



Wild jobs with wildlife:

by Olivia Crosby

Few people will ever stand as close to a giraffe as Betsy Karkowski has. Giraffes are just one of the many species she has had daily contact with as a zookeeper. “You get to know the animals’ habits, their likes and dislikes,” she says. “They recognize you and depend on you, and that’s a great feeling.”

Keepers and other animal caretakers at zoos and aquariums work closely with exotic animals, including pandas, elephants, and poison dart frogs. They study the animals in their care to learn what makes them thrive. “The more we learn about what animals need in captivity, the more we can help them in the wild,” says Curator John Ffinch. “That makes our jobs exciting. And it gets us closer to our ultimate goal of helping these animals survive in the wild.”

Zoo and aquarium work is hands-on conservation. Today’s institutions don’t just display animals. They help threatened

and endangered species by breeding them in captivity and sometimes reintroducing them into the wild.

Taking care of the animals at zoos and aquariums involves more than most visitors imagine. So if exotic-animal work appeals to you, get a head start by learning about a few zoo and aquarium careers, including what the work is like, how to prepare for it, what it pays, and how to gain experience now.

If you’d like to work at a zoo or aquarium without taking care of animals directly, see the box on page 13 to explore your options. Unlike the occupations profiled in this article, many zoo jobs don’t involve animal care.

Creature careers

There’s lots of work to do at zoos and aquariums, from animal health care to exhibit design. The most common animal-care jobs are those of

🐾 Keepers and aquarists, who feed, monitor, and sometimes train animals;

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Photos by Jessie Cohen, courtesy of Smithsonian's National Zoological Park

Jobs in zoos and aquariums

- 🐾 Animal curators, who oversee part of a collection by designing care guidelines, making breeding decisions, and supervising keepers;
- 🐾 Veterinarians and veterinary technicians, who provide medical care; and
- 🐾 Research scientists and technicians, who concentrate on scientific study.

These specialists work together to conserve wild animals.

Keepers

"It's up to us to provide the best care possible for the animals," says Betsy Karkowski, a keeper at the Philadelphia Zoo. "We make sure the animals are safe and healthy."

Like all keepers, Karkowski starts her workday by checking on the animals in her care. Currently, she works with small mammals: pygmy marmosets, tree shrews, and vampire bats, among others. If there's a problem, she notes it in her records or calls the veterinary staff for help.

Monitoring animal health is one of a keeper's main responsi-

bilities. "Veterinarians rely on us to notice anything unusual," says San Diego Zoo Senior Keeper Nicki Boyd.

Keepers are alert for even the smallest symptoms. "You have to use all of your senses," Karkowski says. "When the animal walks, you listen to its feet hitting the ground. You can tell if the rhythm is off. You know what an animal normally smells like, so you would notice a change. Or, you might see that its coat isn't glossy because it isn't grooming itself anymore."

After checking the animals, Karkowski starts preparing morning meals. She chops fruit and vegetables; weighs hay, feed, and vitamin-enriched leaf-eater biscuits; and places the food in dishes in each exhibit. Not every keeper has such close contact with hungry wildlife, however. Carnivore keepers usually feed meat to their charges through a shoot.

The first feeding complete, Karkowski begins her most time-consuming task: cleaning exhibits. Animal enclosures need to be cleaned with special disinfectants every day. Cleaning isn't Karkowski's favorite part of the job, but she knows it's important. "I take pride in making the animals' lives comfortable,"

she says, “so even the grunt work isn’t so bad.”

Some keepers clean the animals, too. Although most wild creatures groom themselves and don’t like to be touched by humans, a few animals need extra cleaning in captivity. For instance, keepers at the National Zoo (officially known as the National Zoological Park) in Washington, DC, hose down the

“It’s up to us to provide the best care possible for the animals.”

—Betsy Karkowski, zoo keeper

elephants every morning, scrubbing their skin with long brushes. And keepers at the San Diego Zoo brush and comfort baby animals whose mothers can’t care for them.

Animals have intellectual needs as well as physical ones. Keepers enrich zoo animals’ lives by finding ways to spark their interest. Enrichment could mean a special food treat or a more challenging way of giving food. Karkowski, for example, has fed warthogs by using tubes they have to dig through to find food. “In the wild, warthogs use their noses to root for food,” she says. “With the tube, they practice more natural behavior.”

Keepers also give the animals objects to explore. Objects from nature, such as seashells and dead logs, are most common.

Some items are scented with intriguing smells from other animals. San Diego Zoo keepers helped to design a more elaborate enrichment object for their tigers: they built the tigers fake prey. The “prey” is a large burlap sack filled with branches and attached to a spring. When the tigers attack, the fake prey jumps away.

Training provides animals with another mental challenge. Many keepers spend time each day training animals. Usually, they train them so medical procedures are easier to do. One of Boyd’s successes was teaching red pandas to take vaccination shots without restraints. She divided the behavior into simple stages, such as training the pandas to stand still while being touched. Then, she rewarded the pandas with food and praise each time they completed a stage. Training the pandas not only made vaccinations easier for the keepers and veterinary staff to give, it made the procedure less stressful for the animals.

Keepers teach people as well as wildlife. Many keepers make public presentations once or twice a day. As a keeper in the children’s section of the zoo, Boyd has many opportunities to talk with zoo visitors informally. She even takes a few highly trained animals out of their enclosures so visitors can see them up close. Boyd considers this work vital to the zoo’s mission. “You can see in people’s eyes when they’ve made a connection with an animal,” she says. “They want to help it survive.”

Skills. Keepers need excellent communication skills. In addition to talking with the public, they describe their impressions to veterinary staff, curators, and other keepers. Keepers also write detailed records of each animal’s behavior.

Sharp observation is another must. Good keepers notice behavioral changes. Some participate in scientific studies by watching for a specific behavior and reporting it to researchers.

Animal keepers also need to stay in good physical condition. A rhinoceros keeper might carry 50-pound bags of feed every week, for example. Keepers say a good rule of thumb is: the bigger the animal, the more strenuous the work.

And keepers have to be able to manage a crisis. They are usually first on the scene when an animal needs help. It’s up to them to control the situation and to know when to call the veterinary staff.

Training. Experience with animals is the most important job requirement for keepers, but the majority also have a bachelor’s degree in biology or animal science. Education is especially important because keeper jobs are highly competitive, particularly at large zoos. The San Diego Zoo, for instance, may receive hundreds of applications for a single keeper slot. Those who have a degree are more likely to get a job than those who don’t have a degree.

There are also a few certificate and associate degree programs in zookeeping and exotic animal training. Boyd found



Photo courtesy of the San Diego Zoo

Keepers often assist with routine medical care, such as administering a mangabey’s insulin shots.



Photo courtesy of the San Diego Zoo

Keepers teach zoo visitors about their animals, including kinkajous.

her job after completing a 2-year certificate program at the Moorpark College Teaching Zoo in Moorpark, California. Later, she earned an associate degree from an animal health technician program.

Unique experience can sometimes take the place of formal education. Amy Jenkins, a bird keeper at the National Aquarium in Baltimore, Maryland, took her first job as a keeper for the Busch Gardens Animal Park after working in an exotic bird shop. “But it’s much easier to become a keeper if you have a degree,” says Jenkins, “especially today.”

Employment and earnings. The Bureau of Labor Statistics (BLS) does not classify workers as keepers, but it does collect information on the more general occupation of animal caretaker. According to BLS, there were 2,780 animal caretakers working in zoos and aquariums in 1998. Most worked as keepers.

BLS data show that animal caretakers in zoos and aquariums

had annual earnings of \$17,120 at the median—meaning half of these workers earned less than that amount and half earned more. Private industry sources show that salaries vary. According to a member survey conducted by the American Association of Zoo Keepers, more than 75 percent of keepers earned between \$15,000 and \$30,000 in 2000, 17 percent earned between \$30,000 and \$40,000, and 7 percent earned more than \$40,000.

Aquarists

Aquarists are keepers in wetsuits. They take care of fish and other underwater creatures at aquariums. Like keepers, aquarists feed and monitor animals and maintain exhibits. Some aquarists train seals, dolphins, and other marine mammals.

Each morning, aquarists check the temperature and condition of fish tanks and look for any medical problems with the animals. Part of the morning is spent preparing food: thawing

frozen fish; chopping shrimp, fish, and plants; and mixing vitamin supplements.

Feeding fish in a small tank is relatively easy: food is sprinkled into the water. Large tanks and large fish present more of a challenge. Aquarists dive into the tanks and feed each of the larger fish by hand. The aquarists wear gloves to protect their hands, wetsuits to keep their bodies warm, and scuba gear to breathe underwater.

As an entry-level aquarist at the New England Aquarium in Boston, Leah Neal dives into the tanks four times a day to feed the animals. She is careful to feed each predator and to record what it eats. Keeping records is crucial because in a tank with different species, a hungry predator eats its tankmates.

While they are underwater, aquarists watch for odd behavior from the fish. They look for injuries, sluggish swimming, lack of interest in food, or changes in a fish's color, which can signal stress.

In an aquarium, bad water means dead animals. To make sure the filtration and temperature systems are working prop-

erly, aquarists take water samples and analyze them with pH strips and laboratory equipment. Periodically, aquarists dive into the large tanks to clean them, using brushes and vacuums.

But aquarists strive for more than just clean tanks. Like keepers, they try to make the animals' environments more interesting. Some fish, such as octopi and squid, thrive in complex

For aquarists, keeping feeding records is crucial: a hungry predator will eat its tankmates of a different species.

and puzzling living areas. Aquarists might add new objects to their tanks and create tunnels and hiding places. Sometimes, divers hide food to exercise the animals' foraging skills.

The aquarists who concentrate most on sparking animal interest are the ones who specialize in marine mammal care. In addition to routine aquarist tasks, marine mammal aquarists spend most of their time training seals, dolphins, sea otters, and other mammals to respond to commands. Some of this training makes it easier to care for the animals. Seals, for example, are trained to come when called, to roll over, and to tolerate being touched.

Dolphins receive the most complex training. They learn how to jump out of the water, hit targets, retrieve objects, and even carry trainers on their backs. Trainers use these tricks to entertain and educate the public and to occupy and exercise the animals.

Many animals in an aquarium come directly from the wild. Aquarists collect creatures and plants from freshwater and seawater a few times each year.

Some aquarists repopulate aquariums and the wild by breeding animals. Jorge Gomezjurado, a senior aquarist at the National Aquarium, is currently searching for the best way to breed seahorses for an upcoming exhibit.

Skills. Aquarists use the same skills keepers do: communication, keen observation, and physical ability. Mechanical ability is another asset. Aquarists change tank filters, unclog equipment, and help build new tanks.

Of course, aquarists also need to be comfortable in the water, and mammal trainers must be strong swimmers.

Training. Nearly all aquarists are certified scuba divers before they take their first aquarium-related job. Certification classes are available at many 2- and 4-year colleges and through private fitness organizations and diving companies.

Most aquarists also have a bachelor's degree in a biological

Photo by Jessie Cohen, courtesy of Smithsonian's National Zoological Park



Keepers and aquarists prepare meals for the animals.

field. They need to understand animal anatomy, physiology, and behavior and the chemistry of fish tanks and mammal pools.

Mammal training aquarists often have a bachelor's degree in psychology or animal behavior. Instead of a bachelor's degree, a few trainers and aquarists have extensive animal experience or an associate degree in an animal-related field.

Employment and earnings. BLS does not classify workers as aquarists, but some of the 2,780 animal caretakers BLS identified in zoos and aquariums in 1998 were aquarists.

Industry sources suggest that most aquarists earn between \$16,000 and \$37,000. Some supervisors earn between \$40,000 and \$45,000.

Animal curators

Curators have broader responsibilities than keepers and aquarists do. They manage part of a zoo's or aquarium's animal collection. Curators decide when and how to acquire animals and which animals should breed. They establish guidelines for animal care, supervise keepers or aquarists, schedule veterinarian visits, and maintain detailed records on each animal. Helping supervise exhibit design also falls to curators because they are experts on animal needs. And many curators organize conservation projects outside of the zoo or aquarium.

In most large zoos, curators specialize in one type of animal—reptiles or mammals, for instance. Associate Curator Valerie Thompson manages many of the mammal collections at the San Diego Zoo. Part of her job is to oversee the breeding of captive tree kangaroos in all accredited North American zoos. Her goal is to maintain the species' genetic diversity. To do that, she works with other zoos to create a continent-wide plan detailing which tree kangaroos will be bred in captivity.

Curators like Thompson also decide which animals to sell to other zoos. "We have to think of what's best for the animal and the species as a whole," she explains. "We can't give a red deer to a zoo that isn't willing to import other red deer."

And curators solve problems with animals already in the facility. As a bird curator at the Philadelphia Zoo, John Ffinch faced a common curator problem when a group of rare animals—specifically, Humboldt penguins—was not reproducing. Ffinch checked the demographics of the group, making sure the age ratios in the penguin group matched the age ratios of penguins living in the wild. Then, he made sure the penguins had proper nest-building materials and even that the nests faced the right direction. When conditions were perfect, the penguins laid eggs and raised chicks.

Part of supervising animal care is planning and refurbishing exhibits. "We work with the architects," says Thompson, "be-



Photo courtesy of the San Diego Zoo

Caring for baby animals requires constant vigilance.

cause we understand how an animal could escape, what sort of vegetation and cover it needs, whether it's skittish, what temperature the exhibit should be—all kinds of considerations."

Assistant Curator Stuart Wells of the National Zoo used his understanding of cheetahs when helping to redesign that exhibit. He added hills so the cheetahs could have perches like the ones they would use in the wild. He also added a cheetah exercise system: a mechanical lure on a rope for the cheetahs to chase.

Many curators put their knowledge to work outside the zoo by taking trips into wild animal habitats. Thompson travels to Australia every year to learn more about the tree kangaroos she manages. In addition to observing tree kangaroo behavior in the wild, she and other zoo workers track and count the animals. They give this information to a conservation organization that uses it to help people decide which forests to protect.

Skills. Curators must have expert knowledge of animals both

in captivity and in the wild. Curators also need excellent communication skills. They coordinate with veterinarians, keepers, and other workers. And they consult with curators at other zoos, often writing care guidelines for zoos and aquariums worldwide.

Animal curators must also be good leaders. They use management skills to make decisions about animal care, exhibits, and employees.

And although they don't have as much animal contact as keepers and aquarists do, curators still need some physical skill. Every year, Finch helps to capture and move eagles before the zoo's aviary is prepared for winter. Curators often help keepers with difficult tasks like these.

Training. Curators usually study biology, animal science, or

wildlife management in college. Most have at least a bachelor's degree, and many have a master's degree. "Advanced degrees make it much easier to become a curator," says Thompson.

Curators also have considerable experience. Nearly all begin their careers as keepers. After working as keepers for many years, they develop animal expertise and demonstrate leadership skills.

Employment and earnings. There were about 390 curators working in zoos, aquariums, and botanical gardens in 1998, according to BLS. Other workers with curator responsibilities may have been classified in other management occupations.

Curators generally earn more than keepers and aquarists do. In zoos, aquariums, and botanical gardens, curators' median earnings were about \$28,080 in 1998, according to BLS.



Photo by Jessie Cohen, courtesy of Smithsonian's National Zoological Park

Keepers and aquarists use food treats to train some animals to cooperate with their caretakers.

Veterinarians and veterinary technicians

Splint a gazelle's broken toe. Give a physical to a sloth bear. Prescribe antibiotics for a seahorse colony. Tasks like these are typical for veterinarians at zoos and aquariums.

Zoo and aquarium veterinarians and veterinary technicians provide medical care for the animals. Often, that means caring for thousands of species, most of which no other kind of veterinarian ever treats. Baltimore, Maryland's, National Aquarium Veterinarian Brent Whitaker calls that kind of variety "fascinating and tons of fun."

Veterinarians, like doctors, diagnose and treat illnesses and injuries, perform surgery, and prescribe medicine and rehabilitation regimens.

Veterinary technicians, like nurses and laboratory workers, assist veterinarians. Some of their tasks include monitoring animals during surgery, administering medicine, and analyzing blood and other body fluids.

One of the most critical tasks of veterinary staff is responding to emergencies. "Traumatic injuries occur when animals fall, bang into things, or spar with each other," says Natalie Mylniczenko, a veterinarian at the Lincoln Park Zoo in Chicago. "Veterinarians have to be ready for anything." The veterinarians at the Detroit Zoo were ready when an endangered

Diagnosing injured animals is difficult because they instinctively hide problems. "In the wild, an animal who looks vulnerable becomes food," says Brent Whitaker, veterinarian.

red-crowned crane fell and broke its leg. A veterinary technician x-rayed the leg. The veterinarians felt for a pulse in the crane's foot, set the leg with pins, and stopped the bleeding.

Some conditions are harder to diagnose. "A keeper might call us if a bear isn't eating the way it usually does," says Mylniczenko. The problem could range from boredom with the food to kidney disease. In such cases, veterinarians work with keepers to perform tests and, if necessary, exploratory surgery.

"Diagnosis is difficult because animals don't tell you what's wrong," says Whitaker. In fact, animals instinctively hide problems for as long as they can. "In the wild, an animal who looks



Photo courtesy of the San Diego Zoo

Curators and keepers put their knowledge to work outside zoos and aquariums by visiting animal habitats in the wild.

vulnerable becomes food," he says.

In an effort to identify problems before they become serious, veterinarians monitor newborns closely and perform regular physicals on every animal in the zoo. The first step to giving many animals a physical is to anesthetize them so they sleep through the procedure.

When the animal is asleep, the physical begins. With the help of a technician, the veterinarian checks for hidden illness. Mylniczenko explains, "First, we check the exterior of the animal, looking at its fur—if it has fur—looking at its skin, running our hands over the body to feel for abnormal bumps. We check its eyes, ears, nose, and throat and feel its abdomen. We might check its heart with an EKG. Often, we take blood and stool samples to check in the lab."

But how do you know what is normal in a wild animal, especially when you care for unusual species? One way is to read about the work done by veterinarians in other zoos; another is to compare the results of an exam with the results from the year before and with the records of other animals.

Treating exotic zoo animals requires creativity. Whitaker says, "When you're working with exotic animals, you don't have to wait long to find a problem that's never been encountered before." One such problem he encountered was a

red-eyed guarti that was going blind. The fish was having difficulty finding food because cataracts were growing over its eyes. Whitaker asked human-eye doctors to help him modify surgical instruments for the fish. The veterinarian and technicians put the fish in a bucket with anesthetic. When it was asleep, they ran tubes of water and anesthetic through its body so surgery could be performed on a dry table. The technician

Veterinary staff in zoos and aquariums need good communication skills because working safely with dangerous animals requires teamwork.

monitored the fish's condition while the veterinarian removed the cataracts.

When they're not treating animals, veterinarians work with curators to develop animal diets. Whereas the curator is an expert on what the animal would eat in the wild, the veterinarian understands animal nutrition. Most animals receive veterinarian-recommended vitamin supplements in their food.

Veterinarians and technicians run zoo and aquarium hospitals, too. Each animal that enters the zoo is quarantined in the hospital until veterinarians are sure it's healthy. Animals recovering from illness and surgery and newborns needing intensive care also live in the hospital. Every morning, veterinarians and veterinary technicians make rounds to check on each patient.

Photo courtesy of the New England Aquarium



Zoo and aquarium veterinarians treat a wide variety of animals.

Skills. To do their jobs, veterinarians and veterinary technicians must be excellent problemsolvers. "You never know what you might encounter in a day," says Whitaker. Diagnosing illness takes logical thinking and educated guessing. And deciding how to administer treatment to a wild animal takes the flexibility to adjust to each animal's behavior.

Veterinary staff need good communication and interpersonal skills, too. Working with dangerous animals requires teamwork. To stay safe, veterinary staff rely on keepers, curators, and each other. Veterinarians also consult with experts and human physicians around the world. "There's no way one person could know how to treat every problem," says Whitaker.

Training. The training requirements for veterinarians and veterinary technicians differ. Veterinarians earn at least 45 college credits and usually a bachelor's degree before attending 4 years of veterinary school. Then, they must pass a national exam and receive a license to practice in their State. Most zoo and aquarium veterinarians begin as interns or residents, working under the close supervision of more experienced veterinarians for 1 to 3 years. The American College of Zoological Medicine certifies veterinarians who complete a residency or work for at least 6 years in an approved facility, publish five professional papers, and pass the College of Zoological Medicine board exam.

Veterinary technicians, in contrast, often don't need a bachelor's or advanced degree, but most have a high school diploma and many have an associate degree. Opportunities are best for technicians with an associate degree from 1 of about 80 programs accredited by the American Association of Veterinary Medicine. In these programs, students learn how to take and analyze blood and tissue samples, prepare animals for surgery, administer anesthetic, give medication, wrap bandages, and care for animals after surgery. Certification is available for technicians who pass the Veterinary Technician National Examination.

Employment and earnings. Because of increased concern for animal health, zoos and aquariums are hiring more veterinarians and technicians. Large zoos usually have three or more veterinarians. Medium-sized zoos usually have one. And small zoos often contract with a local veterinarian as needed, instead of hiring a full-time staff member. Veterinary technicians are more numerous. But zoological medicine remains one of the smallest veterinary specialties.

There are about 1,050 members of the American Association of Zoo Veterinarians, but not all of these veterinarians worked solely at zoos and aquariums and not all worked in the United States. According to BLS, U.S. zoos and aquariums employed at least 100 health professionals, paraprofessionals, and technicians in 1998. That number does not include contract workers or workers who had jobs in addition to the ones they held in zoos or aquariums.



Photo by Jessie Cohen, courtesy of Smithsonian's National Zoological Park

With the help of keepers or aquarists and veterinary technicians, zoo and aquarium veterinarians treat animal infections.

According to BLS, veterinarians in all settings had median earnings of \$50,950 in 1998. BLS does not have data on the earnings of veterinarians in zoos, but industry sources suggest that zoo and aquarium veterinarians usually earn somewhat less than other veterinarians do.

Veterinary technicians in all settings earned a median of \$19,870 in 1998, according to BLS. BLS does not have earnings data on technicians in zoos and aquariums. But according to an association survey, the average salary of Association of Zoo Veterinary Technicians members was \$30,648 in 1999.

Research scientists and technicians

How are animals related to each other? Why do they behave the way they do? How can we help them survive in the wild? Discovering the answers to questions like these is the focus of re-

search scientists' work at zoos and aquariums. While many keepers, curators, and veterinarians participate in and lead research efforts, zoo scientists make research their sole pursuit.

Geneticists in zoos and aquariums study hereditary traits of animals as well as the relationships between animals. They use this information to save species. For example, San Diego Zoo Geneticist Oliver Ryder helped reconstruct the family tree of Przewalski's horses—a rare species of horse living in zoos but extinct in the wild. He used DNA samples he took from the horses to map each horse's genes and compare them to the genes of other Przewalski's. Curators used that information to decide which animals to breed. Now, there are enough Przewalski's horses to reintroduce herds into their native habitats.

Other researchers spend most of their time observing animal behavior. Robert Shumaker, a biologist at the National Zoo, created a symbolic language he teaches to orangutans. He studies



Photo by Jessie Cohen, courtesy of Smithsonian's National Zoological Park

Zoo animals are still wild creatures, so workers follow safety protocols when caring for them.

the learning processes of orangutans that voluntarily climb over to his lab.

Some scientists combine laboratory work with behavioral research. New England Aquarium Researcher Marianne Farrington is studying ways to help cod recover after they have been accidentally caught in fishing gear. She travels on fishing boats and takes blood samples from captured cod before they are released. Her assistant analyzes the chemical content of the blood, and Farrington studies the results, looking for significant patterns. “At the end of the day,” explains Farrington, “I look for the story the data are telling—what answers are sitting on the page for me to pick out.” She is designing an experiment to study the effect of potassium baths on released fish.

In addition to the experiments they conduct, researchers write detailed reports describing their results. And most apply for grants to fund their work.

Skills. Like all scientists, researchers and technicians must be able to think logically so they can design useful experiments. They need excellent math skills to analyze the data they collect and good writing ability to communicate their results. They also need to be observant and detail oriented in order to take good measurements. But zoo and aquarium researchers and technicians also must have patience to observe wild animals and to take tissue and blood samples from them.

Training. Most research scientists need an advanced degree in one of the life sciences, such as biology, zoology, microbiology,

ecology, or wildlife management. Most have a Ph.D.

These scientists also need experience. During college, would-be researchers often work as research interns in zoos or aquariums.

Many research science technicians have either a bachelor's or master's degree in science. Some have an associate degree. Those with a bachelor's or master's degree are more likely to

"I look for the story the data are telling—what answers are sitting on the page for me to pick out."

—Marianne Farrington, aquarium researcher

help design experiments and analyze results. Those with an associate degree usually set up experiments and record results.

Employment and earnings. According to BLS, there were 110 engineering, mathematical, and science managers; 210 life scientists; and 250 science technicians and technologists working in zoos, aquariums, and botanical gardens in 1998.

BLS data show that in zoos and aquariums, engineering, mathematical, and science managers had median earnings of \$60,940, life scientists had median earnings of \$34,530, and science technicians and technologists had median earnings of \$24,540.

The good, the bad, and the smelly

Job satisfaction runs high at zoos and aquariums. Perhaps that's one reason there usually are more applicants for zoo and aquarium jobs than there are openings. For people who like animals, working with them is usually fun. But close contact with wildlife also poses challenges—and dangers.

Rewarding results

The benefits of zoo work vary by job type, but nearly all zoo professionals say they take pride in improving animals' lives. "For me, the best part of the job is seeing a sick animal get healthy," says veterinarian Mylniczenko. Curator Thompson enjoys making an impact on every aspect of animal care: "Doing what we feel is best for a species is a passion," she says.

Zoo workers also value the connection they have with exotic animals. Keepers and aquarists have the most hands-on connection. "It's really satisfying to get to know what goes on in their

Zoo work without the caretaking

Working at a zoo or aquarium doesn't always mean caring for animals. Many jobs combine an interest in animals with other interests, such as art, finance, or teaching. Here are a few noncaretaking jobs commonly found in zoos and aquariums:

- 🐾 Commissary workers order, store, and prepare food for animals and deliver it to exhibits.
- 🐾 Education specialists teach classes for and give tours to the public; organize special learning events, such as summer camps and sleepovers; run internship programs; and write educational materials for teachers.
- 🐾 Fundraisers and development directors ask for and process donations to zoos and aquariums. They organize events and establish relationships with corporate sponsors.
- 🐾 Graphic designers and artists decorate exhibits, create signs, develop brochures, and design zoo and aquarium websites.
- 🐾 Horticulturists and landscape workers plant and care for the trees and plants at zoos. They understand which plants are appropriate around which animals.
- 🐾 Wildlife photographers take pictures of zoo and aquarium animals. The photographs are used in brochures, websites, exhibit displays, and animal records.

The Bureau of Labor Statistics (BLS) does not have data on zoo and aquarium workers in most of these occupations. But it does have data on education workers and landscape workers. According to BLS, there were 1,103 teachers and instructors in zoos, aquariums, and botanical gardens in 1998; 590 professional guides; and 1,870 landscape workers.

day," says keeper Karkowski of the animals she cares for.

Some caretakers bond with animals. Elephant and dolphin keepers, for instance, sometimes say they feel like part of the herd. And the veterinarians and keepers who work with baby animals say bonding with them is one of the best parts of the job. "I loved my time raising babies and then seeing them do well as adults," says keeper Boyd.

Working with exotic animals also gives workers a chance to solve interesting puzzles. "Even if you're working with just one species of animal," says curator Ffinch, "they always have some new behavior to observe and learn from."

For veterinarians, some of the interest comes from the variety of animals they treat. "We see tarantulas, snakes, birds, mammals—everything," says Mylniczenko. Adds veterinarian

Whitaker, “If you don’t mind getting dirty, it’s fascinating work.”

Working in exotic places is another perk—even if it’s only occasional. “I really enjoy fieldwork,” says Thompson.

Experience working with animals is as important as education in qualifying for these jobs, but related nonanimal work also can be a stepping stone to an animal job.

Researcher Farrington agrees, “I love going out to sea to collect specimens.”

But the chance to help conservation efforts is the greatest job benefit, according to many zoo and aquarium workers. “I like getting conservation projects going,” Thompson says. “Conservation is a rewarding and exciting part of the job.”

Dangerous drawbacks

Working with wild animals can be exciting, but with that excitement comes risk. The possibility of injury is one of the most serious drawbacks to animal jobs. “We work with many animals that could kill us,” says Whitaker, “so we have to follow safety procedures.”

The cuddly nature of some creatures can be misleading. “People think that zoo animals are tame,” says Karkowski. “They are still wild. Actually, they could be more dangerous than animals in the wild because many of them have lost their fear of people.”

Karkowski should know. As a keeper at another zoo, she faced a charging 1,000-pound eland and was backed out of an enclosure by a 25-pound antelope butting her ankles. “Your reactions depend on the situation and what you know about the animal,” she says.

Animal care can also be a dirty job, especially when workers are cleaning enclosures or struggling to take samples. “You need to be sure you can handle the cleaning,” says Karkowski.

Animal caretakers work in all weather conditions, too. Zoo veterinarians perform most of their examinations outside, where the animals live. Keepers also work in outdoor enclosures despite rain, heat, or cold.

Unusual hours can be another drawback. “We work weekends and holidays,” says Ffinch. “The animals have to be checked every day.”

Still, most curators and research scientists, who have less direct contact with animals, say they miss animal interaction—even with the discomforts that accompany it. The biggest disadvantages they cite are paperwork and being inside for most of each day. What they give up in animal contact, though, they gain in influence. “Because of all of my administrative responsibilities, I don’t get to work with the animals as much as keepers do,” curator Thompson says. “But I can have a wider impact on conservation as a whole.”

What can I do now?

Preparing for a zoo or aquarium career starts with the classes you choose. “High schoolers should take as much science as they can, especially biology, anatomy, and chemistry,” says veterinarian Whitaker. After high school, students should plan to study science in a 2- or 4-year college, in graduate school, or in a certificate program, depending on the job they want.

But experience is at least as important as education. Fortunately, there are lots of ways to gain experience before graduating from high school or college. “Students can work as veterinary assistants or as volunteers in humane societies,” says Whitaker. “They can work in pet shops or animal rehabilitation centers.” In rehabilitation centers, workers help to return injured or abandoned animals to nature. They often perform keeper tasks like feeding, observing, and cleaning up after animals.

Almost any kind of experience will do if it demonstrates an interest in animals. “I like to hire people who have common sense around animals,” says Operations Manager Rod Fried of the Dakota Zoo in Sertoma Park, North Dakota. “That can be someone who grew up on a farm or a stable or joined 4-H. Experience doesn’t always have to be with exotic animals.”

But employers say you should get onsite experience, too. Many zoos and aquariums have internship, volunteer, or educational programs for high school and college students. Volunteer programs are most common. Some volunteers work as guides for the public. Some help clean exhibits or park areas. Others participate in research by observing and recording animal behavior.

Nearly all zoo and aquarium work is valuable, even if it isn’t related to animal care. Nonanimal work can be a stepping stone to an animal job. Curator Valerie Thompson started her zoo career as a tour guide and tour bus driver. Other animal workers start out preparing animal diets in the commissary or selling souvenirs in gift shops.



Zoo and aquarium workers use science—especially biology, anatomy, and chemistry—in their jobs.

Even with education and experience, it can take time to find paid animal work at a zoo or aquarium. But persistence pays. “Don’t give up,” says Boyd. “If you keep trying, you can get your dream job.”

Further exploration

The library is a good place to look for books and information about zoo and aquarium jobs. One of the resources available at most libraries is the *Occupational Outlook Handbook, 2000-01 Edition*. The *Handbook* describes the duties, education, earnings, and employment prospects of animal caretakers, veterinarians, veterinary technicians and assistants, and life scientists.

Many career and guidance counselors have additional information about zoo careers, internships, and volunteer programs and how to prepare for them.

Associations are another good resource. Each of the following offers career advice, and most maintain lists of available jobs.

The American Zoo and Aquarium Association
8403 Colesville Rd., Suite 710
Silver Spring, MD 20910-3314
(301) 562-0777
<http://www.aza.org>

The American Association of Zoo Keepers
3601 SW. 29th St., Suite 133
Topeka, KS 66614
(785) 273-9149
<http://www.aazk.org>

The American Association of Zoo Veterinarians
6 N. Pennell Rd.
Media, PA 19063
(610) 892-4812
<http://www.worldzoo.org/aazv/aazv.htm>

The Association of Zoological Horticulturists
Curator of Horticulture
Bronx Zoo
2300 Southern Blvd.
Bronx, NY 10460
(718) 367-1010
<http://www.azh.org>

The International Marine Animal Trainers Association
c/o Shedd Aquarium
1200 S. Lake Shore Dr.
Chicago, IL 60605
<http://www.imata.org>

The North American Veterinary Technician Association
PO Box 224
Battle Ground, IN 47920
(765) 742-2216
<http://www.avma.org/navta>

Finally, learn more about zoos and aquariums straight from the zebra’s mouth. Local zoos and aquariums often let visitors see keepers at work. Some zoos have websites with pages devoted to employment and career guidance. Three examples are:

- 🐾 The National Zoo
<http://natzoo.si.edu/zooview/people/people.htm>;
- 🐾 The San Diego Zoo
http://www.sandiegozoo.org/wildideas/kids/job_profiles.html; and
- 🐾 The Monterey Bay Aquarium
http://www.mbayaq.org/lc/kids_place/kidseq_careers.asp.

