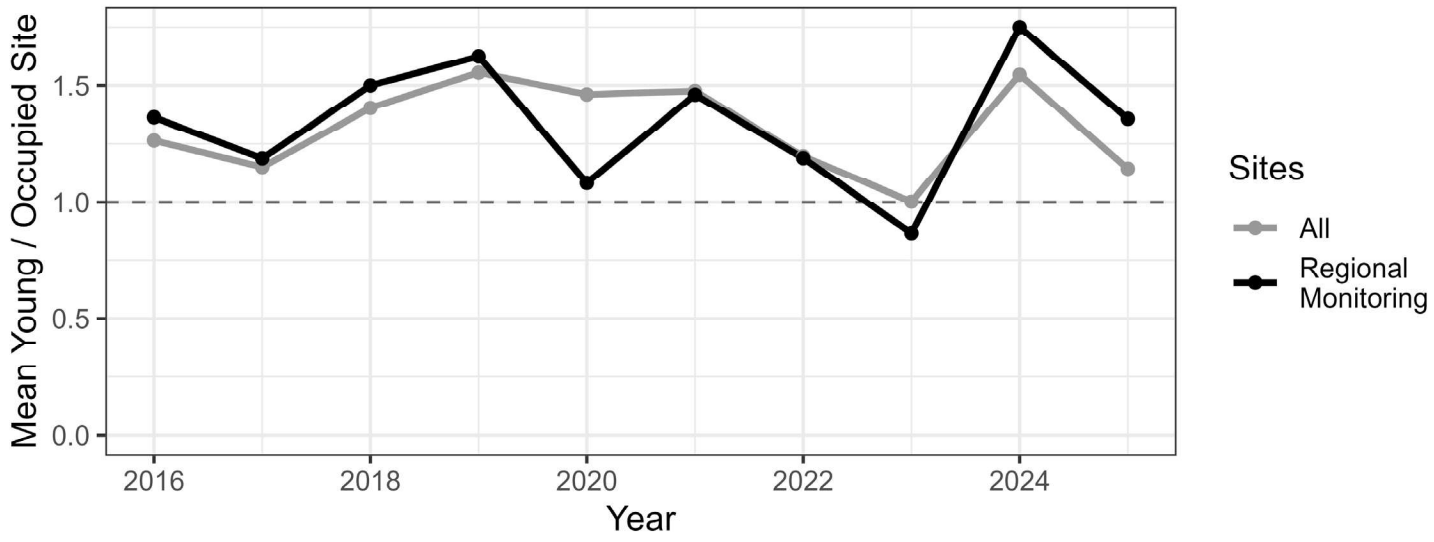


Survey area	Number of sites			Total young	Productivity[a]
	Monitored	Occupied (%)	Outcome known		
Central Wyoming[b]	5	5 (100%)	5	8	1.6
Western Wyoming[b]	5	5 (100%)	2	4	2
Yellowstone National Park[b]	5	5 (100%)	4	1	0.25
Grand Teton National Park[b]	5	3 (60%)	3	6	2
Additional Sites[c]	35	24 (69%)	21	21	1
Total: Regional Monitoring	20	18 (90%)	14	19	1.36
Total: All	**55**	**42 (76%)**	**35**	**40**	**1.18**

[a] Mean minimum number of young per occupied territory with known outcome.

[b] Regional monitoring sites.

[c] Additional sites, including territories in Grand Teton and Yellowstone National Parks, federal, tribal and state lands.



Productivity of Peregrine Falcons in Wyoming, 2016–2025. Plot shows productivity (average minimum number of young per occupied territory with known outcome) for regional monitoring sites (n = 14 in 2025, black line) and all sites (n = 35 in 2025, gray line).

2016. Productivity at the regional monitoring sites of 1.36 young per occupied territory declined slightly from the high of 1.75 young per occupied territory observed in 2024, and was similar to the long-term average of 1.34 young per occupied territory from 2016–2024.

Peregrine Falcon productivity in 2025 at the regional monitoring areas and additional sites was within the range of 1–2 young per occupied territory required to maintain a stable or increasing population trend. Among the regional monitoring areas, productivity was above average in Grand

Teton National Park, Western Wyoming, and Central Wyoming, and lowest in Yellowstone National Park.

Productivity in 2025 remained above average after rebounding to its peak in 2024 from a low point in 2023. We suspect that the low productivity in 2023 resulted from severe winter and spring weather; however, the potential influence of Highly Pathogenic Avian Influenza (HPAI) is unknown and warrants further monitoring. Additionally, we note an unknown amount of the variation in occupancy and productivity is likely due to errors in classification and minor inconsistencies in effort and methods among survey partners. The relatively small number of sites monitored as part of this program make results sensitive to such errors.

Collaborative efforts to minimize recreational disturbance to nesting Peregrine Falcons in central Wyoming continued in 2025. WGFD, U.S. Forest Service (USFS) Shoshone National Forest Wind River District, and the nonprofit climbing organization WyoClimbers initiated a collaborative management effort in 2021 to maintain rock climbing opportunities at locations in the Southern Wind River Mountains with nesting Peregrine Falcons and Prairie Falcons. WGFD also works with Sinks Canyon State Park to monitor nests. In 2025, voluntary closures were implemented at two sites for Peregrine Falcons and one site for Prairie Falcons. Closures were lifted after young successfully fledged at two sites and it was determined that the nesting attempt at the other site had either failed or fledged.

Given recent fluctuations in productivity and unknown effects of HPAI on Peregrine Falcon populations, we recommend continuing annual surveys in the four regional monitoring areas, with surveys of the additional sites as time permits. Ongoing education of observers on monitoring protocols and improved collection of data on the observation process (e.g., number and duration of visits, breeding status at each visit) will reduce bias in the survey process and analysis. In future years, we will continue to replace persistently unoccupied sites in the sample, as recommended in the productivity monitoring protocol. We also recommend continuing collaborative efforts to adaptively manage recreational disturbance to nesting Peregrine Falcons in Wyoming.

Prepared By: Zach Wallace, Nongame Bird Biologist; Courtney Rudd, Migratory Game Bird and Wetland Biologist
Funding Source(s): Wyoming Game and Fish Commission Funds, U.S. Forest Service, Grand Teton National Park, Yellowstone National Park

Movements, Space Use, and Habitat Selection of Pinyon Jay in Wyoming

The Pinyon Jay is an obligate bird of low-elevation coniferous woodlands that has experienced steep population declines since the 1970s. Conservation concern for Pinyon Jays has increased due to population losses, as well as impacts of climate change on the pinyon pine trees that they depend upon for habitat throughout much of their range. Pinyon Jay was proposed for listing under the Endangered Species Act in 2022, and in August 2023 the U.S. Fish and Wildlife Service completed a 90-day review of the petition and concluded that a full 12-month review of the species' status was warranted.

Documentation of breeding is important for management of Pinyon Jay. Conservation of nesting habitat could be an important tool for promoting Pinyon Jay populations in Wyoming, but both colony locations and habitat preferences are largely unknown. Further, long-term monitoring of breeding sites has been suggested as an efficient method to assess population trends in this otherwise nomadic species. Thus, identification of nesting colonies could provide the basis to establish a program to monitor Pinyon Jay populations and identify priority areas for management.

Habitats available to Pinyon Jay in Wyoming differ from the core of their range because the state is near the northeastern edge of the species' distribution. Typically, Pinyon Jays nest in pinyon-juniper woodlands, and specifically in areas that produced a large amount of pinyon seeds the previous fall. However, surveys in Colorado revealed that 75% of nests were found in juniper trees and only 25% in pinyon pines, and Pinyon Jays are known to use other pine species in areas where pinyon does not occur. It is important for managers in Wyoming to understand habitat associations of Pinyon Jays because juniper removal is a common management practice to benefit other species and objectives, including livestock grazing, watershed condition, fuels reduction, and Greater Sage-Grouse habitat restoration. The effects of juniper woodland thinning and removal may be particularly pronounced for Pinyon Jay because of their restricted distribution in low-elevation conifer woodlands, strong site fidelity, and limited dispersal from colony sites.

Our objectives for monitoring Pinyon Jays in Wyoming are to locate breeding colonies, document habitat associations specific to the state, and identify important areas for conservation and future monitoring. Since 2023, we have addressed these objectives using a combination of landscape-scale surveys and tracking Pinyon Jays with GPS telemetry. In 2025, we increased our survey efforts by implementing the Pinyon Jay Working Group Landscape Applications Protocol across Wyoming and expanded our tagging effort, building on previous years' testing of transmitters.

We expanded GPS tagging and survey efforts in 2025 with the goals of locating additional breeding colonies and understanding space-use and habitat associations of Pinyon Jays in Wyoming. We used a new model of transmitter (Druid Tech Nano Featherlight), which records higher-resolution data (estimated 1-hour fix rate) and transmits data to a base station rather than satellites. We deployed transmitters at 4 sites, including 2 locations where we tagged birds in 2024. The new sites were both located near Lander. We baited an additional site near Green River, but did not detect any Pinyon Jays on trail cameras at the bait station.

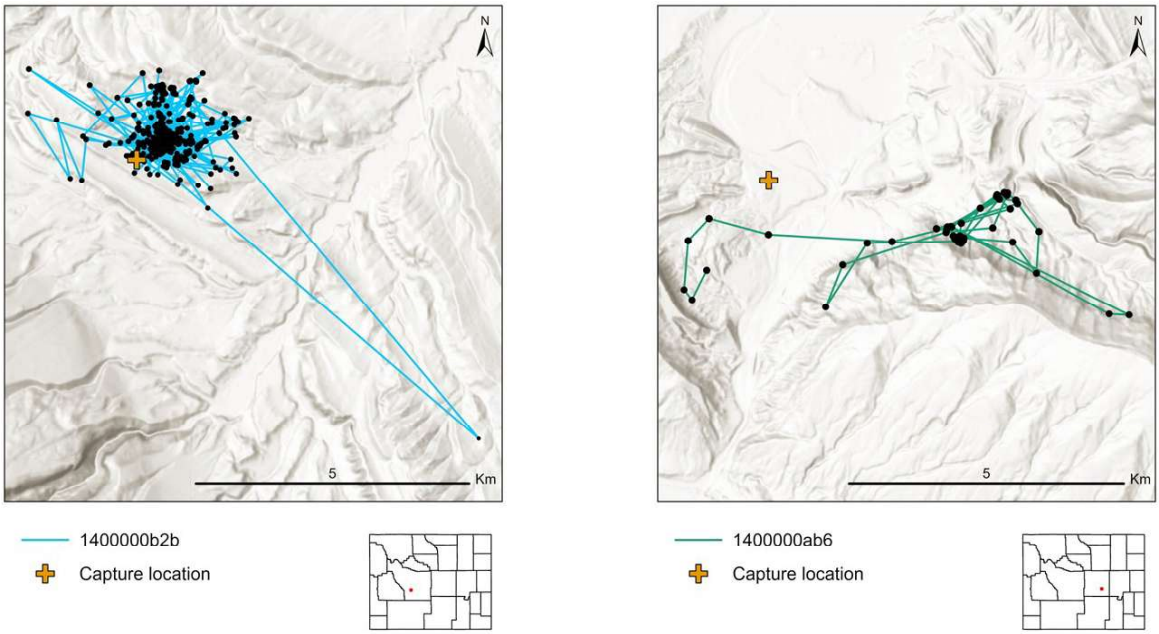
In 2025, we captured and banded 19 birds and tagged 11 with GPS transmitters. To date, the transmitters have provided a total of 979 GPS locations. Five transmitters malfunctioned and did not transmit any post-deployment locations, while the other 6 transmitters provided 52–482 locations each.

As an index of space use, we calculated the area of 95% minimum convex polygons (MCPs) enveloping GPS points from transmitters that provided data for at least one week. MCPs averaged 267 ha and ranged in size from 94-525 ha. As an example of the tracking data, we mapped points and trajectories for individual Pinyon Jays.

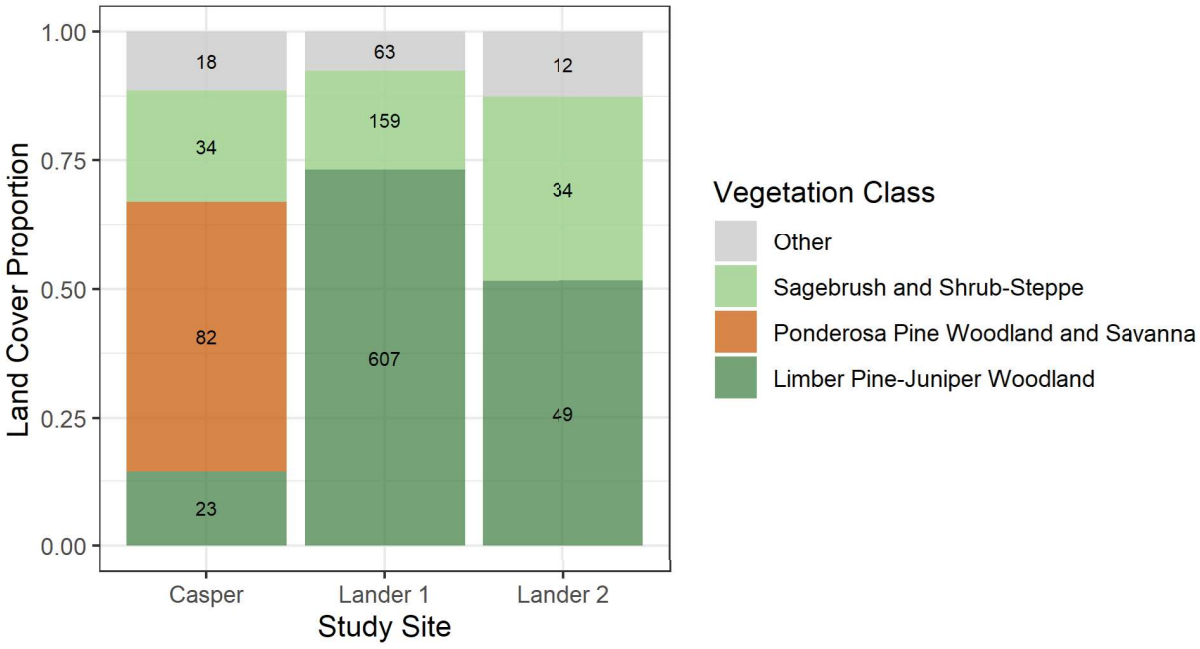
Measurements being taken on a newly banded Pinyon Jay at Dan Speas Fish Hatchery (Casper Region). Photo by Christopher Martin.



Use points (black dots) and trajectories (colored lines) of two Pinyon Jays tracked with GPS telemetry in Wyoming, 2025.



As a preliminary assessment of habitat associations, we summarized the count and percentage of use locations from all transmitters within vegetation classes from the LANDFIRE Existing Vegetation Type dataset. Habitat use did not vary between daytime and nighttime locations, but differed among the three study areas. Limber pine-juniper woodland was the most commonly used vegetation type at the Lander area sites, while ponderosa pine woodland and savanna was the dominant habitat used at the site near Casper. Sagebrush and shrub-steppe was the second most commonly used vegetation type across all sites.

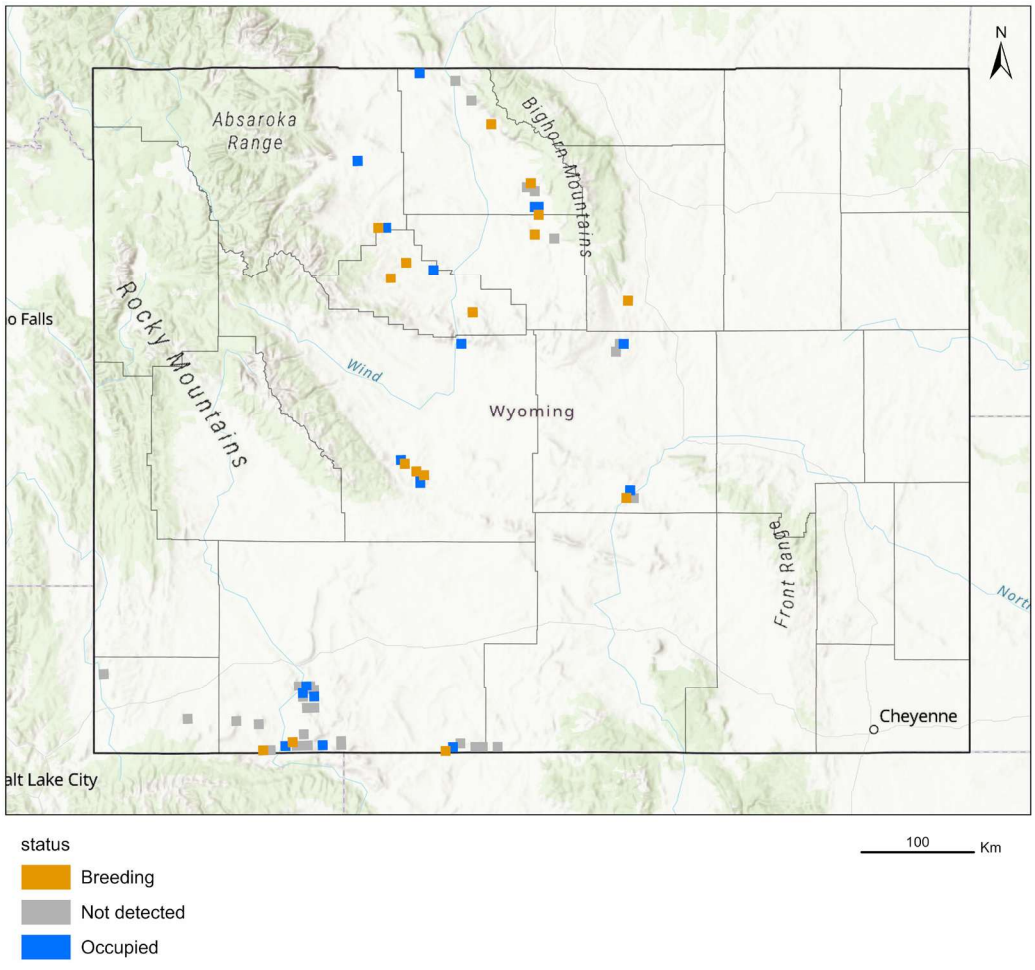


Number and proportion of Pinyon Jay GPS telemetry locations within major vegetation classes at three Wyoming study sites, 2025.

We collaborated with Intermountain Bird Observatory to implement surveys across Wyoming in 2025 using the Pinyon Jay Working Group Landscape Applications Protocol. Our goal was to survey at least 30-50 sites to improve understanding of the breeding distribution of Pinyon Jays in Wyoming. We created a 2.5 x 2.5-km grid across the state and used stratified sampling to prioritize sites with medium to high probability of Pinyon Jay occurrence. We identified cells that were within the top 10% quantile of predicted probability from the Pinyon Jay Working Group habitat suitability model and the eBird abundance model, from which we selected a random, spatially balanced sample. The survey protocol entails a minimum 2-hour visit to each site, during which surveyors must traverse the area sufficiently to be within 1-km of all points in the cell. Sightings of individual Pinyon Jays and flocks are recorded and classified by activity type, including activities that confirm or imply breeding. If Pinyon Jays are not detected on the first visit, a second survey is conducted at least one week later.

Surveys were conducted from May 17 – June 15, 2025. The grid cells surveyed comprised 419 km^2 across five Wyoming Game and Fish Department Regions: Casper, Cody, Green River, Lander, and Sheridan. Some grid cells contained private land, but all surveys were conducted from public land. A total of 67 plots were surveyed with 107 visits, including 27 sites that received 1 visit and 40 sites with 2 visits. Pinyon Jays were detected at 34 (51%) plots, with breeding activity noted at 16 (24%) plots, and 2 nests found. Of the 34 occupied sites, Pinyon Jays were detected during the initial visit at 30 sites. Only 4 sites required a second visit for detection, suggesting an overall high detection probability. We recorded 165 total sightings (157 within plots and 8 incidental), with group sizes averaging 6 individuals and ranging from 1 to 100. Notably, most detections were in the north-central part of the state (25 of 33 sites occupied; 76%) compared to the southwest (9 of 34 sites occupied; 26%). Breeding activity was also more common in the north-central part of the state (13 of 25 occupied sites with breeding; 52%) than the southwest (3 of 9 occupied sites with breeding; 33%).

Map of 2.5 x 2.5-km grid cells surveyed with the Pinyon Jay Working Group Landscape Applications Protocol in Wyoming, 2025. Grid cells are color coded by occupancy status, indicating sites occupied by Pinyon Jays, occupied with evidence of breeding, or not detected.



Effective management of Pinyon Jay in Wyoming requires documentation of colony locations, and understanding of regional natural history and habitat associations. Our work in 2025 helped fill these knowledge gaps by identifying new areas of Pinyon Jay occurrence and breeding in the state, estimating home range sizes, documenting phenology, and providing preliminary information on habitat use. Contrary to our expectations, we found more occupied sites and evidence of breeding in the northern and central portions of the state than the southwest, where Pinyon Jays are known to occur in more typical habitat containing pinyon pines. The high occupancy rate for our survey sites (>50%) exceeded our expectations and suggested the breeding distribution of the species in Wyoming is broader than previously understood. The success of the survey effort also indicated that the combination of habitat suitability models we used to select sites was effective for Wyoming, and the survey protocol was efficient, with most detections occurring on the first visit. Our preliminary data on habitat associations confirms that Pinyon Jays use limber pine-juniper woodlands in areas where pinyon pine does not occur and further indicates that ponderosa pine woodland and savanna may be used in areas where limber pine is less prevalent.

In 2026, we will continue landscape-level survey efforts in collaboration with Intermountain Bird Observatory, with the goal of locating additional breeding sites and clarifying Pinyon Jay distribution in lesser known areas of its range. Landscape surveys will continue to follow the working group protocol with an increased focus on identifying colony locations, including collection of habitat data at colonies after the breeding season. We will continue to deploy GPS tags with the objective to understand Wyoming-specific Pinyon Jay space-use and habitat associations. Tagging will be attempted earlier in the year to target nesting females and we will deploy remote bait stations with the goal of deploying transmitters in areas where birds are not influenced by residential bird feeders.

Prepared By: Frank Stetler, Nongame Biologist and Zach Wallace, Nongame Bird Biologist
Funding Source: Wyoming Game and Fish Commission Funds, Wyoming Governor's Big Game License Coalition Grant, Wyoming Governor's ESA Grant

Raptor Nest Survey for the U.S. Forest Service Thunder Basin National Grassland

The Wyoming Game and Fish Department (WGFD) has conducted inventories of nesting raptors on the U.S. Forest Service (USFS) Thunder Basin National Grassland (TBNG) and adjacent lands in northeastern Wyoming since 1996. Funding for this cooperative effort has been provided by USFS through a cost-share agreement with WGFD Nongame Section personnel conducting aerial surveys and reporting results. Surveys rotate annually between 5 priority areas identified by USFS and have been conducted in most years since the start of the effort (1996–1999, 2001, 2004–2006, 2008, 2017–2019, 2021–2025). The main objective of the survey is to maintain current information on locations of nesting raptors to support management and land use planning.

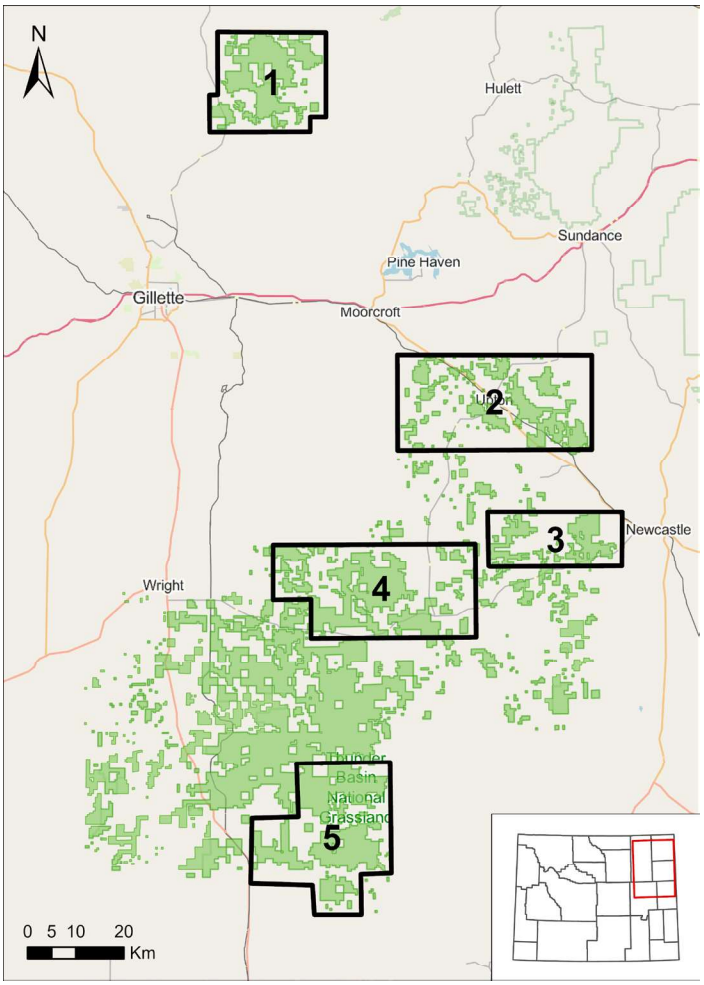
The survey entails searching for raptor nests and individual raptors from fixed-wing aircraft along north-south transects spaced 600 m apart, travelling at approximately 100 km/hr, 30–75 m (~100–250 ft) above ground level. To increase detection of nests, we depart transects to opportunistically search areas of potential raptor nesting habitat that are not fully visible from transects (e.g., trees, cliffs, rock outcrops). The timing of the survey in early- to mid-May coincides with the incubation and hatching stages for Ferruginous Hawks and other Buteo hawks, and the incubation, hatching, and nestling stages for Golden Eagle. We record locations of all raptor and non-raptor bird nests detected, and the locations of individual raptors not associated with nests and generally follow the definitions and data standards of the Wyoming Raptor Working Group. Attributes collected include species, suspected species (for unoccupied nests), number and activities of adults, number of eggs or young, estimated age of young, age-class for individuals not associated with nests, nest status, condition, and substrate. Survey variables include observer experience, seating positions, weather conditions, and aircraft type. Locations are recorded on a handheld GPS unit, which we also use to collect a high-resolution flight track.

On May 7–10, 2025, we surveyed Priority Areas 1, 3, and 4, consisting of 1,467 km², including 1,210 km² on or within 0.5 mi of Thunder Basin National Grassland. Habitat was dominated by grassland and sagebrush steppe with scattered deciduous and coniferous trees, stands of cottonwoods along perennial water courses, and limited areas of more rugged terrain with juniper woodland and ponderosa pine forest. We flew a total of approximately 23 hrs and 2,500 km in the survey area.

We detected a total of 129 raptor nests representing 4 species: Ferruginous Hawk (total n = 15, occupied n = 6), Gold-



Ferruginous Hawk. Photo by Ron Horn.



Thunder Basin National Grassland raptor nest survey Priority Areas in northeastern Wyoming. Areas 1–4 were surveyed in 2025.

Raptor nests detected from aerial surveys in northeastern Wyoming, 2025. Table shows the number of nests by species and status, with the number of nests on or within 0.5 miles of Thunder Basin National Grassland surface in parentheses. Unoccupied nests were assigned to suspected species or species group.

Species	Total	Occupied	Unoccupied
Red-tailed Hawk	57 (43)	57 (43)	0
Golden Eagle	11 (7)	8 (5)	3 (2)
Ferruginous Hawk	15 (10)	6 (2)	9 (8)
Bald Eagle	1 (0)	1 (0)	0
Buteo	40 (29)	0	40 (29)
Buteo or eagle	2 (1)	0	2 (1)
Eagle	3 (3)	0	3 (3)

en Eagle (total n = 11, occupied n = 8), and Red-tailed Hawk (total n = 57, occupied n = 57). We recorded 57 unoccupied nests that we classified based on their size and location as Ferruginous Hawk (n = 9), Golden Eagle (n = 3), Buteo (n = 40), Buteo or eagle (n = 2), and eagle (n = 3). We detected 8 individual raptors not associated with nests, including 3 species: Ferruginous Hawk (n = 2), Golden Eagle (n = 5), Prairie Falcon (n = 1).

The species and density of nesting raptors in the survey area were generally consistent with our expectations for the region. We noted a high density of Golden Eagles nesting in trees in rangeland areas, which we expected given the known high quality of habitat for that species in the Powder River Basin region. We found occupied Ferruginous Hawk nests in trees and rock outcrops, while all unoccupied nests were on rock outcrops or the ground, raising the possibility that our survey missed some occupied ground nests. Additionally, we did not detect any Swainson's Hawks, which are known to occur in the area at low densities. Red-tailed Hawk was the most abundant nesting species, with the majority of occupied nests in cottonwood trees and only one occupied nest detected in a ponderosa pine tree.

We note that many of the occupied nests located in our survey were in open rangelands, while more unoccupied nests were found in rougher and forested terrain. We attributed most of these unoccupied nests to Buteo sp., and suspect many were likely Red-tailed Hawk nests based on size and habitat. Since Red-tailed Hawks and many other raptors maintain alternative nests, it is possible that we failed to detect occupied nests within the territories where we found unoccupied nests. Detections of unoccupied nests from this and other single-visit surveys should thus be interpreted as potential evidence of an occupied territory until further ground-based surveys or repeated aerial visits are conducted. Additionally, we emphasize that multiple years of data are necessary to confirm that an area is unoccupied because many raptor species do not attempt to nest every year. We assigned unoccupied open stick nests to probable species or species groups based on their characteristics, but suggest these classifications should be interpreted with caution because nest characteristics overlap substantially in this area, and the same nest may be used by Buteo hawks and eagles in different years.

For this survey, we suggest 600-m spaced transects provide a reasonable balance between a complete census, which would be more time consuming and expensive, and population sampling, which can provide estimates of density or occupancy, but may not yield as many nest locations. We think this approach is generally appropriate for the main objective of this survey to provide nest locations to inform local-scale management and the amount of funding typically available to conduct the survey. To maintain consistency, we recommend that surveys in future years should be conducted at the same time of year with similar aircraft and survey protocol. However, we also suggest exploring the use of distance sampling or other methods to estimate densities of nesting raptors to support analyses of changes in populations over time.

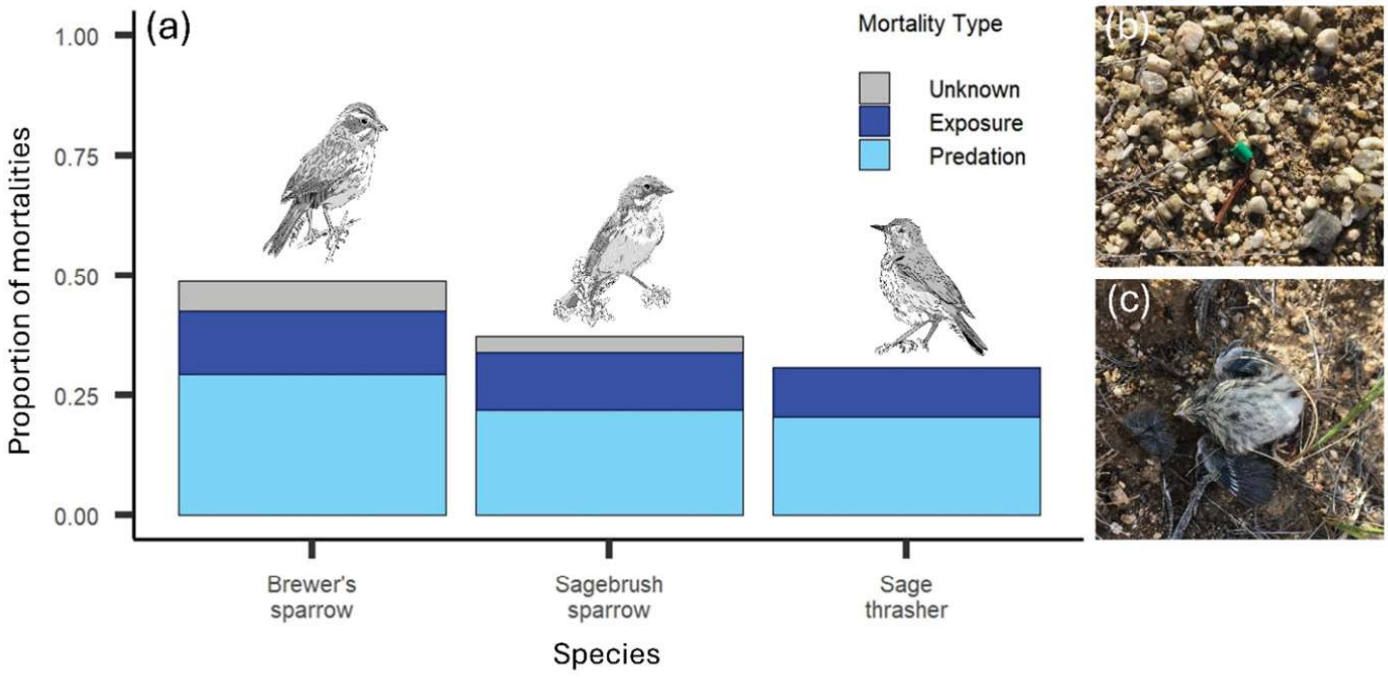
Prepared By: Zach Wallace, Nongame Bird Biologist
Funding Source(s): United States Department of Interior, U.S. Forest Service, Thunder Basin National Grassland; Wyoming Game and Fish Commission Funds

Full Life-cycle Effects of Natural Gas Development on Sagebrush-obligate Songbirds

Research of animals with seasonal cycles historically has focused on breeding season biology, leaving critical gaps in knowledge about behavior and vital rates across the full annual cycle. This bias is especially pronounced in migratory songbirds, which are logistically difficult to study outside of the nesting period. We addressed these gaps in a suite of sagebrush-associated songbirds – Brewer's Sparrow, Sagebrush Sparrow, and Sage Thrasher – that breed in Wyoming and are listed as Species of Greatest Conservation Need (SGCN) in the state. Despite range-wide population declines in all three focal species, information about vital rates outside of the nesting period remains lacking. We therefore tracked juveniles and adults across multiple understudied periods to document movement, survival, and their interactions across stages. We conducted fieldwork during 2020–2024 in Sublette County, Wyoming.

Our first objective was to evaluate the relative influence of various factors on post-fledging survival. We measured and tracked 256 fledglings using radio telemetry during 2021–2023 in pursuit of this objective. We characterized the morphological traits of nestlings most associated with post-fledging survival (wing length, tarsus length, feather development, and body condition), and whether those relationships varied by predominant risks (predation and exposure to extreme weather). We found that predation was the predominant risk for all three species, and that most mortalities (81–86%) occurred in the first five days of the post-fledging period. Carryover effects from the nestling to post-fledging periods were present for all three species, yet varied by species and cause of post-fledging mortality. Whereas traits associated with wing development have been previously emphasized in examinations of predation risk in other avian species, in the sagebrush system tarsus length had an outsized effect on overall mortality and predation risk. Fledglings were unable to fly for several days after leaving the nest. Investment in tarsal development and the ability to run from predators during the early post-fledging period when mortality risk was highest was therefore likely under strong selection. By contrast, nestlings with greater feather development were more likely to survive inclement weather during the post-fledging period. We established linkages between traits during early development and survival in the subsequent post-fledging stage, that varied by cause-specific mortality and across co-occurring species.

Figure 1. a) Mortality during the post-fledging period for Brewer's Sparrows, Sagebrush Sparrows, and Sage Thrashers during 2021 – 2024 could be attributed to multiple causes, including b) predation or c) exposure.



Our second objective was to estimate adult breeding site fidelity and annual survival of songbirds in relation to surrounding development. We tracked 516 breeding adults during 2020–2024 (323 Brewer's Sparrows, 133 Sagebrush Sparrows, and 60 Sage Thrashers), using passive-mist-netting, color-band resight surveys with audio lures, resighting of adults at monitored nests, opportunistic resighting, and passive radio telemetry networks (Motus). We then used a hierarchical, multi-state robust design mark-recapture model to assess adult survival and site fidelity at the landscape scale and generalized linear mixed models to assess site fidelity at local scales (i.e., territory and nest-site placement). Annual survival in adults was relatively high and temporally stable (0.71 for Brewer's Sparrow, 0.69 for Sagebrush Sparrow, and 0.68 for Sage Thrasher). Survival was greater for males than for females in all three species and decreased following breeding seasons with high rates of nest failure. Survival was also influenced by shrub structure (shrub cover and height) on a bird's territory during the previous breeding season. Breeding site fidelity was relatively high (0.59–0.68 likelihood that a bird would return to the breeding grounds, given that it was still alive). Birds mostly did not respond to breeding-site cues, including surface disturbance from natural gas development or previous experience, to modulate breeding site fidelity at any spatial scale. Because surface disturbance from natural gas development previously was correlated with increased nest failure rates, this lack of variation in breeding site fidelity may represent an ecological trap.

A third objective was to determine migratory routes and over-wintering locations of sagebrush songbirds. We used light-level geolocators and stable isotopes in feathers to track non-breeding movements during 2021–2024, focused particularly on the pre-basic molt and wintering periods. We recovered geolocators from 22 Brewer's Sparrows, 13 Sagebrush Sparrows, and 7 Sage Thrashers, and we collected feather samples from 13 of those individuals that were tracked with geolocators. Overall, we found that the migratory strategies of sagebrush songbirds were varied and flexible across the breeding population of each species. All three species used the Chihuahuan Desert region during the non-breeding period. Approximately half of Sagebrush Sparrows and Sage Thrashers were nomadic during the wintering period, rather than using one wintering site, whereas all Brewer's Sparrows and the remaining Sagebrush Sparrows and Sage Thrashers conducted regular, latitudinal migrations to one or two winter sites. Migratory spread across all three species was relatively high, indicating a high level of diversity in migratory strategies (460 km ± 303 SD for Brewer's Sparrows, 529.18 km ± 328.06 for Sagebrush Sparrows, and 671 km ± 360 for Sage Thrashers). Brewer's Sparrows and Sage Thrashers showed no wintering site fidelity across years, and in fact,

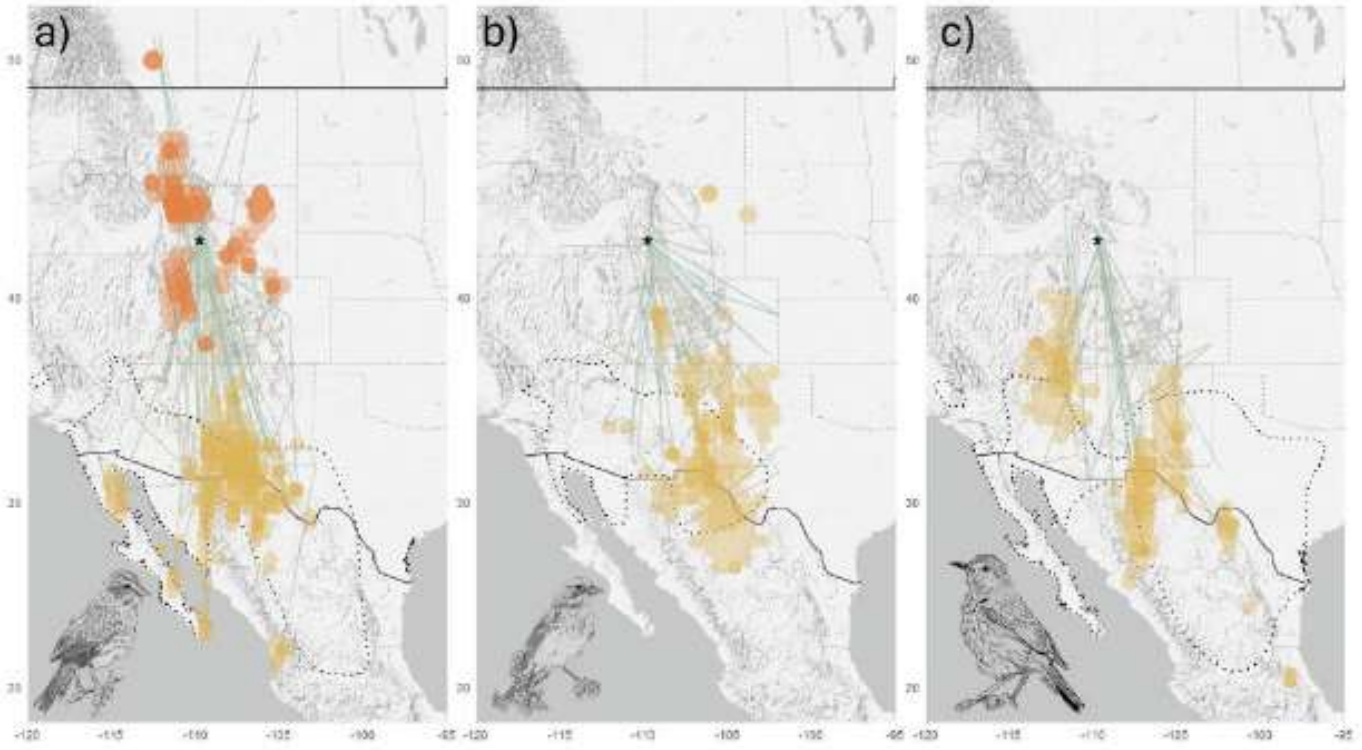


Brewer's Sparrow nest. Photo by Emily Shertzer.

individual flexibility accounted for the high population-level diversity in migratory strategies (Brewer's Sparrows wintered 537 km ± 276 SD and Sage Thrashers wintered 603 km ± 91 from the previous year's site). Molting sites were equally diverse and flexible – individuals conducted the pre-basic molt on the breeding grounds or on molt migrations following the breeding period. Molt migrations were documented in all four cardinal directions from the breeding grounds, and individuals that were tracked over multiple years were flexible in their molting strategies.

A primary goal of this project was to estimate vital rates of sagebrush songbirds during understudied periods. Overall, we estimated survival during three distinct life-stages: the nestling period, post-fledging period, and adult period. The post-fledging period had the lowest survival estimates of the three: 0.57 ± 0.04 SE for Brewer's Sparrows, 0.62 ± 0.06 for Sagebrush Sparrows, and 0.68 ± 0.06 as compared with the nestling period (0.79 ± 0.02 for Brewer's Sparrows, 0.89 ± 0.02 for Sagebrush Sparrows, and 0.88 ± 0.02) or adult yearly survival (0.71 ± 0.05 for Brewer's Sparrows, 0.69 ± 0.06 for Sagebrush Sparrows, and 0.68 ± 0.06 for Sage Thrashers). Our results suggest that the post-fledging period may be particularly risky and therefore important for the maintenance of sagebrush songbird populations. Focusing mitigation efforts on habitat quality for juvenile recruitment, particularly during the post-fledging period, may be especially important for the

Figure 2. a) Brewer's Sparrows, b) Sagebrush Sparrows, and c) Sage Thrashers tracked during 2021 – 2024 spent the nonbreeding season in the southwestern United States and Northern Mexico. The asterisk marks the breeding/tagging site in Sublette County, Wyoming. Yellow polygons represent individuals' longest stationary periods during the winter. Orange polygons represent potential molting sites used by Brewer's Sparrows. Green lines represent migratory tracks.



conservation of these species. Adult non-breeding survival was relatively stable and adult movements during the non-breeding period were flexible, yet site fidelity was high for adults on the breeding grounds. In addition, adults did not respond to novel cues of poor-quality nesting habitat (i.e., natural gas development) by modulating their breeding site fidelity. Therefore, mitigation efforts focused on the breeding period and protection of breeding-ground habitat are likely particularly important for these songbirds.

This research provided important information for management of sagebrush-obligate avian SGCN in Wyoming by increasing our knowledge of understudied seasons (molt, migration, winter) and life stages (post-fledging). Results showing high fidelity to breeding areas, in contrast to low fidelity to wintering and migration areas, indicate that management of breeding habitat in Wyoming is an efficient strategy to conserve these species. The importance of breeding habitat conservation was further emphasized by results suggesting that the high fidelity of these species to their nesting territories may result in an ecological trap when breeding areas are altered by development. This study provided the first estimates of survival during multiple life stages for these species and revealed the post-fledging period as a critical bottleneck in survival. Relevant to management, adult survival was influenced by attributes of sagebrush habitat on the breeding grounds, including shrub cover and height. Overall, this research highlights the importance of Wyoming's sagebrush steppe habitats within the full annual cycle of these migratory species.

Prepared By: Dr. Emily Shertzer and Dr. Anna Chalfoun, Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming
Funding Source(s): U.S. Fish and Wildlife Service State Wildlife Grant; Wyoming Landscape Conservation Initiative; U.S. Department of the Interior, Bureau of Land Management; Wyoming Game and Fish Commission Funds

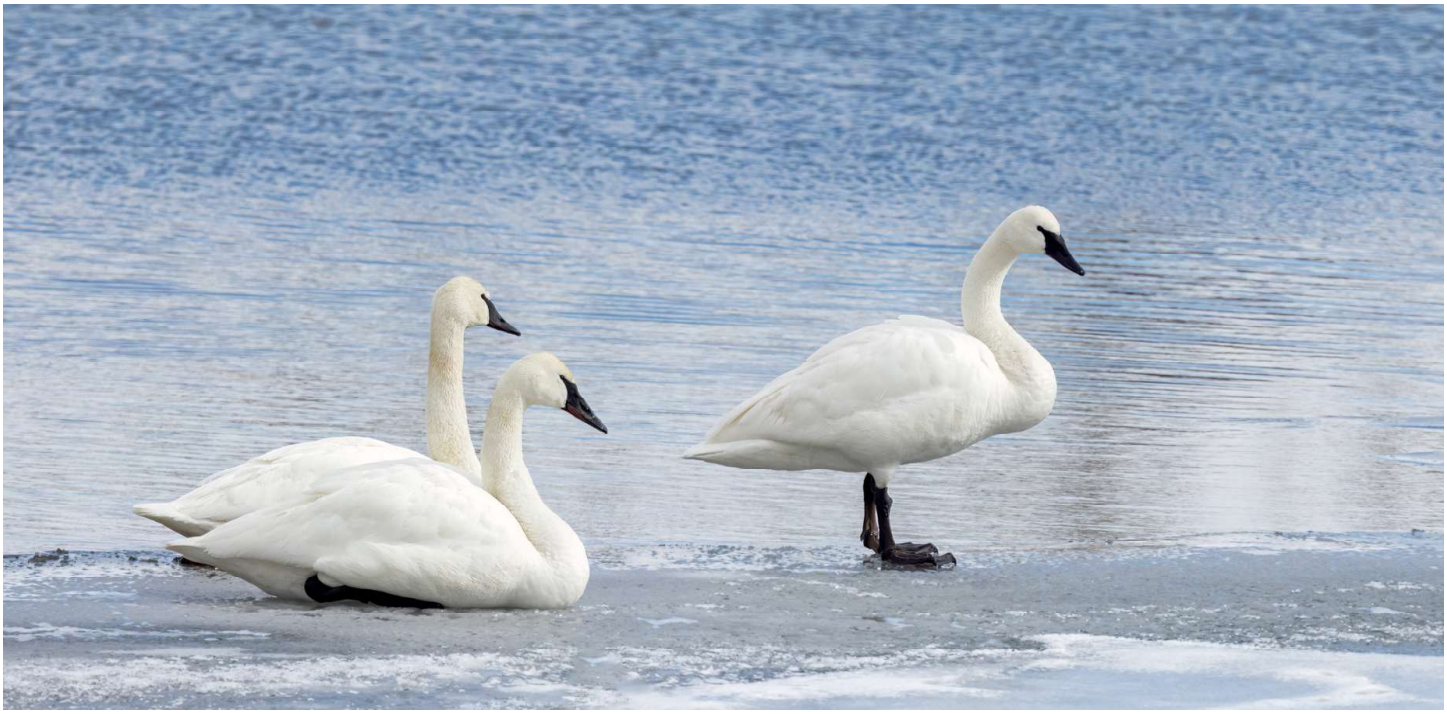
Monitoring and Management of the Rocky Mountain Population of Trumpeter Swans in Wyoming

Trumpeter Swans have been a priority management species in the Greater Yellowstone area since the establishment of Red Rock Lakes National Wildlife Refuge in Montana in 1932 to conserve what were believed to be the 70 remaining individuals in the world. Trumpeter Swan populations have since recovered as the result of significant conservation efforts, including in Wyoming. Beginning in the late 1980s, the Wyoming Game and Fish Department (WGFD) has worked to expand the population size and distribution of swans through releases of captive-reared cygnets and wetland habitat improvement projects. These efforts succeeded in establishing a new nesting population in the upper Green River Basin. However, even as migratory Trumpeter Swan populations in Alaska, interior Canada, and the Midwestern states continue to expand, the non-migratory U.S. Breeding Segment of the Rocky Mountain Population (RMP) remains of concern.

Swans that nest and reside year-round in the Greater Yellowstone area, including western Wyoming, are designated as the Greater Yellowstone Flock (GYF), formerly the Tri-State Area Flock. The management of this swan population is coordinated through the Pacific Flyway Council. The GYF is managed as part of the RMP, which includes swans that nest in interior Canada and migrate south to winter in the Greater Yellowstone area. WGFD is a member of the Greater Yellowstone Trumpeter Swan Working Group, which consists of state and federal agencies, non-governmental organizations, and interested parties that meet annually to discuss population trends and coordinate management actions. WGFD coordinates with the U.S. Fish and Wildlife Service (USFWS) Mountain-Prairie Region Migratory Bird Office, the states of Idaho and Montana, and managers of areas hosting restoration flocks to annually census the number of mature swans and young of the year (cygnets) in the U.S. Breeding Segment of the RMP. Additionally, WGFD collaborates with Grand Teton National Park to conduct annual surveys of swan nesting territory occupancy and productivity in Wyoming outside Yellowstone National Park.

The Big Sandy Trumpeter Swan Restoration Project was initiated in 2023 by WGFD and the Wyoming Wetlands Society (WWS) to address the ongoing limitations of population size, migratory routes, and wintering distribution of swans in western Wyoming. By focusing translocations within the Big Sandy watershed, we intend to fill another largely unoccupied area of Wyoming swan habitat in the Pacific Flyway adjacent to the reintroduced population in the Upper Green River area and diversify wintering locations to improve the resilience of the population to localized threats.

Trumpeter Swans. Photo by Ron Horn.

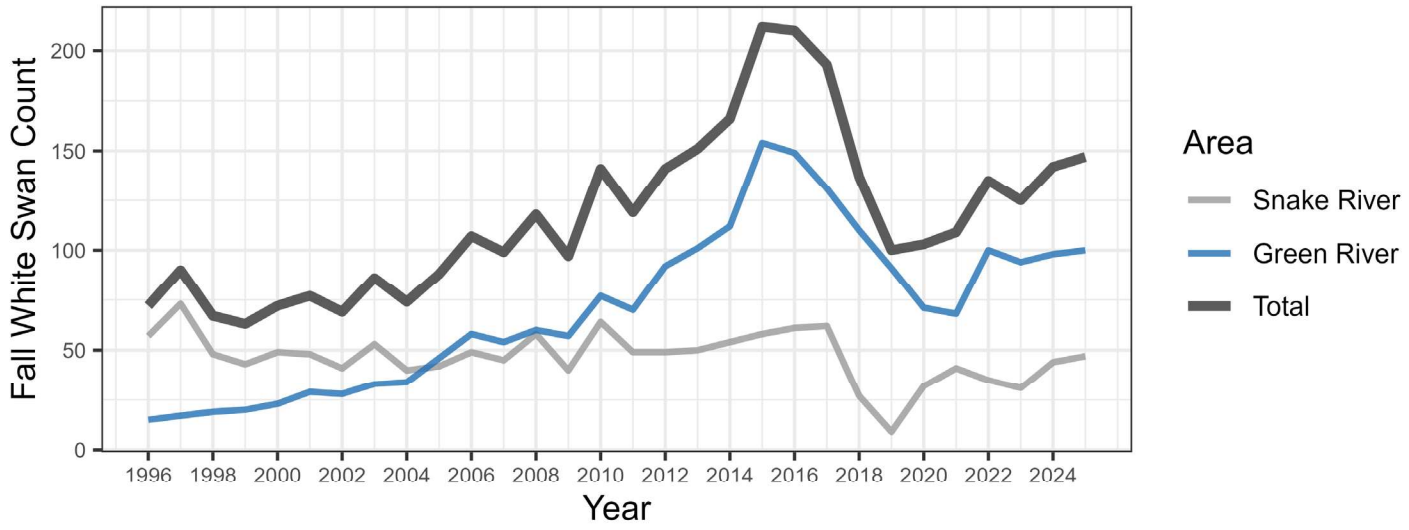


In 2025, we conducted three fixed-wing aerial surveys to monitor nesting territory occupancy, productivity, and population abundance of swans in western Wyoming. All surveys were conducted by pilot Mark Packila (Wildlife Air) in a Scout aircraft with Zach Wallace or Courtney Rudd as observer. We surveyed nesting territory occupancy from May 29 – June 5 and territories with swans received a productivity survey from July 9–15. On September 23–27, we conducted the Wyoming portion of the annual fall population survey, excluding Yellowstone National Park. In addition to the aerial surveys, observations of swan locations and nesting status were provided by federal agencies, non-governmental organizations, and members of the public.

Based on the cumulative results of the three surveys, we found 63 of 161 swan nesting territories occupied by pairs, 51 nesting attempts, 29 successful nests, and 23 broods fledged. Total productivity was 76 cygnets hatched and 55 cygnets fledged, or an average brood size of 2.6 cygnets hatched and 1.9 cygnets fledged per successful nesting attempt. During the fall survey, we counted 159 white swans (adults and subadults) and 55 cygnets.

The Pacific Flyway Council Management Plan for the Rocky Mountain Population of Trumpeter Swans sets objectives for abundance and distribution. In 2025, the count of 826 white swans in the U.S. segment of the RMP exceeded the objective of 718 swans for the seventh time in the last ten years. In Wyoming, the desired distribution of white birds and pairs with fledged young (broods) remained at or below objective in the Snake River (observed/desired white birds: 47/68, pairs with broods: 7/7), Green River (observed/desired white birds: 100/170, pairs with broods: 16/25), and Salt River (observed/desired white birds: 6/6, pairs with broods: 0/2) survey areas. The USFWS Division of Migratory Bird Management produces an annual report summarizing results for the coordinated RMP surveys that includes data collected in Wyoming, which is available from USFWS.

Trumpeter Swan population trends from the fall count of adult and subadult (i.e., white) swans in Wyoming, 1996–2025. Plot shows annual counts for the Snake River core area (light gray line), Green River expansion area (blue line), and the total Wyoming population outside Yellowstone National Park (bold dark gray line).





Trumpeter Swans. Photo by Ron Horn.

The second release of the Big Sandy Trumpeter Swan Restoration Project took place in July 2025, when WGFD and WWS released 4 captive-raised yearling swans at Eden Reservoir, north of Farson, Wyoming. We monitored the released swans using GPS and VHF radio collars, and ground and aerial surveys. In early November, one bird was captured for rehabilitation following a likely fence entanglement. The remaining 3 individuals stayed in the Eden-Farson area within 25 km of the release site until mid-November, when they moved approximately 40 km to the Green River in Seedskadee National Wildlife Refuge—the main wintering concentration area of Trumpeter Swans in Wyoming. We did not encounter either of the potentially surviving individuals from the 2024 cohort during 2025. We will continue efforts to track and resight all potentially surviving individuals. In 2026, we plan to request an allocation of captive-raised swans through the Pacific Flyway Council process, which will be released as cygnets in 2026 or yearlings in 2027. At least half of all individuals released will be marked with GPS collars to evaluate success in establishing new wintering and migration areas, and understand the fate of yearlings and cygnets after release.

The status of the resident Wyoming Trumpeter Swan population has improved significantly since restoration efforts began in the 1980s. Both the population size and distribution of swans have increased, as well as the amount of available wetland habitat. Although most areas of Wyoming remain under the Pacific Flyway Management Plan objectives, fall count data show a stable or increasing trend following declines from the population peak in 2016. Ongoing and emerging threats still need attention, including effects of climate change and drought on habitat, disease (i.e., highly pathogenic avian influenza), diversity of wintering areas and migratory routes, and human development and disturbance.

Prepared By: Zach Wallace, Nongame Bird Biologist; Courtney Rudd, Migratory Game Bird and Wetland Habitat Biologist; Bill Long, Wyoming Wetlands Society
Funding Source(s): Wyoming Game and Fish Commission Funds, Wyoming Governor's Big Game License Coalition grant

Wyoming Bird Records Committee: Summary of Reports Reviewed in 2025

The Wyoming Bird Records Committee (WBRC) was established by the Wyoming Game and Fish Department (WGFD) in 1989 to accomplish the following goals:

1. Solicit, organize, and maintain records, documentation, photographs, audio recordings, and any other material relative to the birds of Wyoming.
2. Review records of new or rare species or species difficult to identify, offer an unbiased opinion of their validity or thoroughness, and use them to develop and maintain an Official State List of Birds in Wyoming.
3. Disseminate useful and pertinent material concerning the field identification of Wyoming birds in order to assist Wyoming birders and ornithologists with increasing their knowledge and skill.

The WBRC is comprised of five voting members and the WGFD Nongame Bird Biologist, who serves as a non-voting Secretary. During 2025, members included Don Jones, CJ Grimes, Matt Fraker, Diane Thomas, and Hilary Turner. The WBRC operates under bylaws that were approved in 1991 and last updated in 2023.

Currently, the WBRC requests reports for species that are included on two separate lists. The first list is known as "All Sightings" and includes 162 species that are reviewed, regardless of the location observed in Wyoming. When a species is documented for the first time in Wyoming, it is automatically placed on the "All Sightings" list. The second list is known as "First Latilong" and currently includes 63 species. Latilongs are the 28 latitude-longitude degree blocks in Wyoming. When a species on the "First Latilong" list is observed in a block with no previously confirmed WBRC record, we request a report from the observer. In addition, if nesting activity is observed for any species on the "First Latilong" list, the WBRC requests a report for that observation, regardless of whether the species has been previously documented in that block.

During 2025, the WBRC made a continued effort to engage with eBird, a worldwide community science database for avian observations maintained by the Cornell Lab of Ornithology. Three of the five voting WBRC members served as Wyoming eBird reviewers. The WBRC tracked eBird postings to find records of rare and unusual bird sightings for review and also encouraged birders to submit rare bird forms directly to the WBRC for observations shared through eBird.

In 2025, the WBRC reviewed 62 reports, of which 54 were accepted and 8 were not accepted or are undergoing further review. Wyoming added 6 new species to its state list in 2025: Crested Caracara, Tundra Bean-Goose, Yellow-bellied Flycatcher, Grace's Warbler, Curlew Sandpiper, and Costa's Hummingbird. Additional details of these state firsts are included below:

Crested Caracara (*Caracara plancus*).

East of Farson, Sweetwater County; Grand Teton National Park, Teton County; Yellowstone National Park; and West of Laramie, Albany County. In the United States breeding occurs in Arizona, Florida, Louisiana, and Texas—largest breeding population of the species in the U.S. The bird near Farson was observed February 1 and was not relocated by other observers. It's unclear whether or not the records from Grand Teton and Yellowstone National Parks from May 13 to May 20 are of the same individual. The bird near Laramie was first observed August 22 and continued through September 1. While breeding only occurs in 4 states in the lower 48, only 3 states remain without records for the species (Indiana, New Hampshire, and Kentucky).



Tundra Bean-Goose at Fort Casper, Natrona County. First documented record in Wyoming. Photo by Jonathan Lautenbach.

Tundra Bean-Goose (*Anser serrirostris*).

Fort Casper, Natrona County. This is only the third interior record for the United States. Breeding occurs across the tundra of northern Russia, but also includes southern Norway and Svalbard. Wintering occurs in western and central Europe and eastern China, Korea, and Japan. This bird was only observed for one day, despite many efforts to relocate it.

Yellow-bellied Flycatcher (*Empidonax flaviventris*).

Jay Em, Goshen County. Most breeding for this species takes place in Canada, but birds have been observed migrating in Colorado, Nebraska, South Dakota, North Dakota, and Montana. This bird was observed May 24 during a storm that created fallout-like conditions, where many birds land to avoid torrential rain. One attempt was made to relocate the bird on May 26, but the observer was unsuccessful.

Grace's Warbler (*Setophaga graciae*).

Dirty Shirt Woods, Natrona County and Curt Gowdy State Park, Laramie County. In the United States Grace's Warbler breeds in pine dominated forests of southern Nevada, southern Utah, southern Colorado, western and central New Mexico, and western Texas. Both observations were of single birds. The Natrona County bird was observed May 29 and May 30. The Laramie County bird was observed only on September 3. The Natrona County bird was a singing male, while the Laramie County bird appeared to be a female/immature bird. There were two other reports of Grace's Warbler outside its typical range in 2025—single birds at Malheur National Wildlife Refuge, Oregon and North Platte, Nebraska. The two records in Wyoming makeup 2 of the 5 northernmost documented observations of the species.

Curlew Sandpiper (*Calidris ferruginea*).

Burlington Lake (Goldeneye Reservoir), Natrona County. The species breeds in the Russian high Arctic and winters in sub-Saharan Africa, South Asia, Southeast Asia, and Australia. This bird in breeding plumage was first observed August 17 and continued the following day. While Curlew Sandpiper has been recorded in all 10 Canadian provinces and 46 states in the U.S., this is the first time one has been seen in Wyoming (leaving just Idaho, Oklahoma, and West Virginia without records).

Costa's Hummingbird (*Calypte costae*).

Story, Sheridan County. In the United States Costa's Hummingbird breeds in California, southern Nevada, and Arizona, and is suspected to breed in southwest Utah, but nesting has not been confirmed. Costa's Hummingbird has been recorded as far north as Washington, Alberta, and Alaska. This immature male was first observed October 4 and continued to be seen at a private residence until October 24.

The WBRC database is a dynamic document, typically updated once or twice a year following the review of a record batch. A full report of all sightings submitted through 2025, species for which the WBRC requests documentation, and bylaws are available from the WGFD Nongame Bird Program. The WBRC website continues to provide a variety of information about species of interest for Committee review, WBRC background and history, and an online rare and unusual bird submittal form (https://wybirdrecordscommittee. wordpress.com/).

Prepared By: Frank Stetler, Nongame Biologist
Funding Source: Wyoming Game and Fish Commission Funds

Curlew Sandpiper at Burlington Lake (Goldeneye Reservoir), Natrona County. First documented record in Wyoming. Photo by Jonathan Lautenbach.



Statewide Bat Monitoring and White-nose Syndrome Surveillance

All Wyoming bat species are insectivorous, preying on a wide variety of timber and crop pests, as well as disease vectors (e.g. mosquitos). The majority of bat species found in the state are species of conservation interest to both Game and Fish and federal agencies. Because bats are small, nocturnal, cryptic, and volant, they are difficult to study, knowledge gaps exist in our understanding of their basic ecology. Gaps include estimates of population size and basic life history, both of which will need to be understood to support populations through various conservation challenges. Bats have a very slow reproductive strategy, with most species having only one pup each year and individuals of several species capable of living into their 30s. Because of these traits, adult survival is the most important driver of bat populations, which are not capable of rapid recovery after any decline.

According to the Western Bat Working Group, the most important conservation challenges facing bats are climate change, habitat loss, persecution, wind energy development, and white-nose syndrome (WNS). These challenges are not evenly distributed across the country, and they affect Wyoming's bats to varying degrees. It is unclear how climate change will affect bat populations in Wyoming, but it has the potential to disrupt important life history events, such as reproduction and hibernation. The effect of habitat loss on Wyoming's bats is difficult to measure as well. We have a basic understanding of habitat use in the state, but population numbers and trends within specific habitats are largely unknown. Persecution in Wyoming has not been studied explicitly, and more information is needed to evaluate this potential threat to Wyoming's bat populations. Training for wildlife professionals and education in handling bat human interactions as wildlife conflict, rather than pest control issues, is likely to improve outcomes for both bats and humans. Wind development, which causes mortality by collision and barotrauma, has a substantial impact on migratory bats. Mitigation of this threat is difficult on the landscape scale, as migration routes for bats in North America remain largely unknown. WNS is a fungal disease that causes mortality during hibernation, but these impacts may be difficult to observe directly in Wyoming as WNS affected bats in the state do not hibernate in easily surveyed colonies. In order to assess the impacts of any of these conservation challenges on Wyoming's bat populations, long-term monitoring of these species is necessary; this is the primary responsibility of the bat program within the Nongame Section of Wyoming Game and Fish.

White-nose Syndrome Surveillance

WNS is a disease caused by the introduced fungal pathogen *Pseudogymnoascus destructans* (Pd), which infiltrates the skin of bats when their immune systems are depressed during hibernation, ultimately causing death. Species occurring in Wyoming that are known to be affected by WNS elsewhere in their range include the Northern Long-eared Myotis, Tri-colored Bat , and Little Brown Myotis . Northern Long-eared Myotis is federally listed as an endangered species, a listing decision is pending for Tri-colored Bat, and the Little Brown Myotis is under review for federal listing. WNS is the major reason for the continuing decline of each of these species nationally. The rest of the *Myotis* genus are expected to be affected to varying extents, though some western species have not yet encountered the fungus. Mortality in hibernacula in the East has been reported as high as 99.9% for many colonies.

Pd surveillance is done by swabbing bats or bat carcasses during or shortly after hibernation, sampling the substrate of winter roosts, or by swabbing active bats in the early spring, often as they return to maternity roosts. Guano samples can also be taken during any of these sampling efforts. All samples are tested for the fungal DNA. Samples directly from bats are preferred, as they have been shown to result in detection of the fungus earlier in the invasion

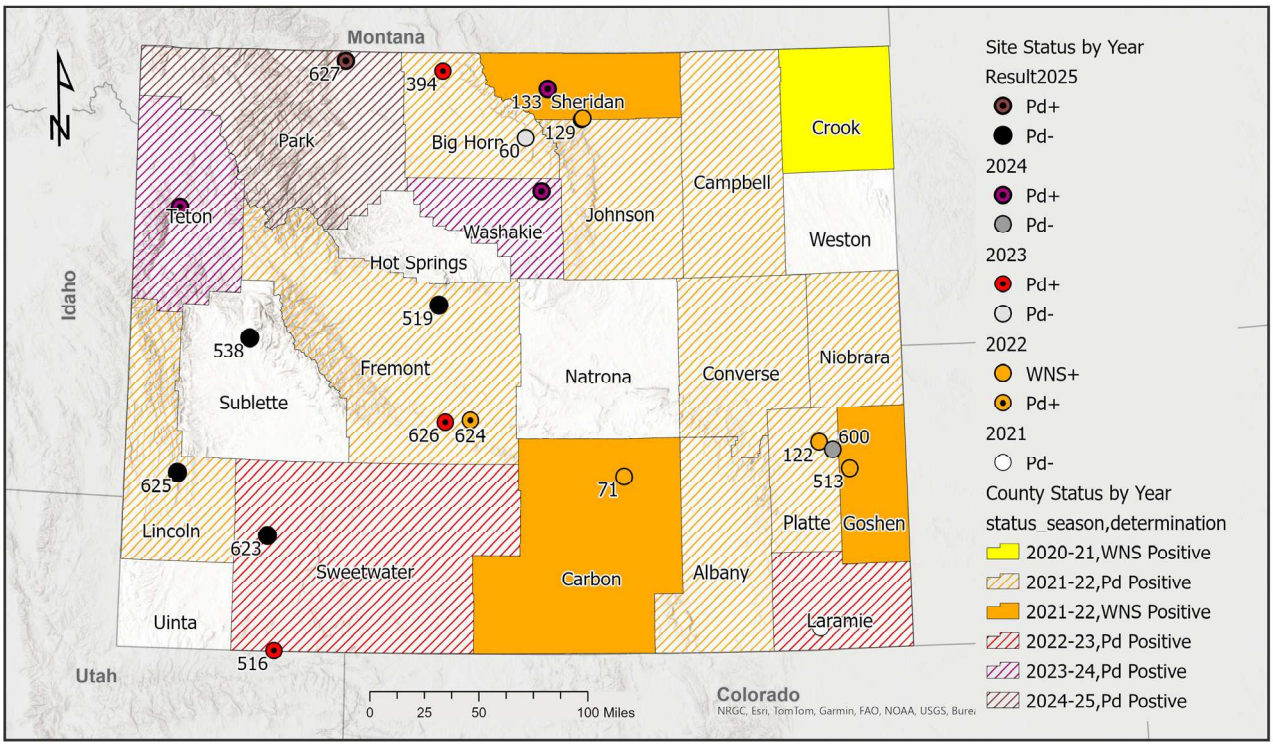
Biologist releases bat after sampling. Photo by Regina Dickson/WGFD.



than substrate samples, but the latter allows sampling without disturbing bats during the critical hibernation season or handling them in the early spring, when body condition may be poor following hibernation. Spring capture for Pd surveillance is an important tool in the effort to manage bats in the face of WNS. Spring capture sites are selected for their potential to yield high numbers of *Myotis*, due to their susceptibility to WNS. In addition to these targeted surveillance efforts, Game and Fish coordinates with the USGS National Wildlife Health Center and the University of Wyoming to test bats submitted for WNS after they have been submitted for rabies testing. All bats submitted in this manner for Pd testing must first test negative for rabies. The Nongame Section of Wyoming Game and Fish coordinates Pd/WNS in the state, to maximize geographical coverage of this effort and maintain communication between all parties involved. Results are used to make Pd/WNS determinations on a county wide basis. All results contributing to status changes within the state from February 2024-January 2025 are reported here for simplicity and shown in the map below.

Nine maternity roosts (designated in the WGFD data base as roost #s 394, 516, 519, 538, 623, 624, 625, 626, and 627) were sampled by WGFD for Pd in the spring of 2025. Bats were swabbed at all maternity roosts. Pooled guano samples were not collected in 2025. As Pd becomes widespread in the region, sampling strategies are changing from primarily documenting Pd presence, to fungal prevalence sampling at previously positive locations, referred to by the National Wildlife Health Center (NWHC) as Surveillance 4.0. Roosts 394, 516, 624, and 626 were sampled for Surveillance 4.0 in 2024 and 2025. All samples were sent to the NWHC and results were reported directly to USFWS. Pd/WNS status was continuously updated on the national WNS spread map in collaboration with USFWS.

Map of major WNS/Pd sampling sites in Wyoming with most recent WNS/Pd status change or negative result. Sites are labeled with WGFD roost numbers, where applicable.



A roost in Park County (627) tested positive for Pd in 2025 after testing negative for the fungus in 2024. This was the only change in status of a county in 2025. Three roosts sampled in Wyoming (538, 623, and 625) continue to have no Pd detected; however, two of these, 623 and 625, are in Pd+ counties. In Fremont County, one maternity roost (519) tested inconclusive for Pd in 2020, but this result could not be confirmed and the roost has consistently tested Pd negative in subsequent years. Bats at roost 516 tested negative for Pd in 2023 and 2024, while the guano collected at that roost was positive for Pd in 2023, which was the first year that location was sampled. In 2025, 2/50 bats tested positive for Pd, with 12/50 testing inconclusive for the fungus.

Roosts sampled for WNS/Pd by WGFD during 2025.

Roost #	2023 Status	2024 Status	2025 Status	County	County Status
R-394	Pd +	Pd +	Pd +	Bighorn	Pd +
R-516	Pd -	Pd +	Pd +	Sweetwater	Pd +
R-519	Pd -	Pd -	Pd -	Fremont	Pd +
R-538	Pd -	Pd -	Pd -	Sublette	Pd -
R-623	Pd -	Pd -	Pd -	Sweetwater	Pd +
R-624	Pd +	Pd +	Pd +	Fremont	WNS Suspect
R-625	Pd -	Pd -	Pd -	Lincoln	Pd +
R-626	Pd+, WNS Suspect	Pd +	Pd +	Fremont	WNS Suspect
R-627	Pd -	Pd -	Pd +	Park	Pd +

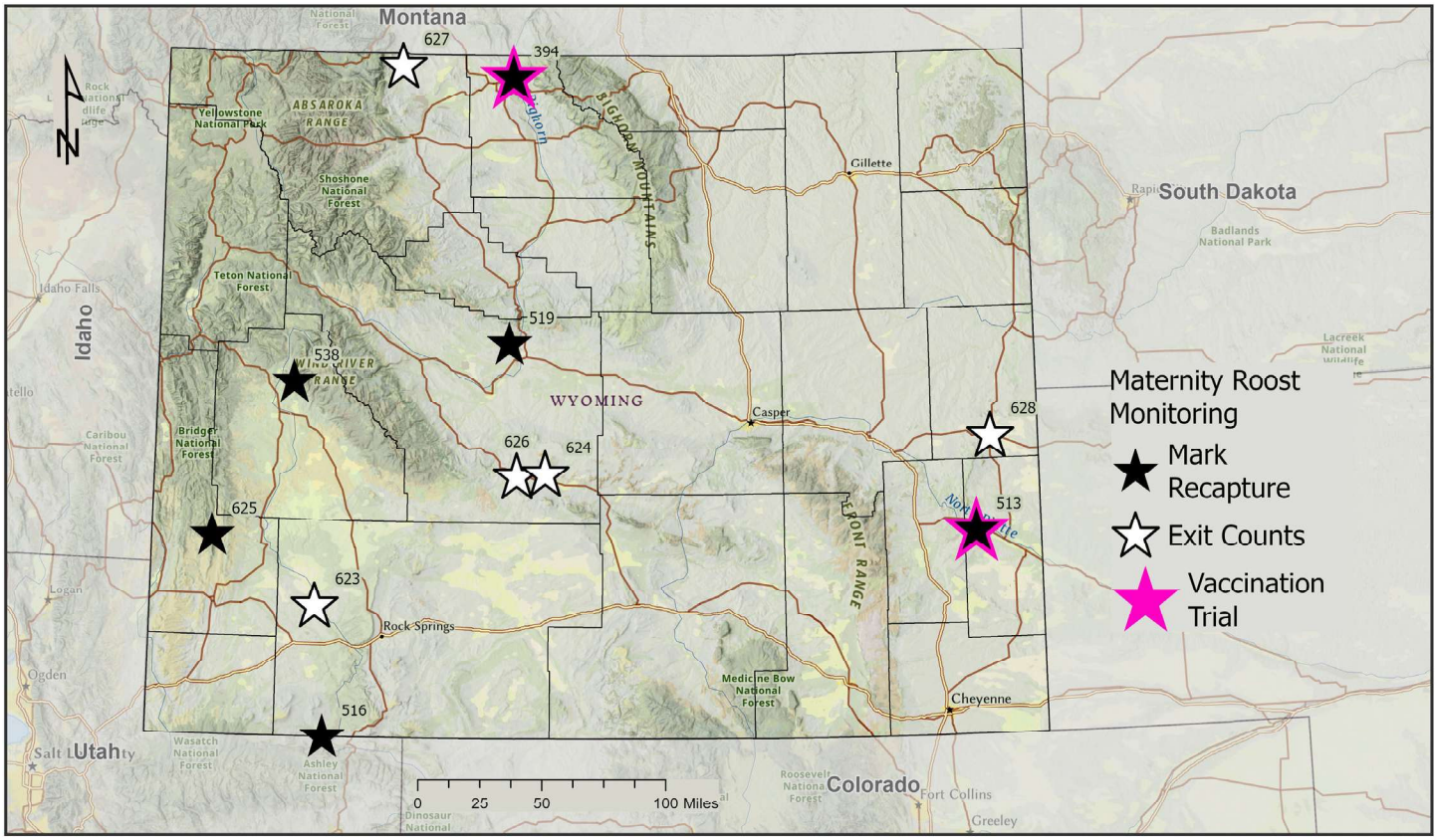
Mixed Pd status within counties may demonstrate early infection in the area, with incomplete exposure to the fungus among individuals concentrating in large summer colonies. Prevalence sampling supports this, as prevalence at several newly Pd+ roosts was low, which could indicate incomplete winter exposure among bats returning to summer roosts. Prevalence in colonies on the eastern side of the state, where Pd invasion first occurred, remains high.

During Surveillance 4.0 sampling of Roost 394, a total of 7 western small-footed myotis were captured and sampled. Of the 50 bats sampled, 47 tested positive for Pd. The two bats that tested negative and the only bat with an inconclusive sample were all western small-footed myotis. As bats in this roost typically cluster in large groups, it is unclear how the western small-footed myotis would avoid carrying Pd DNA when the prevalence was high otherwise. Direct observations of roosting behavior of the western small-footed myotis were not made at this roost, bats were captured exiting the structure that contains a smaller roost box. In light of their observed stable or increased capture rates where disease stage WNS is present (i.e., the Black Hills of Wyoming and S. Dakota), these results may be important in understanding how the species could be avoiding the effects of WNS. This is the first observation of MYCI at this roost. A long-legged myotis was also captured during trapping in support of the NWHC WNS vaccination trials in August of 2025; no Pd sample was taken from that individual. Collectively, these observations add 2 myotis species to the previous probable 2 (DNA is pending to confirm both Yuma myotis and little brown Myotis observed at this large roost).

Population monitoring using exit counts and mark recapture studies will improve our knowledge of population trends for bats in Wyoming. Exit counts were conducted at 10 maternity roosts in 2025 (394, 516, 519, 538, 623, 624, 625, 626, 627, and 628; Figure 2). Four roosts were successfully surveyed during both the pre and post volancy periods in 2024, while 4 roosts were surveyed during the pre-volancy period only, and 2 were surveyed during the post volancy period only. In 2025, all 10 roosts were surveyed during the pre volancy period, but only 3 roosts were surveyed during the post volancy period. Due to time constants and the preponderance of work necessarily conducted during the roosting season, especially during the post volancy period, paired pre and post volancy surveys remain difficult to complete. A high-speed thermal camera was used at larger roosts to improve visibility during exit counts, which resulted in increased confidence in these counts in both 2024 and 2025 over 2023 efforts. A mark recapture study is taking place at 6 roosts in Wy-

oming. Two of the sites in the state (623 and 625) were added in 2025. The mark/recapture work will help elucidate the effects of Pd on western populations of myotis. This project is spearheaded by the Colorado Natural Heritage Program, and funded and assisted by WGFD (roosts 384, 519, 538, 623, and 625) and NPS (roost 513). Population estimates from the mark recapture project will assist in estimating detection probabilities during exit counts using various methods, including visual counts, low resolution thermal cameras, and high-resolution thermal cameras. Data from exit counts is pending entry into the NABat database. Exit count methods continue to undergo refinement, both in Wyoming and nationally. Our observations indicate that even low-resolution thermal cameras improve counts substantially, though at larger roosts higher quality videos are needed for high count confidence.

Maternity roosts monitored for Pd by WGFD and partners in Wyoming.



North American Bat Program Monitoring

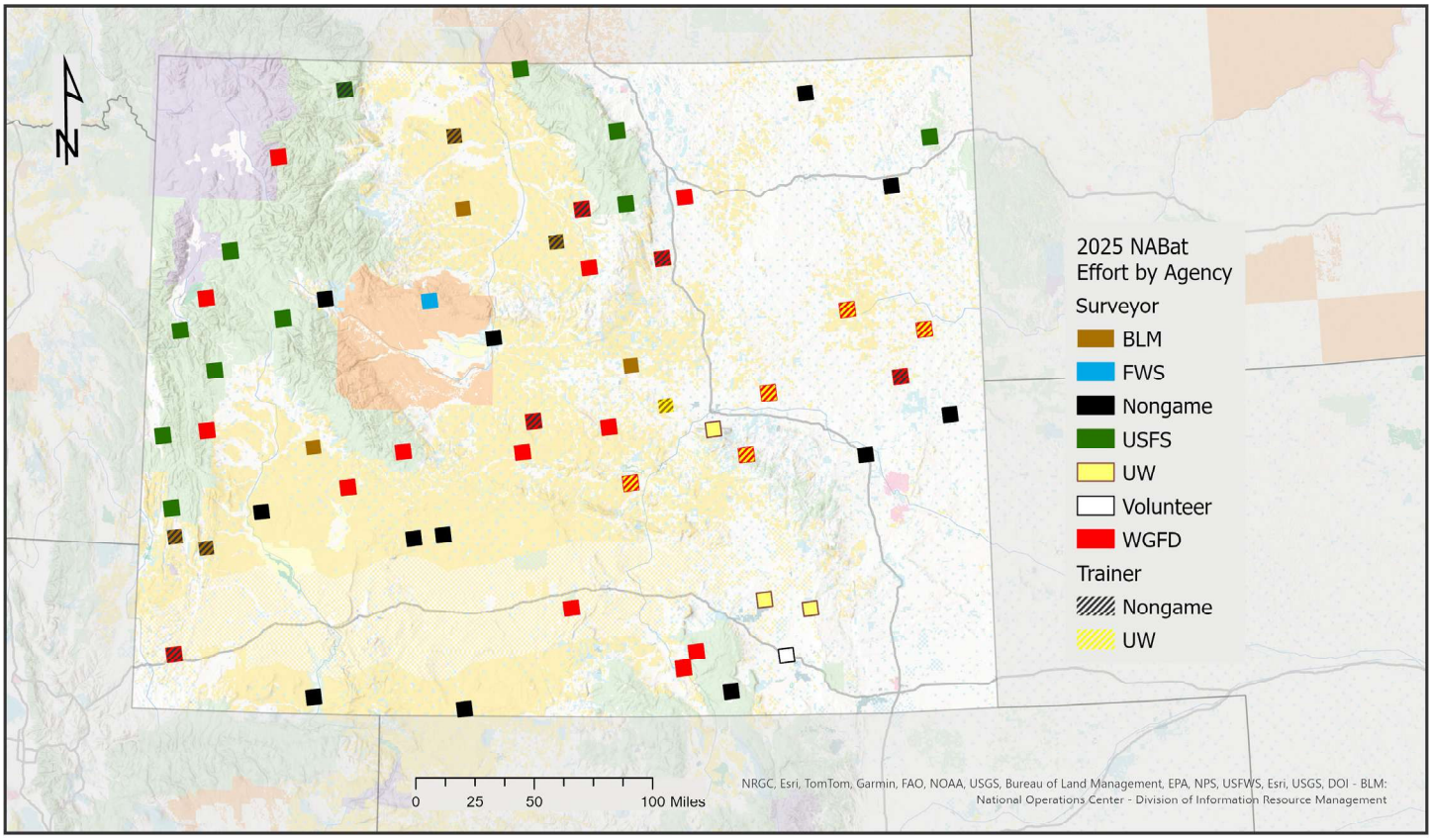
During the summer of 2018, Game and Fish implemented the stationary acoustic survey portion of the North American Bat Monitoring (NABat) Protocol on a statewide basis. Equipment has been deployed at the same sites in each subsequent year, with additional cells added yearly. We have continued to develop the monitoring effort toward the goal of consistently monitoring 2% of priority cells in the state.

In the spring of 2024, Wyoming committed to participation in the Rocky Mountain NABat Hub, and in the fall of 2024 coordination of stationary acoustics in Wyoming transferred to the University of Wyoming to establish the Wyoming NABat Hub. WGFD continues to provide considerable in-kind support through the loan of detectors and the contributions of statewide bat technicians as well as and regional personnel to fieldwork for the project. In 2025, nongame technicians surveyed 12 cells, and trained or assisted local personnel on an additional 8 cells . By using

technicians funded by the WNS Capacity grant to train the majority of local personnel in 2025, we hope that the NABat coordinator will be able to maintain training levels going forward, thus reducing the need to use Nongame bat technicians for this task, as well as decreasing their use for the surveys themselves, which will increase the Nongame's Section's future ability to complete more specialized bat monitoring tasks.

Repeated yearly stationary acoustic monitoring will allow Game and Fish, in partnership with the NABat Program, the Rocky Mountain NABat Hub, and the Wyoming NABat Hub at UW, to document changes in bat distribution and activity through time. In January (2024 and 2026) and February (2025), data from the previous year's stationary acoustic monitoring was uploaded into the NABat database for use in national and regional analysis by USGS and collaborators.

NABat cells monitored with Stationary Acoustics by the WGFD statewide project in 2025. Cells monitored by technicians funded through the WNS grants are shown in black. Cells assisted or trained by those technicians are shown with black hashmarks.



Prepared By: Laura Beard, Bat Biologist
Funding Source(s): USFWS's Whitenose Syndrome Capacity Grant to States and Tribes, State Wildlife Grant

Black-footed Ferret Management Activities at the Shirley Basin and Meeteetse Reintroduction Areas

The Black-footed Ferret (ferret) is a fossorial, nocturnal, and critically endangered mammal that relies exclusively on prairie dogs for food and shelter. Prairie dogs and ferrets both once ranged over 100 million acres of North American prairie. Since 1900, due primarily to the conversion of native grassland to cropland and intense extermination campaigns, prairie dogs have been eradicated in some areas; approximately 2 million acres of colony exist today in isolated patches. As populations of prairie dogs decreased, so did those of ferrets, and they were listed as endangered in 1967. By 1979, ferrets were considered extinct. In 1981, a population was discovered, ultimately resulting in a successful captive breeding program.

The first ferret reintroduction site was established in the Shirley Basin, WY, in 1991. Its success and resiliency spurred the creation of more reintroduction sites; to date there are 31 in North America. In addition to the Shirley Basin Reintroduction Area (SBRA), Wyoming also hosts the Meeteetse Reintroduction Area (MRA), established in 2016 on the same lands where ferrets were first rediscovered. In conjunction with US Fish & Wildlife Service (FWS), Bureau of Land Management (BLM), USDA APHIS Wildlife Services (USDA-WS), and local landowners, the Wyoming Game & Fish Department's (WGFD) Nongame Section manages ferrets and prairie dogs at both sites. These efforts are essential for assessing progress towards recovering the ferret within Wyoming and across the continent.

A newly released Black-footed Ferret peers out her burrow at the Shirley Basin Reintroduction Area. Photo by WGFD.



Shirley Basin Reintroduction Area (SBRA)

The SBRA is the largest reintroduction site in existence, spanning 55 linear miles and containing approximately 180,000 acres of active prairie dog colony. It is a mix of private, BLM, WY State Trust, and WGFD lands. Since its creation in 1991, ferrets have persisted and dispersed across the landscape, largely with a hands-off management approach.

As in most years, in 2025 we performed annual monitoring of prairie dogs at the Main Area—a central location supporting a self-sufficient population of ferrets. We also updated maps of prairie dog colonies at Chalk Mountain. Additionally, we performed nocturnal spotlight surveys at the Main Area, Chalk Mountain, and Bone Creek; the latter two were discovered to support ferrets in 2021.

Prairie dog monitoring

As an annual census of prairie dog populations is not feasible, we have established 10-acre (200m x 200m) plots at randomly selected locations thought to contain a moderate to high density of prairie dogs in order to best represent quality habitat in the area. On three consecutive mornings in June between 0700 and 1200, Nongame Section personnel visited plots and scanned them with binoculars, counting each prairie dog. Personnel then quietly waited 10 minutes to allow the prairie dogs to resume normal behavior and repeated the count. The highest count over the three-day survey window, when adjusted by a detection index accounting for animals underground, acts as a time efficient estimate of the minimum density of prairie dogs within the plot.

In 2025, our prairie dog monitoring indicated the overall density of prairie dogs increased slightly. Density ranged from 0.91 – 3.95 per acre, with an average of 2.04 per acre as compared to an average of 2.10 in 2024. In the Main Area, the prairie dogs show no concerning sings and we are confident the prairie dogs at the Shirley Basin Reintroduction will continue to thrive, though we will continue to monitor annually.

Prairie Dog Colony mapping

Accurate maps of prairie dog colonies are essential for targeting annual monitoring surveys and plague treatments as well as fulfilling Federal reporting mandates. While colony borders

constantly fluctuate due normal cycles of abundance, disease outbreaks can greatly increase the rate of change.

There are multiple methods used for mapping colony, and we use a combination of two. First, Nongame Section personnel estimated colony borders remotely. Using the most recent freely available imagery (August 2020 via Google Earth), personnel circumscribed visible burrows. However, as burrows can remain visible even when vacant, field validation was necessary.

Personnel travelled along 30 meter transects to locate the first active burrow on the edge of a colony. Then, they located the next active burrow within 30 meters, and continued until the colony was circumscribed. Personnel later processed locations of the burrows into spatial polygons. In total, we mapped 1,883 novel acres in the western portion of Chalk Mountain.

During mapping, we collected a single prairie dog carcass which tested positive for sylvatic plague. After consulting with experts, partners at BLM, FWS, USDA-WS, and WGFD acted quickly to apply pesticide and reduce the ability for plague to spread. We treated 924 acres centered on the area which has produced the most litters in the last several years. In 2026, we will monitor the colonies closely and determine if subsequent treatment is necessary.

Ferret Spotlight surveys

As in every year, we performed nocturnal spotlight surveys to quantify abundance of ferrets and number of litters produced. We spotlighted in August through September, when kits are leaving their mothers and are most active above ground. Each surveyor searched a plot of 500 – 800 acres (dependent on the number of fencelines or other obstacles). Between 2200 and dawn over 3 consecutive nights, surveyors used powerful spotlights to locate the emerald green eyeshine characteristic of ferrets.

Each ferret we observed was recorded and a trap was deployed. We then checked deployed traps hourly until ferrets were captured or dawn, whereupon we removed traps.

Since 2020, due to concerns about ferrets' susceptibility to COVID-19, WGFD suspended full workups (e.g., anesthesia in an enclosed space, PIT tag implantation). Additionally, we asked prospective surveyors who tested positive for COVID-19 or felt ill not to attend the effort, and each person on hand wore N95 masks and nitrile gloves to minimize the potential for disease transfer from human to ferret. To minimize transfer of disease between ferrets, we sanitized all equipment (e.g., traps) with chlorhexidine between animals.

When we captured a ferret, we performed a minimal workup at the site of capture with the ferret remaining conscious and in its trap. After inspecting the ferret for injury, illness, and general body condition, we noted the sex and age. Second, we scanned for a PIT tag to indicate origin and year of birth, then vaccinated the ferret against sylvatic plague and canine distemper. We then marked each ferret with unique symbol using a non-toxic animal marker to enable easy subsequent identification. Finally, we applied 2 sprays of topical Frontline (0.29% fipronil), which granted protection from fleas and ticks for 1–2 months. We then released the ferret into the burrow from which it was captured.

In 2025, we surveyed in newly discovered areas or locations we have not visited in several years. In total, we expended 443 hours of effort across 10,214 acres. We located at least 24 ferrets and 3 – 4 litters. Of these, we captured and vaccinated 13. We located more ferrets at Chalk Mountain compared to previous years, likely due to our efforts to establish the area as a self-sufficient source of ferrets with supplemental releases. At Bone Creek, where we have also released ferrets recently, we located 1 – 2 ferrets, but could not capture any. Bone Creek contains quality habitat and predator densities comparable to the rest of Shirley Basin, but ferrets are not remaining in the area. Depending on the results of spotlighting in 2026, we may divert resources to other, more productive locations within the basin.

Ferret releases

To help establish Chalk Mountain and Bone Creek as population sources, FWS allocated 20 captive-bred ferrets to our recovery efforts in 2025. Additionally, FWS provided many extra due to the record-breaking captive breeding season. All told, we released 58 ferrets shortly after spotlight surveys, which allowed the newly released ferrets to become familiar with their surroundings and to begin establishing home ranges of their own before the onset of winter.

We released 41 ferrets (19 male:21 female) near Chalk Mountain and 17 (11 male:6 female) near Bone Creek. The precise location of each release depended on several factors. We released ferrets in high quality habitat close enough to allow interaction, but distant enough to prevent immediate territorial disputes, which can result in mortalities. Additionally, we selected release locations to maximize reproductive opportunities. For example, if we located a lone female which did not reproduce and no males during spotlight surveys, we could release one or more male kits in the vicinity.

The Shirley Basin Reintroduction Area appears stable, and ferrets are increasing in number near Chalk Moun-



A litter of Black-footed Ferrets watches another approach out of the darkness at the Meeteetse Reintroduction Area. Photo by WGFD.

tain. Next year, we will complete updating maps of prairie dog colonies in known ferret areas and investigate the use of drones to greatly speed up the process. The Nongame Section will also continue monitoring prairie dogs and ferrets to enable fast response to potential population crashes, particularly as plague mitigation resources free up from elsewhere in the state. We are confident Shirley Basin will continue to support ferrets for the foreseeable future.

Meeteetse Reintroduction Area (MRA)

The MRA was established in 2016 and brought ferrets back to the same lands where the species was rediscovered in 1981. It is primarily private but interspersed with some BLM and WY State Trust lands.

Plague mitigation

At its inception in 2016, 6,256 acres of the MRA was active White-tailed Prairie Dog colony. Nongame Section personnel documented wild breeding each year from 2016-2018. However, a sylvatic plague epizootic was detected in 2018. Hundreds of acres of prairie dog colony were subsequently lost, the abundance of ferrets dropped, and only a single ferret was detected during annual monitoring in 2020.

It is through the combined efforts of WGFD, BLM, USDA-WS, FWS, and the Smithsonian Institution that ferrets and prairie dogs continue to persist on the MRA. Each year since 2016, the interagency group has collaborated to apply deltamethrin dust and fipronil coated grain to prairie dog burrows. These pulicides suppress invertebrate ectoparasites like fleas and ticks, which transfer sylvatic plague between animals, and inhibit the disease's ability to spread.

Due to a federal hiring freeze, USDA-WS could not hire a plague mitigation crew in 2025. Using other personnel as available, we treated 2,955 acres. We focused on the central regions, where most prairie dogs and ferrets remain. In total, we deployed 183 pounds of deltamethrin and 5,725 pounds of fipronil coated grain. We are confident this interagency effort has averted a catastrophic loss of prairie dog populations, and will continually assess the need for treatments in future years.

Prairie dog monitoring

We documented a post-sylvatic plague outbreak maximum density of prairie dogs in 2022. Since then, density has declined, likely due to the drier-than-normal spring of 2025.

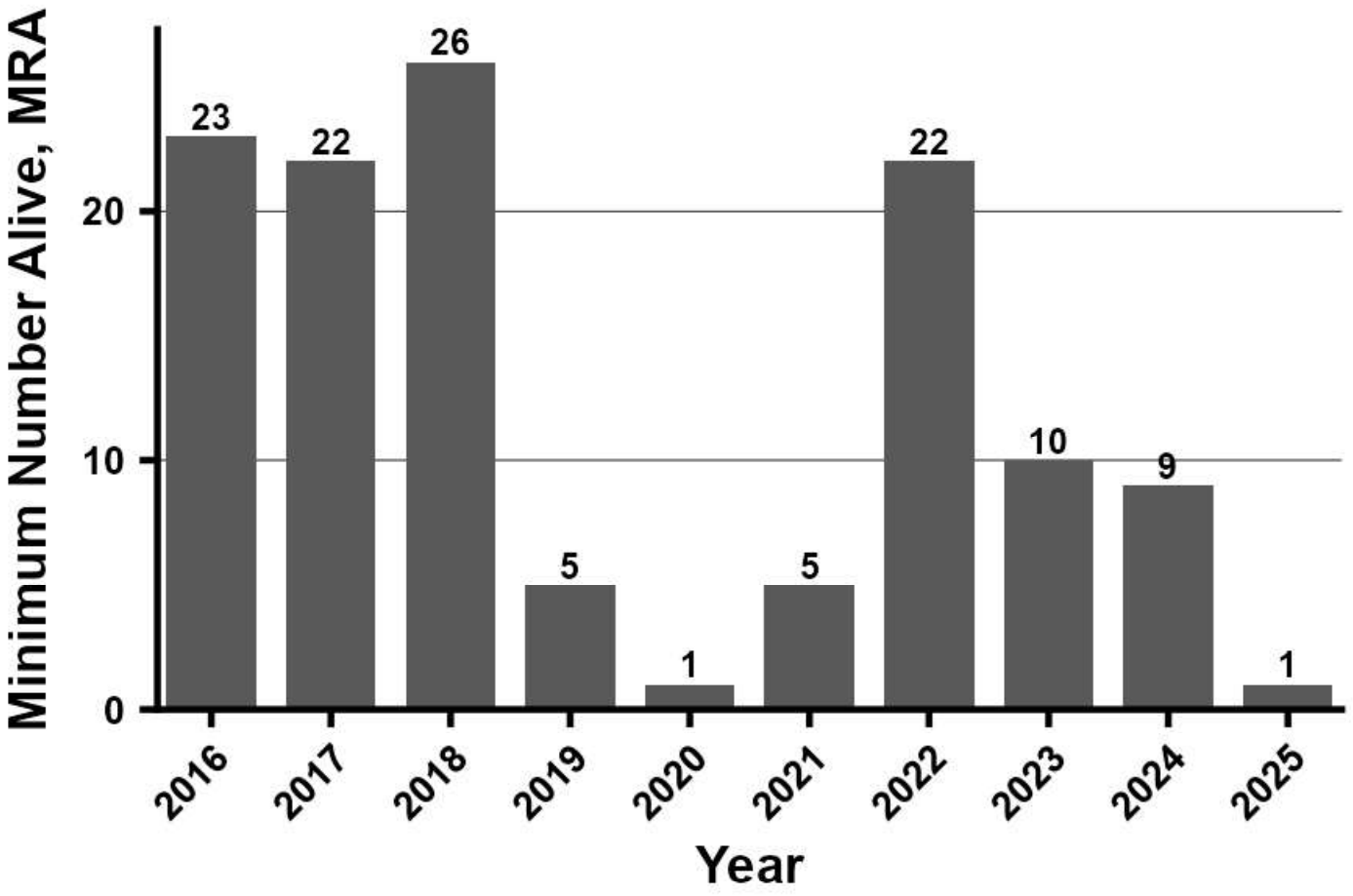
We again surveyed for prairie dogs, using the same methods as in Shirley Basin, and noted a decrease in density compared to 2024. Across 15 monitoring plots, density of prairie dogs ranged from 0.0 to 2.52 prairie dogs per acre, with an average of 0.65 per acre.

In treated areas where prairie dogs weathered the epizootic, they remain on the landscape. While we have not detected any signs of active plague in the last several years, the exceptionally dry weather since 2022 have resulted in a decrease in density approaching that of the worst of the epizootic. Management options to mitigate drought are limited; we intend to continue to support the MRA with plague mitigation and aid recolonization of lost colony by pre-digging burrows, encouraging prairie dog expansion.

Spotlight surveys

Personnel expended 295.75 hours surveying 4,551 acres at the MRA. This acreage is larger than the amount of colony present, but as ferrets must traverse areas lacking prairie dog burrows, we too surveyed these areas. Using the same protocols as in Shirley Basin, we observed 1 ferret which was not captured. While there are likely more that went undetected, we can account for only 1 ferret at the MRA in 2024—the lowest since 2020.

The minimum number of ferrets alive at the Meeteetse Reintroduction area is determined by annual spotlighting surveys.



Drought conditions impact prairie dog body condition, which in turn reduces the number of pups produced. As ferrets depend on pups as a source of easy prey, particularly during the reproductive season, ferret recruitment is subsequently impacted by drought as well. It is likely these conditions were a primary driver of the sharp decline in ferrets on the landscape. The winter of 2025 – 2026 was the warmest and driest in Wyoming's recorded history. While winter kill was likely low, the lack of snow indicates vegetation may not be as lush. Unless late spring and summer rain is prevalent, it is likely 2026 will be another challenging year at the MRA. However, we and our agency partners will continue supporting the prairie dogs and ferrets with the tools available.

Ferret releases

Shortly after spotlighting, we released 10 captive-bred ferrets (6 male:4 female) to ensure the remaining ferrets have ample reproductive opportunities. Releases are targeted at high quality habitat which can support but are currently vacant of ferrets, and the timing allowed the newly released ferrets to become familiar with their surroundings and to begin establishing home ranges of their own before the onset of winter.

In 2026, we will continue to monitor ferret habitat and population status in both reintroduction areas. In Meeteetse, we will continue to treat and monitor the sylvatic plague epizootic, as well as release captive-bred kits to support the area's recovery. In Shirley Basin, we will update or create maps of prairie dog colonies in west Chalk Mountain as well as evaluate the efficacy of unmanned aerial drones and artificial intelligence to automate the process.

Prepared By: Andrew Gygli, Small Carnivore Biologist
Funding Source(s): U.S. Fish and Wildlife Service State Wildlife Grant, U.S. Fish and Wildlife Service Section 6 Grant, Bureau of Land Management Grant, Wyoming Governor's Big Game License Coalition Grant, Smithsonian Institution funds



Black-footed Ferret. Photo by Nicole Mittman.

American Pika Surveys by Community Scientists

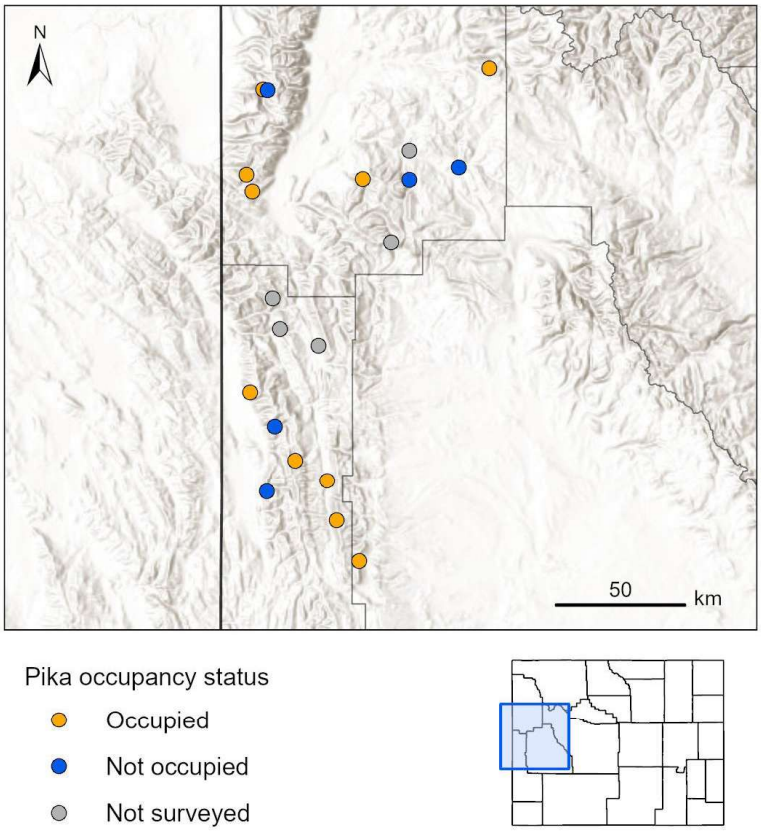
The America Pika is a small lagomorph that occupies rocky talus slopes of alpine and subalpine habitats of the western United States. In Wyoming, their range includes high elevation habitats within the Central Rocky Mountains, Snowy Range, and Bighorn Mountains. Pikas have a narrow thermal tolerance, relying on interstitial spaces between rock structures to thermoregulate on warm days and a thick layer of snow cover for thermal stability in the winter. Pikas do not hibernate; rather, they cache vegetation as haypiles to survive the winter months under talus rocks covered by snowpack.

Pikas have relatively low fecundity, and their dispersal ability is limited by their low tolerance for heat and specialized habitat needs. Because of their unique physiology and reliance on specific geographic and thermal characteristics for survival in alpine habitats, pikas may serve as an indicator species to detect the ecological effects of climate change. Fluctuations in pika populations over time may also signal changes in alpine habitat quantity and quality.

Based on growing concerns regarding the effects of climate change on population and habitat persistence, pikas were petitioned for listing under the Endangered Species Act in 2007 and 2016. In both cases the US Fish and Wildlife Service determined listing was not warranted, due in part to a lack of range-wide data on population trends and response to climate change. To initiate the collection of long-term trend data at a statewide scale, the Nongame Section developed and implemented occupancy surveys for pikas in 2020 and 2021. We selected survey sites from a spatially balanced sample of potential sites, which we then evaluated based on suitable habitat characteristics and accessibility.

While baseline efforts were successfully completed, statewide surveys in remote areas proved to be challenging and labor-intensive. We quickly identified that efficiency and the feasibility of repeat surveys would be improved through greater collaboration and incorporation of local knowledge. Given the need for increased capacity, we prioritized pika monitoring for community science engagement under a new partnership between Jackson Hole Wildlife Foundation (JHWF) and the Nongame Section.

American Pika detection results from 2025 occupancy surveys conducted by community scientist volunteers with Jackson Hole Wildlife Foundation.



JHWF recruited volunteers for pika surveys at a subset of the statewide survey sites within Teton, Sublette, and Lincoln counties. In the first year, sites were constrained to those requiring less than 5 miles of hiking round trip. Volunteers followed Game and Fish survey protocols in which they recorded pika calls and sightings, along with the presence of haypiles and other sign during a 30-minute survey period.

Of the 20 selected sites, surveys were attempted at 17 sites and were completed at 15 sites. Ten locations were currently occupied by pika, yielding a naïve occupancy rate of 66%. A total of 25 volunteers participated in surveys.

The proportion of occupied sites will be compared over time as surveys are conducted annually by volunteers, which contributes important temporal trend data and context for broad scale efforts. Additionally, these efforts enhance public engagement through hands-on participation. Feedback from JHWF volunteers was positive, and we plan to expand survey efforts in 2026.

Prepared by: Dana Nelson, Nongame Mammal Biologist
Funding source: Wyoming Governor's Big Game License Coalition

An American Pika atop a haypile which will be used as an overwinter food source. In addition to calls and visual observations, community scientists record the presence of pika sign, such as haypiles and scat. Photo by Rachael Dunlop, Volunteer, Jackson Hole Wildlife Foundation.



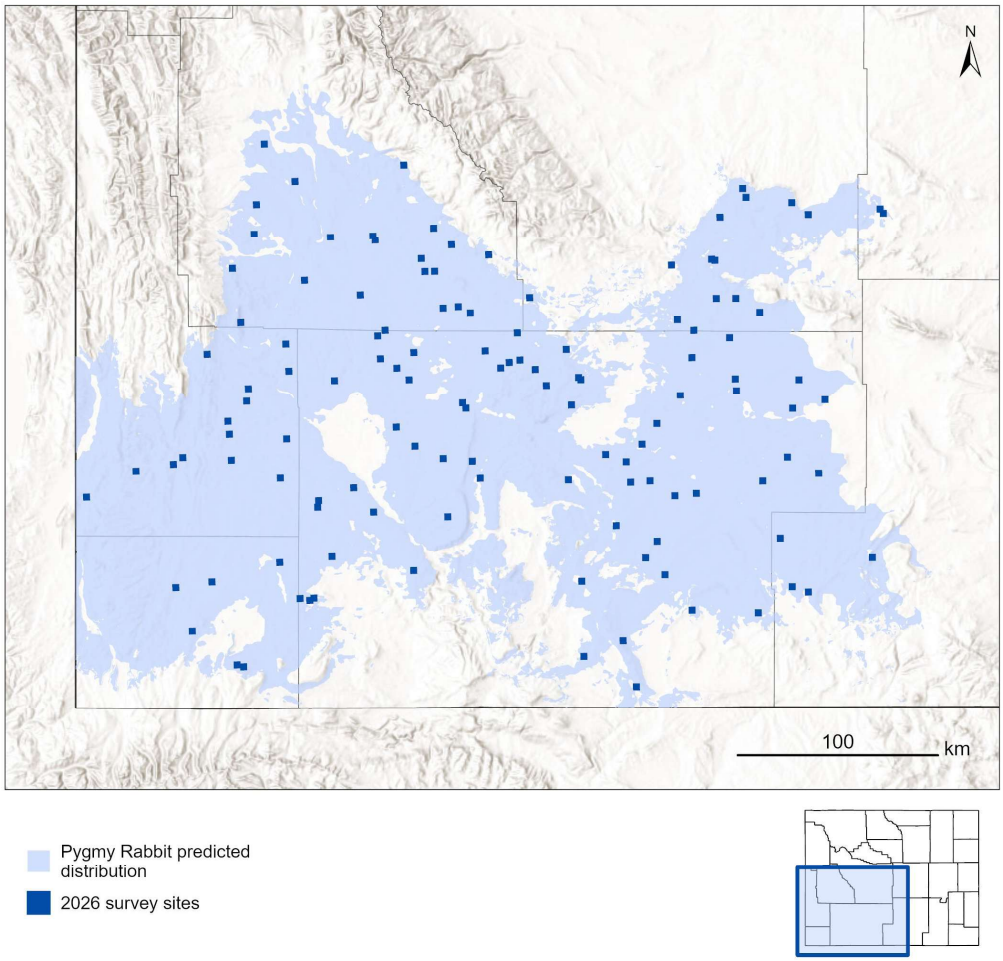
Pygmy Rabbit Distribution and Occupancy

The Pygmy Rabbit is a small lagomorph dependent on sagebrush for food and cover. Pygmy Rabbits are most commonly associated with areas of dense, tall sagebrush with deep, friable soils, as the species builds and maintains extensive burrow systems with entrances at the base of sagebrush. Pygmy Rabbit diet varies through the year, but sagebrush is a dominant food source in all seasons and may comprise up to 99% of their diet in winter.

Because of their reliance on sagebrush, Pygmy Rabbits are at risk of habitat loss due to the cumulative stressors degrading and fragmenting sagebrush systems. Additionally, lethal and highly contagious rabbit hemorrhagic disease (RHDV2) poses another threat to Pygmy Rabbit populations.

Pygmy Rabbits have been considered a Species of Greatest Conservation Need in Wyoming since 2005, and were petitioned for listing under the Endangered Species Act for the second time in 2023. In January 2024, the United States Fish and Wildlife Service completed a 90-day review of this petition and initiated a full 12-month status review.

In 2013, the Nongame Section implemented a protocol to evaluate Pygmy Rabbit occupancy across their distribution in Wyoming. The protocol involves systematic searches for Pygmy Rabbit sign (i.e., tracks, burrows, pellets) across 400 m x 400 m grids. Surveys take place between January and March to maximize sign detectability and to minimize overlap with juvenile cottontails, whose sign is easily confused. The survey was designed to be repeated periodically to monitor population trends and to quantify factors that influence Pygmy Rabbit presence, and, as planned, we repeated surveys in 2019. Because an updated evaluation of Pygmy Rabbit occupancy is necessary to assess current population status, we repeated these surveys in 2026.



Locations where surveys for Pygmy Rabbit sign were conducted between January 6- April 8, 2026 relative to the predicted Pygmy Rabbit distribution in the state.

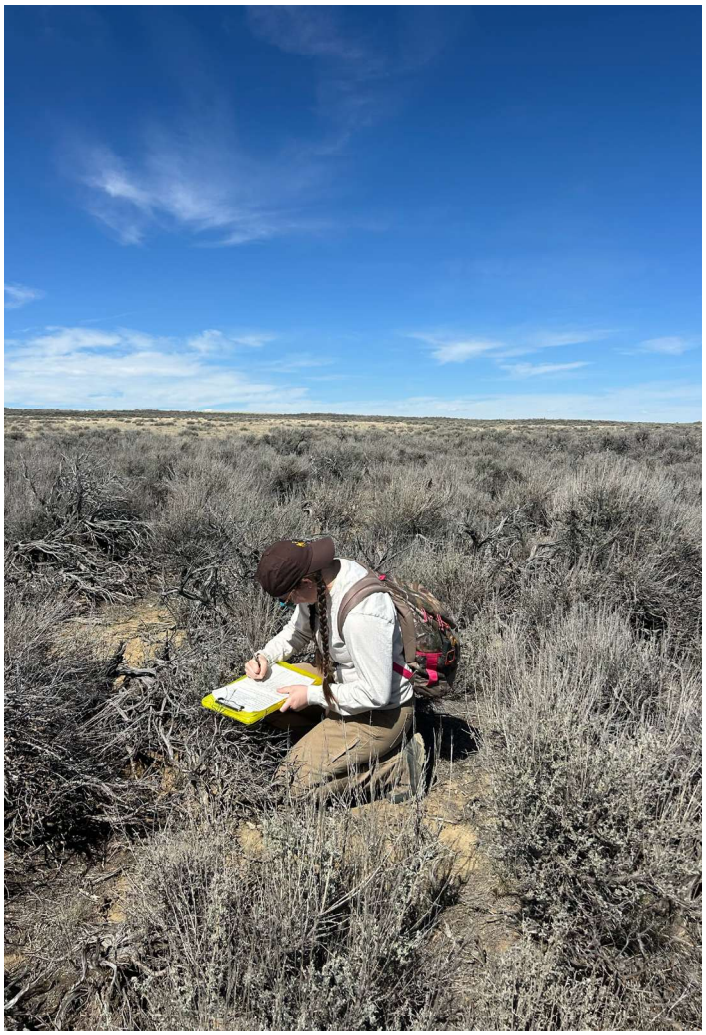
In addition to sites that had been visited in previous years' survey efforts, we selected 45 new spatially balanced sites from within predicted Pygmy Rabbit distribution in Wyoming to improve statistical power and our ability to detect changes in population status. Between January 6 and April 8, we visited 126 survey plots throughout Pygmy Rabbit distribution.

Winter 2025-2026 was exceptionally dry, which resulted in uncomplicated travel and access to a large number of survey sites. However, minimal snow cover can result in lower detectability of sign and reduced confidence that sign is recent. When we encountered sign, we recorded whether pellets, digging, and tracks appeared fresh. We will only include fresh sign and observations of Pygmy Rabbits in estimates of occupancy, for which analyses are underway.

Prepared by: Dana Nelson, Nongame Mammal Biologist
Funding source: U.S. Fish and Wildlife Service State Wildlife Grant



Pellets on top of freshly fallen snow indicate current Pygmy Rabbit occupancy at a survey site near Sweetwater Station in 2026.



University of Wyoming student Tavia Ossa records information on Pygmy Rabbit sign detected near Rawlins. Members of the University of Wyoming student chapter of The Wildlife Society learned how to conduct surveys and identify Pygmy Rabbit sign.



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