



MUNIR VIRANI PHOTO



PHOTO COURTESY JIM BELTROFF

Boise State biology professor Marc Bechard, above, releases an African white-backed vulture captured and equipped with a wing tag in Kenya's Maasai Mara National Game Reserve.

A tiny burrowing owl chick, less than 10 days old, is gently cupped in the hands of a Boise State researcher.

Graduate student Erin Strasser, right, prepares to release a male American kestrel after banding it and recording its weight, size and other physical characteristics.

Boise State's One-of-a-Kind Raptor Biology Program

FLYING HIGH

By ERIN RYAN

Derived from the Latin term rapere, to seize by force, "raptor" refers to a collection of awe-inspiring avian predators. Eagles, owls, vultures and other birds of prey spend their lives on the wing, keeping ecosystems in balance with powerful talons and primeval instincts.

Boise State University is expanding knowledge about these charismatic birds through faculty and student research in Idaho, the Pacific Northwest and around the world. Their work informs the decisions of wildlife managers and public officials and helps scientists better understand the threats raptors face as a growing human population diminishes habitat, climate change alters food supplies and environmental issues from pesticide use to collisions with vehicles affect mortality rates.

MICAH SCHOLER PHOTO



“Within 10 minutes we caught a lappet-faced vulture, which averages 25 pounds with an 8-foot wingspan and a neck like a snake,” Bechard said, adding that a tourist group witnessed the spectacle. “We made this dramatic 100-yard dash and secured the bird, and the tourists gave us a standing ovation.”

The team equipped 12 vultures with cell phone transmitters that text their in-flight locations three times a day.

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—Biology professor Marc Bechard

“We’re going to learn a great deal about how vultures follow herds of wildebeests to find food,” Bechard said. “They play an essential role in preventing the

spread of disease and have been doing so for millennia.”

Bechard participates in many such projects each year, from studying the flapping patterns of griffon vultures migrating across the Strait of Gibraltar to investigating the possibility of mercury contaminating Idaho bald eagles. He is co-founder and director of Argentina’s Center for the Study and Conservation of Birds of Prey and frequently publishes in leading international journals such as *Ibis* and the journals of *Field Ornithology*, *Wildlife Management* and *Raptor Research*, for which he was editor for the better part of a decade.

“Wherever I go, people in the field know about Boise State and its internationally respected raptor biology program,” Bechard said. “It’s the raptor capital of the world.”

SOARING

Erin Strasser came to the “raptor capital” after receiving encouragement from Dufty and biology professor Julie Heath, a graduate of the program who joined the faculty after earning a Ph.D. at the University of Florida.

“I liked the fact that she had published a lot at a young age,” said Strasser, who became Heath’s first advisee.

Now on the verge of graduating, Strasser is analyzing her field work on American kestrels occupying nest boxes across Southwest Idaho. She hypothesized that birds in areas of high human disturbance, such as on power poles or near highways, would have physiological reactions that

would hamper reproductive success. She looked specifically at the stress hormone corticosterone and found strong indications that her hypothesis is right. Getting to that point involved reviewing years of data collected by other researchers, taking countless measurements and blood samples of nestlings and fledglings, and dealing with the resulting “battle scars.”

“Ultimately it’s about the thrill of problem solving. That’s the cool thing about science – you work so hard to discover something, and groundbreaking or not, it is still important and will contribute in some way,” Strasser said. “Dr. Heath helped me realize that. She shares ideas and remembers what it’s like to be a student.”

Heath, who conducts research on avian reproduction, will utilize Strasser’s data in her ongoing studies. Heath also is interested in how raptor habitats are affected by alternative energy developments in the West such as wind farms, and by contaminants such as flame retardants released into the environment at waste disposal sites.

“I would like to start working on the science now,” Heath said, “so the affected birds don’t end up on the endangered species list.”



COURTESY PHOTO



PHOTO COURTESY KEITH BARNES

Flammulated owls, above photo, and burrowing owls, left photo, are among owl species studied by Boise State researchers.

Graduate student Micah Scholer measures the girth of a Douglas fir snag as part of his research to study the habitat of forest owls who nest in cavities in the dead trees. Forest areas near Lowman, Idaho, pictured below, are among his research sites.

Opposite page: An American kestrel, far left photo, is readied for release after being briefly captured and studied. A bucket of burrowing owl chicks is pictured at left.

JOHN KELLY PHOTO

are killed by vehicles along Interstate 84 between Burley and Boise, and screech owls to investigate factors that influence their movements through river corridors and wooded suburban areas.

Another major focus of Belthoff's work is natal dispersal, or the impulse of young birds to leave the nest at a certain time in their development. Belthoff and biology professor Al Dufty, now the associate dean of Boise State's Graduate College, have conducted novel studies of screech owls that suggest an increase in the stress hormone corticosterone is linked to dispersal.

"Dispersal is a phenomenon that occurs throughout all animal life," Belthoff said. "While we're learning more about the basic biology of these birds, we're also helping natural resource agencies better understand their management issues. It's the applied aspect of the work coupled with the advancement of knowledge."

Belthoff said working with students is among the most rewarding aspects of his busy job. Having studied owls extensively in his 16 years at Boise State, he implicitly understands the value of investing in young scientists like Scholer, who are passionate about further discovery.

"Owls as a group are probably less well understood than other raptors, and flammulated owls are tiny and incredibly secretive. The trees they nest in sometimes are more than 100 feet tall and wider than

you can get your arms around, so they're very hard to study," Belthoff said. "It takes all night sometimes, and Micah and I follow up with daytime work. Field biology people are dedicated."

"It takes a certain personality," Scholer said. "I hope I never get a desk job."

MIGRATING

While he does spend time at his desk, Marc Bechard also spends considerable time in the field, from Argentina's Tierra del Fuego National Park to Spain's Punta de Tarifa. A key player in the founding of Boise State's raptor biology program, he has taught raptor ecology, vertebrate natural history and general ornithology for 26 years. When he's not in the classroom, he is globetrotting in the name of science and Boise State.

As an educator, researcher and consultant, Bechard has worked in North America, South America, Europe, Asia and Africa. During a recent research trip in Kenya, Bechard and several colleagues spent time in the Maasai Mara Game Reserve studying the movement ecology of five species of African vultures. Branded the "Vulture Research Group," they spent two weeks driving around looking for carcasses. One day they found a dead hippo and rigged a trap on its body with parachute cord.



MICAH SCHOLER PHOTO

Boise State is home to the only master's program in raptor biology in the United States and possibly the world.

A unique graduate program drives the university's contributions. Boise State offers the only master's program in raptor biology in the nation and possibly anywhere. Over two decades the program has built an international reputation on its research efforts and accomplished graduates, who work in fields from resource management to medicine. The National

Wildlife Service, Bureau of Land Management, Idaho Department of Fish and Game, The Peregrine Fund and other public and private agencies fund raptor studies at Boise

State. By advancing knowledge and training new scientists to take on leadership roles, the university is helping ensure that raptors will survive and flourish in the next century.

"The success of our raptor research program is rooted in the work of exceptional faculty, our ability to attract topnotch students and the partnerships we have developed in both public and private sectors," said Martin Schimpf, dean of the College of Arts and Sciences. "This collaborative approach enhances our capabilities both in research and education."

HATCHING

The birth of the university's raptor biology program wove with the rebirth of The Peregrine Fund. Founded in 1970 by Cornell University's Tom Cade, the international conservation organization successfully brought the peregrine falcon back from the brink of extinction. As its vision grew, it needed to establish a cohesive world headquarters.

In 1983, Cade visited Idaho to connect with Morley Nelson, a celebrated master falconer and conservationist who died in 2005. Cade noticed immediately that the landscape surrounding Boise appeared ideal for the study of raptors, with one of the world's densest concentrations of nesting birds of prey located in the nearby Snake River Canyon. A year later, The Peregrine Fund dedicated its World Center for Birds of Prey just south of Boise. That decision proved prescient when, in 1993, Boise State researchers discovered that the Boise Ridge above the city supports one of the largest raptor and songbird migrations in the Western United States.

"Tom Cade really got us off the ground," said Marc Bechard, who joined Boise State's Department of Biological Sciences in 1983 and today conducts raptor research all over the globe. Bechard helped write the proposal to establish a master's program in raptor biology at Boise State, which was approved by the State Board of Educa-

tion in 1987. Around the same time, Boise State took the academic lead in a cooperative venture that evolved into the Raptor Research Center. The RRC is a research unit of Boise State that has a collaborative agreement with the U.S. Geological Survey to conduct raptor studies.

"The center works on resource management issues for state and federal agencies, but we also address more basic biological questions," said RRC director Mark Fuller, a USGS employee who advises Boise State graduate students in addition to doing research for the USGS. "Through both kinds of research, we get a better understanding of what all organisms on Earth are doing here, their roles in creating the environment we depend on and implications for our shared future."

FLEDGING

For Micah Scholer, owls are key to that understanding. He is a second-year student in Boise State's raptor biology program and recently completed his first full field season in the Boise National Forest. He is modeling forest owl habitat associations using information about biotic and abiotic factors, statistical software and surveys. More plainly, Scholer is driving backcountry roads and snowshoeing into the wilderness at night with a GPS and a device that blasts birdcalls, trying to find if and where elusive owls are nesting in 84 different sites. During the day he studies tree snags and the behavior of resident woodpeckers, as their presence might predict that of owls.

"It's more thrilling than anything," he said of his fieldwork in wild places.

Scholer is looking at six forest owls, including northern saw-whet, boreal, great horned, barred and western screech, but flammulated owls are his focus.

"There is still a lot to learn about the elements influencing why these raptors are where they are," he said. "This is a unique opportunity to start documenting what habitats they're using, and having local information for the Boise National Forest is important because it will guide management decisions for forest treatments and expansions."

Field studies are critical to understanding species because small changes in ecosystems can have broad impacts, noted Jim Belthoff, Scholer's adviser and chair of the Biological Sciences Department.

"Nature has a balance to it," he said. "It self-regulates to a certain extent, but when you have disturbances there are impacts, and it's important to understand what they are."

Belthoff's research subjects in Southern Idaho include burrowing owls to understand how environmental factors such as encroaching subdivisions affect their numbers, barn owls to gain insight into why so many



KIM BRADY PHOTO



EMILY STREIBER PHOTO



NESTING

Perhaps the best measure of the growing impact of Boise State's raptor biology program is its graduates, who work for nonprofit and government agencies and for industry and academia across the country and overseas. At a recent informal meeting of coordinators of management actions for bird conservation in North America, 2 of the 15 were graduates of Boise State's raptor biology program, Heath noted.

"Percentage-wise, that's huge," she said. "Our program produces serious players."

It also produces serious data, such as annual statistics on migratory raptor counts from the Idaho Bird Observatory on the Boise Ridge. The IBO is a university research unit devoted to monitoring migrating raptors and songbirds and teaching the public about their ecological significance. It was co-founded and is directed by Greg Kaltenecker, who graduated in 1997 with a master's in raptor biology.

Kara Donohue, an avian protection specialist for Southern California Edison who earned her master's from Boise State in December, is one of many examples of the program's success. While a student, Donohue co-authored a paper with Duffy that was one of most

frequently cited contributions in the prestigious *Journal of Field Ornithology* within the last five years. The paper, which looked at using DNA analysis and other methods to determine the sex of red-tailed hawks, earned her an invitation to present her findings at an Association of Field Ornithologists conference in Utah in August 2010, an honor shared only by the journal's top 10 authors.

"We are thrilled for Kara, and this is another in the long list of Dr. Duffy's accomplishments," Belthoff said. "It serves to highlight the impact of our raptor biology program and the caliber of our students."

Now living and working in Los Angeles, Donohue cited outstanding professors, relevant research and lifelong friendships with fellow students as highlights of her time at Boise State.

"My degree got me a job I love, trying to reduce bird mortality caused by the company I work for, and my expertise in raptors was particularly instrumental in getting this position," she said. "My experience in the program and with Boise State was exceptional."

Boise State's distinctive program will continue to focus on key research areas in the future, Belthoff said. "The diversity of our projects is increasing, the strength of the program is growing, and our work as faculty members is facilitated more and more by the research of outstanding students," he said. "What started as something of a niche program is now setting a standard for biological education." ♦

A raptor, above photo, is released at sunset at the Idaho Bird Observatory research site on Lucky Peak.

Graduate student Erin Strasser, left, and biology professor Julie Heath analyze blood samples from American kestrels to learn about the quality of the raptors' habitat and stress hormone levels.

