



Dr. John E. Parks

“Raptors, Reproduction and Research – how one professor intertwines all three”

By Melanie Soberon
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It was a hot August day but the energy level in the auditorium was palpable. The 2011 Cornell Summer College students attending their graduation ceremony stood proudly as their enthusiastic classmates cheered for each certificate of completion, which was accompanied by a hearty handshake from their instructor. For five years, John Parks, professor in animal science, has instructed the Captive Raptor Management summer college course for rising seniors in high school. Once selected through a competitive application process, students have the opportunity to earn 3 college credits during the 3 week course while experiencing academic and residential life on Cornell campus.

“It’s a pleasure for me to teach because the students are bright and excited to learn and be here,” said Parks. “The course is capped at 24 students and we get to know them individually.”

Parks is more than qualified to teach on the subject of birds of prey as he has logged thousands of hours working with birds and has taught on the subject for 30 years. The summer course is an adaptation of his fall semester course taught to Cornell undergraduates, Exotic Avian Husbandry and Propagation (Animal Science 2150), which he co-instructs with Dr. Donna Muscarella. The summer course differs because it is a combination of lectures and laboratory practicums, taught solely about birds of prey by Dr. Parks and his Teaching Assistants, whereas the undergraduate, fall semester course is two credits of lecture only, with half the topics covering birds of prey and the other half parrots.

“We cover a lot of information in the course on identification, life cycle, natural history, and biology of many different raptor species. Then, for a third of the course, we go into the principles and practice of captive propagation,” said Parks. “There are many human endeavors with raptors where the principles of care and management are virtually the same, such as raptor conservation, rehabilitation, captive breeding, and falconry. In the lab practicums, we detail the management and care for different species, and students go out to the raptor facilities and learn to care for and work with the birds.”

Although Parks has had a lifelong interest in birds, he traces his first encounters with raptors back to his undergraduate years where he was inspired by a zoology professor whose research area was in prey detection for birds of prey. Later, as a graduate student at VirginiaTech, he and his wife rehabilitated injured owls and soon after, he took up falconry.

“Falconry by definition is using a trained bird of prey to take wild quarry, or to hunt with cooperatively. I trapped and trained a red-tailed hawk and used it to hunt rabbits in the late fall and winter,” recalls Parks. “Over a period of time, I just got more involved with it and when I came to Cornell, I observed the activities of the Peregrine Fund at the Lab of Ornithology where they were breeding endangered peregrine falcons for release to reestablish their populations – it was world famous and highly successful.”

Although Parks began his career at Cornell in 1983 as an instructor of the undergraduate reproduction course, he was given the latitude to apply for research funding and perform research. Thus, it was only natural that he combined his discipline of study, reproduction, with his passion for birds in a collaborative project on frozen semen with the peregrine falcon group located at the Cornell Lab of Ornithology.

“We developed a novel semen freezing procedure, conducted a fertility trial, hatched the eggs and produced several falcon chicks with frozen peregrine falcon semen,” Parks said.

In 1993, Parks approached Dr. Hintz, the chairman of the Department of Animal Science, about formalizing a program that already involved interested Cornell undergraduates; thus began the Cornell Raptor Program (CRP). The CRP includes four major program areas: formal classroom instruction on raptor biology and natural history (AS2140 and 2150), captive propagation and release of specific raptor species, the rehabilitation of sick or injured raptors, and public education programs promoting raptor conservation.



“We have one dedicated building, the Bondareff Raptor Facility, designed for housing birds of prey, adjacent to West House in the Game Farm complex which also contains aviaries designed specifically for housing raptors.” said Parks. “We have capacity for 50 birds and are currently housing 45 birds in our collection representing 24 different species.”

Undergraduate students volunteer in the CRP as an extracurricular activity. Approximately 30 to 40 students meet on Saturday mornings at the raptor facility for a workday; 50% attendance on Saturdays is obligatory for students who aspire to more advanced hands-on experience with birds. As students begin to develop competence and confidence in working with the birds, they can begin to volunteer to feed birds on weekdays as well. If they want to participate in the public education outreach programs, they are required to attend a short course of five to six sessions first and then they are qualified to participate in any of the 35 plus education programs throughout the year.

“If a student is really serious about the program, they can also take responsibility for an individual bird - to hand feed it every day, keep it tamed, help maintain its aviary,” explains Parks. “Maybe 6 to 8 students will actually reach this level of involvement each year.”

Students who have been very involved for a few years will also have leadership opportunities as student supervisors for the Saturday workdays, training other students, or to become a student program director, who is responsible for scheduling the public education programs and organizing transportation to those programs.

“We go into the schools, civic organizations, nature centers, alumni events, and we exhibit the birds and give public education about raptors and raptor conservation,” said Parks. “We average 3 to 4 of these events a month.”



John Parks, Director of the Cornell Raptor Program, and student volunteers participate in a public outreach education event at the Father's Day Fly-In Breakfast at the Ithaca Airport.

“While the vast majority of students initially get involved because it’s an animal activity they can use to apply to vet school or grad school, a fair percentage of students end up as environmental educators or curators,” Parks said. “Many develop a lifelong interest in raptors and while it may not be part of their career, it will always be part of their life.”

Aside from his involvement with the Cornell Summer College program and as Director of the Cornell Raptor Program, Parks teaches the core Animal Science Reproduction and Development course (2400), with optional lab (AS2410), Exotic Avian Husbandry and Propagation (2150) and Gamete Physiology and Fertilization (4250). The other half of the time, he focuses on an active research program in male reproduction, with an emphasis on the production and cryopreservation of sperm.

“My research effort has been in male germ cell development and sperm function, primarily in the bull, but with some comparative work in other species,” said Parks. “Our efforts are to try to improve the post-thaw viability, motility and ultimately the fertility of frozen sperm through modification of the sperm plasma membrane and improving cryopreservation media and protocols.”

“Historically, in the late 30s to mid-40s, artificial insemination was gaining acceptance and A.I. centers were interested in preserving sperm for storage and distribution. By evaluating various biological fluids, studies demonstrated that egg yolk and milk protected sperm during cooling and during freezing.” Parks said. “Soon thereafter, the cryoprotective effect of glycerol was discovered (quite by accident) and the use of frozen semen became commercially feasible. In the mid-70s to 80s, procedures for freezing bull semen were optimized and haven’t changed much since – so that’s where we are – trying to find the needle in the haystack to improve upon bull sperm preservation and fertility and to extend the success to other species.”

Recently, Parks’ research group evaluated different methods of adding cholesterol to sperm to stabilize the plasma membrane at lower temperatures. The challenge of improving sperm fertility is that the sperm cells are so sensitive to *in vitro* processing that any manipulation to improve one aspect of preservation often results in a deficit in function elsewhere.

“The whole procedure of sorting X and Y sperm allows you to achieve the predicted sex of the offspring but the process is hard on the sperm and reduces fertility,” explains Parks. “So, our recent emphasis has been trying to come up with protocols that minimize damage due to simply processing the sperm cells and thus achieve a level of fertility comparable to conventional semen processing.”

For more information about Dr. Parks’ research program or the Cornell Raptor Program, refer to the sites below:

<http://www.ansci.cornell.edu/faculty/parks.html>

<http://www.ansci.cornell.edu/raptor/index.html>

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