From raptor research and rehabilitation to education and conservation—

The living legacy of Dr. Pat Redig
Dear Friends,

First, I want to thank Dr. Julia Ponder, TRC’s competent executive director, for graciously allowing me to usurp her page so I could write this letter—my last, as I am retiring June 30, 2018. It has been quite the ride.

Avian medicine began a transcendence in the early 1980s, and we were well-positioned to ride the crest of this wave. This and changing environmental attitudes made many things possible, leading to an unanticipated meteoric rise for TRC. From the outset, we have taken a scientific and professional approach to all that we do, applying available best practices, publishing results or our research, presenting at scientific meetings, and sharing knowledge with those who were hungry for it.

We started from scratch, limping along until suitable drug agents became available. Today, safe anesthesia for long procedures is routine, and treatments for formerly untreatable diseases, including aspergillosis, are much more successful. We have taught our hybrid fixator technique to repair broken wings throughout the world and at TRC for nearly 25 years, which has undoubtedly led to the return of thousands of raptors to the skies.

We never could have accomplished this and more without public understanding—based on science, not opinion—of raptors, their environment, and our relationship to both. Today, with a trained staff in place and patients responding to well-established procedures, the main challenge for TRC will be to grow a sustainable funding base to build on our existing accomplishments.

As for me, I may dust off my glider pilot’s license, and I will encourage my grandchildren’s interests in raptors and conservation. But most importantly, I am confident I can sit back and enjoy life. TRC has surpassed all expectations. It is in good hands, and its place and its importance in the world have been established.

Thank you for an incredible career!

Sincerely,

Patrick T. Redig, DVM, PhD
Professor and Cofounder
TRC cofounder leaves rich legacy

By Fran Howard

Retiring pioneer avian veterinarian Dr. Patrick Redig cofounded what today is an internationally known medical, educational, and research conservation center. He leaves a legacy that will continue to make groundbreaking contributions to raptor and ecosystem conservation.

“We created a model that has proven its worth and sustainability,” Redig says. “It has been effective across a broad range of fronts important to raptors, and it resonates well with the values held by the people of Minnesota and the region—maybe even globally—about our relationship to the environment and its inhabitants, especially raptors. I think TRC, in one form or another, will be here in 300 years and beyond.”

While it is impossible to know what TRC might look like three centuries from now, it has become indispensable to the health of raptors and the environment over the past 43 years.

Avian medicine, surgery, and rehabilitation

“Prior to Pat’s work, there was a Wild West approach to wildlife rehabilitation and medicine; there was limited science,” says Dr. Julia Ponder, executive director. “Pat led the effort to establish the science that became the foundation for the treatments and models we use today, and the rest of the wildlife community has built on that science. Today, we have a significant amount of science, and we take a scientific approach to all that we do because of the groundwork Pat laid.”

One of the legacies created under Redig’s tenure has been the steady advancement of avian surgery and medicine.

“We started from scratch in the area of clinical avian medicine,” Redig says. “We had to research and co-opt everything, starting with basic anesthesia. Suitable drug options were just not available at the beginning, so we limped along until better agents became available, and we adapted them to our use. The same holds true with orthopedic techniques that we had to build from the ground up; they are now used worldwide.”

Research

As part of the College of Veterinary Medicine, TRC has long focused on research.

“Pat included a research component in his early work, and research continues to be an important component of our work,” says Ponder. “We have built on Pat’s approach and are now trying to identify, understand, and address the challenges raptor populations face rather than just focusing on the individual bird like we did in our earlier years.”
Since its inception, TRC has seen more than 25,000 raptors, all providing clues as to what is happening in the environment.

“We are open-minded,” says Lori Arent, clinic manager. “We pay attention to what the birds are telling us, both when they arrive and after they are released. They provide insight into what is and is not working.”

Another of TRC’s focus areas today is advancing animal welfare standards within the wildlife rehabilitation field. Most of the nation’s 5,000-plus wildlife rehabilitators are not veterinarians, which limits their abilities to perform certain procedures and their access to certain drugs, especially those used for anesthesia and pain relief. Wildlife rehabilitators are required to have a relationship with a veterinarian, but in many areas there are not enough veterinarians to assist with the more than 500,000 animals that wildlife rehabilitators care for every year.

Clinical wildlife medicine veterinarians—like those at TRC—work in collaboration with wildlife rehabilitators to develop the science of wildlife rehabilitation.

“We need evidence-based standards for animal welfare, clinical wildlife medicine, and rehabilitation,” says Dr. Michelle Willette, staff veterinarian. “At TRC, we are continually re-evaluating our practices, and we teach veterinary students about these issues as part of their curriculum. The Raptor Center is in an excellent position to advocate in this area.”

**Education**

Education of the public has also been a long-held mission of TRC.

“Pat recognized that public outreach and education are key to changing what negatively affects raptor populations,” Ponder notes. “He knew early on that human behavior needed to change to benefit both wildlife and humans.”

In spring 2018, TRC will unveil its new visitor center.

“We will bring the clinic into the visitor center by showing visitors what is happening in the clinic, why it matters, and what can be done to help raptor populations, wildlife, and humans,” Ponder says. “We are bringing the same level of excellence that the clinic enjoys into the visitor experience.”

TRC’s educational department has grown to 63 people, including 50 volunteers and 28 birds.

“Our regular program of birds on the glove has moved away from focusing on the individual bird to ecosystem health to help people understand how raptors affect the environment, how the environment impacts raptors, and how that is tied to the human impact on ecosystem health,” says Gail Buhl, education program manager. “We are also devising alternative ways to reach more people.”

Raptor Lab, for example, was introduced in Minnesota middle schools in 2016. It helps students understand the concept of ecosystem health based on Minnesota Science Standards. A new program, which will be available soon, will extend the work of Raptor Lab and help teachers get students outside and interested in an inquiry-based curriculum.

Another audience is reached with the ever-expanding Raptor Academy, which offers comprehensive learning opportunities, including online training, for people who work with raptors in captivity.

“TRC will survive well into the future, and the staff will continue to do all the things it does so well today, along with things that are currently unimagined,” Redig says. “That is truly the greatest accomplishment—not so much of mine, but of the whole cadre of staff, volunteers, and supporters who have contributed to our success.”

Fran Howard is a St. Paul-based freelance writer.
Tales from the trauma center

The power of one

By Lori Arent

It is hard to believe that 43 years has passed since the first group of disabled great horned owls was brought into Dr. Gary Duke’s lab to participate in pellet egestion studies. One veterinary student with a passion for raptors and one professor with a researcher’s curiosity about the digestion system of owls joined forces, and The Raptor Center was “hatched.” This meeting of the minds changed avian medicine and conservation efforts around the world forever.

Since the formal inception of the program, more than 25,000 raptors have visited TRC’s veterinary clinic. Dr. Pat Redig treated 104 injured raptors in 1974; last year, a team of eight clinicians, 100-plus volunteers, and a consortium of veterinary students treated a record-setting 1,058 raptors, and this year we are again at a record-breaking pace. As of October 15, the clinic had treated 898 raptors. The top five species were bald eagle (158), Cooper’s hawk (145), red-tailed hawk (155), great horned owl (124), and broad-winged hawk (73).

Dr. Redig pioneered many of the treatment techniques and protocols used today, not only by TRC but by avian veterinarians around the world. Going forward, the clinic will continue to expand its research to improve raptor medicine and rehabilitation, striving to use the information collected from each patient to help raptor populations.

One population of raptors lives in the wild, and continues to be faced with threats such as habitat loss, toxicities, and new obstacles in its environment. Another population lives in captivity, either temporarily for rehabilitation or permanently for use as educational ambassadors. These birds deserve the highest quality of life possible. Among TRC’s initiatives is the establishment of accepted standards of care and criteria for permanent placement of non-releasable raptors. In the veterinary profession, animal welfare has come to the forefront in recent years, and there is a great opportunity to work on behalf of captive raptors.

Dr. Redig dedicated his career to developing a strong, adaptable organization. Going forward, TRC is positioned to continue the advancement of the medical treatment of raptors, respond to emerging environmental threats in a timely manner, and share the knowledge we gain through the most up-to-date training venues, such as online training, to reach people on a global scale. One person truly can make a difference in the world.

Chase

The power of one does not just apply to people. Back in 1990, TRC admitted an adult male peregrine falcon with a fractured left wing from downtown St. Paul. It turned out to be Chase, a banded peregrine from Rochester, Minnesota. It was one of the first peregrines I had the privilege of rehabilitating, and at that time, peregrine falcons were on the endangered species list.

The broken bone healed, but there was a slight “divit” in the wing web when the falcon flew. I remember asking Dr. Redig to accompany me to observe this bird’s flight to decide if it was ready for release. We prepared the falcon for exercise on a creance (a line attached to the bird’s leg with jesses) and drove him to a nearby field. When I set the falcon on the ground for his first flight of the session, he powered up and flew in strong, wide circles around us.

Dr. Redig gave the thumbs up, and Chase was released at the Mayo Clinic back in Rochester. He went on to produce 13 young, and one of his sons produced 32 peregrines to help the population recover. Another inspiring example of how one individual can have a legacy recognized by many.

Lori Arent is The Raptor Center’s clinic manager.
Philanthropy: putting values into action

“Don Gabbert was the right person with the right vision at the right time for The Raptor Center,” reflects Dr. Pat Redig, cofounder. “In 1983, the gift from Don and Louise allowed us to build our current home; it was a game changer.”

The Gabberts had the vision to understand what TRC needed to move into the future, Redig explains. “The building allowed the world to come to us. Don was a conservationist in the early days, just as we were learning about the connection between raptors, the environment, and human health.”

The Raptor Center now welcomes nearly 20,000 visitors each year, provides medical care for 800 to 1,000 birds annually, and educates veterinarians from around the world.

Recently, 34 years after the Gabberts made their momentous gift, John Gabbert, Don and Louise’s son, made a donation to renovate the visitor center, helping to create more enriching experiences for a new generation of environmentalists.

“Birds of all kinds were always an important part of our lives—everything from knowing who was at the bird feeder to providing housing for house martins, wood ducks, and wrens,” Gabbert recalls. “Somehow, it was communicated to me that raptors held a special place in our connection to this planet we call home. With this gift, I hope to inspire others to support organizations that help the environment and keep my parents’ legacy alive.”

John Gabbert and his family had their photo taken with Dan Hnilicka, interpretive naturalist, and Maxime, a bald eagle, at The Raptor Center. Gabbert recently made a donation to renovate TRC’s visitor center, continuing his parent’s legacy.

Taking flight together

After more than 43 years of devoted service, The Raptor Center’s cofounder, Dr. Pat Redig, has announced his plans to retire on June 30, 2018.

“I am deeply connected and committed to TRC,” Redig says. “Its mission and the people who support it are like family to me. I am simply moving into a different phase of life.”

“As Dr. Redig fulfills his remarkable career of service, we want to secure his powerful legacy—and the future of The Raptor Center—by fully endowing the Patrick T. Redig Chair in Raptor and Ecosystem Health,” says Ellen Orndorf, The Raptor Center’s development officer.

The Patrick T. Redig Chair was launched with the philanthropic support of Doug and Wendy Dayton, who recognized the importance of having a faculty position dedicated to raptor research and conservation and focused on the role of raptors in the health of the environment.

For more information about how you can support the Patrick T. Redig Chair, contact Ellen Orndorf at 612-624-8457 or eorndorf@umn.edu.

Help us Max the Match on November 16

Mark your calendar: The first $53,000 in gifts to The Raptor Center on Give to the Max Day will be matched by three loyal donor families; the WM Foundation, the Hollstadt family, and the Sarah J. Andersen Fund of the Hugh J. Andersen Foundation. Funds raised on Give to the Max Day are critical in helping TRC provide care and treatment for injured and ill raptors. Please join other supporters of TRC to keep eagles and other raptors soaring. To make a gift, please visit Crowdfund.umn.edu/TRCGTTM2017.

For more information about making a gift, or to learn about other ways to support TRC, contact Ellen Orndorf, TRC’s development officer, at 612-624-8457 or eorndorf@umn.edu.
Education: a cornerstone of The Raptor Center

By Gail Buhl

Since the beginning of The Raptor Center, one of its basic tenets has been education, both public education and veterinary education. Dr. Gary Duke and Dr. Pat Redig, TRC’s cofounders, understood the importance of education and often presented programs about the work of The Raptor Center. One of The Raptor Center’s first hires was a staff person to present educational programs and care for a small collection of education birds.

In the 40 years since, people have enjoyed “beak-to-nose” experiences with our live raptor ambassadors—which now number 28—at The Raptor Center and in classrooms across Minnesota. Our mission: to help people understand the role of raptors, how we affect them, what they can tell us about the environment, and how we can help them survive and thrive.

Over the years, TRC’s annual number of public education programs has increased to 1,200 a year. Approximately 600 of these programs are at The Raptor Center. To meet this demand, we recently redesigned our mews (raptor enclosures) for our permanent residents and to make it easier for guests to experience the birds.

Education has always been a key component of The Raptor Center’s work. TRC reaches thousands of people every year with public education programs and events at TRC and throughout the region.

Renovations in the works

This year, we are renovating our lobby, classrooms, and Glass Gallery hallway to provide a more immersive experience. Some interactive displays will help people understand what happens in our rehabilitation clinic. Others will explore raptor adaptations and connections to people.

Raptor Lab brings TRC to more classrooms

We want to reach many audiences. One way we are looking to reach more school classrooms in a meaningful way is through our web-based Raptor Lab. This online learning platform is designed to teach how science works, using raptors in our rehabilitation clinic as examples. Students use real-time data to work through science questions, learn how to chart data, and write a scientific research paper. Along the way, they experience different careers working with wildlife. Our latest addition to the Raptor Lab is a component to have students design and run their own science projects outside of the school building.

Education has always been a cornerstone of The Raptor Center’s work, and we are always looking to become more effective in teaching. Only when people learn about the environment and the raptors that live in it can they take the next step: caring enough to be active in conservation.

Gail Buhl is education program manager at The Raptor Center.

An artist’s rendering shows plans for renovations of The Raptor Center’s classrooms.

A new education eagle

Dan Hnilicka, interpretive naturalist, feeds a tidbit of meat to Freedom, The Raptor Center’s new education eagle. Read more about Freedom in “The Training of an Education Eagle” on page 11.
Battling modern-day versions of DDT

By Fran Howard

While the environmental and conservation sciences have made vast strides since Drs. Patrick Redig and Gary Duke founded The Raptor Center (TRC) in 1974, new toxicants and technologies continue to threaten raptors.

“In 1974, one of the main problems raptors faced was the pesticide DDT, which was the impetus for much of Pat’s early work,” says Dr. Julia Ponder, executive director. “Neonicotinoids are the 2017 version of DDT.”

A class of insecticides once thought safe for birds, neonicotinoids affect the nervous system and are the most widely used pesticides in the world.

TRC is currently looking at the potential sublethal effects the pesticides have on grain-eating birds exposed to neonicotinoid-treated seeds left uncovered in farm fields during planting. The project is being conducted in partnership with the Minnesota Department of Natural Resources and the University of Southern Illinois-Carbondale.

TRC veterinary resident Dr. Dana Franzen-Klein has already tested blood and tissue samples from 144 chickens, some exposed to neonicotinoids and others used as controls. Chickens are being used as models for wild birds, and researchers are testing fecal samples of wild birds as well.

“The thought is that exposure to neonicotinoids in wild birds may not be directly lethal, but has the potential to suppress the immune system, making it harder for these birds to survive in the wild,” Franzen-Klein says. The study could prove foundational for future work and set a baseline for acceptable exposure levels in wild birds.

Deterring eagles from wind turbines

The bald eagle, a longtime and early focus species of TRC, has made a dramatic recovery, but it too faces new environmental threats. Although the exact number is unknown, an estimated 300 to 500 or more eagles perish each year in the United States after colliding with wind turbines, according to Scientific American and other media outlets. TRC’s research in this area, part of a multilevel, multipartner project funded by the U.S. Department of Energy, is focused on hearing.

“We are trying to understand the range of sounds eagles hear,” Ponder says. “We don’t know whether eagles are so fixated on hunting that they are not paying attention to turbines or whether an auditory signal could be used as a deterrent.” One way to deter eagles could be through technology that issues a tone alert emitted from the turbine as the eagle approaches.

TRC and auditory experts from the University of Minnesota’s Center for Applied and Translational Sensory Science and Boys Town National Research Hospital have successfully mapped the auditory system of a red-tailed hawk to test the methodology TRC is now using with eagles, while the University’s St. Anthony Falls Laboratory is providing engineering expertise related to wind turbines.

Fran Howard is a St. Paul-based freelance writer.
Long-serving volunteers are testimony to TRC’s legacy

By Fran Howard

From an informal handful of helpers in the early days to roughly 300 organized volunteers today, The Raptor Center’s volunteer program has kept pace with TRC’s growing caseload and demand for educational programs. And they’re dedicated. More than one-third of TRC’s volunteers have served more than five years. Three longtime volunteers recently shared their memories.

Dorothy Kelly, education volunteer: 35 years

When Dorothy Kelly started volunteering in 1982, the focus was on birds needing medical care and rehabilitation. But relatively little was known about raptor medicine and rehabilitation or the human impact on raptors.

“We did everything at first—feeding, cleaning, handling, education,” says Kelly. “Today we have much more information, given the research that has been done here over the years. When I started, kids and some adults didn’t even know the meaning of the word ‘environment.’ We’d have to define it.”

Kelly has enjoyed watching the expansion of TRC’s research and reach. “The work being done is so great,” she says. “The center sees trends in what is happening in our world. If these birds are suffering, it means something is wrong in our neighborhood, our city, the world. I look forward to each new discovery.”

Mary Larson, clinic volunteer: 29 years

Mary Larson, leader of Friday night’s clinic crew, has seen many improvements.

“Due to the shortage of staff and money in the beginning, volunteers were trained to admit birds to the clinic,” Larson recalls. “I learned to draw blood and give fluids.”

She also recalls removing the floors of the old wooden cages to wash them. “They were so warped, we could barely get them back in,” she says.

Today, TRC’s state-of-the-art cages are designed based on years of research. Clinic volunteers serve different functions, and there is a waiting list to volunteer on a clinic crew.

“The standards of professionalism and care are raised every year,” Larson says. “Pat, Juli, and the staff are remarkable—knowledgeable and skilled in advancing avian medicine. I am grateful to be on the journey.”

Linda Wadsworth, flight crew volunteer: 25 years

Linda Wadsworth enjoys working on the eagle flight crew so much that she refused to schedule Friday morning classes when pursuing her master’s degree. Before committing to becoming a snowbird, she made sure she could return to her volunteer position at TRC when she returned home to Minnesota.

“I like rehabilitating birds, but it is just as important to me to work with people who are so dedicated to their work, both staff and volunteers,” Wadsworth says. She sees TRC’s role in educating the public as crucial.

“The science of what we are learning from these birds shows what is happening in the environment,” she says. “Providing this information to kids will help save our environment. The science is important, but you also need to be able to communicate that science to nonscientists.”

Fran Howard is a St. Paul-based freelance writer.
### Around The Raptor Center

### Staff news

**Dr. Meredith Lum** and **Dr. Mariana H. Sosa** are TRC’s new clinical interns. A 2017 graduate of the University of Minnesota College of Veterinary Medicine, Lum earned her undergraduate degree at Otterbein College in Westerville, Ohio. Sosa grew up in Mexico City and is a graduate of the National Autonomous University of México College of Veterinary Medicine. **Dr. Anna Kathleen MacAuley** and **Dr. Adrien Pesque** completed their clinical internships.

**Dr. Hoa Nguyen-Phuc** has joined TRC as a postdoctoral associate. Nguyen-Phuc earned his PhD at the University of Wisconsin-Madison, and just finished a postdoctoral research appointment at Texas A&M University. His background is in disease ecology and surveillance of wild bird populations with a focus on ecotoxicology (the study of the effects of toxic chemicals on the ecosystem).

**Treana Mayer** was TRC’s Summer Scholar for 2017. Summer Scholars are veterinary students who work in research with faculty members during their summer break. They receive grant funding through a competitive process based on proposals they write. Mayer worked with Dr. Julia Ponder, executive director, on a research project on reducing subjectivity in raptor body condition scoring.

### Teaching

**Dr. Julia Ponder**, executive director, presented an avian orthopedic wet lab at the Association of Avian Veterinarians annual conference in Washington, D.C., in July.

**Dr. Michelle Willette**, staff veterinarian, traveled to Raleigh, North Carolina, in August to serve as a subject matter expert in a partnership with the Association of Zoos and Aquariums and U.S. Department of Agriculture, which are preparing materials for zoos to respond to emergencies and disasters. In October, Willette coordinated a course at the University of Minnesota College of Veterinary Medicine on preparedness for animals in disasters.

TRC staff assisted with College of Veterinary Medicine courses for veterinary students, including Avian Core, an Avian and Exotics rotation, and GOALE (Gopher Orientation and Leadership Experience).

### Public education and events

Summer camps were held at TRC from June through August. The camps included Wizarding World of Wildlife, Working with Wildlife, Grossology, Enraptured with Raptors, and Raptor Biomimicry and Engineering.

An estimated 4,000 people attended TRC’s Fall Raptor Release event on September 23. Six raptors were released back to the wild, including a bald eagle and several species of hawks.

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**Student saves up to sponsor Nero**

Nine-year-old Leah W. of Minneapolis recently raised $1,000 to sponsor Nero, a turkey vulture, as part of The Raptor Center’s Sponsor-a-Raptor program. Leah saved her allowance, did extra chores around the house, and ran multiple lemonade stands. It took nearly a year, but she achieved her goal. Leah is pictured with Dan Hnilicka and Nero. Learn more about TRC’s Sponsor-a-Raptor program at z.umn.edu/sponsoraraptor.
The training of an education eagle

By Gail Buhl

The Raptor Center has a new educational ambassador: Freedom, a young bald eagle hatched in 2016 and injured when he tried to leave his nest. Rescued by a member of the community, the young eagle was brought to TRC for treatment. But the injury to his foot was permanent, and Freedom was not able to be returned to the wild. He has found a permanent home with TRC’s Education Department.

Before Freedom goes out on any education programs, he needs to learn a lot of new things. We want him to be comfortable in front of many types and sizes of audiences in a variety of venues. To do that, he needs to start small, so we assign one person to be his primary trainer during the formative stages of his learning.

First, Freedom needs to learn how to learn. We teach him a sound that he associates with food. This allows us to let Freedom know when he is doing something we are interested in having him do, and that earns him a reward—like a piece of rat or fish. We can pair this with asking him to step on a scale for weighing or to step on a glove.

We want our birds to be actively involved in the training process—and to help guide the process. The Raptor Center’s handlers and trainers learn to be very sensitive to a bird’s body language. We need to know whether the bird is becoming uncomfortable with what we are doing or asking them to do. We want the birds to be comfortable and confident in what we ask.

Freedom has learned many things and is in the process of learning many more. He has learned how to step on a scale in his enclosure (mew). He has learned to station on the top of his hutch for Dan Hnilicka, his main trainer, and confidently step on Dan’s glove. He is learning that hoses, carts, and people are OK.

He is also experiencing many types of enrichment. Training is a wonderful way to keep Freedom engaged, but he has also learned that food will be inside different objects we present to him. He is curious about the objects. We have to teach him to be curious and not concerned about new objects around him, and once he learns that certain objects may have treats inside, he investigates them fully. Lately, he is learning that carved pumpkins are great fun. Not only do they contain food treats, like fish, but they are also fun to tear apart!

Everything we do in our training is aimed at Freedom’s health and welfare and toward the goal of having Freedom become one of The Raptor Center’s “teachers.” He will help us teach many people of all ages and backgrounds how important raptors and other wildlife are to our ecosystems. It is all part of our One Health perspective—all of us are connected.

Gail Buhl is The Raptor Center’s education program manager. Follow Freedom’s progress on TRC’s blog at z.umn.edu/TRCblog.
Celebrating four decades of dedication to raptors