HONORING A LEGEND

This year’s Annual Report is dedicated to the late Dr. Murray Fowler—a true giant in the world of Zoological Medicine who passed away this year.

Dr. Fowler joined the UC Davis School of Veterinary Medicine faculty in 1958 as an instructor of large animal surgery. In the decades that followed, he built an incredibly successful and varied academic career that touched the lives of many and changed the landscape of zoological medicine forever.

As Chief of the Zoological Medicine Service, Dr. Fowler assumed responsibility for the first program of its kind in the world. He forged strong relationships with the Sacramento, Lodi, and Folsom Zoos, which allowed his veterinary students to gain hands-on experience with zoo animals. In 1974 he initiated a joint residency training program in zoological medicine with the Sacramento Zoo, which has since graduated more than 32 residents and become one of the most lauded programs of its kind in the world.

Dr. Fowler authored and edited 27 textbooks, including the *Zoo and Wild Animal Medicine* series, considered the definitive reference set for the zoological medicine discipline. He also served as the editor of the *Journal of Zoo Animal Medicine* for nine years. Dr. Fowler was a founding Diplomate of the American College of Zoological Medicine, which was started in 1983 and has since certified more than 150 veterinarians as specialists in Zoological Medicine.

Dr. Fowler retired from the University in 1991 after 33 years of service, but remained extremely active in the profession in his “retirement.” In 2006, the Sacramento Zoo dedicated its state-of-the-art veterinary hospital to Dr. Fowler in honor of his lifelong contributions to zoological medicine and animal health.
NEW LEADERSHIP

2014 marked the first year for Kirsten Gilardi and Mike Ziccardi at the helm of the Karen C. Drayer Wildlife Health Center. The two were appointed Co-Directors by Dean Michael Lairmore in March, with the broad support and approval of School of Veterinary Medicine faculty.

As Directors, Gilardi and Ziccardi's goals are for the WHC to play a vital and expanding role in the School's research, service, and teaching mission, and to advance the WHC as a global leader in wildlife health and conservation. They envision the Center keeping a laser-sharp focus on wildlife, while creating and expanding opportunities for faculty and staff, growing the WHC's network of partners and affiliations, and building its portfolio of grant, contract, and donor support.

In presenting their vision for the WHC, Gilardi and Ziccardi remarked on their combined 30 years of experience developing and managing the core programs and projects of the Center, as well as an MPVM, PhD, and Board Certification in the American College of Zoological Medicine between them.

Mike and Kirsten, both of whom enrolled in the School of Veterinary Medicine in 1989, benefited greatly as students from the mentorship of Drs. Walter Boyce, Murray Fowler, and Linda Lowenstine among many others, and from the leadership of Dr. Boyce and Dr. Jonna Mazet while working as wildlife veterinarians for the WHC.

They know that, as Co-Directors of the Karen C. Drayer Wildlife Health Center, they are standing on the shoulders of giants. As part of their vision for the WHC, they will aim to identify and mentor future leaders in wildlife health by offering the same transformational training opportunities and experiences they have been given throughout their careers as students and professionals.

A YEAR IN PICTURES

With an eye on the future, the Karen C. Drayer Wildlife Health Center updated its mission statement this year:

Advancing the health of wildlife in balance with people and the environment

While the WHC maintains a One Health perspective and continues to conduct the majority of activities within the School's One Health Institute, the new mission statement highlights the WHC's focus on wildlife health and conservation.

Each page of this 2015 Calendar highlights a specific program or project of the WHC. Whether it is a graduate student's work with black bear populations in California or a worldwide effort to prevent a global pandemic, the Karen C. Drayer Wildlife Health Center's faculty, staff, students, and affiliates have been tremendously successful in furthering the Center's new mission.

Special thanks to Phil and Karen Drayer for their ongoing passion and support, which has been a guiding force for the WHC since its inception.

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To follow the stories and projects of the Karen C. Drayer Wildlife Health Center, subscribe to our quarterly web publication, Evotis: evotis.org/subscribe
The Karen C. Drayer Wildlife Health Center’s Zoological Medicine curriculum is one of the most comprehensive in the country, preparing students and residents to care for the wide variety of species they will encounter in their careers as zoo and wildlife veterinarians. Through lectures from experts and weekly field trips, third-year students learn about everything from how to safely anesthetize an elephant to how to heal a fracture in a flamingo. Residents in the Zoological Medicine program help to teach veterinary students, conduct research, and work as clinicians for three years in the Sacramento Zoo, Zoological Society of San Diego, and SeaWorld San Diego.
This year, Dr. Tara Myers Harrison (right) joined the WHC and the SVM’s Department of Medicine & Epidemiology as an Assistant Professor of Zoological Medicine. Dr. Harrison is pictured here with the legendary Dr. Murray Fowler, who passed away in May, 2014.
Oil spills in the ocean are a significant and very visible risk to wildlife throughout the world. More than 3,000 oil releases were reported off the California coast in 2013 alone. Increased oil exploration within the United States has created a shift from marine transport of oil by ship to land transport of oil by rail, thereby expanding the places where oil might impact wildlife.

In 2014, the Oiled Wildlife Care Network’s mandate was expanded to include inland waters of California, including rivers, lakes, and wetlands. By building new partnerships and increasing readiness, our teams are meeting this challenge head-on to protect wildlife, like the snow geese pictured here, wherever a spill might occur.

PHOTO BY CURT HART
Stephanie Herman is the newest addition to the Oiled Wildlife Care Network staff. As a Wildlife Response Specialist with vast experience in wildlife rehabilitation, Stephanie provides technical help to each of the four key areas of the OWCN – Recovery, Hazing, Field Stabilization, and Care & Processing – wherever the need may be.
More than 100 southern right whales – almost all of them first-year calves – were found dead in the breeding area at Península Valdés, Argentina in 2012. That is the highest number ever recorded in one season for the species, and the cause of the deaths remains unknown.

The Karen C. Drayer Wildlife Health Center's Dr. Marcy Uhart began monitoring whale mortalities in 2003 in an effort to better understand the health of the population. Uhart and an international team of experts are exploring many different possible explanations for calf mortality – everything from nutritional deficiencies and infectious diseases, to biotoxins and wounds caused by kelp gulls that feed on the whales' skin and blubber at Peninsula Valdés.
Waterfowl in Argentina’s wetlands are threatened by toxicity from extensive use of lead shot. The WHC is studying the effects and severity of lead ammunition on wildlife to improve wetland health and inform policy. Drs. Marcelo Romano and Andrea Caselli collect samples from rice fields and wetlands where hunting with lead shot occurs annually.
It can be a challenge for veterinary and graduate students to acquire funding for research projects while pursuing their education. The Karen C. Drayer Wildlife Health Center provides annual research opportunities for several UC Davis students to pursue their interest in the health of free-ranging wildlife through the Phil and Karen Drayer Fellowship Award. The fellowship, which is made possible by the generous contributions of WHC donors, awards up to $5,000 to each student whose project proposal is deemed most worthy by their peers.

In 2014, fellowships were awarded to Katie Delk to work with flamingos; Evan Eskew to study amphibians; Tara Roth to research rabbits and ticks; and Charlene Lujan Vega to work with red-tailed hawks.
Katie Delk is a Zoological Medicine resident at the UC Davis School of Veterinary Medicine. She recently finished the first year of her residency at the Sacramento Zoo and is now at the Zoological Society of San Diego and SeaWorld San Diego for the final two years of her 3-year program.
Sea stars from Alaska to southern California are losing limbs and dying from a mysterious disease about which researchers know very little. The disease leads to behavioral changes, lesions, and loss of limbs — to the point that the sea stars waste away completely.

The Karen C. Drayer Wildlife Health Center’s SeaDoc Society team is collaborating on an investigation into the die-offs, and has helped determine that the underlying cause is likely an infectious agent, although it remains to be seen what actually triggers the outbreaks and how the mass mortalities will alter near-shore communities on the Pacific Coast.

PHOTO BY MARC CHAMBERLAIN

SeaDoc Society
In 2014, former SeaDoc Society Postdoctoral Fellow Dr. Ignacio (Nacho) Vilchis published the results of his research, which took a novel approach to determine which marine bird species are in decline in the Salish Sea, and why.
California’s black bear population has tripled to an estimated 30,000 bears in the past 25 years. The species is expanding into geographical areas that had previously been inhabited by grizzly bears, which have not been seen in California since the 1920s. As black bear populations continue to rise and expand, contact and conflict between black bears and humans becomes increasingly common.

Bear populations are currently measured using hunting data, but Karen C. Drayer Wildlife Health Center faculty and graduate students, in cooperation with the California Department of Fish and Wildlife, are using capture-mark-recapture methods in live bears to more accurately track populations and generate data that will help prevent human-wildlife conflict and inform bear-management policy.
Jamie Sherman is a black bear expert who, through her research, is helping recommend better ways to estimate black bear population size throughout California.
Gorilla Doctors’ team of Africa-based veterinarians provide life-saving veterinary care to ill and injured mountain and Grauer’s gorillas in Rwanda, Uganda, and the Democratic Republic of the Congo.

To reduce the risk of human disease transmission to gorillas, Gorilla Doctors provided annual health screenings to 473 national park employees in 2014, and provided quarterly preventive medication to more than 2,000 of their family members. For many of these conservation employees and their families, access to this kind of preventive care would otherwise be almost impossible.

PHOTO BY GORILLA DOCTORS
Dr. Olivier Nsengimana, a field veterinarian for Gorilla Doctors, was one of only five Young Laureates selected for the Rolex Award for Enterprise in 2014. He was recognized for his achievement and future promise as a wildlife veterinarian in Rwanda.
There is concern that the African buffalo population in central Tanzania may be in decline due to a number of causes, including disease. Seasonal drying of local water sources due to upstream irrigation and climate change is resulting in a loss of dry-season habitat, thereby increasing the potential for contact between wildlife and livestock.

Through a longstanding collaboration with Sokoine University of Agriculture in Tanzania, Karen C. Drayer Wildlife Health Center researchers are working to understand the health, ecology, and population dynamics of African buffalo in Ruaha National Park.

PHOTO BY GANESH RAGHUNATHAN
Dr. Annette Roug is leading the WHC’s buffalo project in Tanzania’s Ruaha National Park. In October 2014, ten adult female buffalo were sampled and radio collared in order to learn more about the health and herd movements of the Ruaha buffalo population.
The endangered white abalone, once the target of a lucrative fishery, is now on the brink of extinction. Experts say there are not enough white abalone in the wild to support a natural recovery, making extinction possible in the next 10 years.

But there is hope: Karen C. Drayer Wildlife Health Center researchers and their collaborators at the Bodega Marine Laboratory, California Department of Fish and Wildlife, and aquaria have established an innovative captive-breeding program, which has spawned increasing numbers of white abalone for three consecutive years. Next they will expand the program so that abalone can be transplanted into the ocean to aid recovery in the wild.
This 1-year-old captive-bred white abalone was the result of the first successful captive breeding of the species in nearly a decade.
In 2014, the world experienced the largest Ebola virus disease outbreak in history, affecting thousands of people in West Africa. Like Ebola virus, most emerging infectious diseases are of wildlife origin, and the regions most at risk for emergence often do not have sufficient capacity for surveillance and disease detection.

Last year, the Karen C. Drayer Wildlife Health Center’s USAID Emerging Pandemic Threats PREDICT project concluded five years of wildlife viral surveillance and capacity building in 20 countries around the world. PREDICT scientists discovered more than 800 viruses and responded to many deadly disease outbreaks in people and animals. In 2015, the WHC and its partners have embarked upon Phase II of the PREDICT project, building on its successes to date to further explore the links between humans, animals, and the environment on which we all depend.

PHOTO BY TIERRA SMELEY EVANS

PREDICT
Dr. Tierra Smiley Evans has developed a novel, non-invasive sampling technique for virus detection in monkeys – a dental rope dipped in strawberry jam. Researchers collect the rope after the monkey drops it and then extract genetic material in the monkey’s saliva to test for pathogens.
In the winter of 2011-2012, thousands of Pacific Coast band-tailed pigeons died of a disease epidemic associated with an internal parasite. Mortality events like these have become increasingly frequent during the past decade in this species, which is a major challenge to its long-term survival given its very low reproductive rate of about one chick per year.

Karen C. Drayer Wildlife Health Center researchers and their collaborators discovered a new pathogenic parasite, *Trichomonas stableri*, in band-tailed pigeons, and are now studying how this organism, along with the pigeons’ behaviors and environmental conditions, could be contributing to die-offs.
Yvette Girard (top), a former postdoctoral scholar at the WHC, and Krysta Rogers, an environmental scientist with the California Department of Fish and Wildlife, are working together to lead the band-tailed pigeon study.
Raccoons are important sentinel animals that live in urban areas, at the forefront of the wildlife-human interface. In a recent study, brain tumors were diagnosed in raccoons throughout Northern California and Oregon. A discovery made by Karen C. Drayer Wildlife Health Center-affiliated faculty at the UC Davis School of Veterinary Medicine revealed a new virus called raccoon polyomavirus. The virus was found in all of the tumors tested and may prove to be a cause of the cancer in raccoons. The discovery could lead to a better understanding of how viruses cause cancer in other animals as well as humans.

Wildlife Pathology

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Dr. Patricia Pesavento (left) is a veterinary pathologist and WHC-affiliate in the Department of Pathology, Microbiology, and Immunology at the UC Davis School of Veterinary Medicine. Her raccoon study was published in the journal *Emerging Infectious Diseases*.