

THE ROOST

Annual Newsletter of the Owl Research Institute

NOVEMBER 2025 - VOLUME 29

Photo© Daniel J. Cox/NaturalExposures.com



Who We Are

The Owl Research Institute (ORI) is dedicated to owl conservation through research and education. We are a non-profit, 501(c)(3), tax-exempt organization, established in 1988. Our headquarters are located in Charlo, Montana on the Flathead Indian Reservation.

ORI is funded by individual donations, grants from foundations and corporations, and occasionally agency contracts. We accept donations of real property, stocks, crypto, and DAF grants. Please consider us in your estate planning. Donations are tax-deductible to the extent of the law.

What We Do

We conduct long-term field research on owls, their prey species, and their relationship to the habitat in which they live. We use this data to provide information for maintaining stable populations. Additionally, we collaborate on academic projects, educate the public about owls, and provide research results to land management agencies and conservation partners.

This issue of *The Roost* was designed by Jeanna Clifford and printed in Montana by Advanced Litho. Thanks to Mission Valley Printing for their assistance. Content by Denver Holt, Beth Mendelsohn, Adam Potts, Hayley Madden, Solai Le Fay, and Gabriela Mendes. Cover: Great Gray Owl with chicks. Photo: Daniel J. Cox/Naturexposures.com.



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Great Gray Owl delivering prey to chicks.
Photo: Melissa Groo

Denver next to the ice far north of the Arctic Circle near Utqiagvik, Alaska (Formerly Barrow).



Automated Recording Units (ARUs), nests were hard to find in 2025. See pg. 12. Nonetheless, we were able to mount a live camera on one Great Gray Owl nest. See pg. 14.

On the contrary, 2025 was a great year for small owls. We used good old-fashioned night survey techniques and exhaustive boots-on-the-ground nest searches to locate owls. Boreal Owls nested again in 2025; and Pygmy and Saw-whet owls had the highest nest counts ever. See pg. 10. Several years ago, we initiated surveys for Western Screech Owls in western Montana. In 2025, our teams located numerous territories, and a few nests. See pg. 7.

In 2024, the ORI initiated the oversight of the Global Owl Project's Burrowing Owl study in Oregon. In 2025, the ORI financed in part, a graduate student study. See pg. 4.

The ORI maintains some of the longest field studies of several North American owl species. And over the past two seasons, we have been analyzing data and writing papers. To help in data management and analysis, we brought in a part-time statistician volunteer. See pg. 21.

In October, five of our team attended the Raptor Research Conference in Costa Rica and gave talks. See pg. 23.

Because of their unique looks and wide-spread public appeal, the ORI is promoting owls as indicator species of habitat health, and surrogates for other wildlife species. See pg. 22.

Our Annual Newsletter is our primary source for generating funding to continue our long-standing projects: field research, education, and conservation of owls and other species of wildlife. Please consider a donation to help support or match grants. Thank you and pass the newsletter on when you're done reading it.

Denver Holt, Founder

Message from the President

Greetings from the ORI. It's been a beautiful autumn here in the Mission Valley, MT, as we were spared much of the smoke from western wildfires. I'll summarize our 2025 field season. For more detail, refer to the page numbers.

Between my home and the ORI Field Station we had four raptor nests in less than a square mile: 2 Great Horned Owls, 1 Osprey, 1 Red-tailed Hawk. Of these, 1 Great Horned nest failed, while the other fledged 3 chicks, the Osprey fledged 2 chicks, and Red-tails fledged 2 chicks. Not bad.

The breeding season of 2025, was distinctly variable. There were zero Snowy Owl nests at our Alaska breeding site. See pg. 16. And, back in Montana, after a big breeding year in 2024, few Short-eared Owl nests were found in 2025. See pg. 15.

Although we detected numerous Great Gray Owls using

2024/25 Publications

A Worldwide Review of Snowy Owl Feeding Ecology: The Importance of Lemmings and Voles in a Changing Climate

D.W. Holt, M.D. Larson, M. Seidensticker and S.P. Hiro. 2024.
Birds 5(3): 341-351 DOI: 10.3390/birds5030022

Winter Roost Site Characteristics Morphometrics, and Diet of Northern Saw-whet Owls (*Aegolius acadicus*), in

Open-Country Habitats of Western Montana

S. S. Le Fay, M.D. Larson, S.P. Hiro, B. Mendelsohn, D.W. Holt
Northwestern Naturalist - December Issue 2025.

Breeding Snowy Owls are Obligate Lemming Predators in Utqiagvik, Alaska: Results from 30 Years of Study

D.W. Holt, M.D. Larson, M. Seidensticker and S.P. Hiro. 2025
Diversity, 17, 209.



Photo: Kurt Lindsay



Restoring Burrowing Owls at Weapons Depot

HISTORY OF THE PROJECT

In north-central Oregon, bordering the Columbia River in the Morrow and Umatilla counties, sits a former chemical weapons depot. Sprinkled with 1,001 half-buried storage bunkers called “igloos”, the site was opened in 1941 and served as a US Army installation that stored supplies, munitions, and about 12% of the country's chemical weapons in the 1960s. Between 2004 and 2011, the Army incinerated all chemical weapons on site and the land was subsequently divided between the Oregon Military Department and the Columbia Development Authority, including the Port of Umatilla, the Port of Morrow, Umatilla and Morrow Counties, and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

To date, the westernmost portion of the land is operated as the Rees Training Center by the Oregon Military Department, and much of the easternmost portion of the land is in the process of being transferred back to the Tribes to be conserved as wildlife habitat. Another type of unexpected storage container lies buried underground across both sides of the former Depot: a network of artificial burrows fashioned from old plastic juice barrels, corrugated pipe, and buckets.

These artificial burrow systems were designed and

installed by David Johnson of the Global Owl Project to serve as an emergency recovery project for the diminishing population of Burrowing Owls on the land. By the early 2000s, the former Depot's Burrowing Owl population had dwindled to the last 3-4 breeding pairs, due to the local extirpation of the site's badgers. The badgers excavate the burrows, which the owls were reliant on for nesting sites. In an effort to keep the remaining Burrowing Owl population from disappearing, David Johnson designed and began installing artificial burrow systems in 2009. With the easy access to the sites, innovative design of the artificial burrows, and effective trapping techniques, the artificial burrow colony at the former Depot presented an opportunity for long-term monitoring and detailed data collection with minimal disturbance to the owls.

Over the years, the number of artificial burrow sites installed across the former Depot increased, and with them the Burrowing Owl population rebounded. Once fully established, the artificial burrow colony at the former Depot exceeded 90 sites, and most breeding seasons saw nearly 50 breeding pairs nesting in the burrows. In 2024, the Depot experienced a record year for the Burrowing Owls, with every artificial burrow site in use (some even double occupied), over 100 nest attempts monitored, and 489 chicks banded.

Today, the project serves a multitude of purposes: a conservation success story, an important source population for Burrowing Owls in the Pacific Northwest, training grounds for biologists around the world, a platform for community outreach and education, and a long-term collaborative research and management effort. Those involved include non-profit groups, universities, the Oregon Military Department, and the Confederated Tribes of the Umatilla Indian Reservation, who renamed the tribal portion of the land Papuunmí Tanawtpamá Tičám, meaning “Home of the Burrowing Owl” in the Umatilla language.

2025 BREEDING SEASON

2025 marks a significant moment for the long-term owl study as, after 17 years, the leadership of the Burrowing Owl work is handed off from the Global Owl Project to the Owl Research Institute to continue supporting the conservation and research of Burrowing Owls at the site. Like 2024, this breeding season saw the burrows at full capacity. While some burrow sites had to be removed over the winter and others could not be accessed for the year, the remaining accessible burrow sites were all confirmed to house owls, and the vast majority of those owls attempted nests. In total, this year we monitored 81 nest attempts from 77 breeding pairs, caught 162 adult owls (87% of which were already banded) and banded 285 new chicks; these numbers are undoubtedly higher in reality when considering the 11 burrow sites that likely had breeding owls, but could not be monitored by the team. With nearly every breeding adult caught and identified, the high percentage of adults that return to the site banded, and the number of newly banded chicks joining the population each breeding season over the past 17 years, the amount

of Burrowing Owl band recapture data that comes from this project is unlike any other (Figure 1, pg. 6).

It is clear over the last two years of this project that the Burrowing Owl population has drastically expanded at this study site. With the recent removal of 8 burrow sites and all other sites full, adding new burrows to Papuunmí Tanawtpamá Tičám in the coming years will allow for more owls to move in and breed, further supporting this site and other nearby Burrowing Owl populations as individuals disperse to breed elsewhere.

The Burrowing Owl Project is special not only for the conservation success and immense data collection, but for the potential for education and outreach - and 2025 stands apart as a banner year. With the close access to sites, ample numbers of owls, ease of handling and banding chicks, and accessible terrain, the Burrowing Owl Project allows guests of all ages, abilities, and backgrounds to join biologists in the field for education and a nearly-guaranteed close-up experience with this charismatic species.

This year, we welcomed visitors from 5 countries and 5 states on many educational field trips, consisting of owl handling and banding, morphometric measurements, nest checks, chick aging, adult trapping, and burrow installation. Our guests ranged from students, military personnel, Tribal members and scientists, environmental consultants, filmmakers, visiting researchers, the local Audubon society, and other many other community members, providing individuals with a sense of pride and ownership over the project. In addition to one-off visits, many individuals were trained on owl handling and banding to aid their careers in wildlife research and conservation. With the project being

Hundreds of visitors had a chance to participate and view the banding and measuring process. View a 1 min. video clip here of our process. One military person was overheard saying, "Besides my son being born, this was one of the best experiences of my life."

YouTube





kept on through the Owl Research Institute, these training and educational experiences can continue to be provided for the years to come.

COLLABORATION WITH THE TRIBES AND FUTURE

Like so many of the Owl Research Institute's projects across Montana and Alaska, the Burrowing Owl Project has been closely collaborative over the years with the local Tribes. Whether working on Tribal land, being assisted in the field by Tribal biologists, or learning about the cultural and historic significance of the land, flora, and fauna, this project has greatly benefitted from the support of the CTUIR. Meaningful environmental work requires one to understand the environmental system they're working within, not only through spending time within that environment, but with the people connected to it—particularly with those whose histories and cultural knowledge are tied to it.

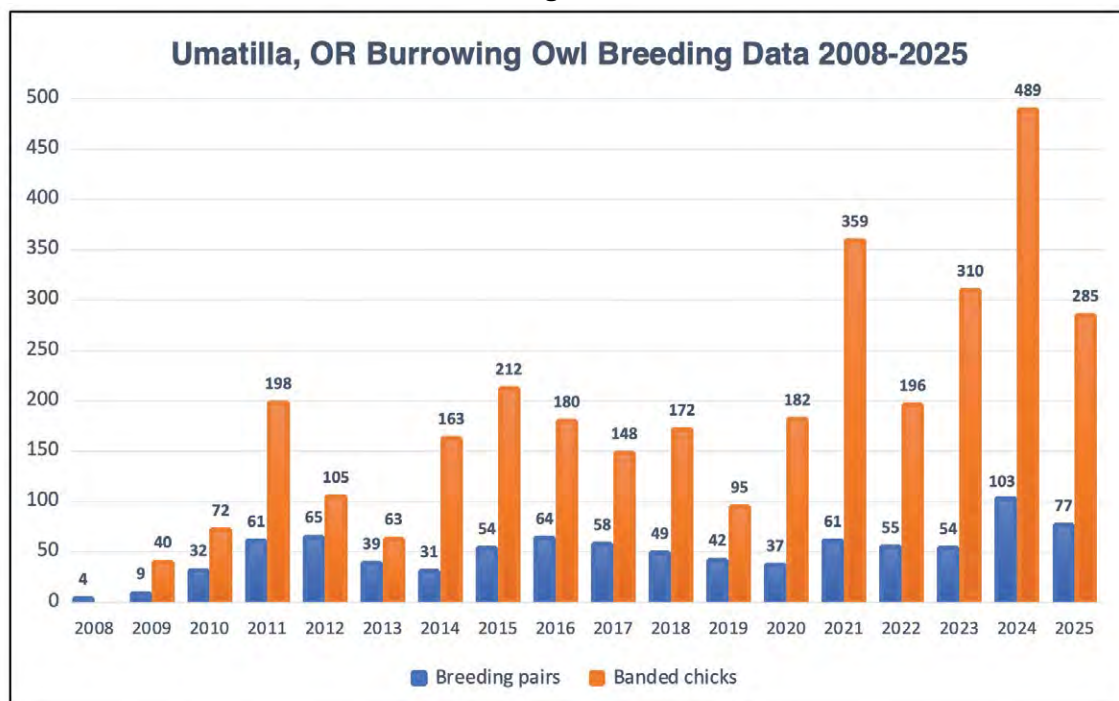
For many members of the CTUIR, the Burrowing Owl Project is a source of pride. Having recovered the population in the region from near-local extirpation, the project has served an important purpose, albeit through unnatural means. To some members of the CTUIR, the continuation of the project on Papuunmí Tanawtpamá

Tičám is seen as a temporary solution to the larger issue of restoring the degraded land back to its natural and healthy state. In regard to the Burrowing Owls, this means seeing badgers return to the land in numbers great enough to sustain a colony of owls nesting in natural, badger-dug burrows and eventually removing the artificial systems from the ground. While this inevitably would mean the end of the site's Burrowing Owl research system as we currently know it, this vision for the population is mirrored with that of David Johnson, who has long-stated his hope to eventually be "put out of the burrow-digging business".

Though the project was never intended to last as long as it has, the loss of the site's badgers has outlived expectations. However, miraculously without intervention or relocation efforts, the first badger on the former Depot was spotted in 2023, and the discovery of 4 natural, badger-dug Burrowing Owl nest sites in 2024 and 7 in 2025 marks the beginning of a new era for the project and opens the doors for future research at the site. The CTUIR's support for the recovery of wildlife as a whole on the land will involve the removal of fences blocking movement, the restoration of native vegetation communities, and the collaborative efforts of the Oregon Military Department, who share the land that the owls, badgers, ungulates, insects, grasses, fire, and all other components of the local ecosystem freely move throughout.

— Solai Le Fay

Figure 1.





Western Screech Owl chick on branch. Photo: Matthew O'Connor

Screech Owls: a Volunteer's Journey of Listening & Learning

Fifteen years ago, I started hearing the “bouncing ball” song of the male Western Screech Owl, *Megascops kennicottii*, echoing through the riparian areas of a nearby creek just after sunset. The “bouncing ball” is a single note that increases in rate and volume over a three second repeating interval.

The rhythmic and soothing sound brought back memories of another birdsong from my Midwest upbringing — the call of the Whip-poor-will.

When I heard the Western Screech Owl in Montana, near this same creek, my friend and neighbor Steve Hiro encouraged me to “find the nest.”

Steve is an expert on Northern Pygmy Owls. About 10 years ago, he installed a couple of screech owl boxes in the area, but they have remained vacant.

This spring, Adam Potts was assigned to start a WSO study by ORI. In late March, Adam, Steve and I went out to the riparian region, where the forest meets the stream, after sunset to

listen for the owls. The area along the creek spans approximately three acres, a blend of cottonwoods and arching hawthorns. Adjacent to the thicket lies a four-acre field. Almost as soon as we arrived, we heard the sound of the male’s “bouncing ball.” The female soon called back in response. Her beautiful whinnying song was quieter and more subtle than the male’s. They called back and forth within 20 feet of where we stood.

For the next six weeks, Adam and I met before dawn and right after sunset in various regions of this creek area. We came incredibly close to a male who often patrolled the low-lying hawthorns, which provide good protection from Great Horned Owls nearby. We discovered where he roosts, and captured photographs of him in the daylight. We even collected his discarded pellets and inspected the remnants of voles and insects that made his last meal.

Around the same time, a family of

GHOs took up roost in a mistletoe patch on a Ponderosa Pine at the end of the drive in our neighborhood. Neighbors began gathering beneath it, delighted by the new inhabitants. On one lucky occasion near the nest, I overheard a young man on a bicycle exclaim, “That’s the second owl nest I have seen today.” I quizzed him about the first nest he saw and deduced that it may have been occupied by a Western Screech Owl. I went to investigate the location he named up in a nearby recreation area, and sure enough, there it was, a Western Screen Owl nest 15 feet up a larch tree along the creek facing west.

Discovering this nest invigorated our search. Adam identified three more pairs of Western Screech owls, for a total of 5 pairs along this creek. We placed several of Troy Gruetzmacher’s Owl Sense Bioacoustic Recorders at these sites, which were a great help. Troy is a staff member at ORI. One morning in mid-May, I went out before



Well camouflaged female Western Screech Owl. Photo: Matthew O'Connor

dawn to the original site and the mystical whinnying of the female near the field along the creek. The sound bounced around me in a 200-meter circle. Just as dawn crested the clearing, I locked in on the female with my binoculars. I watched her high up on a cottonwood branch, and then, she entered a cavity!

I positioned a spotting scope on the cavity and monitored the site three times a day for the next two weeks. It was stupendous. Just before sunset, the female appeared at the mouth of the hole, blending seamlessly into the cottonwood bark. A week later, little owlets emerged from the cavity,

resembling sock puppets. The owlets then starting branching. They arrived as creek runoff peaked, and the sound of the water drowned out their begging calls, possibly protecting their vulnerable bodies from predators.

Soon after, the altricial owlets began flying to nearby trees. They flew farther as their pectoral muscles developed and demonstrated more athleticism. There were four owlets in total, but one lagged behind, slow to leave the nest. Unlike songbirds, some raptors are raised as they hatch from their eggs and are sometimes several days to a week apart. For the next two weeks, the owlet group traveled in a pack around the small thicket.

I watched as they left their roost at sunset and followed their begging calls. The adult owls delivered food in miraculous abundance. Once, an entire baby squirrel was deposited and devoured by the owlets. One of the parents minded the late bloomer while the other tended to the threesome. After two weeks, the family moved approximately 400 meters away to another stand of woods along the creek.

We could hear their begging calls, but their flight patterns became more adult-like and harder to follow. After one month, the begging sound ceased, and the only remaining sign

was the “bouncing ball” song of the male, who sent his offspring on to their own territories.

As I reflect on the spring, I see how much I learned by just sitting still and listening. It was meditative and soothing. Given the uncertainty of current events, I welcomed, and maybe even needed this change. Wendell Berry wrote this bit of wisdom.

“When despair for the world grows in me and I wake in the night at the least sound in fear of what my life and my children’s lives may be, I go and lie down where the wood drake rests in his beauty on the water, and the great heron feeds.

I come into the peace of wild things who do not tax their lives with forethought of grief. I come into the presence of still water.

And I feel above me the day-blind stars waiting with their light. For a time I rest in the grace of the world, and am free.”

And Emily Dickinson penned, “Hope is the thing with feathers ...”

— Phil Gardner is an ear, nose and throat physician in Missoula, Montana. He and his wife Julie raised three daughters appreciating birds and their habitat. [Thank you to Gillian Dohrn for editing].



Photo: Troy Gruetzmacher

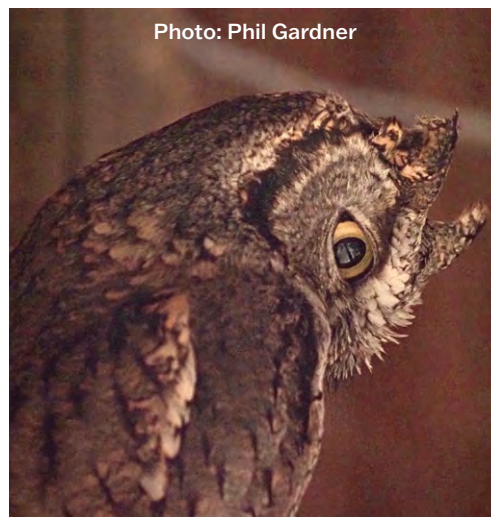


Photo: Phil Gardner



Photo: Matthew O'Connor



TOP ROW: Four stages of growth in Saw-whet Owl chicks. BOTTOM ROW: Four stages of growth in Boreal Owl chicks.

From Hatchling to Fledgling: Aegolius Owls

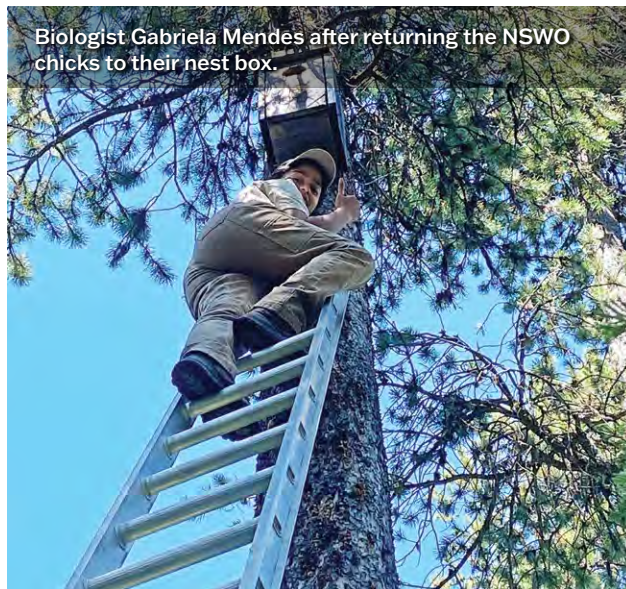
ASSESSING GROWTH AND MORPHOLOGICAL CHANGES IN YOUNG AEGOLIUS OWLS

The 2025 breeding season was particularly successful for *Aegolius* owls in western Montana. In biology, a genus is a way of grouping together species that are closely related in evolutionary terms and share common characteristics that set them apart from other groups, such as osteological and morphological traits. In North America, the genus *Aegolius* is represented by two species: the Northern Saw-whet Owl (*Aegolius acadicus*) and the Boreal Owl (*Aegolius funereus*). These small owls typically nest in cavities of live or dead trees (snags), but they also make use of artificial nests such as nest boxes, which facilitates the capture and monitoring of individuals and makes them excellent study subjects.

This year, we were able to launch a long-envisioned project at ORI: a photographic and descriptive guide documenting the development of chicks of both species. The purpose of the guide is to help researchers and others determine chick ages when the exact hatch date is unknown. For this project, we combined data collected in 2025 with information previously gathered by ORI, drawing on records

from more than 40 nests. Data were collected from hatching until fledging (approximately 1–2 to 31 days of age). Nests were visited every three days, and the chicks were carefully handled by trained professionals as part of a licensed research study. After photographs and measurements were taken, the chicks were also banded.

As the chicks developed, differences were observed in features such as eye color, cere color, bill color, feather length, and plumage type. Weight proved to be an unreliable characteristic for estimating the chicks' age, since natural weight fluctuations (for example, between a chick that had been fed prior to our visit and one that had not) can mislead researchers and create a false impression, with chicks of different ages sometimes weighing the same. Because female owls are generally heavier than males, sex-related differences can also make weight an inconsistent factor.



Biologist Gabriela Mendes after returning the NSWO chicks to their nest box.

For NSWO, we were able to photograph chicks at 33 different ages. The complete results of this study will be submitted in a scientific paper by Gabriela Mendes, et al. in 2026. Our results were also presented at the 2025 Annual Raptor Research Foundation conference in Costa Rica, in October 2025.

—Gabriela Mendes

Life of Snags and the Small Owls Who Rely on Them

Even though owls are among the most recognized birds of the forest, many people are surprised to learn that most owl species do not build their own nests. Instead, they depend on existing structures like natural cavities, clumps of mistletoe, stick nests made by other species, abandoned woodpecker holes, or broken treetops, to raise their young. This makes them particularly vulnerable to forestry practices and highlights the importance of preserving these critical features in our forests. Without suitable nesting sites, some species of owls may not reproduce, threatening their long-term survival.

In forests, life doesn't end when a tree dies, it transforms. One of the most critical, but often overlooked elements of healthy forest ecosystems is the snag, which is a standing dead or dying tree that remains rooted in place. While to some, snags may appear hazardous

or unsightly, these trees are lifelines for wildlife and indicators of sustainable forestry. They play a central role in the lives of many owl species, and their protection is crucial to biodiversity and ecological resilience across the country.

THE ANATOMY OF A SNAG

The term "snag" typically means it's a standing dead or dying tree formed through natural processes such as wind, lightning, disease, wildfire, insect infestation, or age-related decline. When a tree top snaps off, it's called a broken-top snag. As the top decays, it can serve as a nesting platform for larger owls like the Great Gray or Great Horned. Where a branch breaks off, a natural cavity can be created by decay processes. Other cavities are made by woodpeckers feeding on insects and drilling their own nest holes. These cavities can serve as homes for smaller species of owls such as Flammulated, Screech, Northern Pygmy, Boreal, and Northern Saw-whets, as well as other small mammals such as squirrels, bats, and insects.

DECODING SMALL OWL REAL ESTATE

Some of our recent research has focused on snags for cavity-nesting owls, particularly Northern Pygmy



Adult Saw-whet Owl peeks from its aspen cavity nest on right, photo: Daniel J. Cox/naturalexposures.com

and Northern Saw-whet owls. These studies reveal specific patterns in tree species preference, cavity dimensions, tree size and condition.

Data from over 100 nest cavities show that Northern Saw-whet Owl nests were found mostly in dead trees with bark still intact, most commonly being found in Quaking Aspen, Ponderosa Pine, and Black Cottonwood. These cavities average 3.5 x 4 inches in diameter, and each tree often hosts two or three cavities.

Northern Pygmy Owls, on the other hand, have a greater diversity of trees that they use, more often in live Western Larch, Black Cottonwood, and Quaking Aspen. Their cavity entrances are smaller, about 2.2 inches in diameter, and are typically found in trees with fewer number of cavities.

Continued...



Pygmy Owl peeking out of a cavity. Photo: Kurt Lindsay.

NORTHERN SAW-WHET OWL CAVITIES (3.5 x 4in)							
	TREE COUNT	AVERAGE DBH (INCHES)	TREE ALIVE	TREE DEAD*	BARK ON*	BARK OFF	AVERAGE CAVITY HEIGHT ON TREE
Western Larch	8	16	1	7	5	2	55%
Engelmann Spruce	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--
Ponderosa Pine*	14	17	1	13	9	2	62%
Black Cottonwood*	14	21	0	14	11	3	64%
Quaking Aspen*	27	16	9	18	20	6	61%
Douglas Fir	--	--	--	--	--	--	--
Western Red Cedar	--	--	--	--	--	--	--
* Most common				Average number of cavities is 2-3 cavities per tree			

CORNERSTONES OF BIODIVERSITY

Snags support far more than owls. Over 75 species of birds use cavities for nesting. Snags also provide perching and nesting sites for hawks, eagles, Osprey, ravens, and songbirds; denning locations for mammals; and homes for countless invertebrates. Woodpeckers excavate nesting cavities in these snags, which in-turn, become homes for secondary cavity-nesters, such as owls.

These old, standing trees become full miniature ecosystems. Removing them interrupts complex ecological relationships that often take centuries to establish. Yet many snags are still removed out of fear they may fall, become a fire hazard, spread diseases, harbor insects, or because they appear unsightly. That is why it’s important to know just exactly what types of trees and their characteristics to leave behind.

CHANGING THE NARRATIVE: FROM EYESORE TO ASSET

There is a growing need to shift public perception of snags. Rather than being seen as hazards or firewood, may they be recognized as vital ecological infrastructure. Sustainable forestry includes protecting snags during harvest and, when appropriate, even creating new ones by hollowing out the

This is an example of a Black Cottonwood tree with a Saw-whet nesting inside.



NORTHERN PYGMY OWL CAVITIES (2.2 x 2.2in)							
	TREE COUNT	AVERAGE DBH (CM / IN)	TREE ALIVE*	TREE DEAD	BARK ON*	BARK OFF	AVERAGE CAVITY HEIGHT ON TREE
Western Larch*	16	47 / 18	13	3	16	--	40%
Engelmann Spruce	4	31 / 12	--	4	2	2	68%
Lodgepole Pine	3	25 / 10	1	2	3	--	68%
Ponderosa Pine	2	41 / 16	1	1	1	--	39%
Black Cottonwood*	12	53 / 21	8	4	10	1	62%
Quaking Aspen*	14	35 / 14	11	3	14	--	34%
Douglas Fir	1	46 / 18	--	1	1	--	100%
Western Red Cedar	1	58 / 23	1	0	1	--	67%
* Most common				Average number of cavities is 2-3 cavities per tree			

bowls of broken-top trees, or by leaving dying trees in place to allow natural processes to occur for the future.

Several steps to promote snag conservation:

- Retain snags on property that fall within the best nesting characteristics whenever possible.
- Create snags by removing the tops of dead trees and hollowing the tops out, or letting them decay naturally.
- Share information with others about the importance of snags for wildlife.
- Advocate for forestry policies that incorporate snag retention.

SUSTAINABLE FORESTRY AND SNAG STEWARDSHIP

For family forestland owners in the Northwest, integrating snag conservation forest management plans is a tangible, effective step toward sustainability. We recommend people work with an arborist or professional forester who understands that wildlife habitat can yield long-term ecological benefits. Selective thinning, patch cuts, and wildlife tree retention strategies can be implemented to balance timber production with conservation. In addition, the habitat surrounding the snag is critical, e.g. a snag in a clearcut won’t support the same species, especially the Great Gray Owl, as a snag in a forest.

CONCLUSION

In the Northwest’s forests, snags harbor a variety of life even in death,

providing shelter, food, and breeding sites for the forest’s most secretive residents. Owls like the Great Gray, Flammulated, Screech, Northern Pygmy, Boreal, and Saw-whet depend on them, and in protecting snags, we protect an entire web of forest life.

Sustainable forestry is about the trees we choose to leave behind. Let’s leave the right ones.

— Jeanna Clifford

A version of this article was published in the summer edition of Northwest Woodlands Magazine, the theme of the issue was ‘Sustainable Forestry’ and went out to approximately 3,500 members of the Idaho Forest Owners, Montana Forest Owners, Oregon Small Woodland Owners, and Washington Farm Forestry associations.

This is an example of a Ponderosa Pine snag with multiple cavities ideal for small owls.





Female Great Gray Owl on nest with her two chicks, watched by thousands around the world on an ORI cam by Explore.org

OWL RESEARCH INSTITUTE
explore.org

Complex Nesting Ecology of Elusive Great Gray Owls

Over the past 5 years, the ORI team has invested a considerable amount of time and resources into locating and monitoring Great Gray Owl nests across western Montana. With field expertise, persistence, and hard work, the team discovered 25 nests, adding to a database that now includes 43 known nest sites, some documented by ORI and others by collaborators. Each nest found represents more than hours in the field, but seasons and sometimes years, of tracking owl activity across vast areas of forested habitat.

The work begins by listening for vocalizations and collecting thousands of hours of audio data. The recordings are then meticulously analyzed for the faintest signs of owl presence. Once owl activity is confirmed, the team methodically searches the area to gather more clues. Every potential nest structure, whether a broken-top snag or a stick nest built by another bird, is documented and mapped. This process involves hiking long transects over multiple days and return visits to determine whether a site is active.

To make things even more complex, Great Gray Owls may maintain territories even in years when they don't

breed, a behavior that can mislead even seasoned researchers. While some nests are found quickly with a bit of luck, others take years to uncover.

Each new nest found builds a clearer picture of one of North America's most enigmatic raptors and is the result of the knowledge and skill of the ORI team.

WHAT WE'VE LEARNED

The Great Gray Owl is the only *Strix* species, or wood owl, found across the globe, and it uses different habitats in different parts of its range. ORI's study was designed with conservation in mind, with the goal of answering key questions about the owl's nesting behavior and habitat needs in western Montana.

Population density: We found on average only 3 nesting territories per 20 square miles, an indication that these birds are hard to find within the study area centered on the Mission Valley. In some areas, we observed nests as close as 0.5 miles apart, indicating that higher densities of nests can occur locally when varying conditions coincide. Other areas that appear to be excellent habitat remain unoccupied by Great Grays.

Nest trees: Great Gray Owls used a near-equal mix of broken-top snags and stick nests (mostly built by Red-tailed Hawks). This ratio is especially interesting when compared across their range: in California they do not use stick nests at all, while in Alberta, about 90% of nests are stick nests. In Montana, both nest types had similar success in producing young owlets, although broken-top snag nests had slightly larger broods. Some owls showed flexibility, switching nest types between years, suggesting that other factors may drive nest choice (Table 1).

Table 1: Nest Types Used by GGOWs in NW MT

	Total	Percent	Nest height	DBH
Broken-top	17	59 %	10 m	26 in
Stick	12	41 %	20 m	24 in

Nest trees tended to be large and mature, with an average diameter of 25 inches in Western Montana. The average height for nest snags is around 32 feet, with a lot of variation from 18 to 65 feet. Stick nest canopy cover of 60%, often towering 100 feet tall, provided shade and protection. Broken-top nests were most commonly in Black Cottonwood trees, and stick nests were most often in Ponderosa pine, with Western Larch trees also important for both nest types. These insights can help forest managers make more informed decisions about habitat conservation (Table 2).

Site fidelity: Despite expectations, nests were rarely reused during the study. Out of all monitored nests, only



Two Great Gray Owl chicks sitting on nest. Photo: Melissa Groo

three (all broken-tops) were reoccupied within five years. Stick nests were less durable, with 45% blowing down or apart, compared to 27% of snag nests that fell. While snag-nests may have greater long-term value for nesting, stick nests are often rebuilt or added by hawks and corvids, providing new nesting opportunities. This dynamic nest landscape suggests that Great Grays do not necessarily rely on a single, consistent location, but rather make-do with a continual supply and re-supply of snags and stick nests. Effective conservation must account for the centuries-long natural processes that form snags, as well as the essential role that hawks and ravens play as nest builders.

HUMAN IMPACTS & HABITAT THREATS

We observed a close proximity of nests to logging roads, with the average of only 200 yards, and some as close as 10 yards. While this reflects the extensive network of old and new logging

Table 2: TREE SPECIES with Great Gray Owl Nests



infrastructure in our study area, it also underscores the effects that forest thinning and commercial logging have on nesting habitat. We've documented nest trees being cut down and important nesting habitat made unsuitable by timber harvesting and forestry operations.

Factors affecting nest success: Nest success in our study averaged 74%. Prey fluctuations and low small mammal availability in some years likely contributed to nest failure. Predation of eggs and young by suspected bears, large raptors, and ravens also occurred. Human-caused mortality of adult Great Grays we banded

included vehicle strikes, fence entanglement, and suspected electrocution.

We've made significant progress in understanding the Great Gray Owl in Western Montana, but like all wildlife research, each answer brings more questions. The ghost of the forest still holds many secrets, and we're committed to measuring and documenting, one nest at a time.

—Beth Mendelsohn

A cover article about Great Gray Owls and habitat, including some of the ORI's work, will be highlighted in the upcoming winter issue of the National Audubon Magazine.

Value of Nest Cams and our Partnership with Explore.org

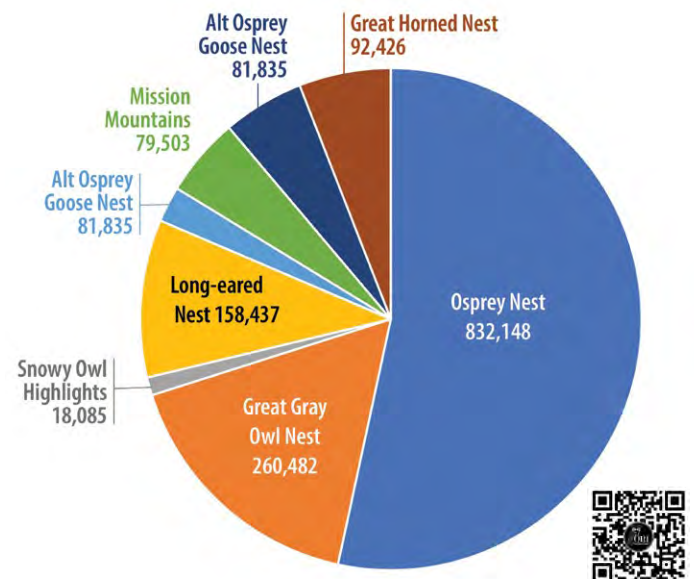
EXPLORE.ORG CAMS BRING OWLS AND OSPREYS TO MILLIONS GLOBALLY

This spring, the Owl Research Institute partnered with Explore.org and the Confederated Salish and Kootenai Tribes (CSKT) to place a camera on a Great Gray Owl nest located on the Flathead Indian Reservation. The live cam was an extraordinary success, drawing thousands of viewers across the U.S. and abroad who tuned in daily to witness the male and female Great Gray Owl raise two chicks to fledging. At any one time, between 40–80 people were watching simultaneously, documenting and sharing the nesting season in real time.

We are deeply grateful to the CSKT for their willingness to share this special nest and for the opportunity it provided to study, learn, and build awareness of this remarkable species.

ORI currently helps maintain eight Explore.org cameras in Missoula and Mission Valleys. Collectively, these cameras attracted more than 1.5 million viewers worldwide over the past year. We extend our sincere thanks to Explore.org for their continued support and partnership in bringing raptor research and conservation into homes around the world.

1.5 Million Viewers on ORI Managed Cams



DOWNLOAD APP OR SCAN QR CODE TO WATCH ON EXPLORE.ORG

SnowBear replied to your [comment](#)

This is such a wonderful cam and nest. We are so grateful for all the hard work of the ORI team finding and researching this and other GGO nests. Thank you to Explore for getting the tech stuff done in order to make this happen in time to see the eggs hatch. And big thank you to the Tribal Nations who agreed to have this cam! Thank you all! This is such a blessing...





Photo: Nathan Clark Photography

What Drives Short-eared Owl Nesting & Wintering?

In the grasslands of Montana's Mission Valley, the presence of Short-eared Owls can vary dramatically from year to year. Some winters, just a handful gather at historic roost sites. Other years, groups as large as 80 owls roost together in the same spots. ORI researchers have found that this fluctuation is tightly linked to one key factor: the abundance of voles, especially *Microtus* species.

While we've long known that Short-eared Owls depend on open habitat to thrive, ORI's multi-year research is helping us understand what drives their more specific choices to nest or roost in certain places. Habitat characteristics—such as grass height, clumping structure, and plant density—do influence where owls are likely to appear. But even in areas with the “right” vegetation, owls won't settle in if there isn't enough food.

Short-eared Owls are categorized as nomads – they will relocate seasonally and yearly for better opportunities.

They can be found in the same general areas to nest or roost year after year, but we believe that the congregations of owls are not necessarily the same individuals. This flexibility allows them to track shifting vole populations across large landscapes—a critical survival strategy in a grassland ecosystem where prey numbers can rise and fall dramatically.

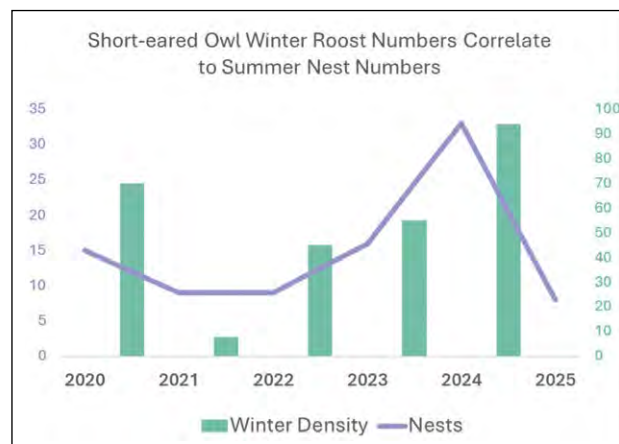
But even when they do find the resources to nest, success isn't guaranteed. ORI has documented high rates of nest failure, largely due to coyote predation on eggs and young chicks. Interestingly, in years when vole

numbers are high, nest survival tends to improve slightly—possibly because coyotes also eat the voles, which are easier to find than concealed owl nests. Or perhaps because the higher number of owl nests reduces predation rates, increasing chances that some nests survive.

Nesting habitat was noticeably affected by land management practices. In areas where cattle grazing occurred, nesting activity dropped significantly, with a gradual rebound seen a few years after grazing ended and vegetation grew back.

ORI's work highlights the importance of not only preserving habitat, but also the understanding of the full scope of ecological processes that shape these grassland ecosystems. From small mammal population fluctuations, to weather events and predator reproduction, to agriculture, fire, and development – each factor plays a role in supporting species like the Short-eared Owl.

—Beth Mendelsohn



35 Year Snowy Owl Overview: 1990-2025

We completed our 35th year studying Snowy Owls in Barrow in 2025. I began correspondence with Craig George, North Slope Borough Department of Wildlife, Bowhead Whale biologist, in 1990. I couldn't get to Barrow in 1991 as planned, so I had colleagues help that year. By 1992 and extending to 2025, I have been to Barrow almost every year to document the breeding ecology of Snowy Owls, and study their main food - lemmings.

Our Barrow research seasons are usually long – June, July, August. The weather is cold, humid, rainy, and windy. Just how the Snowy Owls like it.

Since the study began, we have found over 300 nests in our 100 square mile study area. All nests are closely monitored from incubation to fledging or failure. We have banded only a few adults, but 815 nestlings. Although it's difficult to document, we have resighted very few banded owls over the years, despite rigorous efforts. There has been a steady decline in Snowy Owl nest numbers at Barrow. And the 2025 field season was one of the lowest years ever in terms of number of owls and number of lemmings. Although we still do not understand the reasons for the steady decline, we will hope for a rebound in owls and lemmings in 2026 (Figure 1).

Some highlights of our research include; the longest breeding season study of Snowy Owls in the world; the first Snowy Owls in the world to be tracked using satellite transmitters; a detailed documentation of nestling growth and development (see QR code for Solai, Chloe, and D poster); the relationship between stress hormones and nest departure; nest site selection; dietary analysis from Barrow



Snowy Owl female near nest in Utqiagvik, AK. Photo: Melissa Groo

and a worldwide assessment, and nest defense behaviors directed at our researchers to protect their young.

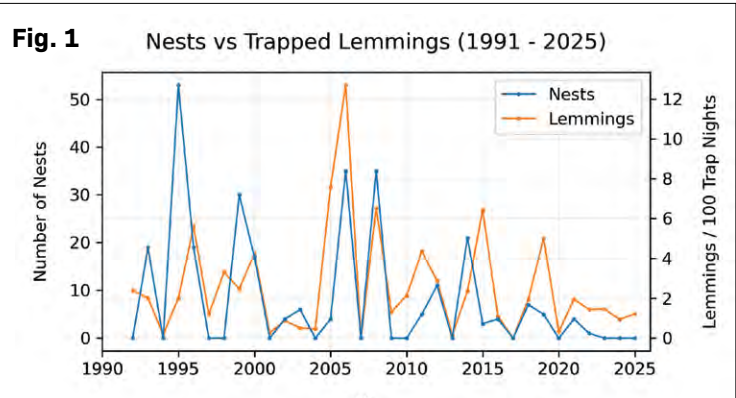
Our lemming sampling method has shown a clear and highly correlated relationship with Snowy Owls. Basically, if there's lots of lemmings, there's lots of owls. Our pellet dissections have buttressed this relationship, as the owls at Barrow have eaten > 45,000 prey, with ~ 90% lemmings.

What have we done with all this data? We have published about 15 papers, authored the Birds of North America (now Birds of the World) species account on Snowy Owls with the new revision due in 2025 or 2026. There's more to come.

We have been featured in a cover article of the *National Geographic Magazine*, worked with the series *David Attenborough's Life of Birds*, *Frozen Planet I and II*, and *National Geographic Explorer*, among other outlets.

In 2024, the film *SoCal Snowy Owl*, highlighting a rare Snowy Owl sighting in southern California, won the People's Choice Award in the Short Documentary category at the Newport Beach Film Festival. It later aired on PBS. Denver Holt played an advisory role with cameos.

Finally, the Snowy Owl is without doubt the avian icon for Arctic conservation. By saving land for Snowy Owls and lemmings, that the owls depend on for food, the status of Snowy Owls can be an indicator of the overall health of the Arctic ecosystem. — *Denver Holt*



Where Have All the Snowy Owls Gone?

The ORI team returned to the Arctic this June for another season of this long-term study. After two successive summers with no Snowy Owl nests, the team was hopeful for a rebound in the numbers of both Snowy Owls and lemmings. However, after the snow cover melted off, it became clear that lemming numbers would remain low, and the tundra revealed only a few pairs of Snowy Owls and a few single males.

Denver observed some courtship displays from males attempting to impress females with gifts of food. However the females ultimately left the study area around Utqiagvik, possibly in search of sites with more food in order to successfully breed.

The field team of Hayley, Gabriela and Zach covered the 100 square mile study area on foot and on ATV. They found few owls in the study area, possibly the lowest numbers of owls seen in any breeding season. The numbers of other Arctic predators also appeared to be low. However the team did get to observe plenty of Arctic wildlife including; shorebirds, eiders, seals, walrus, whales, caribou, Arctic Foxes, and even a Polar Bear.

Each year we return to the Arctic, we are awed by this incredibly rugged, tough landscape, and the people and animals that call this place home. This long-term research to learn about Snowy Owls and other species remains necessary to document changes to the flora and fauna as Arctic temperatures increase.

DIVING INTO SNOWY OWL NEST DEFENSE STRATEGY

This year, we also wrapped up a



L-R: Hayley Madden, Denver Holt and Gabriela Mendes this summer in the Arctic.

study on a Snowy Owl nest defense strategy. Early in his studies on breeding Snowy Owls, Denver Holt would observe female Snowy Owls in the distance, appearing to be sitting on a nest. However, as he began walking towards the female, she would suddenly fly off, sometimes from up to a half a mile away. This made locating the nest, a bowl loosely scraped into the top of a mound, quite difficult since there was no white owl on top to identify which mound the nest was on.

Denver hypothesized that this may be a strategy used by females to make it harder for predators to find their nests. When the tundra is not snow-covered during the summer breeding season, female Snowy Owls are easy to see with their white feathers. Their presence would make it easy for visual hunting predators such as jaegers, Arctic Foxes, ravens, bears, wolves, dogs and even humans to find nests.

However, we needed to find out if this behavior was truly a strategy used only by nesting females, or if females were just warier of all threats than males, even when not nesting. To assess these behaviors, we recorded the distance at which the female flushed off their nest every time we visited it. We also

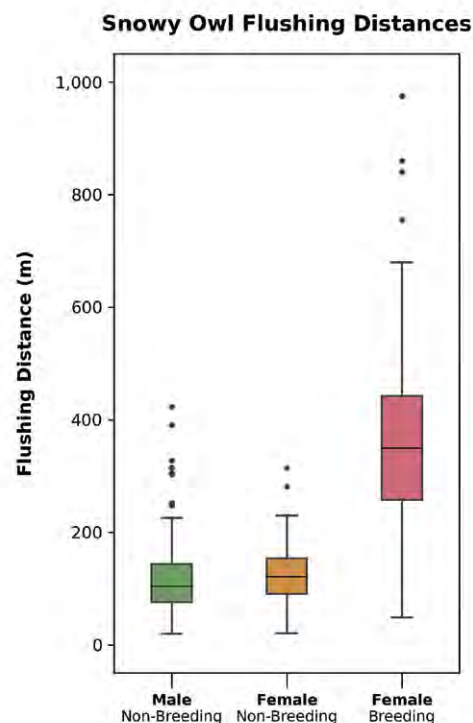
recorded the distance at which non-breeding females and non-breeding males flushed from our approach when they were roosting on the ground. We had hundreds of these distances recorded from over 30 years of studying Snowy Owls in Utqiagvik.

Our results showed that breeding female Snowy Owls flush from much further distances than non-breeding females and non-breeding males. The distance was almost three times greater, with breeding females flushing from an average of 350m (1,148 ft) and non-breeding females as well as non-breeding males around 120m (394 ft). See Figure 1.

Our study results suggest that this behavior is one of the first steps in a series of behaviors used by nesting female Snowy Owls, to keep their nests safe from predators.

—Hayley Madden

Figure 1





Prairie Falcon in flight.
Photo: Alex Kearney, Volunteer

16,147 raptors counted

Mission Valley Raptor Survey Highlights

Some species migrate south, while others may stay closer to their breeding grounds. In the Mission Valley, Rough-legged Hawks begin arriving in October and leave in March, and migrant Red-tailed Hawks pour into the valley and join the resident pairs. Bald Eagles can be seen year-round but arrive in greater numbers in January and February. Our winter Mission Valley Raptor Survey, for the last 5 years, has set out to document these numbers. As the surveys continue, we're excited to learn more about raptor behavior, population demographics, and winter habitat use and share those insights with the research and conservation communities.

SPECIES COMPOSITION

Our study area covers 150 square miles, nearly 60% of the valley. Over five years, we've recorded 16,147 raptors. Breaking that down, it is an average of over 4 raptors per square mile, and highs of up to 33 raptors per mile. That includes 17 raptor species!

AGE STRUCTURE

Among Red-tailed Hawks, the overall age ratio was about 6 adults for every 1 juvenile (85% adults). However, this varied by year, with the highest adult ratio of 9:1 in winter 2021-2022, and the lowest of 5:1 in winter 2024-2025.

In Rough-legged Hawks, the age ratio averaged 3 adults to 1 juvenile and varied between winters from 2:1 to 4:1.

For Bald Eagles, age classes were: 50% adults (full white head and tail), 25% subadults, and 25% juveniles (1st-year).

We also noticed that winters with higher total raptor counts had more juveniles present, particularly among Bald Eagles, Red-tailed and Rough-legged Hawks. This could suggest greater resource availability, decreasing competition during the winter, or higher productivity the previous breeding season, adding more young birds to the population.

SPECIES TRENDS

- Red-tailed Hawks, Rough-legged Hawks, Northern Harriers, and American Kestrels tended to rise and fall together, likely linked to vole populations.
- Bald Eagles followed a different pattern, possibly reflecting their reliance on other food sources, like carrion.
- Notably, winter 2024-2025 was our highest overall count (3,643 raptors recorded), and accounted for by a spike in Red-tailed Hawk numbers.

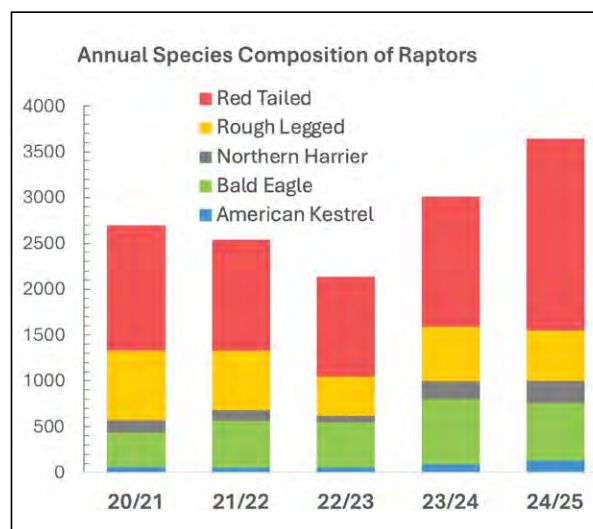
WHAT ARE RAPTORS DOING?

While the surveys were conducted from back roads, using a 0.5-mile observation radius, only 14% of raptors were actually perched along roadways, despite the abundance of telephone poles and fence posts located there.

Habitat use was concentrated in agricultural areas (75%), primarily pasture with scattered trees, which represent the most prevalent habitat type in the valley. Grasslands were the next most common location of raptors at 11%, with the remainder located around homes, wetlands, or forested areas.

— Beth Mendelsohn

The Roost **18**



A Grueling Night-in-the-Life, Studying Nature's Secrets

It had snowed in the mountains the night before. Denver, Zach, and I smirked at each other as we loaded tow ropes and tire chains into our research vehicle. Each of us knew what we were about to undertake. Beyond a nearby summit lay an untouched research area that had remained frustratingly out of reach until today.

The base of the mountain greeted us with strong winds. Bracing against the gusts, we studied the single route to the summit through our binoculars. It was then that the warden pulled up alongside our research vehicle, ready to escort us the rest of the way. As he rolled down his window to greet us, his face told the story of countless journeys into this wilderness before.

"Your call," he said, gesturing between his proven truck and our research vehicle. "But if you're returning alone tonight, you'll want to know your rig can handle what's ahead."

Following the warden's lead, we began our ascent on the winding gravel road. Each locked gate along the way marked our progression deeper into this restricted territory. At the summit, we abandoned the gravel road for a treacherous descent through a

drainage basin on the southern face.

Below the snowline, solid ground transformed into a slick mud that clung to our tires. The warden's truck carved deep ruts ahead of us as we committed to a controlled slide through portions of the challenging slope. Slowing our descent by any amount though, would mean certain entrapment in the mud.

Twenty miles from where we met the warden, we reached stable ground. The warden stuck his hand out of his truck's window and gestured towards our study area without pause. His truck then disappeared over the next ridge,



Research vehicle parked along a rocky road beneath a clear and starlit sky.

Six hours of fieldwork were ahead of us. As we stood silently in the cold listening for the vocalizations of our target species, we found entertainment in the star-filled sky above. Who would spot the first shooting star? How many satellites could we count?

In the frigid pre-dawn hours, magic happened. Four Western Screech Owls called through the darkness, confirming their presence and revealing prospective nesting zones for the coming spring. We triangulated their positions, mapped their calls, and began to gather data that would require multiple return journeys to complete.

As we loaded ourselves and our gear back into our research vehicle, the magnitude of what we had accomplished—and what's yet to come—became clear. Today had consumed nearly twenty hours. Yet somewhere in that punishing routine lay the essence of field research: the willingness to endure extreme conditions, navigate impossible terrain, and push limits for the chance to unlock nature's secrets.

—Henry Mros III



Henry next to an owl-calling device, recording data under red light.

leaving only muddy tracks behind to guide our eventual return.

We began to scout a five-mile linear stretch of pristine habitat, cataloguing potential research sites and noting a fresh bison carcass that could attract scavengers by nightfall. Every discovery had to be mapped and marked while the sun was still overhead.

But the real work began after dark.

At 9:00 p.m., with temperatures plummeting below freezing, Henry and Zach returned to the study area to begin our Western Screech Owl survey.



View out of Suburban window going down a steep hill. Photos on page: Henry Mros III

Volunteer Initiatives Bring Conservation to Life

This past year, volunteers have been at the heart of our research efforts, from surveying Short-eared Owls in frozen fields to placing audio recorders deep in the forest to detect elusive owl species. Beyond data collection, these experiences invite people into the conservation process, building lasting connections between individuals, wildlife, and the habitats they share. This year, we saw incredible volunteer turnout:

- 30 contributed their talents to the Winter Raptor Survey
- 26 trekked through snow for Short-eared Owl winter surveys
- 32 deployed recorders in the forest for owl monitoring
- 15 worked at the Saw-whet Owl banding station

Thanks to a \$10,000 matching grant from the National Forest Foundation, we're able to support and expand these opportunities. This funding plays a vital role in advancing our work by engaging volunteers directly in data collection, fostering a deeper connection to forest ecosystems, building long-term commitment to conservation, and empowering people to take an active role in public land stewardship. It also helps spread awareness about snag conservation, protecting standing dead trees that provide essential habitat for owls and countless other species.

Just a few examples that measure their impact:

- Increased the number of audio recorders deployed by 115%, helping detect more forest owls and leading to the



Hayley Madden, Gabriela Mendes, and volunteers Brent Pristas and Cara Thompson brave the cold for a Short-eared Owl winter roost survey.

discovery of the first known Flammulated Owl nest on the Flathead Reservation

- Covered 3 sq. miles each month to locate Short-eared Owl winter roosts (work that, without them, would have required ORI researchers to walk up to 25 miles per day).
- Contributed their birding skills to complete five survey routes totaling 150 miles in a single day each month, something not possible with only ORI staff.
- Kept the Saw-whet Owl banding station running six nights a week with just one full-time bander.

Volunteer work has allowed us to significantly expand the scale and scope of our research, improving the quality and value of our data. —Beth Mendelsohn

HUGE THANK YOU TO OUR VOLUNTEERS THIS YEAR

Our volunteers brave the cold, dark, and snow with generosity and commitment, helping us collect better data, expand our reach, and build a future where wildlife can thrive. We couldn't have done it without you, we appreciate all your hard work!

Payton Adams	Annabelle Church	Elle Eberts-	Marla Jenne	Tricia O'Connor	Rob Sheets
Riley Allen	Holly Church	Robocker	Brooke Kapalka	Denny Olson	Ashley Stivers
Lauren Arsen	Carter Clinken-	Dustin Gage	Danny Kastner	Patsi Pohle	Dan Stoken
Deanna Baginski	beard	Kerry Gallagher	Laura Katzman	Adam Potts	Dan Stone
Jon Barlow	Kelly Coloff &	Jess Garby	Alex Kearney	Brent Pristas	Taylor Tewksbury
Lisa Bate	Family	Phil Gardner	Pat Klever	Elliott Ress	Cara Thompson
Jami Belt	Danielle Crandell	Gaby Gebo	Marea Kuehl	Rob Rich	Joel Tohtz
Mark Benedict	Sue Crawford	Weber Greiser	Amber Langley	Keith Rush	Michele Tohtz
Gael Bissell	John Delagrang	Julia Gruetzmacher	Braydon Luikart	Isabela Sant'	Abigail Vandervoort
Leah Breidinger	Rob Domenech	Joan Herzog	Rick Mace	Anna-Skites	Rod Walette
CJ Brown	Nicole Dupuy	Steve Hiro	Krista Marshall	Joan Schmidt	Addie Wichman
Carol Buchan	Kaylie Durglo	Alex Jehle	Judith Mendelsohn	Jay Schutze	Pam Willison
Zachary Burke	Steve Flood	Elsa Jehle	Alex Nadasi	Mary Shaw	John Zardis

ORI Staff & Volunteer Updates

Volunteer Highlight: Data Dedication with Henry Mros III

Henry Mros III is a Geographic Information Science (GIS) specialist with a career that spans high-growth startups and international organizations. We affectionately call him the "Data Whiz"! He began his professional journey with the United Nations Office for the Coordination of Humanitarian Affairs, where he developed geospatial data standards for the Humanitarian Data Exchange.

Later, Henry joined an early-stage tech startup, where his GIS modeling innovations played a key role in the company's eventual public offering. Since then, Henry has traveled extensively across the U.S., visiting all 50 states multiple times. Whenever he's in western Montana, Henry stops

by ORI to support our data and spatial statistics work. He's been contributing to our research efforts since 2019. On his last visit, he had just completed a solo motorcycle ride tracing the outline of the continental U.S. in only 11 days, a testament to both his passion for geography and his adventurous spirit. His deep understanding of the American landscape led him to a role at FEMA, where he continued applying his GIS expertise to serve the public good. Following a federal restructuring that demobilized his team, Henry made his way back to Montana to lend us his support once again during parts of the summer.

Henry began a new position at National Institutes of Health in September and



we wish him much success there. His assistance in our data management and analysis has helped us catch up with stats we need for scientific papers and his contributions have been invaluable, thanks Henry!



Field Intern Zachary Burke Joins the Team

Zachary Burke, originally from Pennsylvania, is an aspiring ecologist with a strong foundation in field techniques and avian conservation. He earned his Bachelor of Science in Ecology and Evolution from the University of Pittsburgh, where he was active in outdoor clubs, including the Birding Club.

His research experience began with the Bird Conservancy of the Rockies in 2023, working as a Mexican Spotted Owl Technician. In this role, he surveyed owls in remote, off-trail terrain, used playback calls, collected species data, and camped for up to ten days at a time. His adaptability and commitment to owl conservation prepared him for his most recent work with the U.S. Forest Service, where he surveyed for California Spotted Owls, American Goshawks, and

Great Gray Owls, while also deploying camera traps and acoustic recorders to monitor wildlife.

Zach further expanded his skills as a Conservation Science Trainee at Hawk Mountain Sanctuary, assisting with migration counts and contributing to owl population studies. He independently mapped Great Horned and Barred owl territories, gaining valuable experience in territory monitoring and ecological mapping.

Through his previous volunteer efforts, including with the Owl Research Institute, Zach has combined technical expertise, diverse field experience, and a passion for raptor research. His skills and dedication align closely with ORI's mission of advancing owl conservation and long-term ecological studies.

Owls as Indicator Species

Animals have always been used as barometers of environmental change. Many species have been labeled as bellwether, bio-indicators, capstone, flagship, keystone, umbrella, and so forth. However, these words are often confusing. We need a simple word to describe the basic concept. I personally like the phrase "indicator species". It's a wide-ranging concept and the phrase has been around for many years and is understood by most people.

RECOGNIZED BY MOST CULTURES

Owls occur on all continents except Antarctica, and in all types of habitats. Owls as a group, or a specific species, are ideal to generate public support for local or large-scale conservation. Based upon my 40 years of field research experience, and interacting with the public through lectures, and a variety of other mediums, I believe owls fascinate people throughout the world, unlike most other species or groups of animals. The fact is, everyone from every culture from prehistoric to present times knows what an owl is. Owls have been both revered and reviled through history.

OWLS THROUGHOUT HISTORY

Interestingly, perhaps the oldest bird cave art known, is of owls and dated to the Paleolithic Period in France (15,000 to 36,000 years ago). From cave paintings and verbal history, owl stories have been passed through generations in numerous cultures. Owls have been depicted on Greek coins dating to 400 BC, and even a Canadian 50-dollar bill. Owls are mentioned in stories by Aristotle and Pliny. Owls are represented in paintings by Durer, Michelangelo, and Picasso, and poems such as *The Owl and The Pussy Cat*. Countless trinkets of bones, bronze, ivory, pottery, soapstone, wood, and

other substances idealize owls throughout the world.

OWL MARKETING

In present times, owls are consistently used in product advertising and sales pitches. Owls have become sport logos (Temple University Owls), food logos (Wise Owl Potato Chips) spirits, wine, and beer labels (White Owl Whiskey, La Cuvée Mythique wine) and corporate logos (White Owl Cigars, Trip Advisor), and so forth. Owls have even become movie stars, such as Hedwig in the Harry Potter series. Owls gather our attention, perhaps like no other group of animals in the world, and they do it consistently. For whatever reason, people exert emotion when observing owls, and encouragingly, owls are likely to bolster support for conservation.

POSTER BIRDS FOR CONSERVATION

I propose using Owls as the poster birds for habitat conservation, and indicators of the relative health of the terrestrial ecosystems. If we position certain high-profile species or groups of animals as indicators of environmental health, then other less popular species can fall under this declaration and be beneficiaries. For example, conserving Arctic habitat for Snowy Owls will benefit lemmings and tundra ground-nesting birds; conserving grasslands for Short-eared Owls will benefit small mammals and birds needing vegetative cover for nesting and hiding; conserving forests for Great Gray Owls will ensure diverse forest structure for many species of birds and mammals; and conserving dead and decaying trees for small cavity nesting owls will ensure these trees will be available to other species of birds and mammals for nesting and roosting sites.



Northern Saw-whet Owl: big eyes with attractive looks, and in turn a big ambassador for conservation.

Indeed, we must evaluate this proposal in a business-like manner and determine which species will generate public and political support, and give us the best chance of protecting habitats. This is not a matter of biological science, but rather using appealing-looking species, effective marketing and sales, to achieve conservation. Smart marketing works.

SPECIES WITH HIGH MARKET VALUE

Just as popular actors, actresses, or athletes influence people to favor products, agendas or politics, certain animal species have influencing effects on people. These animals render admiration, concern, and sympathy for their wellbeing for a variety of reasons. Most often, these species are admired for their looks, physique, or behavior. They are often handsome, sexy, large and powerful, or sometimes small and cute. Indeed, bears, eagles, elephants, lions, penguins, whales, and some primates, receive much media attention in documentaries, internet sites, magazines, newspapers, and television. Visuals matter and owls command attention, making them powerful allies in winning public support for conservation. —Denver Holt

Educational Highlights From 2024 and 2025

Nov: Beth presented at the Mission Valley Conservation Alliance meeting on predation in ground nesting owls, Charlo, MT

Beth, Gabriela, & Jeanna hosted Charlo Gradeschool K-3 field trip at the ORI

Dec: Denver Holt was the guest on the FurReal Podcast about Owls

Jan: Denver gave a virtual presentation on owls to the Bexar Audubon of South Central Texas
Denver presented Owls of MT to the Kalispell Rotary Club, Kalispell, MT

Feb: Denver and Laura Katzman of Flathead Land Trust led a tour of the wintering birds of prey in the Mission Valley to members of the Flathead Landtrust

University at Buffalo, Department of Environment and Sustainability, and WNY Raptor and Wildlife Care, Inc. sponsored a Snowy Owl presentation by Denver Holt in Buffalo, NY

Beth gave a virtual Short-eared Owl presentation during the Fernald Preserve Winter Bird Fest in Ohio

Hayley and Gabriela gave an Elementary School presentation, Bonner MT

Denver gave a Snowy Owl presentation for Rochester Birding Assoc. in Rochester, NY

March: ORI's Winter Raptor Survey was featured on a Montana NPR program

Beth gave updates on Wintering Raptors at the Mission Valley Conservation Alliance meeting, Charlo, MT

Beth gave a Flathead Audubon Presentation on Short-eared Owls and ORI was presented with a Conservation Award, Kalispell, MT

Adam Potts presented on owls at the Science Palooza in Frenchtown, MT

April: SoCal Snowy Owl documentary aired on PBS for the month of April

Hayley gave a Five Valleys Audubon Advanced Owl/Birding Workshop, Missoula, MT

Beth gave a presentation on Northern Saw-whet Owl Migration Research to the Flathead Lake Biological Station, Bigfork, MT

Adam Potts Presented to Mission Mtn. Audubon on Barred Owls, Polson, MT

Hayley Madden and Zachary Burke took a Field Ornithology class from Salish Kootenai College into the field looking for cavity nesting owls

Denver led a Glacier Institute Owl Workshop of the Mission Valley

Denver did Q&A for SoCal Snowy Owl documentary at LA Museum of Natural History

Adam presented to middleschoolers on owls at MT Outdoor Science Academy, Potomac, MT

May: Denver was a keynote speaker on the Snowy Owl at Biggest Week in American Birding Festival in Northwest OH

Beth, Hayley, and Gabriela gave an owl workshop to Camp Paxson for youth near Seeley Lake, MT

Hayley and Zachery gave an Owls of Montana presentation at the Ronan Cooperative Brewery, Ronan, MT

Denver Holt was a keynote speaker on Owl Adaptations at the Jackson Hole Birding Festival in Jackson, WY

June: Denver presented two programs to the University of Alaska Anchorage ADAC-ARCTIC students and faculty, Utqiagvik, AK

July: Swan Valley Connections and ORI Volunteer Results Presentation by Beth on Great Gray Owls & ARUs in Condon, MT

Sept: Beth gave Owl presentation for the Mission Valley Conservation Speaker Series hosted by Lake County Conservation District and DNRC, Charlo, MT

Hayley gave a Snowy Owl Presentation at Flathead Lake Biological Station's DataFest

ORI hosted 2 Fall Visitor Nights and the Coeur d'Alene Audubon group at their Saw-whet Owl Banding Station at FLBS, Bigfork, MT

Oct: ORI hosted 3 Fall Visitor Nights and a high school field ecology class from Hamilton, MT at their Saw-whet Owl Banding Station at FLBS near Bigfork, MT

Four ORI representatives attended the 2025 Raptor Research Foundation Conference in San Jose, Costa Rica. Denver Holt gave a talk on Wintering Raptor Surveys; Hayley Madden gave two talks, one on Snowy Owl Breeding Season Flushing Distances and one on Short-eared Owls; Jeanna Clifford on Securing Private Funding by Non-Profit Researchers; Gabriela Mendes gave two talks, one on Burrowing Owls and one on Short-eared Owls of Brazil, and a poster on Aging Northern Saw-whet Owl chicks.

The Many Ways to Support ORI, Plus Our Annual Wish List

On our website we have tribute gifts, or you can symbolically adopt an owl, and we have the ORI Store, which has fun clothing, stickers, mugs, & more. In each newsletter, we provide a list of items that will help us with our research projects and

facility maintenance. Or, there are multiple ways to make a donation on our website. We can also accept gifts of crypto, stocks, and Donor Advised Funds (DAFs). Please consider us in your estate planning. *Thank you!*



ITEM WISH LIST

- Starlink internet
- Data storage system
- 2 High resolution monitors
- Docking station
- Weather recording station
- Fenix headlamps
- Thermal imaging optics
- Stihl weed wacker

- iPads (new or used)
- Kestrel weather meters
- Side-by-side ATV
- Small Tractor for field station maintenance
- Snow blower attachment for tractor
- Flatbed trailer
- Gas cards



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Partners in Conservation

Great Gray Owl with chicks.
Photo: Melissa Groo



MONTANA

Confederated Salish & Kootenai Tribes
Five Valleys Audubon
Flathead Audubon
Flathead Lake Biological Station
Glacier Institute
Mission Valley Conservation Alliance
Montana Fish, Wildlife and Parks
Montana Wild Wings Recovery Center
CSKT Bison Range National Natural Exposures Photography
Ninepipes Lodge & Great Gray Gifts
Raptor View Research Institute
Swan Valley Connections
UM Conservation Genomics Lab
U.S. Fish & Wildlife Service
U.S. Forest Service
Wild Skies Raptor Center

ALASKA

ADAC-Arctic (DHS) U of Alaska
Alaska Department of Fish & Game
Alaska Raptor Center
North Slope Borough, Dept. of Wildlife
Utqiagvik Inupiat Corporation (UIC)
UIC Science and Logistics
U.S. Fish & Wildlife Service

OTHER WORKING PARTNERS

Coeur d'Alene Audubon
Dry Creek Welding
Explore.org
Global Owl Project

International Snowy Owl Working Group (ISOWG)
Henry Mros III
Leica Biosystems
National Forest Foundation
Owl Sense
OnX Backcountry
Sitka Gear
Texas Backyard Wildlife
University of Texas El Paso

LAND OWNERS

Alfred Deschamps
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Arnold Lucero and Katana Padilla
Barbara and Peter Lewis
Brian and Stephanie Morton
Bruce Sanders
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Cheryl Thomas
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Susan Gardner
Susan Rivers and family
Greg Baine
Thomas Fry

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Watch wild owls and Osprey in real time as they roost, nest, and raise a family! Cams are seasonal, and are made possible through our partnership with [Explore.org](https://explore.org) - the world's leading philanthropic live nature cam network and documentary film channel. Watch online or download the Explore.org app on your phone and watch today!

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