Promoting precision

Generosity strengthens TRC’s high-quality intensive care medicine with new lifesaving equipment
Average lifespan
As with most raptor species, there is much to learn during the first year of life for peregrine falcons. If peregrine falcons surpass the one-year mark in the wild, they can live into their teens. In captivity, peregrine falcons have lived as long as 25 years.

Migratory pattern
Peregrine falcons are found on every continent except Antarctica, and most populations migrate. Some individuals travel more than 15,000 miles in a year between nesting grounds on the tundra and wintering habitat in South America.

Palisade's story
Palisade was acquired through the generous support of a loyal TRC donor and purchased from Andy Weaver, a falconer who teaches biology at Stillwater Area High School in Stillwater, Minn. This particular peregrine falcon was bred in captivity by Weaver, who breeds falcons in special breeding chambers and involves his students in observations of the breeding birds and their chicks. Falconers like this have been instrumental in the recovery effort after large numbers of peregrine falcons disappeared due to the chemical pesticide DDT.

Diet
In the wild, peregrine falcons hunt birds, bats, small reptiles, and small mammals.
Clinic statistics

A rocky start

by Lori Arent

The late spring and summer months are commonly filled with stories reflecting unique challenges young raptors face once they leave the safety of their nests. In mid-August, the clinic admitted a young male osprey that fledged from its nest near a local gravel company. On one of its first flights, it landed on a chute used to dispense gravel but went tumbling down the chute when gravel began to flow and was buried in a pile of small rocks.

Thankfully, workers at the gravel pit noticed almost immediately, quickly dug out the hapless raptor, and called for help. Surprisingly, there were no broken bones. Although the bird suffered a few abrasions and a bruised wing from the ordeal, the most concerning issue was that it was experiencing respiratory distress, likely from inhaling a large amount of gravel dust.

With the help of an oxygen concentrator previously donated by a clinic volunteer, the osprey’s breathing appeared to return to normal in a few days. Wound management and supportive care were provided for another week as the bird’s soft tissue wounds healed. When test flown, respiratory issues resurfaced and several more weeks of rest were needed. Then, after a few weeks of exercise, the bird was on its wing to begin its long migration south.

Admissions

Total admissions to date in 2019: **686**

Admissions at this time in 2018: **790**

Barred owl: 60

Great horned owl: 96

Bald eagle: 139

Cooper’s hawk: 85

Red-tailed hawk: 108

All other raptors: 198

Photo by Lori Arent
Growing eagle populations and shrinking habitats have led to an increased number of reports of clashing territorial eagles. These mighty birds require many helping hands to recover from injury and illness. In early July, when two adult bald eagles had one such skirmish in the St. Croix River near Marine on St. Croix, Minn., a few key players helped save a life.

As the birds thrashed in the air, they were spotted by a local couple, who then followed the birds to where they landed in the water. When they found the birds, the couple sought help from the Washington County Sheriff’s Office and The Raptor Center (TRC). TRC volunteer Terry Headley suggested the couple try and separate the birds, so one of them jumped into the water to do so with a boat paddle.

The eagles eventually let go of one another. The stronger of the two birds swam away and hopped out of the water, eventually flying away. The other bird drifted downstream, where it slowly scrambled onto a floating log. The couple took photos and texted them to Headley, who was already on her way. After many attempts, the marine manager and Headley were able to safely capture the injured bird. Headley brought the bird into TRC, where veterinarians examined the eagle and found that it was previously banded as a nestling in 2014 in Bayport, Minn., as part of a forest service project to measure contaminants.

“Since she just turned 5, she was probably the interloper—not the territory holder,” says Lori Arent, assistant director of TRC. Veterinarians at TRC also determined that the eagle did not have young this year.

The eagle had suffered several puncture wounds to its upper right leg, abdomen, and lower left back, as well as bruising to its right wing. “When I went to suture the puncture wound on her abdomen, I found that it went all the way into her body cavity,” says Annette Ahlmann, DVM, MS student, who provided care to the eagle in TRC’s clinic. “I could see her liver.” Fortunately, the bird has shown much resilience on the road to recovery.

The bird was given opportunities to rebuild its strength and was released in a more “neutral” area, about 50 miles downriver from where the battle took place. It headed north and Arent says there is always a chance that the eagle could return to the area where it was recovered.
Homegrown health

TRC partners to grow Minnesota’s bird habitat

by Steve Turnbull

Minnesota has an estimated 1 billion ash trees, all of which are at risk of dying due to emerald ash borer—a small, invasive beetle whose larvae feed inside the trees, eventually killing them. The insect was first found in St. Paul in 2009 and signaled a threat to our local forest canopy. Coupled with the concerns of a changing climate, the race is on to prepare our forests for problematic impacts.

Mississippi Park Connection, a nonprofit in St. Paul, has partnered with several organizations, including The Raptor Center (TRC), to build community tree nurseries to address these threats. Using a unique approach, the tree nurseries use gravel in place of dirt to encourage thick, fibrous root growth early in the tree’s development, which increases its survival rate once transplanted in the wild. At TRC, five native tree species were chosen due to their resilience to invasive species, alignment to future climate projections, and ecological benefits.

“Reforesting with smart species selections and healthy stock that comes from community tree nurseries is key to the success of this initiative,” says Mary Hammes, environmental stewardship and volunteer manager at Mississippi Park Connection. “Our goal is to plant 15,000 trees by fall of 2021. We are prioritizing areas that are most likely to be impacted by the loss of ash, are facing intense invasive species pressure, have high benefit for habitat, and are likely to be impacted by our changing climate.” The community effort currently has seven partners hosting community tree nurseries, with 6,300 trees planted so far in the program and another 2,000 expected this fall.

This past October, volunteers planted TRC’s 250 trees at Lilydale Regional Park along the Mississippi River. “We need healthy forests for a strong ecosystem, not just for raptors but for all species,” says Nancie Klebba, volunteer coordinator at TRC. “With this year’s planting completed, we’re ready to start all over again next spring.”

Photos by Steve Turnbull
A minimally responsive great horned owl was found in a South Minneapolis backyard and arrived at The Raptor Center (TRC) in August. Upon examination, Annette Ahlmann, DVM, MS student, discovered that it was severely anemic. “We elected to give him a blood transfusion,” she says. The care team also gave the bird supplemental oxygen therapy.

The owl’s care team couldn’t find a wound responsible for the bleeding, so they suspected its critical condition was likely the result of trauma. “But also,” says Ahlmann, “birds often get into rodenticides, which can cause blood clotting disorders.” Blood clotting proteins are produced by a raptor’s liver, which needs vitamin K in order to appropriately activate the clotting proteins. Rodenticides—pesticides that kill mice, rats, and other rodents, and provide short-term control of infestations—hinder this process. “We decided to give him vitamin K,” Ahlmann says.

The owl, who Ahlmann estimates was barely alive upon arrival at TRC, made a significant turnaround thanks to one of TRC’s new syringe pumps, which supplied the bird with a carefully measured blood transfusion to start rehabilitation. Within a few hours of the blood transfusion, the bird was more alert and appeared more conscious of its environment.

METICULOUS MEDICINE

TRC’s new fluid pump and syringe pumps help automate the desired administration rate of fluids, medications, or blood transfusions over a specified length of time. The two new syringe pumps and fluid pump arrived at TRC in June and were made possible by generous gifts from two donors. One of those donors, Miki Cook, has been volunteering at TRC for decades. “I have volunteered in the clinic for more than 40 years and have seen the many needs they have firsthand,” she says. “I don’t necessarily have a lot of extra money, but I felt really strongly about this cause, so I decided to do what I could to make this happen. I have already seen the impact this new equipment has had on our patients, and it makes me all the more excited to volunteer each week.”

Dana Franzen-Klein, DVM, MS, helped provide care to the great horned owl. She says the precision with which she can deliver medications, blood transfusions, and fluids allows her to perform high-quality emergency and critical care medicine. “We have already used them for a couple of blood transfusions as well as to deliver intravenous fluids during surgery,” she says. “When we have given blood transfusions in the past, we had to do it by hand.”

Now, TRC’s expert staff can deliver precision medicine to their patients while also achieving a higher level of animal welfare, as they can now place the birds in an oxygen cage or a quiet, calm place while they are undergoing treatment with a syringe or fluid pump.

The pumps are particularly useful for birds who come in starving. “In starvation cases, you have to introduce food and rehydrate them in a very specific way due to severe electrolyte imbalances,” says Ahlmann. “If done incorrectly, the patient can develop severe side effects, like abnormal heart rhythms.”

Traditionally, veterinarians could measure how much fluid was in a single drop in an IV set and count how many drops fell in a second to get an estimated rate of how fast fluids were being delivered. With the new fluid pumps, fluids and medications can be delivered safely and precisely—if the IV catheter or fluid line gets blocked, or there is air in the fluid line, the pump sends out an alert.
PHILANTHROPY-FUELED FLIGHT

The gifts that supplied TRC with these new pumps have already saved a few lives this summer, but generosity has touched Ahlmann’s and Franzen-Klein’s daily life at TRC in a myriad of ways.

Ahlmann recently finished a one-year internship in raptor medicine and surgery at TRC and has transitioned into a three-year program, functioning as a three year clinical research assistant. The program is funded by the Partners for Wildlife (P4W) initiative, which is 100 percent backed by donor support. As part of her research assistantship, Ahlmann is pursuing a master’s at the University of Minnesota College of Veterinary Medicine. A stipulation of this appointment is that her thesis must improve raptor and wild animal welfare. Julia Ponder, DVM, MPH, executive director of TRC, is serving as her mentor.

“I am very grateful to P4W for the opportunity to continue my clinical work with individual raptor patients at TRC while also transitioning to a new role that will focus more on the big picture of wildlife rehabilitation of all species,” Ahlmann says. “Wildlife medicine is a relatively new specialty within veterinary medicine, and centers such as TRC have started building the foundation of high-quality veterinary care in wildlife rehabilitation. We still have a lot to learn, especially as the veterinary field advances, and TRC has several ongoing projects to advance this knowledge.”

Meanwhile, Franzen-Klein was recently promoted to staff veterinarian, thanks in part to a $50,000 matching gift from loyal donor Bob Wilder. “I am very grateful to be able to spend my career caring for wildlife and educating the public about our interactions with wildlife and what we can do to preserve the world we share,” she says. “I am also grateful to work at an institution with an extensive, committed group of volunteers and supporters that help make our work possible. And even though I have touched hundreds of raptors, I am still fascinated by the unique evolutionary characteristics they have to fill their specific role in nature, as well as their intrinsic beauty.”

ROOM TO BREATHE

Raptors that have recently experienced head or respiratory trauma benefit immensely from supplemental oxygen therapy, provided by oxygen concentrators. This summer, TRC veterinarians have treated several birds each month that required oxygen therapy, and, in some instances, there were two or three birds in TRC’s care that needed oxygen treatment at the same time. But currently, TRC only has one oxygen concentrator. “Oxygen therapy helps birds recover from severe head trauma,” says Dana Franzen-Klein, DVM, MS, “and allows them to get enough oxygen to their body and tissues if they have a compromised respiratory system, such as internal trauma that results in bleeding into the lungs.”

Recently, a young osprey came into the clinic with severe internal trauma (story on page 3). “He was having a hard time breathing because he was bleeding into his lungs,” says Franzen-Klein. “Without oxygen support, his mucous membranes were turning blue instead of a normal healthy pink color. So we placed him in an incubator with an oxygen concentrator for a few days, along with additional medical treatment, until he could breathe more comfortably. If we didn’t have the ability to give him oxygen, he probably would not have survived.”

If you are interested in supporting the purchase of a second oxygen concentrator, contact Ellen Orndorf, TRC’s development officer, at eorndorf@umn.edu or 612-624-8457.
From capable caregiver to empowered rehabilitator

by Steve Turnbull

The Partners for Wildlife (P4W) initiative, aimed at improving animal welfare in wildlife rehabilitation, has just graduated its first cohort of fellows. Housed within The Raptor Center (TRC), P4W has worked to mentor rehabilitators and veterinarians, provide resources for rehabilitators, and create a professional network to achieve the most humane outcomes for wildlife.

One of this year’s fellows, Sonnya Wilkins, DVM, has been a veterinarian for 20 years and owns her own practice in Montesano, Washington. Frustrated by the lack of services available for wildlife in her area, Wilkins opened Twin Harbors Wildlife Center this year. “The P4W fellowship renewed and strengthened my passion and accelerated my plans to open a wildlife center in our community,” Wilkins says. “Before opening the center, our veterinary facility would transport most of our wildlife to a rehabilitation center 100 miles away from us. Now our wildlife rehabilitate here, in our own area.”

“We are so proud of Dr. Wilkins’ accomplishments and what this means for her and her community,” says Julia Ponder, DVM, MPH, executive director of TRC. Since becoming a P4W fellow, Wilkins has seen an improvement in her case management and treatment protocols with wildlife. She is also now sharing what she has learned with other veterinarians and wildlife rehabilitators in her area. Says Ponder, “It’s great seeing P4W’s work to improve animal welfare have tangible, measurable results, and we are so excited for Dr. Wilkins and the future of this program.”

Susan Wilder Visitor Center welcomes guests

We are happy to report that the final phase of our visitor center assembly is complete. Our educational ambassador birds will now greet guests from their upgraded enclosures, which are full of natural habitat elements that provide the birds with enrichment and enhance the visitor experience. Natural-looking rock caves, cliffs, and rocks, along with 3-D models of other animals found in each habitat, are just some of the changes made to their spaces. The newly designed enclosures complement the interactive displays and videos that are housed in the new center. Visitors can now get a better look at what happens in the veterinary clinic and learn about migration, ecosystems, and challenges raptors face in our shared world—there is something for everyone. If you have not visited us recently, we invite you to bring your friends and family today! The Susan Wilder Visitor Center is open Tuesday through Sunday each week.

Tours run every half hour on the following days:

**Tues–Fri**
First: 10:30 a.m.
Last: 3:30 p.m.

**Sat–Sun**
First: 12:30 p.m.
Last: 3:30 p.m.
Expanding treatment, research, and education

by Emily Zavadil

Thanks to the generosity of Bob Wilder, the Raptor Center (TRC) has added a new, full-time staff veterinarian. Dana Franzen-Klein, DVM, MS, began in the role July 1. She has already helped TRC grow alongside its swelling caseload by providing necessary leadership and training to interns, who have had to interact with eagles earlier on in their training than in the past due to the increased caseload.

Franzen-Klein will also spearhead research projects to add to TRC’s wealth of raptor knowledge. Franzen-Klein finished her master’s at the University of Minnesota College of Veterinary Medicine in April and brings research experience to the role.

Prior to Franzen-Klein entering the new position, Michelle Wilette, DVM, assistant professor in the Department of Veterinary Population Medicine at the CVM and previous staff veterinarian, divided her time between teaching veterinary and undergraduate students and the clinic. Now, Willette is able to focus on teaching and developing academic courses.

Wilder will match all donations for the establishment of the position up to $50,000. TRC has received several gifts to help with the match, but we are looking for a few more to complete it.

Max the match on November 14

Mark your calendars! On Give to the Max Day, the first $54,000 of gifts raised for The Raptor Center (TRC) will be matched by three loyal donors: Rachel Hollstadt, the Acorn Charitable Trust, and the Sarah J. Andersen Fund of the Hugh J. Andersen Foundation. These funds will be critical in helping TRC provide food, world-class medical treatment to injured and ill raptors. Please join us on Thursday, November 14, and keep raptors soaring.

To make a gift, please visit z.umn.edu/TRCGTTM2019

For more information about making a gift, or to learn about other ways to support TRC, contact Ellen Orndorf, TRC’s development officer, at eorndorf@umn.edu or 612-624-8457.
imidacloprid, a pesticide often used on soybeans grown around Minnesota, is one of seven types of neonicotinoids available to farmers right now. Almost all agricultural seeds are treated with some type of neonicotinoid. “Farmers put pesticides on their seeds and, as the seed grows, the pesticide is incorporated into the structure of the plant so it keeps insects from destroying the crop,” says Dana Franzen-Klein, DVM, MS, The Raptor Center’s (TRC) new staff veterinarian. Franzen-Klein finished her master’s degree in April with a thesis assessing negative effects the substance could have on chickens (as a model for wild grain-eating birds, such as grouse) at sublethal doses.

Franzen-Klein, who previously completed a residency at TRC, says her time spent at the center helped her further develop her expertise in avian medicine. She applied these skills during this project, particularly as she performed precise, specific neurologic assessments of birds in the study. Julia Ponder, DVM, MPH, executive director of TRC, mentored Franzen-Klein on the project.

Studies have previously identified lethal levels of imidacloprid in some bird species, but Franzen-Klein collaborated with several scientists, including researchers from the Minnesota Department of Natural Resources and the US Environmental Protection Agency, to more specifically pinpoint how much of the substance a bird would need to ingest to exhibit clinical signs. The scientists also measured the intensity of those signs as dosages increased. The project was funded by the Legislative-Citizen Commission on Minnesota Resources.

The researchers saw a range of neurological signs in the chickens responding to different dosages of imidacloprid, which included mild depression, whole-body muscle tremors, and a lack of response to external stimuli. “We gave them scores based on how severe their clinical signs were so we could estimate what amount of chemical we would expect to produce certain levels of clinical signs,” Franzen-Klein says. She saw clinical signs develop within as little as five minutes of the pesticide hitting the birds’ stomachs.

The neurologic signs observed in the domestic chickens in the study may not be exactly mirrored in wild birds, but the research provides information that can be used to develop a risk assessment to help predict what could happen when wild grain-eating birds interact with this pesticide. “The most likely way a wild bird could be exposed to imidacloprid is by ingesting spilled treated seed,” Franzen-Klein says.

If a wild bird developed similar clinical signs as the domestic chickens in this study, the neurologic signs could put the bird at a higher risk of predation. But based on what Franzen-Klein saw, a human or predator who hunted and consumed a bird affected by the pesticide would be unlikely to develop neurologic signs. Franzen-Klein suspects imidacloprid’s effects would be unlikely to transfer up the food chain, but more specific research into this area is needed.

“Next steps would be to study the interface between wild birds and agriculture to determine which wild bird species are being exposed to imidacloprid and how much of the pesticide they are exposed to,” says Franzen-Klein.

But how does this relate to raptors? “Part of our mission at TRC is focused on ecosystem health,” says Franzen-Klein. “All animal species in an ecosystem are linked. For example, if the pesticide is getting into the water, that could result in fewer water insects. This could result in decreased survival of insect-eating birds. Some hawk species primarily eat smaller birds, so within that local ecosystem, there would be a decreased food supply for the hawks.”

And while a neurologically impaired grain-eating bird might be easy prey for a raptor, the researchers do not yet know whether a bird with neonicotinoids in its system would be safe for the raptor to ingest.

“Everything is interconnected,” says Franzen-Klein, “so this research is looking at animal health and the effects humans have on animal health and our environment.”
The Raptor Center (TRC) is collaborating with Matthew Bonner, PhD, research scientist at Medtronic, Inc., on creating a physiological way to measure stress in raptors. The local company has lent TRC implantable cardiac monitors ("Reveal Linq ICM") that birds can also wear externally. Heart rate can be an indicator of stress, but there is currently no noninvasive way to measure a raptor’s heart rate unless the bird is in hand, and handling often elevates stress levels (and thus heart rates) in wild raptors. The new monitors allow TRC to measure a raptor’s heart rate when the bird is resting or exposed to different stimuli in its housing environment. The clinic is using the monitors diagnostically with its patients. Then, TRC will plan a research project on using heart rate as an indicator of stress in education raptors. TRC has already identified where on the body to place the monitor, both to get a good signal and to prevent the birds from removing it. One bird kept a monitor on for two weeks, and its heart rate was highly variable. The new project could help measure the welfare of raptors under human care for educational programming and lead to updated protocols for training and management.
Help us max our match!

To make a gift, please visit:
z.umn.edu/TRCGTTM2019

Contact Ellen Orndorf for more information:
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