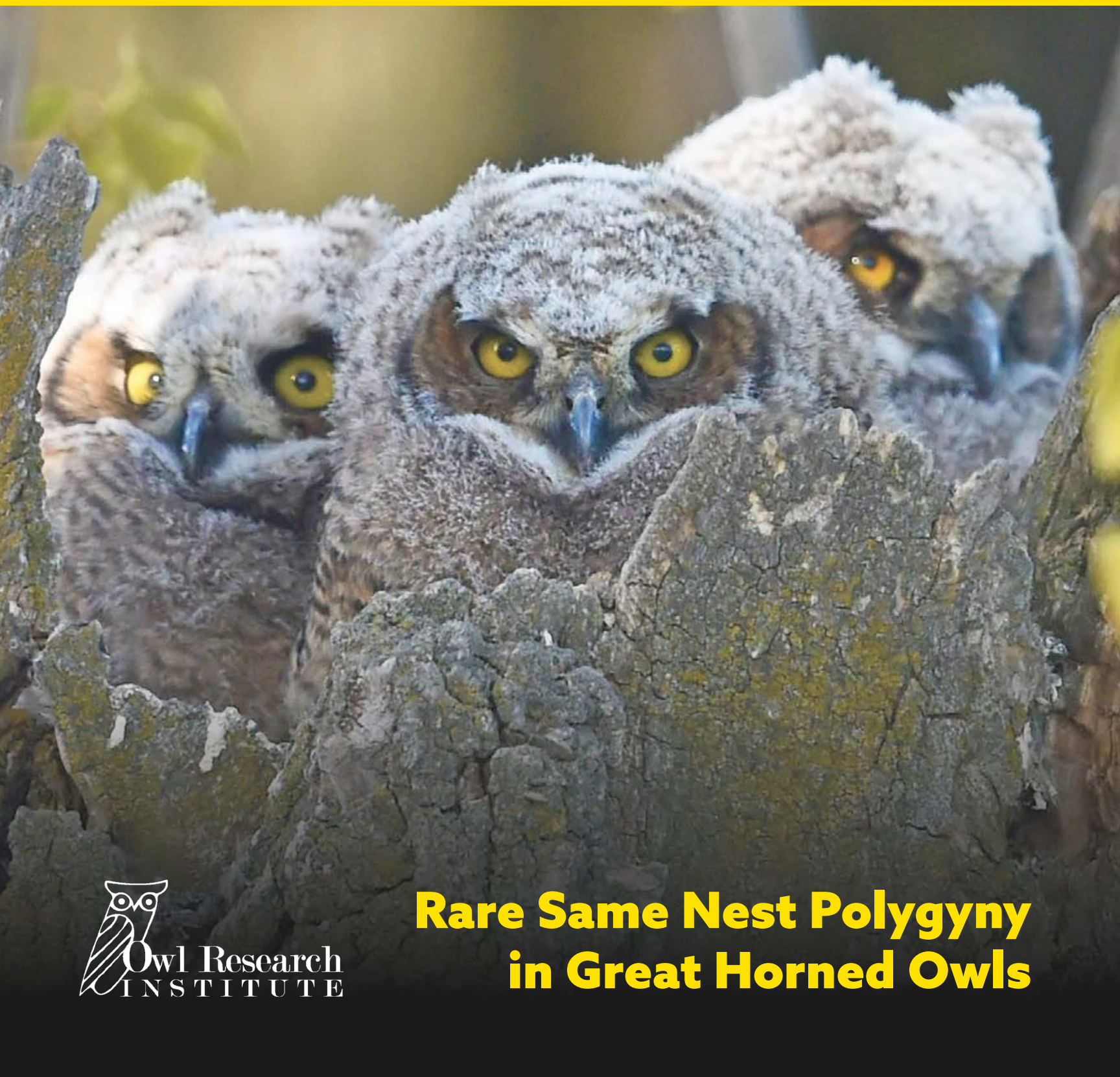
THE ROOST

Annual Newsletter of the Owl Research Institute

NOVEMBER 2024 - VOLUME 28



Owl Research INSTITUTE

Rare Same Nest Polygyny in Great Horned Owls

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.

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Founder/Senior Field Researcher

Beth Mendelsohn
Senior Field Researcher

Steve Hiro
Volunteer Researcher/
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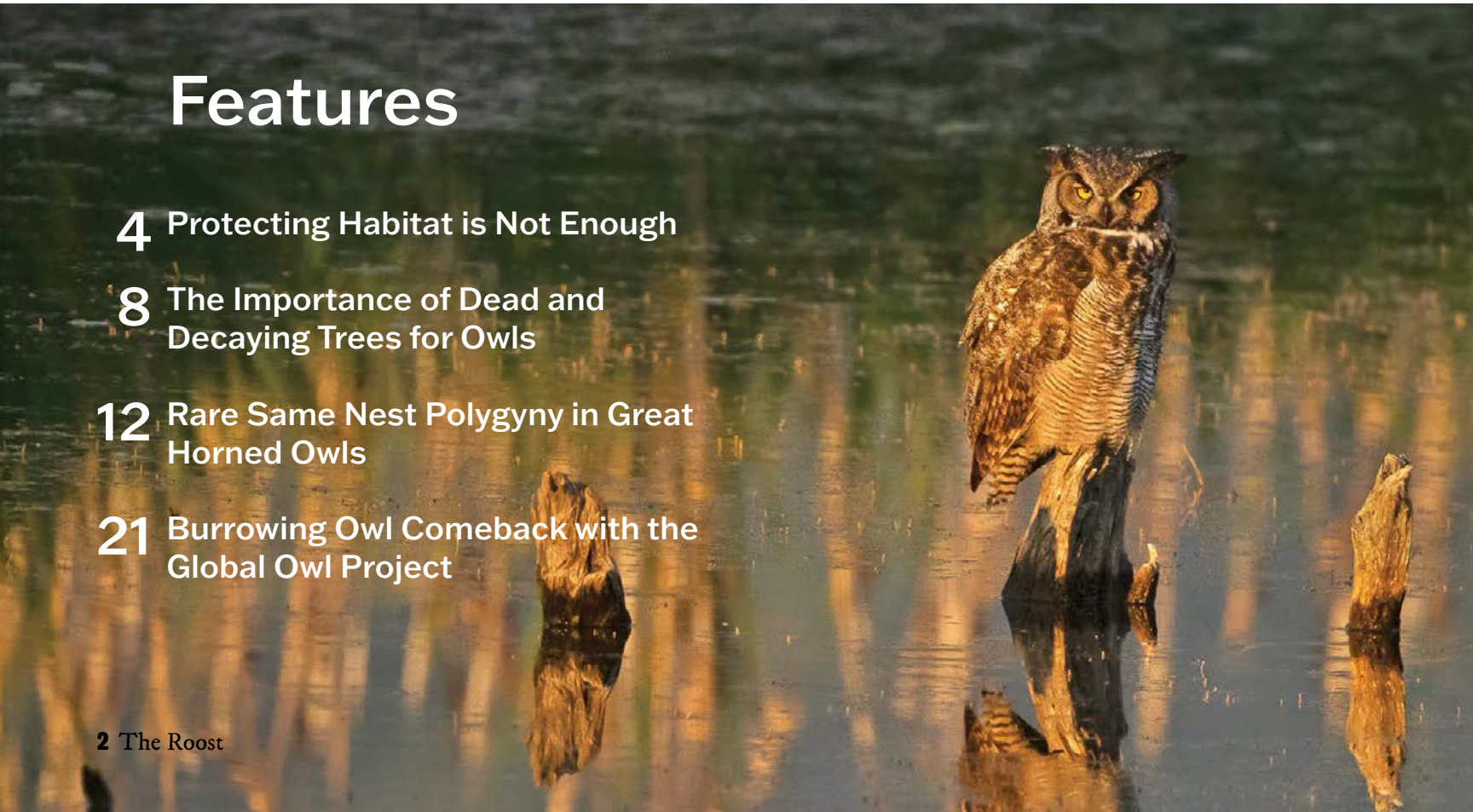
This issue of *The Roost* was designed by Jeanna Clifford. Content by Denver Holt, Beth Mendelsohn, Adam Potts, Hayley Madden, Solai Le Fay, and Lauren Tate. Cover: Great Horned Owl chicks. Photo: Kurt Lindsay. This page - Great Horned Owl. Photo: Melissa Groo

Features



Denver on National Geographic Explorer Ship, guiding at Svalbard archipelago, Norway

Message from the President

In this issue of the Roost, I want to highlight the role of long-term research, large samples, education, and communication with the non-researcher public in achieving conservation.

I also ask: is setting aside land really enough? How do we really know how populations are doing if we do not monitor annual reproduction? Seasonal surveys or counts can only give so much information. See "Saving Habitat is Not Enough" on pg. 4.

Within habitats, specific characteristics are important. For example, we highlight the importance of dead and decaying trees for owls and other wildlife. Ironically, dead and decaying trees are full of life, see pg. 8.

Adam Potts, supported by the ORI, finished his Master Thesis on Barred Owls in western Montana. Read his perspective on the Barred Owl Controversy, as well as a link to view his thesis, see pg. 11.

We have observed what we believe to be the first documented successful example of polygynous Great Horned Owls. The trio produced 5 fledglings, see pg. 12.

In cooperation with the University of Montana Flathead Lake Biological Station, our new Saw-whet Owl migration study is now in its third season, see pg. 14.

Our winter raptor surveys reached a milestone with over 12,000 raptors counted over 5 seasons, see pg. 19.

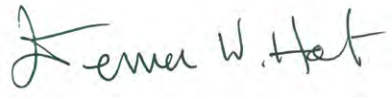
On a different note, our interns come and go and we usually have them for one to two seasons, before other interests lead them on their career paths. See ORI Staff and Volunteer Updates, pg. 22.

We made it to the Big Screen! See pg. 23.

Ultra-marathon runner Pete Ripmaster has now run twenty-six 100-mile marathons for the ORI. He has raised close to $40,000 for our programs. Unfortunately, he lost his home in Ashville, NC during hurricane Helene. On a personal note, I am deeply saddened by this and wish him all the best. Please follow him at peteripmaster.com.

Our annual newsletter is also our primary request for your financial and in-kind support. We realize it's been a rough 3 - 4 years for many Americans, as the cost of living has increased significantly. If you still have the means, we hope you can again donate. If not, thanks for all your past support.

Finally, we have another opportunity to match a $100,000.00 grant from a private foundation and hope you can contribute. As always, when finished with this newsletter, please pass it on to a friend. Thanks, and enjoy the upcoming winter and holiday season.



Denver Holt, Founder

2024 Publications

Snowy Owl (*Bubo scandiacus*). Version 2.0
D.W. Holt, M. D. Larson, N. E. Smith, D. L. Evans, D.F. Parmelee, T. McDonald, M.J. Stoffel, M. Blom, H. Pletz, and D. J. Zazelenchuk. 2024. In Birds of the World (S.M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.snoowl.02 In press.

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

Protecting Habitat is not Enough

Photo: Daniel J. Cox
naturalexposures.com

This field was burned during the Short-eared Owl spring nest site selection period; consequently the owls had to move on.

We all know habitat is the key to maintaining species and their survival. But we cannot just say populations are okay because a particular habitat is protected, no matter its size. Annual or periodic surveys are helpful in detecting trends – if they are long-term programs such as: Breeding Bird Surveys (BBS), Christmas Bird Counts (CBC), Raptor Migration Counts (RBC), and so forth. While surveys and counts help to alert conservationists of trends, they do not always provide the cause of trends. For example, population stability, population declines, or population increases.

All too often, conservationists, wildlife biologists, and others suddenly realize the numbers of a particular species or group seem to have declined or disappeared. But the reasons often remain an enigma or speculation.

HABITAT MANAGEMENT

Once landscapes are protected, often they are managed. But how they are managed influences owls and other wildlife. For example, in our study areas, numerous land owners manage their lands in different ways, which can impact habitat and some wildlife species. In the following text we outline a few examples related to open country species of owls.

BURNING

Natural fires occur throughout the owls' geographic ranges, and most ignite during the dry season of mid to late summer. Burning can have positive and negative impacts on open country species of owls. Burning can be used as a management tool to help control invasive plants, and stimulate regrowth of native plants. On the other hand, burning can have negative effects by reducing nesting cover for owls and their prey.

Spring burning may affect Short-eared Owls more than other ground nesting species. Short-eared Owls are one of the earliest ground nesting species to initiate nests. And, they need tall grasses and shrubs to conceal nests, incubating females, and nestlings. Burning vegetation before nesting forces the owls to relocate, or destroys active nests, and potentially kills eggs and chicks.

Furthermore, small mammal populations that serve as food for owls can also be affected due to loss of cover for nesting and increased exposure to predation. Any effect on their numbers and distribution could affect the owls' reproduction due to their dependency on species such as voles.

In an attempt to reduce effects of burning, some wildlife land managers have incorporated a burning rotation system, from parcel to parcel over several year periods. This appears a reasonable attempt to mitigate negative effects.

Results from this rotation system indicate burning may have a two or three season lag affect. For example, during spring of a breeding year, burning will reduce or eliminate nesting cover. Although burning may be terminated by early summer, the vegetation growing season is shortened,

and plants do not reach full growth. Consequently, during the second spring, there are little tall dead grasses needed for nesting cover when Short-eared Owls are selecting nest sites. Thus, in its second spring, vegetation is growing but it will take a full second spring/summer for maximum growth and then die, leaving tall residual cover for nesting in the third spring. The owls may not have nesting cover into a third season following burning. So, by employing a parcel

Short-eared Owl. Photo: Daniel J. Cox NaturalExposures.com

rotation system, ground nesting owls and other birds such as ducks and pheasants have options for breeding.

WORKING TOGETHER

Many owl species face land management decisions related to mandates or priorities, personal preferences, or politics.

Most federal, state, tribal, and private land managers have much experience and knowledge within their areas of interest. The ORI is working with these groups to meet a middle ground where everyone's interests are discussed. It's really just a matter of good communication. For example, coordinated management employing a rotation system that considers seasonal timing with nesting chronology of the owls should result in a win-win for all parties involved in grassland conservation.

ALTERNATE HABITAT CONSIDERATIONS

Habitat does change over time, albeit at a slow rate. A grassland may change to shrub-land, or marsh to bog. If open country species of owls are nomadic or migratory, then we must consider providing alternate habitat locally and regionally. Indeed, these species can be considered mobile ecological units that move nomadically or migrate in search of adequate resources for breeding. Thus, we need to acquire more land to serve as alternate areas when traditional areas change over time.

ANNUAL REPRODUCTIVE OUTPUT AND SURVIVAL

Given limitations of only protecting habitat or conducting periodic surveys, the next and most important step in detecting causes of population fluctuations is monitoring annual reproductive output. Whether observing a species, group, or entire community, we need to know about survival. Yet, survival without knowledge of annual reproductive output, although helpful, is also limited.

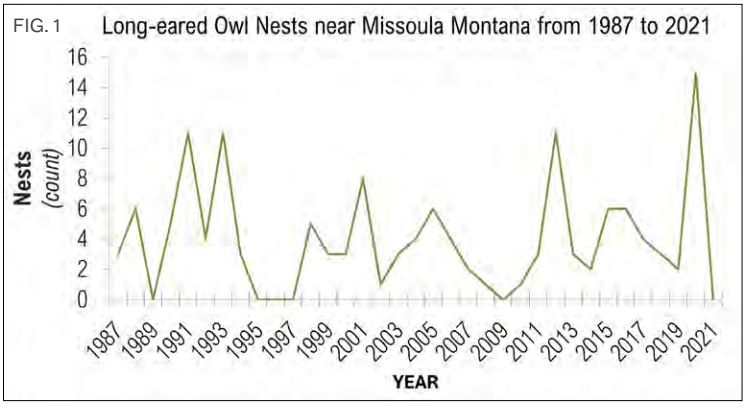
For example, did the species of interest breed? How many young were produced? Did young survive their first year? Did adults and their young breed in ensuing years? Did known individuals return to the same areas? If food sustains life, then what food sources drive reproductive output? What is the status of food sources? Documenting these types of data can only be gathered by boots-on-the-ground field research. Using these data, we can generate models and make predictions, but how do we validate models and predictions?

The value of long-term research and monitoring can be tracked in the three graphs on the next page. The fact is, one might conclude the population is stable, low, or in decline depending on what time frame you choose to explore. For example, if we only studied Long-eared Owls

A special thanks to Amy Lisk and Marlin McDonald, who assisted Beth with the install. This was a collaboration with CSKT and the US Fish and Wildlife Service. Unfortunately all the signs were stolen.

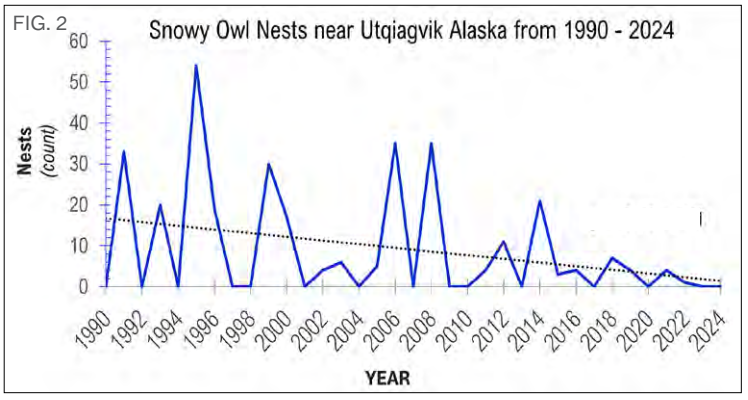
Meg Getzinger and Steve Hiro examining feather molt in order to age a Long-eared Owl. Photo: Jiayi Chen

from 1991 - 1993 (a typical two-season graduate study) we might say all is fine. But if we studied the Long-eared Owls from 2007 - 2010 we might say the owls are not doing well (Fig. 1). However, if one commits to years-upon-years of long-term research and monitoring, we can see population fluctuations, and overall, we can see trends. Clearly, the Long-eared Owl nesting population fluctuates, but appears stable over 37 years for this study area (Fig. 1).

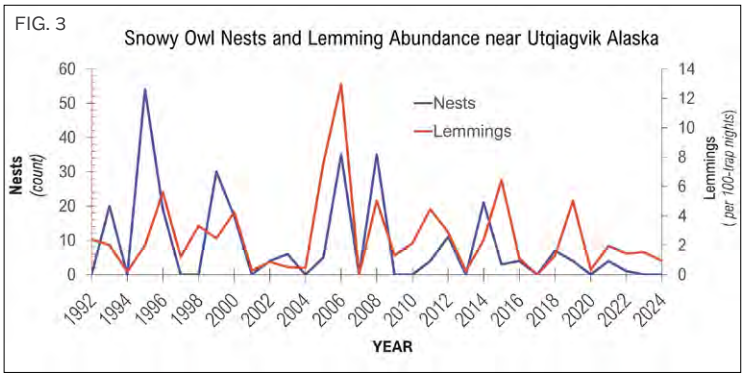


In a second example (Fig. 2), if one was to study Snowy Owls from 2001 - 2005, we might say things are not looking good. But if we studied the owls from 2006 - 2008, we might conclude the population is doing well. However, by studying the owls for the long-term, we see population fluctuations, in this case, the overall trend line is downward over 35 years in this study area (Fig. 2).

Now, while showing a trend line is important, it does not provide answers to the trend. So how do researchers tease apart and explain what drives the populations? This begins



with monitoring reproductive output, and what drives output. For example, there is a correlation between Snowy Owl nest numbers and the lemming population index (Fig. 3). Although correlations are not a hard fact, their values can lead us in a direction to explore in more detail.



So, technology, advanced mathematics, complicated models, new molecular methods, and correlations are important tools in modern wildlife research. However, in order to really know how populations are doing, we need long-term boots-on-the-ground field research.

NON-BREEDING SEASON HABITAT

Similar to knowing about breeding output, we need to know more about non-breeding season habitat and its status. What are animals doing on their migratory routes or non-breeding grounds, such as wintering?

Indeed, we awe at the migratory travels of many animal species, whether documented by direct observation, some form of mark-recapture or resighting, or tracked remotely by satellite and monitored via computer. Some examples: Snowy Owl migrations from Arctic breeding grounds to wintering grounds, elephant migrations across the plains of Africa, songbird migrations from north temperate breeding grounds to southern tropical wintering grounds, whale migrations from northern summer feeding grounds to

Photo | Kurt Lindsay

A group of young Snowy Owls winters in a field in Western Montana

winter calving grounds, Albatrosses circumnavigating the vastness of the oceans, and Arctic Terns migrating 11,000 miles from Arctic breeding grounds to southern wintering grounds, and then back. A 22,000-mile roundtrip!

But the important issue is often not discussed. What are they doing? What habitats are they using? What is the future of that habitat? And most importantly, what are they eating? Food sustains life. Are there conservation measures in place to protect these migration or non-breeding habitats? Are there plans for future habitat protection, and consideration of protecting additional or alternate habitats? Habitat can change over time. They can change from productive to non-productive and visa-versa. Human impacts can alter or take away habitat. Are we considering alternate habitats as one habitat changes over time? Are we satisfied with the current protected areas such as National Wildlife Refuges, or other federal and state conservation lands? Maybe we should consider adding and expanding habitats? While habitat protection is foundational, regular monitoring of species and reproductive output offers crucial insight into population trends and drivers amidst changing environments.

— Denver Holt

Communal roost of wintering Long-eared Owls within the branches of a willow thicket. Photo: Courtesy of Explore.org live cam.

HUGE THANK YOU TO OUR VOLUNTEERS THIS YEAR

Much Appreciation & Recognition For Our Volunteers, We Couldn't Have Done it Without You!

Addie Wichman
Alex Kearney
Amber Langley
Amber Swicegood
Andrew Johnson
Annabelle Church
Anne Dahl
Ashley Mertens
Ava Johnson
Braydon Luikart
Brent Pristas
Bridger Donaldson
Cara Thompson
Carol Bibler
Carol Buchan
Christopher Moore
Cyndi Elliott
David Steindorf
Dee Baginski
Dennis Olson
Dustin Gage
Eli Estey
Eric Godin
Gael Bissell
Grant Pegram
Helene Michael
Holly Church
Isabela Sant-Anna-Skites
Jacki Pagano
Jami Belt
Jan Jackson-Moore
Jess Garby
Joan Schmidt
Joel Tohtz
John Delagrange
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Rodney Wallette
Sara Ibis
Sara Lamar
Shannon Donaldson
Steve Hiro
Steve Lamar
Taylor Tewksbury
Tina Zenzola
Tricia O'Connor
Weber Greiser

Great Gray Owl.
Photo: Daniel J. Cox
NaturalExposures.com

The Importance of Dead and Decaying Trees for Owls

A major focus the ORI's research over the past four decades has been to encourage the conservation of dead and decaying trees for owls and other wildlife. Consequently, we have spent a great deal of field time searching for natural sites where owls nest. Our objective from the beginning was to identify these natural sites, so forest managers, landowners, firewood harvesters, landscapers, and homeowners would have the knowledge to incorporate saving some dead and decaying trees for wildlife.

However, we never realized how long it would take to gather sample sizes adequate enough for meaningful statistical analysis. To this end, we continue to add to our sample sizes.

Of the 260 - 270 species of owls in the world, we chose to use Mikkola's (2016) list of 268 species for our summaries. We realize however, the number of owl species can change depending upon various techniques to define species. Nonetheless our anlysis will be close-enough to convey the message.

We also reviewed the current literature and species accounts of the world's owls. We gleaned information from: Handbook of the Birds of the World (Holt et al. 1999, Bruce 1999); Owls of the World (Konig and Weick 2008); Owls of the World: Photographic Guide (Mikkola 2016); and Birds of the World (Cornell Lab of Ornithology (2024). Interestingly, in some species of owls, zero or few nests have ever been found.

Whether it be for owls, woodpeckers, tree nesting ducks, bats, tree squirrels, pine martens, and other arboreal species, dead and decaying trees are often cut down for numerous reasons. For example, disease, fire hazard, safety, unattractiveness, and so forth. Yet, they serve numerous specific needs for wildlife.

ALMOST ALL OF THE WORLD'S OWL SPECIES ARE DEPENDENT ON TREES FOR NESTING

The fact is, few species of owls build their own nests. Most owl species depend on natural decay, structural damage to trees, or other species of birds or mammals to construct their own nests, which the owls then use. For example, stick nests

in trees, natural or woodpecker holes in trees, broken-top trees, chimney-top trees, forks of branches in trees, caves, cliffs, under old fronds / leaves such as in palm trees, mistletoe, on the ground, and even underground. Some species have even adapted to human structures, such as abandoned buildings, barns, silos, and under or on bridges. Many species even use artificial sites, such as nest boxes, platforms, baskets and so forth. But overall, almost all of the world's owl species are dependent on trees for nesting.

SUMMARY OF FINDINGS

Many of the smaller species are obligate cavity nesters. This means they are exclusively dependent on natural or other holes made by species such as woodpeckers. These owl species include almost all Scops Owls, Screech Owls, and Pygmy Owls, among other species. In North America, these are represented by Eastern

Matt Larson and Chelsea Molloy assist Denver Holt with tree measurements as part of a study on Northern Hawk Owl nest site characteristics.

Left: Flammulated Owl in a woodpecker cavity. Photo: Matt Larson - Middle: Great Gray Owl nesting in broken top snag. Photo: Troy Gruetzmacher
Right: Northern Hawk Owl in a burned out tree top. Photo: Daniel J. Cox/NaturalExposures.com

Pygmy Owl sticks its head out of a natural hole Photo: Kurt Lindsay

and Western screech owls, Northern Pygmy Owls, Northern Saw-whet Owls, and Boreal Owls.

Other species, particularly larger owls diversify their nesting requirements and use sticks, broken top trees, cliffs, caves, and man-made structures. These species include "eagle" owl types and "long-eared" owl types. In North America, these are represented by Great Horned Owls and Long-eared Owls.

Still other species need large holes in trees where a branch broke off and a hole rotted out. Or a "chimney' tree where the top several feet are hollowed out, but the outer trunk remains intact. For example, in North America, Spotted Owls, Barred Owls, and sometimes Northern Hawk Owls.

Some species are so large they need the relatively flat broken-top of a large tree where they can situate their belly and breast to incubate eggs. For example, in North America, Great Gray Owls and Great Horned Owls.

A few species nest solely on the ground. These include African Marsh Owls and a few species of "grass" owls in the genus Tyto and, in North America, Snowy Owls and Short-eared Owls. One species nests exclusively underground: Burrowing Owls.

Overall, each group has a general nest requirement, but when the typical nest site is not available, an alternative non-typical nest site is used. For example, some species nest primarily in trees, but if a site is not available, may nest on the ground.

So, the message to forest managers, landowners, firewood cutters, backyard landscapers, and homeowners is to save – if possible

Northern Saw-whet Owl nestlings deep inside a tree cavity. Photo taken with a peeper cam.

- some dead and decaying trees for owls and other wildlife.

A NOTE ON NEST BOXES

Owls are well known to use artificial sites, particularly nest boxes. Indeed, many researchers who study small to medium sized cavity nesting owls use nest boxes to gather natural history information. Boxes are usually placed in easily accessible areas, such as adjacent to roads. Boxes are also placed at easily accessible heights where a small ladder can be used. They are placed at convenient intervals, such as quarter-mile apart.

Unfortunately, most nest box programs do not follow a standardized method or explain the objectives of this program. Consequently, there are numerous individual and agency approaches to nest box placement. Because of convenience sampling, most nest box programs are biased, although much good data can be gathered.

Perhaps the most important question we are lacking is data on natural nest sites. We lack information on distribution of nest trees within the landscape, and characteristics of trees used. Does nest box placement mimic natural distribution of available cavities? Does information from nest box studies support data from natural nest sites? Are data on mating systems, clutch size, hatching and fledging numbers, site fidelity, and population metrics affected by nest boxes? Finally, biases of only conducting nest box studies, does not provide data needed to alert land managers what trees and their characteristics should be saved for owls and other wildlife species.

— Denver Holt

It had been 6 years since Boreal Owls nested in our study area, but we found one nest in a box in 2024. Photo: Steve Hendricks

The Barred Owl Controversy {2022 – 2023}

Left: Adam Potts
Right: Barred Owl

Out of the national consciousness for decades, the plight of the endangered Spotted Owl has recently stepped back into the media spotlight. This is due to a US government-led effort to eradicate a competing owl species, the Barred Owl, where the two now overlap in the Pacific Northwest. The U.S. Fish and Wildlife Service (USFWS) has a plan to kill around 450,000 Barred Owls over 30 years to reduce their population. This plan raises difficult moral questions, particularly as the status of the Barred Owl in western North America is uncertain. Barred Owls are native to North America, and although their historic range lies in the continent's eastern forests, it was not introduced (like house sparrows or starlings were) to the western United States. So how exactly did they get here?

One might assume that studying Barred Owls on the West Coast is the way to get to the bottom of this. But it may be best answered by looking at their expansion into Montana, the first western state colonized by the species. This is a central argument of my graduate thesis "Better Understanding the Barred Owl", which I defended this spring to receive my M.S. from the University of Montana. (Thank you Denver for serving on my committee!)

The main focus was analyzing Barred Owl nest site selection in the forests of the Seeley-Swan and Mission Valleys, and determining whether they prefer older forests for nest sites. This was long understood as fact, but as scientists try to deduce how Barred Owls could expand across the continent and impact Spotted Owls the way an "invasive species" might, Barred Owls' old-forest dependence has been questioned. My secondary focus was reviewing theories of western expansion. The hypothesis most in vogue, often cited by the government (USFWS), is that they came up the Missouri River to Montana due to White settlement-induced forest increases, caused by eliminating the bison herds and suppressing Native burning practices. However, Canadian and Montanan researchers (including ORI's Denver Holt) consistently agree that they arrived naturally, spreading west across Canada's boreal forests.

My results indicated that Barred Owls prefer a larger-than-average forest for their nest stands, which are also situated in relatively contiguous forest. They weren't in young forest, but also didn't require old growth. But though Barred Owls appear to be more adaptable than previously assumed, this adaptability has been overstated by authors eager to illustrate their invasiveness. The popular hypothesis referenced above hinges on just a few early unverified reports from central Montana, and even today there are no sightings from eastern Montana or western North Dakota.

This spring was mainly spent writing and analyzing data, but I still got out in the field this year to look for more Barred Owl nests – partly for thesis inspiration, and partly to keep a Barred Owl survey effort rolling forward as best I could. I located two additional nests, one up the Jocko and another near Seeley Lake. I am now working on converting my two thesis chapters into manuscripts for journal submission. Feel free to read my thesis here: https://scholarworks.umt.edu/etd/12333/

—Adam Potts

Two Female Great Horned Owls on nest with chicks. Photo: Kurt Lindsay

Rare Same Nest Polygyny in Great Horned Owls

TWO FEMALES SHARE ONE NEST

Our winter raptor surveys have provided us with valuable information about the hawks, eagles, and falcons wintering in the Mission Valley. However, they have also given us the opportunity to learn more about some of our resident owls. In 2023, on our mid-March survey, we observed two female Great Horned Owls apparently incubating eggs in the same nest. We returned to the nest for a few observations throughout the season, only to find that one of the females abandoned the nest after a few weeks, leaving the other to finish incubating the eggs. The spring of 2024, we returned on another survey and spotted two owls in incubation posture yet again, but in a new nest approximately 100 feet from the 2023 nest. The busy demands of the season, along with the location of the nest (situated 60 feet high in a tree, on fairly inaccessible private land), made close observation tough. Despite these challenges, we made an effort to observe these birds through evening observations, a drone, and pole cam footage. Photos and videos from our cameras showed 5 chicks in the nest, an unlikely number of offspring for a monogamous pair of Great Horned Owls to rear. Additionally, we observed the male deliver prey to the nest and heard vocalizations from all of the owls. Through this, we concluded that it was polygyny, with one male tending to two females that presumably both laid eggs in the same nest.

Social monogamy with biparental care is the predominant mating system among birds. In contrast, polygyny - a case in which one male mates with more than one female - is less common. Typically, a polygynous male apportions parental care between multiple nests, often prioritizing the ‘primary’ female. The reduction or absence of parental care can significantly impact the reproductive success of the 'secondary' female involved, particularly if they are unable to independently rear their offspring. Polygyny, although infrequent among North American Owls, has been documented in Barn Owls, Long-eared Owls, and Flammulated Owls, usually with the male providing for two separate clutches in separate nest sites.

To our knowledge, our observations this spring would make this the first case documented of successful polygyny in Great Horned Owls.

This leads us to some interesting questions, such as the genetic relatedness of the birds and the behavioral choices that lead to a polygynous trio.

Unfortunately, these questions are left unanswered as we did not make it out to the nest as often as we had hoped. Collecting DNA would have played a significant role in answering some of these thoughts, as well as more time spent simply observing the behavioral patterns of these birds. We do know, however, that all 5 chicks fledged.

Next year, we plan to spend ample time on observations and collecting DNA from these owls- that is, if they nest here again! — *Lauren Tate*

Two Female Great Horned Owls sitting on nest with 5 chicks, while the male was observed nearby. Photo: Kurt Lindsay

Snowy Owl Project Update

THE ZERO NEST SUMMER

2024 marks the 35th season for the Snowy Owl Project in Utqiaġvik, Alaska (formerly Barrow, Alaska). Over the past 35 years we have collected all kinds of data on the tundra, from the number of Snowy Owl nests each year, to the number of lemmings on the tundra, to the growth rate and plumage development of chicks. We've observed years with over 50 Snowy Owl nests and years with none.

Unfortunately, 2024 marks one of the years with zero Snowy Owl nests in our 100 square mile study area. This year we observed only single adult male Snowy Owls. It is possible the females arrived and left before we stepped foot on the tundra in June.

Denver, Lauren and Hayley staying warm in Utqiaġvik, Alaska

It is no coincidence that we found very low numbers of both brown and collared lemmings at our sampling locations. Lemmings make up approximately 90% of the Snowy Owl's diet during the breeding season. Therefore, if lemming numbers are low, it is unlikely that a pair of Snowy Owls will be able to feed a nest full of chicks. Snowy Owls will instead move to other areas in the Arctic with more lemmings or choose not to nest that year. We simply have to hope that lemming populations were higher in other parts of the Arctic and that the Snowy Owls had a good breeding season in another remote corner of the world.

However, we did find approximately 20 male Snowy Owls this year and continued to collect data for our behavioral studies. We witnessed owls hunting successfully, roosting peacefully in the sunshine, and spreading their wings in flight across the tundra. We feel truly lucky that we were able to spend the summer observing them from afar, learning as much as we could. Spending a field season in the Arctic is no easy feat: we braved winds up to 30-mph, driving snow and rain, and the relentless cold. However, long-term data collection is necessary to understand the challenges Snowy Owls and other Arctic animals face as global temperatures increase. We will continue this research in order to protect the future of Snowy Owls.

— *Hayley Madden and Lauren Tate*

Male Snowy Owl. Photo: Jennifer Sperry

P.S. After over a year with us, the ORI wishes Hayley the best as she leaves for her future endeavors.

Northern Saw-whet Owl Migration Station

VISITORS, VOLUNTEERS, AND MIGRATION MYSTERIES

At the end of summer, many bird species begin their migration south to their wintering grounds. Some Northern Saw-whet Owls head south, while others migrate in different directions. From August to December, researchers across North America stay up late into the night to catch these owls on their journey and find out more about their fall movements. The Owl Research Institute has been capturing and banding migrating Saw-whet owls since 2010.

2022 marked the first year we moved our banding site from Missoula to the University of Montana's Flathead Lake Biological Station in Yellow Bay. We were cautiously optimistic that this new lakeside site would be productive, and we ended up catching about 200 owls each year. We were open for an average of 5 nights a week for about half the night.

Similar to previous data, we caught mostly young Saw-whets, with over 80% being birds in their first year. These young birds are on their first migration and often make up a large proportion of migrants. This high ratio of first-year birds suggests that it was a productive breeding year. We are able to age these birds up to third-years using UV light and molt sequence.

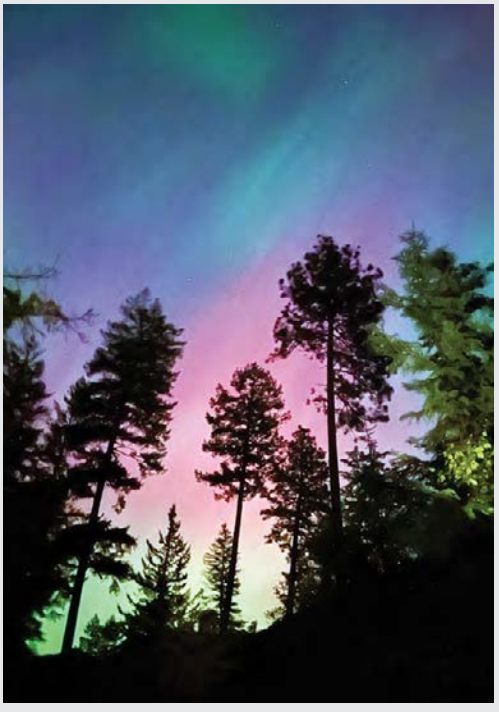
One of the most exciting parts of banding is re-captures: owls that already have a band when we catch them.

At this station, we have had 5 non-local recaptures so far, meaning the bird was banded at a different station. Some have come from Lucky Peak near Boise, Idaho, and others from Alberta, CA. We also had what was likely a "local" wintering resident who visited our nets multiple times this season. These recaptures give us glimplses of information on the migration patterns of the Northern Saw-whet Owl.

Since opening at the Flathead Lake site, we have welcomed the public to weekly visitor nights. Participants get a tour of the banding site and a presentation on the natural history of Saw-whet Owls and other owls of Montana. Many of them also witnessed the banding of one or more wild owls. We are thrilled to be sharing our work and sparking excitement for these wild owls and conservation. We have hosted over 350 visitors at the FLBS station and we hope that everyone has enjoyed these events and learned something new.

Most of the owls we caught were females (see pie chart on next page), which aligns with the idea that this is the more migratory sex, whereas males likely tend to stick closely to the breeding grounds in order to claim nest cavities in the spring. We look forward to continuing this project in order to deepen our understanding of these elusive, yet common birds. This project wouldn't be possible without the many volunteers who dedicated their late nights to helping out at the banding station.

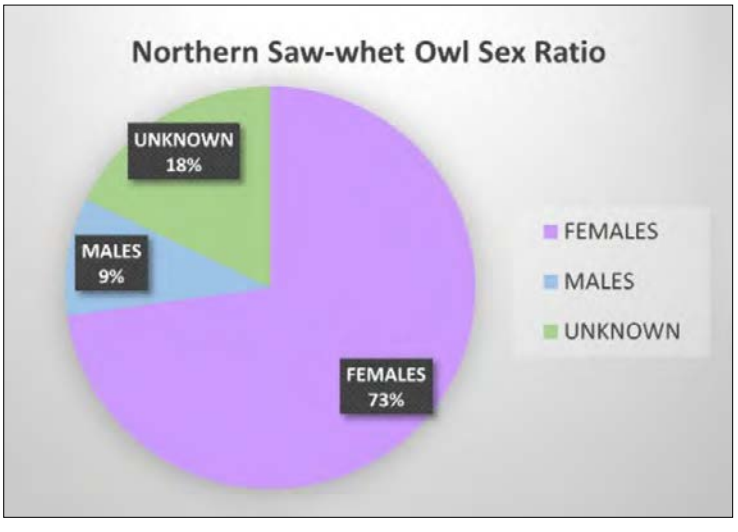
Photo: Uli Rodriques



Left: Using molt sequence and UV light to determine feather age, researchers are able to age the owls up to the third molt cycle. Middle: We also take wing length and other measurements to determine if it can help sex the birds and take DNA samples to compare. Right: Visitors from the Coeur d'Alene Audubon were treated to some stunning auroras. Northern lights photo courtesy of Theresa Shaffer.

We are extremely grateful to the CSKT Wildlife Program for helping us set up our bear fence, keeping our station safe. Finally, we want to thank the Flathead Lake Biological Station for providing the site and support to conduct this important research. — *Hayley Madden & Lauren Tate*

Hamilton's High School's Classroom Without Walls visited the banding station where students learned about biology, dissected owl pellets, and watched the research process. Photos: Jeanna Clifford



Short-eared Owl Nesting & Predation Research

By Beth Mendelsohn

Short-eared Owl hunting over grasslands. Photo: Melissa Groo

RECORD SETTING NESTS

If you live in the Mission Valley, you may have noticed the vast number of vole runways and tunnels throughout your yard or fields this summer, or vegetables missing from your garden! High prey populations carried through from the winter into the spring breeding season, and consequently, we saw high numbers of Short-eared Owl (SEOW) nests – a whopping 33!

Large clutch sizes are typical when there is an abundance of food, this nest had 10 eggs.

We also found the earliest nest we have seen, initiated on March 10.

Range wide, population declines, attributed to habitat loss, have been documented in the species. Road collisions, wire fencing, and poaching are known to kill Short-eared Owls. But what was causing the alarming 75% nest failure rate on high-quality habitat in the Mission Valley? To help uncover these immediate and local threats to Short-eared Owls, we deployed 13 more nest cameras this year, bringing the total to 29 nests monitored with cameras over the years. We were able to conclude that many nests fail due to predation by coyotes and some fail due to abandonment. Further, in years with higher nesting density, there was a greater proportion of successful nests, indicating that food availability is correlated to predation.

By using remote cameras, we made some new discoveries and documented behaviors such as feeding, nest sanitation, predator defense, and prey exchanges - and there are still thousands of video clips left to analyze!

Huge thanks to Dan Ballard, Drake Ballard, and Troy Gruetzmacher for technological innovations that led to a novel camera system that would not have been possible without their expertise.

Coyotes lead the pack as the primary predators of SEOW nests in the Mission Valley

Please consider donating to help us fund a network attached storage system (NAS). Not only have we been accumulating many terabytes of video data, but we also have an impressive archive of photographs and are in the process of digitizing over 40 years of data. We really need this system to ensure that our data is kept safe and secure and will be available and accessible for analysis.


SEOW chick that has just been banded, measured and about to be released


Beth collects evidence at a recently failed nest to compare findings with cam footage

SCAN QR CODE WITH PHONE TO WATCH ON YouTube

Short-eared Owl Predation Research: Day in the Field with ORI's Biologist Beth Mendelsohn

Ever wonder what a day-in-the-life is like for a raptor wildlife biologist? Viewers get a rare glimpse at a day with Beth. She is focused on unraveling the mysteries of Short-eared Owl failure, a critical area of study that sheds light on the challenges these owls face in their natural habitats. Through a combination of high-tech tools like nest cameras and her own sharp investigative skills, Beth gathers data to understand the factors affecting nest survival.

These are the types of methods and insights that drive ORI's research, capturing the dedication and curiosity required to uncover answers.

SEOW WINTER STUDY

The Short-eared Owl is a migratory species exhibiting a 'nomadic' lifestyle. What does that mean? Differing from resident or typical migrants, nomadic animals generally make less predictable, long-distance movements within their range in search of resources. For Short-eared Owls, we use the term nomadic to describe their behavior of seasonal movements anywhere from a few hundred to a few thousand miles that may differ in timing and location from year to year and season to season. We believe that the driver of these movements in Short-eared Owls is most importantly food, particularly small mammals such as voles, but also influenced by environmental and habitat fluctuations, and social/breeding behavior.

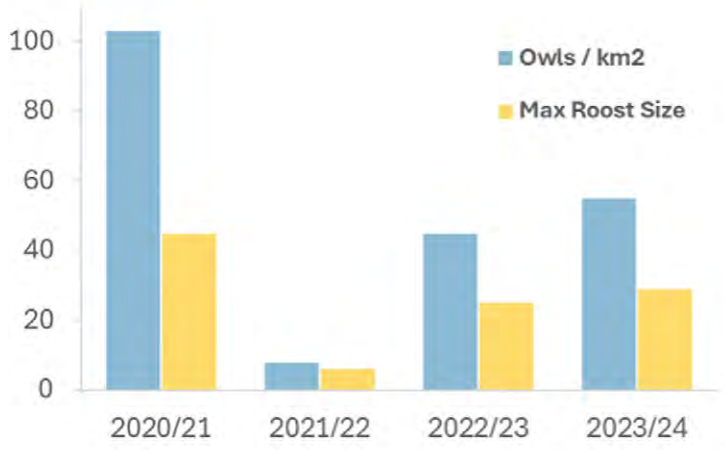

Photo: Melissa Groo

To help get a better idea of how the owls are using the conservation lands in the Mission Valley year-round, we survey for owl roosts during the winter. Last winter we saw a huge boom in local meadow and montane voles. Consequently, we saw large numbers of Short-eared Owls. Our monthly Short-eared Owl Winter Roost Surveys

rely on a team of stalwart volunteers that brave the cold, muck, fog, and snow to count birds. This year they were rewarded with days of 50-100 owls! Our data over the last 4 winters shows that the owls are present every year, but numbers fluctuate drastically from 3 to 300 owls per square kilometer. The size of communal roosts also becomes larger when there are more owls in the area (Fig 1).

Natural population fluctuations of their most common prey, voles, causes food abundance or scarcity. This means that you may see a large influx in the number of owls in one area during some years or seasons, while in other years the same habitat may have few owls (Fig 1). This nomadic strategy likely gives owls a better chance of surviving and reproducing successfully without being stuck in one place and dependent on the resources there. We hope this flexible strategy may help the species hold on as their available habitat disappears.

Fig. 1. Winter Short-eared Owl Abundance



L-R: Nicole Dupuy, Hayley Madden, Eli Estey, Addie Wichman, Ava Johnson, Denny Olson, Carol Buchan

Nomadic movements may also serve a genetic purpose, keeping the gene pool mixed and healthy. We are interested in starting a genomics project on Short-eared Owls but haven't found funding for it yet. Genomics would help us answer questions about population structure, genetic connectivity, genetic health, future resilience to change, and mating behaviors and fill in some key knowledge gaps for the species that will be vital to conservation.

Jon Barlow taking measurements.

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

On our website we have tribute gifts, 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, make a donation and you can designate it for a specific item on our Wish List. *Thank you!*

ITEM WISH LIST

- Weather recording station
- Thermal imaging or regular drone
- Electronic Tablets (iPads)
- File Storage system (NAS)
- Kestrel weather meters
- DNA analysis
- Chainsaw
- GPS
- Dissecting Microscope
- Snowmobiles
- Side-by-side ATV
- Small Tractor for field station maintenance
- Snow blower attachment for tractor
- Riding lawn mower
- Weed whackers
- Gently used or new backpacks for field work
- Shop tools

Mission Valley Raptor Survey Update

By Beth Mendelsohn

12,027 raptors counted

17 raptor species observed

Northern Harrier. Photo: Melissa Groo

Wow, thanks to over 1,200 volunteer hours, we've tallied 12,027 raptors so far! For each raptor seen, we don't just note the species and move on. Instead, we log details such as what they are doing, the habitat they are using, their color morph, possible subspecies, and more.

RESULTS THUS FAR SHOW:

1. Utility Poles account for 30% of perches that raptors are using
2. Trees and shrubs are another 30% of perches
3. Low posts like fence posts are 20%
4. And irrigation equipment like center pivots are 12% of perches

Perch preference can differ by species. American Kestrels are seen 50% of the time on utility wires, and Rough-legged Hawks are seen perched on trees only 10% of the time, but use irrigation equipment 20% of the time.

For habitat, 77% of the raptors are utilizing agricultural land during the surveys, mostly pasture, hay and cut fields which make up the majority of land in the county (67%). The Mission Valley is also home to about 15,000 acres of grasslands, many of these designated for conservation. 12% of the raptors were found in these grasslands, even though it only accounts for about 8% of the land in the survey.

Stay tuned via our email list for winter Raptor Workshop opportunities to learn how to find and identify raptors with Denver and Beth in the Mission Valley!

We are also working in an educational and consulting partnership with Flathead Land Trust to help on preserving local habitat.

Would you like to support one of our monthly surveys? We are looking for donations new or lightly used tablets to make data collection easier.

1. Harlan's Red-tailed Hawk

2. American Kestrel

3. Merlin

4. Rough-legged Hawk

Photos courtesy of volunteer, Alex Kearney.

Great Gray Owl Update

By Beth Mendelsohn

Our Great Gray Owl nesting research project has really taken off over the last few years and we've been able to add over twenty new nest sites in western Montana, which accounts for a significant proportion of the total known historical sites in the state. We are out every March – May diligently surveying and searching. Thank you to those who have helped out by reporting their Great Gray Owl nest sightings!

Great Gray Owls often move their nest sites from year-to-year, sometimes even over a mile, which can make relocating new nests a challenge. This strategy sometimes occurs when a mate dies, the nest structure is damaged, predation, harassment, or unknown factors. As we accumulate more data, we have a better understanding of their specific habitat requirements for nesting, such as old growth forest, a tall canopy, an abundance of snags, and small bogs.

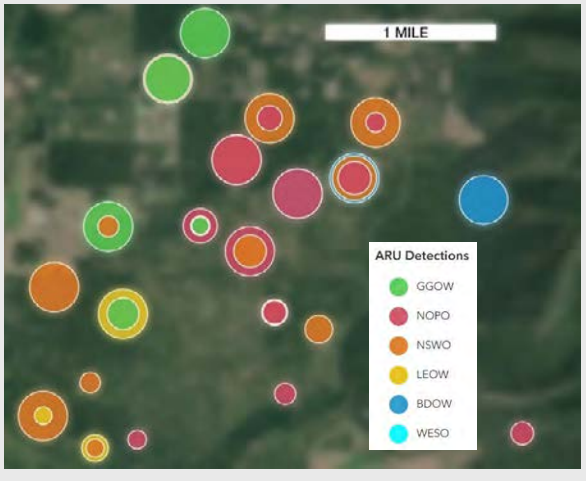
This spring, we were joined by Troy Gruetzmacher in the role of Applied Technology Specialist. Troy's company Owl Sense developed the audio recorders that help us immensely in surveying for breeding owls. Troy also processed the 26,000 hours (that's almost 3 years!) of audio data using machine learning algorithms, which are a branch of artificial intelligence (AI). Besides Great Grays, we detect the locations of all the forest owls around. Placing

Volunteer John Delagrange releases an adult female Great Gray Owl after banding. Photo: Troy Gruetzmacher

breeding owls on the map is a huge treasure trove of data for forest and wildlife conservation [see map below]. For many owl species, little is known about the specific nest-site locations within their breeding ranges – for example the Great Gray, Boreal, Flammulated, and Western Screech are all designated as "species of concern" in Montana, in large part due to lack of data on these species.

We are continuing to gather essential data, including audio recordings, to help guide conservation efforts for Great Gray Owls and other forest-dwelling owls. Thank you to everyone who has contributed sightings and support to help make this project a success!

Color banding helps us learn about survival, dispersal, pair fidelity, territory usage, and nest site selection, and eliminates the need for recapture.



A map of owls we detected with recorders. Each color corresponds to a different owl species, the larger the circle, the more vocalizations were detected. We use this to guide nest searching efforts and to inform management agencies on the locations of breeding owls.

Want to Help Great Gray Research?

REPORT YOUR SIGHTINGS IN MONTANA!

What to look for:

- Adults hooting in February – April (review the Owl ID guide on our website)
- 1 – 2 adults seen in March/April
- An adult carrying prey April – July
- Juveniles (scruffy looking) or fledglings June – August (they make screechy food begging calls)

Contact us at info@owlresearchinstitute.org or call (406) 644-3412 to report possible nests!

Burrowing Owl Comeback with the Global Owl Project

In mid-May, Denver and Beth had the chance to visit the Global Owl Project's Burrowing Owl study site at the Umatilla Army Depot in northeastern Oregon. Upon arrival, the Depot may not immediately stand out as a mecca for wildlife. The twenty thousand acres of sagebrush steppe is dotted with a thousand storage bunkers (or "igloos"), old barracks, and crumbling warehouses. An armed guard checks passes at the gate. For over 70 years the site was used to store munitions and chemical weapons for the Army, but since 2012 the site has been closed, weapons destroyed, and chemicals cleaned up. The land is now managed jointly by the Confederated Tribes of the Umatilla Indian Reservation and the Oregon National Guard. In 2008, they reached out to David Johnson of the Global Owl Project to see if anything could be done about the disappearance of the iconic Burrowing Owls from the site.

As the name implies, Burrowing Owls rely on the abandoned burrows of fossorial animals to nest. At the Depot, these burrows are most commonly dug by badgers. Unfortunately, as a result of coyote eradication efforts in the 80's, all of the badgers on site had been killed off as by-catch. Without the badgers, the Burrowing Owls had no burrows to raise their young in, and over time the remaining burrows collapsed and the Burrowing Owl population crashed. By the time the Global Owl Project stepped in to intervene, the Depot was down to only 2-3 remaining breeding pairs of owls.

With life-long dedication to owls, David Johnson founded the Global Owl Project

This intervention led to the world's most extensive Burrowing Owl research project. Over the next 15 years, David Johnson and his team installed over 100 'artificial' burrow sites, each consisting of 2-3 artificial burrows, using plastic ducting, barrels, and buckets. Each year, the Burrowing Owls were closely studied using perfected methods for banding and monitoring. The first year, only a couple of the burrows were used. However, over the years more and more owls started to return and successfully nest, eventually leading to the dramatic recovery of the Depot population. When Denver and Beth joined the field efforts this past spring, the Depot was experiencing a record-breaking breeding year, with a total of 102 nests. Further, the badgers have started to come back! For the first time in over 20 years, badgers occupied the Depot and 3 pairs of owls used natural, badger-dug dens for their nests. To date, over 815 nests have been monitored, over 3,800 Burrowing Owls have been banded, and over 3,010 chicks have hatched on the Depot.

Solai Le Fay with a young volunteer, band, weigh, and measure the Burrowing Owl chicks

Burrowing Owl chicks awaiting banding

Besides being a fun excursion, we had an ulterior purpose to our trip. Beginning next spring, ORI plans to adopt the project as David Johnson retires from a long career dedicated to owls. It would be a shame to bring such a successful project to an end, so we gladly accepted. Luckily, ORI's past intern Solai Le Fay has been working on the project and is using the data for her Master's degree research at Boise State University, and will be running the field work next year.

The ORI is looking forward to collaborating with the project and helping to maintain its current objectives of studying Burrowing Owls and assisting with their conservation goals.

— *Solai Le Fay and Beth Mendelsohn*

ORI Staff & Volunteer Updates

Global Owl Project Researcher from Brazil Joins ORI for the Winter

Gabriela Mendes has had a strong passion for owls since she was a kid, when a Barn Owl visited her house. During her first year of college, she had the opportunity to start working with owls in Brazil.

She has experience with owl rescue, rehabilitation, scientific research, fieldwork, environmental education, citizen science, and has interest in owl mythology, as in Brazil, owls are still very persecuted due to popular beliefs.

She obtained her master's degree at the State University of Maringá, where she developed a project involving urban Burrowing Owls, analyzing their nest production in environments with different levels of urbanization. Gabriela is also part of the Global Owl Project and had the opportunity to contribute on their project with Burrowing Owls in different states and countries.

Gabriela dedicated her whole academic life to owls and is really excited about coming to the ORI!

Field Intern and Lead Saw-whet Owl Bander

Having grown up in Idaho, Lauren Tate discovered her interest in the natural world through her proximity to endless miles of beautiful foothills and rivers.

Lauren graduated from the University of Portland with a degree in Environmental Science and Biology, and since then has worked with breeding and migratory songbirds in Oregon, Colorado, Idaho and Wyoming. Her previous position as a part-time owl bander at the Intermountain Bird Observatory affirmed her passion for owls. She has been the lead bander at the Saw-whet Migration station this season, organizing volunteers, and conducting visitors nights. She was also able to join in the Arctic Snowy Owl research this summer. In her free time, Lauren enjoys fly fishing, silversmithing, climbing, knitting, and birding. She is now off to pursue other birding research opportunities.

Applied Technology Specialist and Long-time Volunteer

Troy Gruetzmacher has always been interested in birding and spending time outdoors learning about the world. Through a chance encounter with a Pygmy owl years ago, he became captivated by them and wanted to learn more.

Troy's educational background is unique for ORI, since he has a Bachelor's degree in Computer Science and extensive experience with software development and applying technology to enhance processes. Troy started as a volunteer with ORI a few years ago to help with Great Gray night surveys and shortly thereafter decided to look into technology based solutions to supplement night surveys with recording devices. He has designed and produced the ARUs the ORI uses and has even started his own company, Owl Sense. He's become enthralled with learning more about Great Gray vocalization behavior and trying to decipher its meaning. He also enjoys biking, camping and spending time with his wife Julia and son, Oliver.

Educational Highlights From 2023 and 2024

Nov: Denver Holt presented at the Flathead Audubon Society in Kalispell, MT

Dec: Denver was keynote at the Montana Forester's Association Christmas Dinner Fundraiser

Jan: Denver Holt and Beth Mendelsohn participated in The Children's Hour, Inc. radio show and interview with kids

Feb: Beth Mendelsohn presented at Science on Tap at Flathead Lake Brewing in Bigfork, MT

Hayley Madden guided an Owl Walk for the Montana Natural History Center, Missoula

Beth gave a Careers in Wildlife Biology presentation to Western Field Onithologists Student Chapter via Zoom

March: Beth Mendelsohn dissiminated Osprey Baling Twine info and gave an update on SEOWs to the Mission Valley Conservation Alliance Meeting, Charlo, MT

Denver Holt gave a Radio interview with KFGO-AM which reached the entire state of North Dakota, as well as parts of South Dakota, Minnesota and Manitoba.

Adam Potts gave a Zoom presentation to Parker Oregon Learning Gardens: Youth Educational Outreach

April: Denver gave a presentation to Mission Mountain Audubon in Polson, MT

Adam Potts gave a presentation at the school's Sciencepalooza in Frenchtown, MT

Hayley Madden did a kids education overview at Hotsprings Elementary, MT

Denver presented Owls of Montana and Snag Management at the MT Forest Landowner Conference in Helena, MT

Beth and Hayley had a booth at CSKT Earth Day Event in Pablo, MT

Denver presented at the Whitefish Science Quencher, Whitefish, MT

May: Denver did a radio interview program on KGVM in Bozeman

Jeanna attended and had a booth at the Biggest Week in Birding Festival in Oak Harbor, OH

Denver presented to Ohlone Audubon Society in California via Zoom

Beth, Hayley, and Lauren presented at an outdoor educational program at Camp Paxon, Seeley Lake, MT

June: Beth had a table at Raptor Day at the Daly Mansion in Hamilton, MT

Denver was interviewed on the Finding Genius Podcast

Denver presented to ADAC Arctic - Univ. of Alaska Anchorage Arctic Summer Internship Program in Utqiaġvik, AK

Aug: Beth presented at the Swan Valley Connections potluck in Condon, MT

Denver gave ORI Overview at FLBS Open House, Polson, MT

Denver presented to Centennial Valley Assoc. in Lima, MT

Sept: Denver was interviewed on the Paula Poundstone Podcast

Denver presented for the Five Valleys Audubon in Missoula, MT

Jeanna and Lauren presented and had an info table at Birds of Prey Festival at Lone Pine State Park near Kalispell, MT

Oct: Denver participated in Q&A session at Newport Beach Film Festival, CA

Beth, Lauren, and Jeanna presented and gave tour of Saw-whet Migration Station to the Hamilton's Classroom Without Walls

Lauren, Beth and Denver gave public presentations for 5 Saturday nights as well as to the Flathead Audubon Group and to the Coeur d'Alene Audubon on separate evenings at the Saw-whet Migration Station, FLBS, MT

Beth presented a paper and Lauren presented a poster at the Raptor Research Foundation conference in Charlotte, NC

ORI MAKES IT TO THE BIG SCREEN

Denver Holt (far right) on panel discussion after the premiere of SoCal Snowy Owl in Lido Theater.

Our expertise on Snowy Owls was sought after by Emmy Award winning film producer Walter Josten of Blue Rider Films. The short human interest documentary titled: SoCal Snowy Owl, received the Audience Award for Best Short Documentary at the 25th Anniversary Newport Beach Film Festival. Denver Holt was in the film as well as one of the producers on the film. He attended the premiere "red carpet" event on Oct. 18th and was a member of the panel discussion afterwards at the Lido Theater in California.

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Great Horned Owls.
Photo: Kurt Lindsay

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Susan Rivers and family
Thomas Fry

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