

# THE ROOST

Annual Newsletter of the Owl Research Institute

NOVEMBER 2023 - VOLUME 27

Photo © Melissa Groo

## Year of the Short-Eared Owls



# Whoooo 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 and non-profit group donations, grants from foundations and corporations, and occasionally agency contracts. We accept donations of real property. Please consider us in your estate planning. Donations are tax-deductible to the extent of the law.

## What We Do

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

This issue of *The Roost* was designed by Jeanna Clifford. Content by Denver Holt, Beth Mendelsohn, Steve Hiro, Hayley Madden, Solai Le Fay, and Adam Potts. Cover: Short-eared Owl. Photo | Melissa Groo. This page: Short-eared Owl. Photo | Kurt Lindsay

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Genomics Laboratory to decipher many questions regarding parentage, population structure, and other interests from our enormous samples of owl blood, feather, and tissue.

Thanks to our younger generation of biologists, we have advanced our use of technology. We now have portable cams for nesting observations and automatic recording units for nocturnal breeding season surveys. Results were mixed with strengths and weaknesses to each method. Our portable cams complimented our permanent live cams with our partner [www.explore.org](http://www.explore.org). Oh, and our younger generation of biologists are also very good at social media.

We were honored to play an important role in the New York Times Best selling book; *What An Owl Knows* by Jennifer Ackerman. Jennifer visited the ORI for a week. She assisted in the field, doing actual boots on the ground field research – which is what we are known for. Throughout her book, Jennifer acknowledges the ORI's contributions to owl research and conservation. In fact, I was honored when asked to review drafts of the book prior to publication. See *What An Owl Knows*, page 19.

Our paper titled: *Experts in the Field*, was published in *The Wildlife Professional* in 2022. In that paper I emphasized the need for rigorous long-term field research, verses the short-term approach we have become so accustomed to today. And, the same researcher must conduct these long-term studies in order to become an expert. See a restructure of that paper under Expertise and Expert Performance, page 20.

We hired a desperately needed Director of Communications/Office Manager to help us reorganize and prioritize our daily activities, update our business savvy, and keep ORI on track as we continue to grow. See Jeanna Clifford, page 22.

Finally, we need your support to continue our projects. We are trying to match a \$100,000 grant. If the 7,000 people who receive our newsletter all make a donation, we could match that grant. If so, the ORI could accomplish more in owl research, education, and wildlife conservation. We are also looking to hire a biostatistician.

Make your donation today, and pass the newsletter on to someone else when you are done. Thanks, and enjoy the upcoming winter season!

## Message from the President

Greetings. Another year has passed, and each year seems to pass faster than the previous. Our projects also increase in years, as do the amounts of data. However, depending on each project, annual variation in results is always apparent. Some species have a good year while others do not. In this issue of *The Roost*, we briefly summarize all the years of research for all our projects. Some are still going, a few have finished, some in pilot stages, and one new graduate study. This should give you an idea of what you have supported.

The value of long-term research and monitoring cannot be over emphasized, if we are to understand how and why populations fluctuate. Owl population estimates based upon various methods are helpful in gross estimates of abundance, but generally cannot pinpoint direct causes of population variability. They are just estimates and often never validated. Graphing results of long-term field studies like ours – although few and far between – help us visualize population fluctuations at local scales. See graphs on pages 10, 11, and 15.

Recently, we teamed up with the University of Montana, Flathead Lake Biological Research Station (FLBS) for our new Saw-whet Owl migration study. We have also partnered with University of Montana Conservation

# Short-Eared Owls {1987 – 2023}



**120** nests monitored  
**224** owls banded

Photo | Melissa Groo

Denver Holt began studying Short-eared Owls (SEOWs) in 1982 in Massachusetts. The Montana study began after he founded the Owl Research Institute in 1988, and established the headquarters, or “farm” in the Mission Valley, a notorious site for Short-eared Owls. Between 1987–1992, 56 nests were located and 28 adult females and 144 nestlings were banded. After a hiatus, the nesting project was revived in 2014, and since then, 66 nests have been monitored and over 50 owls banded. Surveys for pre-breeding were established in 2009–2012, and winter survey protocols were launched in 2021.

The ORI has been central in creating and publishing methods for nest searching and survey techniques for the species which are now standard throughout the west.

Although we’ve banded many owls, only one nesting female has ever been recaptured, leaving the species’ movements somewhat of a mystery. ORI experimented with satellite transmitters, but found the units detrimental to survival and productivity of the birds. We plan to start a genetics study, and are in search of funding to get the project off the ground.



Beth Mendelsohn banding a Short-eared Owl and examining feather molt in order to age the bird.



Photo | Kurt Lindsay



Top: Tiny nest cameras provide us an inside view of rarely seen behaviors at well-concealed nests that we've never been able to see, such as parental care, prey exchanges, and nesting behavior. Below: SEOW nest in the grass with 5 eggs and 3 newly hatched chicks.

## CAMERA TRAPS FOR NEST PREDATION

This year's winter and spring vole population was abundant and supported a higher number of nests. 2023 was our second season of placing remote camera traps on Short-eared Owl nests to detect predation. Thanks to Tricia Rodriguez, University of Montana Bird Ecology Lab (UMBEL), and Dan and Drake Ballard of Texas Backyard Wildlife, we started working with a new system. Sponsored by a conservation grant from Sitka Gear, we deployed camera traps on 9 nests in the study area this summer. The



Photo | Melissa Groo

Extraordinary photo captured of a courtship flight, where the male performs fantastic dives and hoots. It remains unclear if the sound made by the wings is due to air passing through or physically hitting them together, or a combination of both.

cams provide a non-invasive way to study predation and nesting behavior. Preliminary results reveal that coyotes are a major nest predator and that Short-eared Owls may be sensitive to nest disturbance during the

early egg-laying stage. Vast variations in the survival of young at nests suggest that low productivity may influence population declines. Preliminary results were presented at the 2023 World Owl Conference in October.

This research project will reveal threats to productivity and thereby benefit conservation of SEOWs, as well as benefitting other ground nesters, such as waterfowl, upland game birds, and harriers.

## VITAL HABITAT

Short-eared Owls rely on a rapidly dwindling category of habitat for their way of life – grasslands. Unfortunately, over 90% of native grasslands have been destroyed. Large tracts of grasslands and open country habitats help protect SEOWs from predators and provide sufficient small mammal prey. Part of our research is to measure the vegetation height, cover, and species composition. By researching the habitat characteristics, we will contribute to SEOWs conservation.

# Great Gray Owls

## {1993 – 2023}

**55** nests monitored **34** owls banded

ORI has been recording Great Gray Owl (GGOW) nests and evidence of breeding in western Montana since 1993. We have also collaborated with researchers and individuals across the state to compile a database of 55 confirmed nests in Montana, almost doubling the total nest records for the state. Beginning in 2020, we embarked on a more formalized study, increasing survey effort, nest searching, and nest monitoring. Completing over 550 nocturnal surveys and hundreds of hours nest searching, we have located and monitored 20 new breeding sites in the past 3 years! We share our results with the US Forest Service and Montana FWP for forest management plans and to protect Great Gray Owl breeding habitat.

We also spend time each spring observing behavior at nests and on nest cameras. This helps us gain a better picture of the species' breeding biology. We have banded 34 individuals, including 19 chicks and 15 adults, to help us understand nest site fidelity and survival.

### NESTING OBSERVATIONS

Great Gray Owls are well known for nesting atop old broken-top trees. We are looking at the specific characteristics of 25 snag nest sites, to figure out why they are choosing certain trees. For each nest, we are studying the dimensions and features to determine what characteristics are important. In fact, Great Gray Owls only seem to use snags to nest about half of the time. Our data shows that 51% of nests in Montana are in snags, 43% are in stick nests, and 6% are in mistletoe growths in trees.

### NEW TECHNOLOGY

This past year, thanks to our dedicated volunteer and supporter Troy Gruetzmacher, we tried something new. Troy singlehandedly designed and built 35 autonomous recording units (ARUs) and donated them to ORI to test in the field. We had been interested in using passive audio techniques to improve our ability to detect breeding Great



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Photo | Kurt Lindsay



Recently banded Great Gray Owl chick flaps its wings after its release.



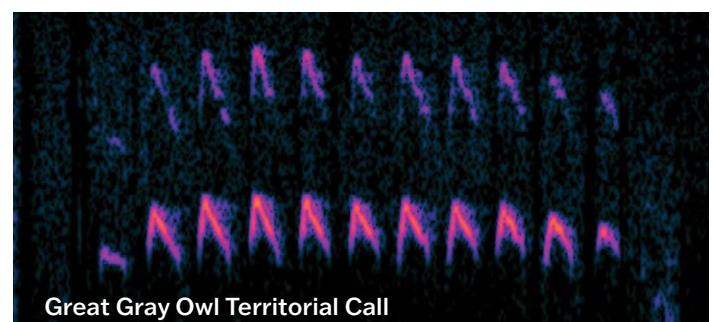
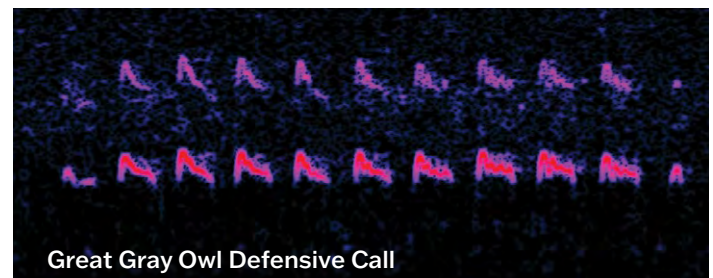
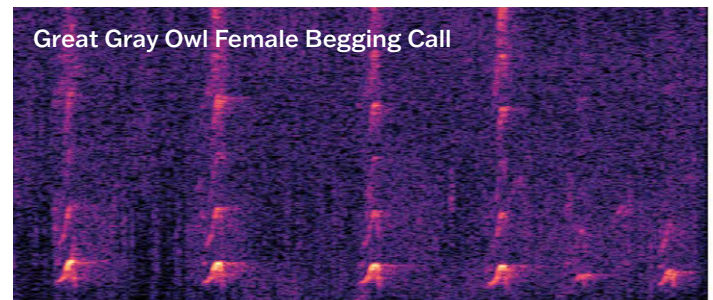
Left: volunteer Shelby Horton holds a banded fledgling. Middle: image of an ARU that detects owl calls. Right: Troy Gruetzmacher, with an adult GGOW.

Below: examples of vocalizations recorded on the ARU's.

Grays, which have a low detection rate using traditional callback techniques. However, the commercially available ARUs had previously been cost prohibitive, so we were grateful for Troy's contribution.

In the early spring, we deployed ARUs in 160 locations, accumulating over 20,000 hours of recordings. Thankfully, Troy also helped us analyze the audio data with advanced computer software designed to find specific owl vocalizations. Great Gray Owls were detected at 40 locations, Northern Saw-whets at 32, Long-eareds at 40, Barred at 8, Northern Pygmy at 39, and Great Horned at numerous locations.

With the help of these units, the team found 8 nests. What we love about the ARUs is that they enable us to successfully cover a large area and are completely non-invasive to wildlife. Coupled with nighttime playback surveys, they are a great tool to help us unravel the mysteries of the elusive Ghost of the Forest in western Montana. Next year, we would love to expand and deploy 30 more ARUs. Please consider directly funding this project – your donation of \$120 per recorder, or \$3,600 for all, could go a long way to help researchers discover more nests, and lose less sleep! Increasing this type of knowledge on the species is vital for conservation.





## Northern Pygmy Owls {1980 – 2023}

One could say the ORI began with the Northern Pygmy Owl (NOPO), as two ambitious University of Montana undergraduate students (one of which being Denver) in 1980 chose to forego classes, and instead, focus on monitoring a pygmy owl nest in near Missoula, Montana. As it turned out, a Northern Saw-whet Owl also nested in the same tree. From these observations, two papers were published, and the Owl Research Institute was born.

This ongoing study in western Montana is now in its 44th season. Since 1980, we have pieced together various aspects of NOPO breeding biology. We have found 57 nests. Only one other study in the US has recorded nest numbers like this. However, surveys to find NOPO nests are extremely difficult. Surveys begin

**57** nests monitored **19** owls banded

in mid-February, with morning or evening excursions. We initially listen for spontaneous breeding songs, or if needed, elicit a response to recorded calls.

With the development of 'peeper cams' versus climbing or using ladders to access nest cavities, we have been able to unravel much about their breeding behavior. We now know egg laying typically occurs around mid-April, hatching in mid-May, and fledging in mid-June. Furthermore, we have documented egg laying intervals, incubation period, clutch size, hatching sequence, growth and plumage development, as well as fledging behaviors.

Our observations confirm female NOPOs do not commence incubation until most or all eggs have been laid. Our observations also indicate eggs hatch near synchronously or synchronously within a 24-hour period. Nestling growth, plumage development, and



fledging are within a few days of each other or near synchronous.

Finally, unlike, other species of young owls, Pygmies can fly well right out of the nest. These behaviors are unusual among other owl species and perhaps unique to this species.

We have only managed to band 19 adults and young. This is due to the difficulty in accessing nests,

which can often be greater than 60 feet high. On top of that, their nest cavities generally have a small 2-inch circular entrance hole, making accessing the chicks extremely challenging.

All nests were located in natural or excavated holes created by woodpeckers. The cavities occurred predominantly in aspen, cottonwood, and larch trees.



Above: Dan and Drake Ballard work on setting up the Pygmy cam. Below: a rare look inside a Pygmy Owl's nest.



Adult Northern Pygmy Owl feeding its fledgling a vole. Photo | Dan Cox.



Photo | Dan Cox

## Video Footage from 2023 Season

SCAN QR CODE WITH PHONE TO WATCH ON  YouTube



**Northern Pygmy Owls in Montana**  
with **Steve Hiro**

OWL RESEARCH INSTITUTE Photo by Kurt Lindsay

Steve Hiro, a former heart surgeon, and volunteer researcher with the Owl Research Institute, shares information and video footage from the 2023 Northern Pygmy Owl breeding season. All video footage was taken in the late spring of 2023 at one of ORI's research locations in Northwest Montana.

Steve has been volunteering with ORI and studying Northern Pygmy Owls for the past 28 years. In this video, he shares insights from observing these remarkable little owls during their breeding season.

Photos and video footage courtesy of Dan Ballard, Drake Ballard, Steve Hiro, Kurt Lindsay, Avery Maxwell, and Matt Larson. Special thanks to Damian & Megan Powledge for graciously allowing ORI access to their property to observe this nest throughout the 2023 breeding season.

# Snowy Owls {1992 – 2023}

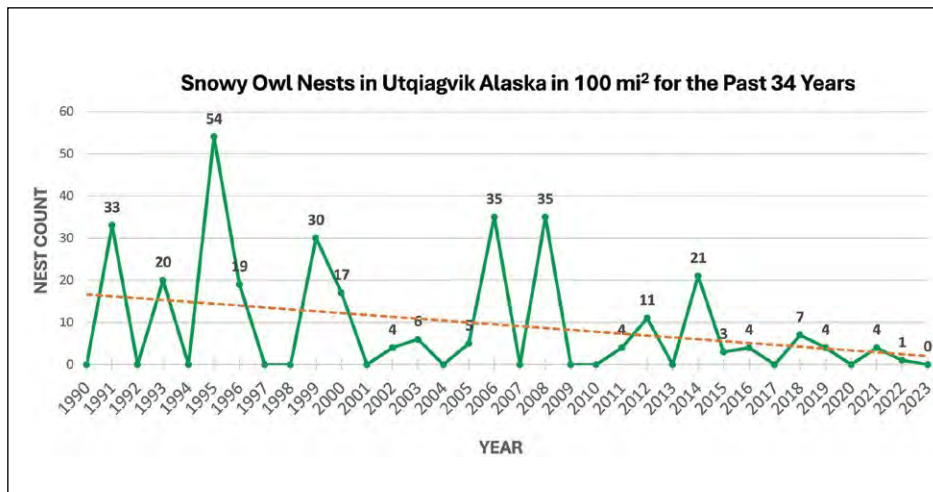
## Snowy Owl Breeding Ecology & Lemming Population Study

**312** nests monitored  
**800+** owls banded



Male Snowy Owl. Photo | Kurt Lindsay

Clearly Snowy Owls (SNOWs) are the avian icon of the Arctic. Our ongoing study at Utqiagvik, formerly Barrow, Alaska, has just finished its 32nd season. It is the longest running breeding season study on SNOWs in the world.



Our field season is three-months long, and the weather mostly cold, humid, and windy. Our crews cover 100 square miles mostly on foot and ATVs. We were initially set to begin the study in 1991, but could not get to Barrow. So fortunately our colleagues located and recorded data for 33 nests for that year. Thus, we have now recorded data for 312 nests and banded more than 800 Snowy Owls.

We have measured 100 nests for nest characteristics and habitat associations for local conservation

protection. We attached the first satellite transmitters to Snowy Owls in the world. We have studied growth and plumage development in 225 nestlings. We have studied stress hormone levels in nestling

in relation to leaving the nest on foot weeks before flying. Our data suggest this is an anti-predator strategy, given they are ground nesters. Through banding and resighting, we believe that few Snowy Owls may return to the same nesting area at some point in their lifetime.

We have published and hypothesized as to why Snowy Owls are white, and why females only breed with older white males. When not breeding, we conduct season-long surveys and behavioral studies, such as roost site preferences. *Special thanks to Leica Biosystems for a research grant and binoculars!*

# Snowy Owl Chick Rescued & Rehabilitated

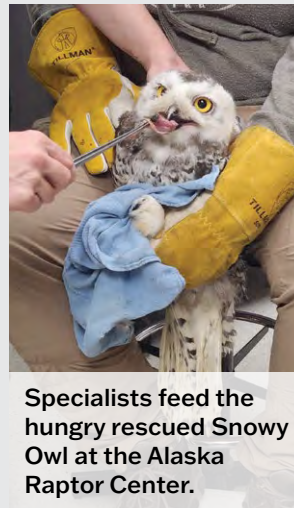
In September 2022, ORI was contacted by a wildlife veterinarian in Utqiagvik, AK about a banded Snowy Owl that had been injured and unable to fly, found in a field near a school. While we will never really know what happened to the owl, we are sure its injuries were human-caused. Fortunately the Alaska Raptor Center of Sitka helped us to quickly arrange transport for the young Snowy Owl to their facility for x-rays, which determined she had sustained fractures to the pelvis and wing that had already begun to heal.

Arrangements were made for the young Snowy Owl to travel to the Wild Skies Raptor Center in Montana, where she could spend the winter in the expert care of the rehab team, continuing to heal, learning to fly and hunt. After the Snowy Owl's successful rehabbing, she was released near her birthplace in June of 2023. She was spotted up to two months later in the area, still flying and thriving.

WATCH RELEASE VIDEO ON  YouTube



Owl shortly after rescue and x-ray showing broken pelvis.



Specialists feed the hungry rescued Snowy Owl at the Alaska Raptor Center.

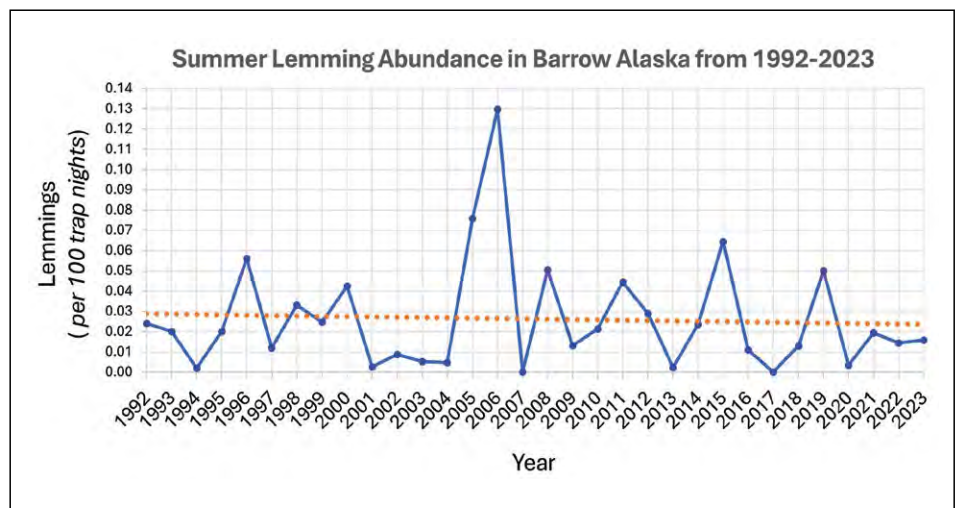


Brooke Tanner of Wild Skies Raptor Center opens the travelling crate to let the Snowy Owl out into her private area in the rehab facility in Montana.

## Lemming Study Data



Simultaneously, we monitor lemming populations to correlate lemming population fluctuations with Snowy Owl population fluctuations and reproduction. This relationship is clear. Our Snowy Owl food habits study has yielded 3,000 prey items cached at nests, and 46,649 prey recorded from pellets. These are the largest samples in the world. Indeed, > 95% of the owls' diet is lemmings, dominated by brown lemmings.



Thus, highlighting that lemmings are the most important component driving SNOW breeding success. Any effects of climate change on lemmings – negative or positive – will directly affect and effect SNOW breeding.

# Long-Eared Owls {1987 – 2023}

**279** nests monitored  
**2,177** owls banded

Our Long-eared Owl (LEOW) study in western Montana is now in its 37th year. Our field season is almost year-round with a lull in July and August. This is perhaps the longest breeding and wintering study in North America. Field work is rigorous and not for everyone. We scramble through Hawthorn scrub whose branches are armed with inch long stout thorns. Cockleburs, stickle-burs, stickseeds, prickly wood rose, and so forth wreck your fleece. Carhart™ work clothing is the only clothing protecting us from body piercing vegetation.

As of writing, we have banded 2,177 Long-eared Owls and monitored 279 nests. Of these, most are never seen again, buttressing the suggestion that Long-eared Owls are highly migratory and nomadic during their lifetime. In fact, according to our definition of site fidelity, only 127 banded individuals have remained or returned to our study area, showing site fidelity. Of these, only 25 nestlings have shown natal philopatry

and 3 natal dispersal. Of all known breeding pairs, only once has a known male and female mated with each other in ensuing years. We conclude LEOWs are seasonally monogamous and lifetime polygynists. We have recorded stress hormones in breeding versus wintering LEOWs. Our results suggest life is more stressful for males and females, when raising a family, than surviving winter individually. Results for nest dispersal suggest young leave their tree nests around 3 weeks old – well before they can fly – as an anti-predator behavior. We developed a technique based on plumage alone, allowing us to predict sex with greater than 90% success. We have also recorded 41,941 prey items, of which 92% are voles, thus showing how important these small rodents are to LEOW reproduction and survival.

**Left:** volunteer Jon Barlow is holding LEOWs from a winter roost before being banded. **Middle:** image captured by Jeremiah Thompson, this particular owl has gone into "concealment mode" by making itself look as thin as possible. **Right:** Steve Hiro gets ready to release an owl after banding.



# Barred Owls {2022 – 2023}



Female Barred Owl.  
Photo | Melissa Groo  
Below: Adam Potts



Eight years ago, when I heard a Barred Owl in Montana for the first time, I didn't believe my own ears. I'd grown up in SW Montana and had spent a good chunk of my lifetime exploring it, and by 2015, I'd also worked as a seasonal biologist in multiple locations around the West. Although I'd gained familiarity with Barred Owls' "who cooks for you" calls during my college career back East, I'd never heard one in the western US and assumed they weren't here. My backpacking companion, who was from New Hampshire, first noticed the owl hooting across the lake from our campsite in Glacier National Park. He shook his head when I tried to convince him (and myself) that it was just an odd-sounding great horned owl. "No, that's definitely a Barred Owl," he assured me. As the 'resident wildlife expert', I remained skeptical—much to my chagrin!

I could never have guessed in that moment that Barred Owls would become the focus of my master's thesis. I've just wrapped up my second season of conducting broadcast transect surveys for them, which are the first of their kind in Montana. The few published works on the Barred Owl in Montana have been based on incidental sightings of the species. The purpose of these transects is to detect as many Barred Owl territories as possible. Given our incomplete understanding of Barred Owls' distribution and density in the state, when I began in 2022 I surveyed across a broad swath of western Montana, from Bozeman (where I live) up to Whitefish. These preliminary transects gave me a better idea of

where my surveys would be most fruitful; I ultimately concentrated further surveys in the forests of the Seeley-Swan and the Mission Mountain foothills.

The central goal of my research is to learn more about Barred Owls' nest stand selection in Montana. This spring, I undertook an intensive nest-searching effort within the territories I'd located, and confirmed eight Barred Owl nests. This summer, I returned to these locations and took measurements on the nest site's characteristics, such as the diameters and heights of the surrounding trees. Black cottonwoods, both live and dead, seem to be an important nesting tree for the species: 6 of the 8 nests I located were in cottonwood cavities. These tree measurements, as well as an accompanying GIS analysis I plan to do on canopy cover, form the core of my thesis research. I hope to begin formally analyzing my data towards year-end.

The scope of my work wouldn't have been possible without the generous support of the Owl Research Institute. Denver is of a like mind that further research on Barred Owls in Montana is needed, and generously agreed to underwrite the fuel costs for my nest searches this spring. I also located numerous other territories in addition to the eight where I located the pair's nest. It is my hope that these efforts will be further built on, and other Montanas feel as inspired as myself to continue learning about these charismatic creatures. With so little known about Barred Owls in Montana, the opportunities for more research are great. —Adam Potts

# Northern Saw-whet Owls {1980 – 2023}

**65** nests monitored  
**2,100+** owls banded

## NUMBER SUMMARY FOR BREEDING

Back in 1980, Denver Holt found his first Northern Saw-whet Owl (NSWO) nest, and in the last 44 years that number has climbed to 65 nests. Most of the Saw-whet nests we study are in natural cavities excavated by woodpeckers, often in snags. Whereas most breeding studies of NSOWs, are nest box programs. It is important to gather data on natural nest sites, such as tree species, nest height, cavity size, and excavator species. It's also important to understand the characteristics of these fast-disappearing and little understood natural sites for conservation and management. We have also been able to band 70 nestlings and 14 adult females, and recorded clutch size, hatching, nestling growth, plumage development, and fledging.

## NUMBER SUMMARY FOR WINTER

While hard at work searching for winter roost sites of Long-eared Owls, we regularly would come across Northern Saw-whet Owls taking advantage of the dense cover and nearby proximity of fields for prey during the winter. In 2011, we decided to document and measure these roost sites and analyze the winter diet of the Saw-whets in shrubby draws. We quantified characteristics at 43 winter roosts, such as roost substrate, height, branch

diameter, and canopy cover, we also banded 31 owls to see if they had any site fidelity, and 6 of them were recaptured in the same season and same location, but never in subsequent years. Interestingly, the same roost sites were occasionally re-used by different individuals in subsequent years. Unlike many of the other owl species we study in Montana, Saw-whet winter diet relied heavily on mice (39%), voles (48%) and other small mammals (n = 481 prey items).

## NUMBER SUMMARY FOR MIGRATION

During autumn, many avian species migrate to wintering grounds. Northern Saw-whet Owls are one of these species that begin to disperse from their nesting areas and move to alternate places, sometimes farther south, during the colder, snowy months. Owl researchers across the continent take advantage of these movements to band thousands of owls from August – November. In Missoula, migration peaks from the last week of Sept. until mid-Oct. (see graph on next page) Here in Montana, ORI has been banding Saw-whets on migration since 2010 in the Missoula area. In total, about 1800 have been banded during the fall migration season. We are working to analyze this large dataset.

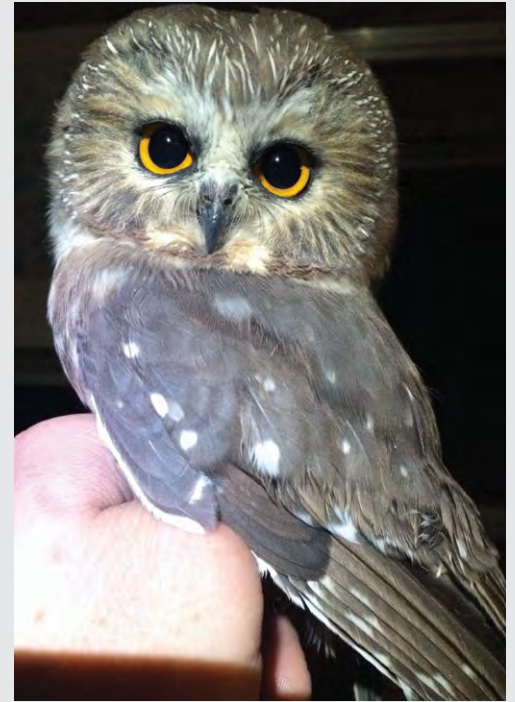


Photo | Radd Icepoggle

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Female Saw-whet, peeks out of her nest in an Aspen tree. Photo | Kurt Lindsay



Solai Le Fay with a young visitor assistant processing and banding the migrant Saw-whet Owl at the Biological Station on Flathead Lake.

## GENETICS

In collaboration with the Luikart Genetics Lab at the University of Montana, we are working on using genetic techniques to determine the sex ratio of male and female Saw-whets that we band. It is important for conservation and understanding of the natural history of the species to know what sex the bird is. This year, we moved our banding site to University of Montana's Flathead Lake Bio Station



Northern Saw-whet Owl nestlings (a couple weeks from fledging) to be banded and measured and returned to their nest.



and tried out a few other sites as well with our mobile banding unit. We have been able to offer weekly nights that are open to the public to observe the research. So far the new site is proving to be productive.

### HELP FUND THIS RESEARCH!

We need 10 new mist nets! Having good quality nets increases our chances of captures, and safety of the birds. Our field techs and researchers spend many hours every season making repairs in mist nets, but sometimes the fragile nets become broken beyond repair (especially from encounters with squirrels and other mammals). Sponsor a mist net (\$180 ea.) and be an important part of banding owls and keeping our researchers' sanity! This will allow us to expand the project to other study sites with our mobile banding unit.

## Boreal Owls {1984 – 2023}

**47** nests monitored **142** owls banded

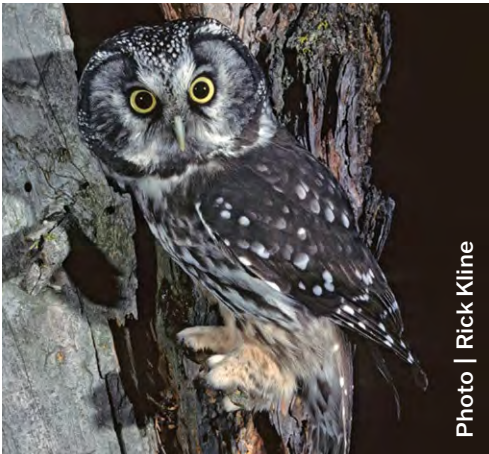


Photo | Rick Kline

Beginning in 1984, we helped develop the survey methods for Boreal Owls (BOOWs) in Montana, and the west. In the late 1980s, the USFS hung nest boxes in several national forest in western Montana. We monitored many of these boxes, but primarily on the Lolo and Beaverhead NF. In 1988, we recorded the first nest site

for BOOW in Montana. It was in a woodpecker hole in a spruce tree.

Over these 40 years, we recorded 47 BOOW nesting attempts, and banded 142 owls (31 adults and 111 nestlings). One nest was in a natural cavity, and all others in nest boxes. We have recorded clutch size, hatching and fledging success, growth rates, site fidelity, and philopatry for a few individuals. We have also recorded > 250 prey items from nests.

Since 2017 however, zero BOOWs have been found nesting on our study sites. We are unsure of the reason why. But we do know, intentional cutting down of our marked trees with boxes, general road expansion, firewood cutting, wildfire, and recently very extensive logging have reduced the number of available boxes. Yet,

even in the remaining boxes, the owls have not been recorded nesting. And this brings us back to stressing the importance of recording natural nest site for cavity nesting owls such as Boreal, Saw-whet, Pygmy, Screech and so forth. So that forest managers have that data to implement inforest management plans.



## Northern Hawk Owls {1994– 2015}

**36** nests monitored **72** owls banded

Over this 22-year period, we banded 72 Northern Hawk Owls (NHOWs), of which only one was recaptured in our study area. Of the 36 breeding records, 18 were known nest trees, while the others were recently fledged young. All nests were in moderate to severely burned forests from 1–11-year post-burn. Nests were found in black cottonwood, quaking aspen, Engelmann's spruce, and western larch. Average nest tree height was 64 feet,  $n = 17$ , average nest height was 48 feet,  $n = 17$ , and average diameter at breast height

was 17 inches or about one and half feet,  $n = 17$ ). Average measurements of nest tree height and nest height were larger than those reported from elsewhere in North America. Based on 274 prey items identified from pellets, 88% were voles, most frequently Meadow Voles. Given that only 1 of 72 banded owls was recaptured or recovered over the course of 22 years, suggest NHOWs are nomadic with low site fidelity. Our lone recapture was the first report of a philopatric NHOWs in North America. Although this owl is still considered a rare breeder in the conterminous United States, we documented breeding records in 11 of the last 12 years of this study. All

but four known breeding records in Montana occurred within Glacier National Park during our study.





# Types of Snags and Why Conservation is Critical

What are snags? They are often overlooked but hold a significance that transcends the casual observer's eye. These sentinels, remnants of once towering trees, may be dead or dying but are still standing upright. They can be created in different ways, for



Above: is an example of a broken top snag whose top can be used for nesting. Below: is an image looking down on a Great Gray Owl nest we were able to capture with a drone, it's interior is deep and soft.



example; breakage due to wind, lightning strike, wildfire, old age, drought, disease, and insects. The results of these processes provide broken tops for nesting, the availability for woodpeckers to also create nest cavities or natural decay or holes where branches have broken off.



This particular tree has been marked with a "W" to signal to potential loggers to leave the tree for wildlife. The holes made by woodpeckers above and natural hole formations below make perfect nests for smaller species of owl.



Snags are a natural part of the forest lifecycle, contributing to wildlife habitat and soil nutrients. As ecological resources, they play a pivotal role in sustaining the delicate balance of life for several species of owl, including Great Gray, Boreal, Northern Hawk, Western Screech, Northern Pygmy, Northern Saw-whet, and Flammulated Owls – not to mention the myriad of other species and benefits these old standing trees provide. The smaller species of owl are dependent on woodpecker holes and naturally eroded cavities for nesting, whereas the larger owls may nest atop a snag.

Often considered a "danger" or an gnarly "eyesore", we are hoping to help change attitudes about the truth of these enigmatic pillars. They offer essential shelter, protected roosts, a good perch for hunting and provide nourishment through the insects that inhabit them. They provide their own ecosystem, serving as a vital link in the intricate chain of biodiversity.

What can you do? Leave any snags alone, purchase sustainably harvested firewood, have your arborist create snags by leaving or removing the top of a tree instead of taking down the whole tree or removing limbs only. Install nest boxes where snags are absent, promote snag formation by leaving dying trees, drill holes to speed up the decay, spread the word and awareness about the importance of snags, and encourage your local management agencies to use sustainable forestry practices.

# Mission Valley Winter Raptor Survey {2018 – 2023}

**8,660** raptors counted  
**17** raptor species observed



A. Photo | Alex Kearney (Top Volunteer)

We continue our monitoring program for the raptors wintering in the Mission Valley of western Montana that began in 2020. Since then, we have run 17 monthly surveys with the help of 65 talented volunteers. That is a kettle of volunteers (hawk joke)! The running count is up to 8,660 raptors of 17 different species! This is an average of 4 raptors per square mile, supporting the long-observed phenomenon of one of the densest populations of wintering raptors in the western United States, causing birders to flock to the Mission Valley.

Our surveys also document habitat use so we can see how raptors use different types of agricultural land, grasslands, wetlands, and forests. We also record the types of perches raptors use. Additionally we document details of each bird, including the age, sex, color morph, and subspecies whenever possible. Over time, our data will be used to assess the quantity and species composition of raptors.

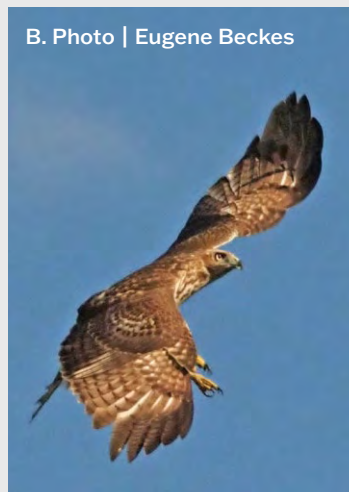
To volunteer on the project, please head to our website and fill out our volunteer questionnaire! If you would like to contribute to this project, but aren't located in western Montana, consider donating a gently used or new tablet, or \$300 so that we

can purchase tablets to help us streamline data collection in the field for 5 teams and make our data easier to share in real-time!

Thank you to the hard-working flock of volunteers – we **COULD NOT DO THIS WITHOUT YOU!** (See our volunteers on page 22).

**QUIZ TIME!** Can you identify the raptors on this page? (Labeled A. B. and C.) Turn to page 22 and see the bottom of the page for answers.

B. Photo | Eugene Beckes



C. Photo | Alex Kearney

# ORI and *What An Owl Knows* Book

**An instant New York Times bestseller, debuting at #6 on the non-fiction list!**

Owls are probably the most popular and widely recognized group of animals in the world. There are many books on owls, and from every marketing angle imaginable. From dry and emotionally removed pure academic books, to emotionally highlighted coffee table books.

Few books can combine academic summaries with the excitement of seeing owls. Jennifer Ackerman has been able to bring together the expertise of everyone interested in owls, from hobbyist, rehabilitators,



veterinarians, photographers, owl-a-holics, and researchers. She weaves together an enormous amount of information to give us perhaps the best popular and fact-filled information book on owls to date.

For me, this book came along at the right time in my life. Over the past two

years, I was spending far too much time in the office running the ORI, and getting caught up in the academic goal of publish or perish. Although I do need to analyze data and write, the office was consuming me. I have been a field researcher my entire career, and had forgotten why I devoted my life to being a student of owls.



**Author Jennifer Ackerman next to a Great Gray Owl. Photo by Sofia**

I needed Jennifer Ackerman to remind me of the allure of owls; their mythology, evolution, diversity, adaptations, behaviors, and, that owl face and those large owl eyes.

Thanks to Jennifer Ackerman for unravelling What An Owl Only Knew, and conceptualizing to us, on behalf of owls, What An Owl Knows.

—Denver Holt

## Jennifer and Doug Betters, Making the World a Better Place



**Jennifer and Doug Betters on the water.**

Doug Betters, former NFL legend for the Miami Dolphins, had a life-altering ski accident in 1998 and is now a quadriplegic. That hasn't slowed down this man's participation in life and he and his wife Jennifer's generosity to children who need to travel to receive medical treatment, through his

foundation, and to the Owl Research Institute. In 2014, Doug and Jennifer participated in a Day in the Field with Denver Holt, and thus began their being big owl fans! They have recently included ORI in their estate planning, and we're soaring with gratitude for their support to our cause, thank you!

## 2022/2023 Scientific Publications

- Holt, D.W. 2022. **Why are Snowy Owls white and why have they evolved distinct sexual color dimorphism?** A review of questions and hypotheses. *Journal Raptor Research* 56: (4) 440-454. <http://doi10.3356/JRR-21-56>.
- Holt, D.W., M.D Larson, S. P. Hiro, and M.T. Seidensticker. 2022. **Is This Philopatry or Dispersal in**

**Female Boreal Owls?** *Northwestern Naturalist* 103(2), 154-161, (1 August 2022). <https://doi.org/10.1898/NWN20-35>

- Holt, D.W. 2022. **Experts in the Field. The Wildlife Professional Nov /Dec 16 (6) 55-57 On Being A Wildlife Field Researcher.** *The Wildlife Professional* (Nov - Dec issue).

# Expertise and Expert Performance

By Denver Holt

The following excerpt is from an article I wrote in 2022. I have included the most important concepts, and changed a few words. Nonetheless, the message is the same. To read the article in full see: Experts in the Field; The Wildlife Professional, 2022 Nov / Dec vol. 16 (6) 55-57.

## TO BECOME BETTER FIELD RESEARCHERS, WE NEED MORE PRACTICE

In his 2020 essay in The Wildlife Professional, Aldo Leopold Memorial Award recipient Leigh Fredrickson referred to himself as a “bucket man.” As a wetland ecologist, he suggested it takes 10,000 hours in the field to have a reasonable understanding of wetland ecology.

Many years ago, I noticed most wildlife biologists were spending less time in the field and more time in the office. Even in the mid-1990s, wildlife biologists were expressing similar worries. In a 1996 editorial in Conservation Biology, Reed Noss expressed that he was coming to grips with becoming a “keyboard biologist” (Noss 1996). Today as the number of keyboard biologists have grown, it raises concerns.

The 10,000 hours suggested by Fredrickson is usually referred to as the 10-Year Rule by those who study Expertise and Expert Performance. The rule, widely agreed upon, argues that it takes years piled upon years of practice—with continued effort, refinement and knowledge—to reach expertise in any domain. As I read more about this research, I found many lessons we could apply to wildlife research.

## PRACTICE, PRACTICE, PRACTICE

Many cognitive researchers believe the expert proficiency scale—naïve, novice, initiate, apprentice, journeyman,



Denver Holt in the field in February in Barrow, Alaska.

expert—is a reasonable outline for how individuals gain expertise (Chi 2006). The most significant finding that separate experts from non-experts is practice. Experience alone is not enough.

True experts engage in deliberate practice with sustained training and effort. This goes on routinely for years—or a lifetime (Ericsson 2006b, Ericsson 2016c). Deliberate practice is the most influencing factor in reaching expert level—often practicing alone, in “extended engagement in domain-related

activities” (Ericsson 2016c). There is “no substitute for practice” in reaching expertise (Hoffman and Gavan Linter 2006), and personal initiative, diligence, and especially high levels of self-regulatory practice are the foundations of expertise (Zimmerman 2006). For most professionals, even after years of work, they reach only an average / “pedestrian” level of performance (Ericsson 2006b, 2016c).

In fact, merely engaging in daily tasks is not enough to advance (Ericsson 2016c). It is years of practice that allow experts to display superior anticipation skills, (Abernathy et al. 2016), possess superior working memory, make meaningful decisions (Ericsson 2016b), and outperform non-experts (Endsley 2016). And, age plays a role in reaching expert level performance. The pinnacle of cognitive expertise is rarely reached in our 20s. Most outstanding contributions in the arts, literature, and science come from adults who are middle-aged and older (Horn and Masunaga 2006), and who maintain high levels of cognitive skills by deliberate practice, at least to age 70 (Krampe and Charness).

## TIME IN THE FIELD

If most wildlife biologists are spending far less time in the field and more time in the office, then becoming an expert wildlife field researcher could be a rare achievement. As a

young college student, I noticed that neither my professors nor the agency wildlife biologists I volunteered for went into the field very often.

To me, the highlight of wildlife research is to conduct field studies and become a recognized expert field researcher by colleagues and peers. Yet, according to the Wildlife Techniques Manual, “successful research biologists spend about 40% of their time in design and planning phases, 20% in actual field work and 40% in data analysis and writing publications” (Garton et al. 2012). I have found that most professional wildlife biologists probably spend < 10% of their time—maybe six weeks of the year—in the field. That’s not enough become experts.

It’s my impression over the past 25 years, wildlife biologists have become very good mathematicians and modelers, and they make great use of technology. However, it’s also my impression that today’s wildlife biologists are not as diversified ecologists or astute field researchers as those of my generation. How can they be when they spend so little time conducting field research and so much time staring at computer screens? We find more reasons not to go in the field. We send; students, technicians, and volunteers to collect data. Or, we make inferences staring at our computers, such as satellite tracking. Many studies come from students in their 20s and 30s working on graduate degrees. Yet they only engage in field research for a few short seasons. Their sample sizes are often small, and their knowledge is limited. What can we conclude about their rigor of their studies? And, many researchers are driven to publish as many papers possible from short-term studies verses to conduct rigorous, long-term field research.

## OUT OF THE OFFICE

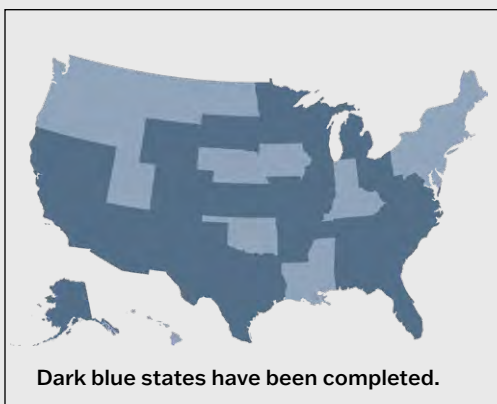
We like to leave messages on our email or voicemail, “I’m in the field and will not be back in the office until ....” In reality, though, most of us become some form of office biologist for a variety of reasons. We want a full-time job, good salary, family, and benefits. Responsibilities at home take precedence over field research, and in academia, other responsibilities take precedence over field research. These are legitimate factors that influence our lives, but also influence our ability to become experts.

We have all heard someone use the phrase “as a scientist” to indicate their commitment to facts. But just because someone says they are a scientist does not mean they’re a good one. Few of us advance beyond the short-term, graduate-student approach to research. As Gloria Dall’Alba, noted, teaching “natural scientists” does not necessarily lead to good science—they must think like scientists, not just rely on what’s been taught to them (Dall’Alba 2016).

We are in an era where the mistrust of science is very high, and wildlife researchers are not helping ourselves or our causes by conducting such short-term studies. Our approach to wildlife research needs a paradigm shift. If as wildlife researchers we believe in the scientific method, then perhaps we should listen to researchers who use the scientific method to study Expertise and Expert performance. Practice is essential to improving our skills. If “practice makes perfect,” as is often said, we need to get out and conduct more long-term, rigorous field studies to truly become expert field researchers.

## How Far Would YOU Go to Raise Money for Snowy Owls?

### *Pete Ripmaster’s Owl Run Hundreds Project*



Top ultra marathon runner, Pete Ripmaster, has committed to run 100-mile marathons in all 50 states to raise money for the ORI! His goal: to be the first person to run 100 miles in all 50 states, raising \$50,000 to support ORI along the way.

So far, he has run in 26 of the 50 states and raised \$33,667 (as of Oct. 2023). He plans on having the 50th race in Montana. For all you ORI supporters, especially those who are runners, keep up with Pete on his website or to donate at: [peteripmaster.com](http://peteripmaster.com)



# ORI Staff & Volunteer Updates

## The Bushwhacking Field Assistant and Leader of the Banders

Hayley Madden's been working with the Owl Research Institute since March. In the last 6 months, she has snowshoed and bushwhacked through the Mission Valley, hiked the tundra, and banded migrating Northern Saw-whet Owls. She's enjoyed every second of it (maybe with the exception of fighting off mosquitoes in the Arctic). She says she feels so grateful that she gets to study and learn from so many species of owls in their natural habitats.

Originally from Vancouver, British Columbia, that is where Hayley first

fell in love with the outdoors. With the Coast Mountains on one side, and the Pacific Ocean on the other, she had a rich education in the natural world. After getting her Biology degree from the University of British Columbia, she had the opportunity to work on a project studying Swainson's Thrushes. When she had the chance to work with Northern Spotted Owls, she became thoroughly hooked on owls too! She feels that working with the Owl Research Institute is the perfect combination of owls and field work.



## New Communications Director/Office Manager at ORI Headquarters!

Hey there, fellow wildlife enthusiasts! I'm Jeanna Clifford, and I'm absolutely thrilled to introduce myself to the fantastic ORI community. You might say I'm the new "old" kid on the block, stepping into Lauren's shoes and becoming the Director of Communications. So, what's my gig, you ask? I've been cranking out "The Roost," this beloved annual printed newsletter.

I'm also the inbox magician who'll be sending you those exciting news emails and keeping our website fresh and fabulous. With over 2 decades

of experience in marketing, graphic design, and working with non-profits previously, my goal is to make ORI shine even brighter. And here's the kicker: I'm a Montanan through and through. I practically grew up in ORI's backyard, just a stone's throw away from our office on an organic farm. So, I'm not just here to work; I'm here to embrace the culture of wildlife conservation and research in our stunning Mission Valley. I'm ready for some wild adventures and looking forward to making a positive impact together!

## Huge Appreciation & Recognition for Our Volunteers this Year, We Couldn't Have Done it Without You!

Ser Anderson  
Matt Applegate  
Jenna Asnault  
Deanna Baginski  
Dan Ballard  
Drake Ballard  
Jon Barlow  
Lisa Bate  
Jami Belt  
William Blake  
Annabelle Church  
Holly Church

Matt Church  
Charlie Davis  
John Delagrange  
Larry Depute  
Robert Domenech  
Charlie Dov Schön  
Steve Flood  
Weber Greiser  
Melissa Groo  
Julia Gruetzmacher  
Troy Gruetzmacher  
Jasmine Gutbrod

Chloe Hernandez  
Sara Ibis  
Alex Jehle  
Elsa Jehle  
Andrew Johnson  
Danny Kastner  
Laura Katzman  
Alex Kearney  
Pat Klever  
Matt Larson  
Pat Little  
Angela Marbaus

Deven Mccoy  
Judith Mendelsohn  
Amy Miller &  
Family  
Pam Miller  
Caleb Molinar  
Elizabeth Moore  
Liam O'connor  
Tricia O'connor  
Denny Olson  
Haylee Pearce  
Katie Pellegrino

Jason Poole  
Patsi Pohle  
Adam Potts  
Hattie Ransom  
Adrian Rouse  
Keith Rush  
Lynda Saul  
Jay Schutze  
Nayib Talavera  
Coy Theobalt  
Christa Torrens  
Raylene Wall

Larry Weeks  
Bruce Wetherby  
Pam Willison  
John Zardi

### Pg. 18 Answers:

- A. Rough-legged Hawk
- B. Red-tailed Hawk
- C. Harlan's Red-tailed Hawk

# Education Highlights From 2022 and 2023

**Oct:** Denver presented at the Raptor Research Foundation Conference in Ft. Lauderdale, FL.

**Nov:** Denver gave a presentation to the Hartford, CT Audubon Society (virtual event).

**Dec:** Denver presented to the Sacagawea Audubon, the the Ellen Theater in Bozeman, MT

**Jan:** Denver presented to the International Owl Center, Houson, MN (virtual event).

Denver presented to a group in Cypres, CA. (see photo).

**Feb:** Beth presented to the Ronaoke, VA Valley Bird Club (virtual event).

Beth presented to the Bitterroot Audubon (virtual event).

**March:** Lauren presented to McAllister Elementary School 1st graders (6 classrooms).

Beth presented to Rattlesnake School in Missoula, MT.

**April:** Lauren presented to Charlo, MT 3rd grade.

Denver presented to Fly Fishers of the Bitterroot, MT.

Beth presented to the Vermont Insitute of Natural Sciences (virtual event).

Beth presented to Five Valleys Audubon Club, MT.

Lauren presented to Bonner, MT Elementary

Lauren presented at Frenchtown, MT School's SciencePalooza.

Lauren presented to Potomac, MT Elementary & Middle Schools.

**May:** Beth presented to Swan Valley Connections Master Naturalist Course, Condon, MT.

**June:** Book Tour: *What An Owl Knows: The New Science*



Denver was invited to Cypres, CA to present, due to the local buzz about the spotting of an irruptive Snowy Owl in Southern CA.

*of the World's Most Enigmatic Birds* had a virtual discussion between NYT best-selling author Jennifer Ackerman and ORI's Denver Holt.

**July:** Denver presented at the Flathead Lake Bio Station, MT (virtual event).

**Aug:** Denver hosts Montana Owls Flathead Lake Bio Center Open House.

**Sept - Nov:** ORI hosted 7 weekly vistor nights on Fridays at the Flathead Lake Bio Station for the Saw-whet Migration.

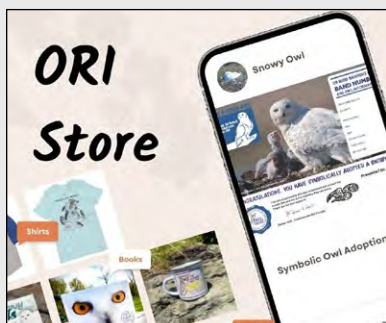
**Oct:** Beth presented to Charlo's Kindergarten class.

Two Presentations were given on *Saw-whet Migration* to the Flathead Audubon Society at Flathead Lake Bio station.

**Oct:** Denver gave a keynote presentation on Long-eared Owls, Beth gave a research presentation on Short-eared Owls, and Solai presented a research poster on Snowy Owls at the World Owl Conference in La Crosse, WI.

## 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 we'll designate it for a specific item on our Wish List. *Thank you!*



ITEM	# NEEDED	COST/PER	TOTAL
Mist nets	8	\$150	\$1,200
Thermal imaging drone			\$19,000
Electronic Tablets	5	\$300	\$1,500
ARUs	30	\$120	\$3,600
DNA analysis	300	\$20	\$6,000
Headlamps	3	\$50	\$150
New Computer			\$1,800
Snowmobiles	2	\$10,000	\$20,000
Vehicle donation: ATV type for field work			\$20,000
Banding gear: pliers, nests, traps			\$5,000
Small Tractor: field station maintenance			\$17,000
Snow blower attachment for tractor			\$1,900
Flatbed trailer: for ATVs & snow mobiles			\$10,000



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## Partners in Conservation

Short Eared Owl  
Photo | Melissa Groo



### MONTANA

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

### 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 Services

### OTHER WORKING PARTNERS

Explore.org  
International Snowy Owl Working Group (ISOWG)  
Henry Mros II  
Leica Biosystems  
Sitka Gear  
University of New Hampshire  
University of Texas El Paso

### LAND OWNERS

Andy Aldeen and Meadowland Ranch  
Mark and Mary Benedict  
George and Barbara Biggs  
Susan Clairmont  
Karen Biron and Mike Warrington  
Bud, Laurel, and Jo Cheff  
Jim and Donna Cheff  
Alfred Deschamps  
Fred Deschamps  
Susan Gardner  
Norma and Gary Granley  
Jeffrey Jones  
Ronald Jorgensen  
Jodi and Brett Kulina  
Diane Lemm  
Barbara and Peter Lewis

### Tune in to live owl cams!

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](http://Explore.org) - the world's leading philanthropic live nature cam network and documentary film channel. Tune in today!

**explore**  
explore.org



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