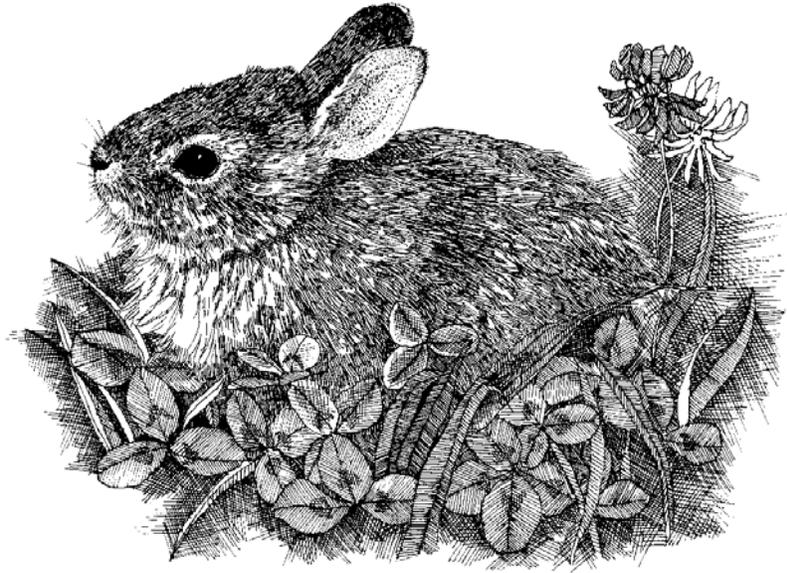


Animal Life



"The wild things of this earth are not ours to do with as we please. They have been given to us in trust, and we must account for them to the generations which will come after us and audit our accounts."

—William T. Hornaday

Introduction

Kids are naturally fascinated by animals, and California's state parks provide an opportunity for kids to see animals in their natural habitats. In this section, we've included a general sample program which can be adapted to the specifics of your park. We've also added an example of how you can make a program specific with an Animal Life program developed by Stacey French for Turlock Lake S.R.A. Both programs encourage the Junior Rangers to see distinctions between the different types of animals, to discover what animals do to survive, and to find out what different animal characteristics reveal about that animal.

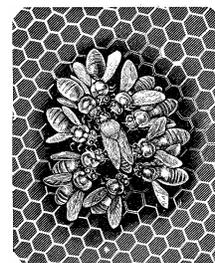
A program on animals can be broad or very specific. An interpreter could give a general program on animals or one on owls, insects, predators, etc. Know the animals in your unit and use them to make your program relevant to your park. If they are available, mounts and furs are very useful hands-on tools in this program.

The Animal Life program encourages the Junior Ranger to develop an awareness of people's impact on wildlife (endangered species, extinction, shrinking habitats, loss of

migratory corridors, deforestation, interference in predator/prey relationships) and to discover that people are animals, too!

Interesting Animal Facts

- 80,000 bees must fly the equivalent of three times around the world to gather enough nectar to fill just one bottle of honey.
- One beaver can cut down 216 trees a year.
- Flies walk on their food because they have tiny taste buds in their feet.
- Caterpillars have 4,000 muscles in their bodies. Humans have only 639.
- A dragonfly can fly 46.5 miles an hour.
- A newborn blue whale drinks the equivalent of 200 gallons of milk a day.
- A sea star turns its stomach inside out in order to eat its prey.
- The whirligig beetle has four eyes: it uses two to search above the water for enemies and two to scan below for food!



California's State Animals



What is the State Animal?

Grizzly bear (the grizzly bear has been extinct in California since 1922)

What is the State Reptile?

Desert tortoise

What is the State Fish?

California golden trout

What is the State Bird?

California valley quail

What is the State Insect?

California dog-faced butterfly

What is the State Marine Mammal?

California gray whale

Sample Program: Animal Life

I. Introduction

Introduce yourself to the group.
Introduce the Junior Ranger Program.

II. Focus

Have the group be still and quiet for a moment, and try to hear and see signs of animal life. After a few moments ask, "Do you hear birds singing? See insects? Some animals may be easy to see without trying very hard, while you might not notice others unless you pay very close attention and look and listen very carefully." Observe for a few more minutes.

III. Objectives

Animal life is all around us. There are so many kinds of animals, all with different looks, adaptations, habits and lifestyles. In this program, we will find out about what animals do to survive and how they sometimes change over time so they can survive. We will also find out what we can do to protect animals.

IV. Inquiry/Discussion

A. Classification

1. What makes animals different from plants?
Animals can move, plants can't.
Animals find food, plants make their own.
Animals have a nervous system; plants don't have one.
2. We put animals that are similar into groups. Do you know the names of any of these groups?
Mammals, reptiles, fish, amphibians, birds, insects, etc.
Name some different kinds of animals in each group.
3. What do these animals have in common?
Encourage the Junior Rangers to compare and contrast different animals in each group. For example:
"A bear and a mouse are both mammals—what do they have in common?"
"Is a fish a mammal? Why not?"
"How do you know a bird is a bird? Because it flies? Then is a bee a bird?"
4. Activity: Animal Charades (see activity section below)

B. Animal Characteristics

1. Most of the differences between animals are there for a reason—they help the animal stay alive in its environment. In fact, animals may change and adapt to the environment over generations, helping them to more easily survive. How do the different kinds of animals breathe?
Humans: Nose, lungs (good for breathing air)
Fish: Gills (good for getting air from water for breathing)
Frogs: Skin (good for living in and out of the water)

Whales: Blow holes, lungs (good for living in the water but breathing air, whales hold their breath underwater)

2. What do animals eat?
Plants, other animals
3. Can you tell by looking at an animal whether it eats plants or other animals?

Carnivores are "full-time" predators. They are meat eaters and have sharp, tearing teeth and claws (use examples from your park).
Herbivores are plant eaters. They have flat, grinding teeth and often have hooves.

Omnivores are "part-time" predators. They eat plants and animals. They have both tearing and grinding teeth.

4. What kind of teeth do you have?
Do your teeth make you a carnivore, herbivore, or omnivore?

C. Survival

1. Who has a better sense of smell, you or a deer?

The deer—Animals' senses are often very different from ours. Some of their senses may be much sharper and stronger than ours are, while other senses may not be as strong as ours (discuss senses of animals in your unit). Animals' senses have evolved so that the senses the animals need get stronger, and the ones they don't need get weaker. (Such adaptations take place over a long period of time, over many generations, not during the lifetime of an individual animal.) Have you ever heard the expression, "he's blind as a bat?" Well, bats don't see that well. Since they live in dark places like caves and are awake during the night, they really don't have much use for vision like ours. But don't feel sorry for them: they have a skill we don't have. A bat can send out an ultrasonic (sound waves at a higher frequency than humans can hear) pulse to see what's in its path. If there's a moth in the bat's path, this pulse will bounce off the moth and echo back to the bat. So by following this pulse, the bat can still find food even though it can't see very well.



2. How can you tell who has a better sense of smell, sight, hearing, etc.?
Example: A long nose/snout shows an animal adapted to depend on the sense of smell.

3. What are your human adaptations? What are they for?

4. Activity: Bat and Moth Game (see activity section below)

Many animals have a defense against their predators (the animals who want to eat them). How do you think animals protect themselves from predators?

Running away using speed; fighting back with teeth, claws, horns, antlers, and stingers; repelling with bitter taste and odor; safety in numbers by herding; coming out only at night and hiding with protective coloration;

and sensing the predator first using acute senses of sight, smell, and hearing

5. Activity: Silent Stalking (see activity section below)
How do animals protect themselves from the weather?
Fat, fur, shelter, hibernation/estivation (summer dormancy—common in desert areas), feathers, migration
Are there animals we can do without?
Discuss the necessity of predator and prey, scavengers, etc.
6. Activity: Support to Survive (see activity section below)
How do we know where animals have been?
Animal tracks, fur, feathers, nests, burrows, eggs, teeth, bones, antlers, spider webs, scat (also shows what the animal has been eating)

V. Guided Discovery

Begin a nature walk, and look for the signs of animals. Discuss the importance of making a minimal impact on animals' habitats. Ask children what happens when people make changes in the wild. Discuss extinction (extinction is forever) and endangered species (there is still time to prevent extinction). What is being done? What still can be done? Are there any endangered species in your park? Explain the relationship between preserving wildlife and the Junior Ranger pledge not to feed animals or disrupt the park environment.

VI. Conclusion

- A. Discuss park stewardship, emphasizing that the park is the animals' home and we are visitors. What is the park doing to protect animals? Do you think we should do more?
- B. Stamp logbooks.
- C. Announce other interpretive programs going on in your unit and the next Junior Ranger program.

Sample Program: Animal Life at Turlock Lake S.R.A.

This sample program was developed by Stacey French when she was leading Junior Ranger programs at Turlock Lake S.R.A. With her enthusiasm and ability to “think like a kid,” Stacey had a talent for interpreting to children. Stacey's program outline is included as an example of how you might tailor one of the general sample programs in this handbook to the specifics of your park. Notice how Stacey uses posters, pelts, antlers, and games to make the program fun and keep the kids' interest on the subject.

I. What is an animal?

- A. Discuss characteristics of animals
Backbones, fur, method of movement, type of food it eats (carnivore, herbivore, and omnivore)

II. Are humans animals?

- A. Yes, humans are characterized as animals, because we differ from plants.
 - 1. Food: Animals feed on other plants or animals; plants make their own food.
 - 2. The way we move: Animals can move freely; plants are stuck in one place.
 - 3. Nervous system: Animals have one and can react because of it; plants lack it. Plants communicate messages (shock, exposure, growth instructions, etc.) internally with chemicals (auxins) rather than by nerve impulses.
 - 4. Growth: In animals, growth occurs everywhere. In some plants, it occurs only at the roots and branches. If you were a plant, you'd probably have a neck four feet long! Example: A scar, nail, or branch on a tree trunk doesn't move upward as the tree gets older. Woody plants do add girth (growth rings) as they grow older.

III. What animals are found at Turlock Lake SRA?

- A. Show pelts.
 - 1. Mammals: Deer, opossum, cottontail and jack rabbit, striped skunk, kit fox, coyote, ground squirrel
 - 2. Snakes: King snake, gopher snake
 - 3. Birds: Red-tailed hawk, quail, magpie, woodpecker, jay, swallow, heron, egret, crane, great horned owl
 - 4. Fish: Bass, bluegill, trout, catfish



IV. How do we know animals are here?

- A. Show antlers.
Animal tracks, feathers, nests, burrows, eggs, teeth, bones, antlers, spider webs, fur

V. What can we learn from these signs?

- A. Show skull.
- B. Teeth: Sharp = carnivore; dull flat = herbivore
- C. Tracks: Shape of foot determines type of food animal eats
Claws = carnivore; hooves = herbivore
- D. Skeleton: If it's light and hollow, this animal flies
- E. Show the difference between a "hollow" bird bone vs. a cow bone
- F. Crabs and lobster: Exoskeleton
Show crab skeleton.

VI. How do animals protect themselves from other animals?

- A. Coloration, teeth, claws, antlers, stingers, bitter taste, speed, odor, camouflage; acute senses of smell, sight, and hearing

VII. How do animals protect themselves from the environment?

- A. Fur, feathers, and fat for warmth; shelter, migration, hibernation

B. What kind of shelter do they have?

1. Show shells and gall.

Birds: Tree nests, ground nests, cliff nests

Insects: Ant mounds, spider webs, galls

Mollusks (soft body): Snails, clams, oysters (They have a shell)

Mammals: Rodent burrows, deer beds

VIII. Activity: Squirrels and Coyotes (see activity section below)

IX. Activity for Posters

A. Each junior ranger can design a poster on one or all of the following:

What is the state . . .

Animal? Grizzly Bear (extinct in CA, on the CA flag)

Reptile? Desert tortoise (endangered)

Fish? California golden trout

Bird? California valley quail (here in this park)

Insect? California dog-faced butterfly

Marine Mammal? California gray whale

Activities

Animal Charades

Number of Children: 2 or more

Environment: Any

Equipment Needed: None

Purpose of Activity: To bring attention to the distinctive characteristics of different animals

Activity:

1. Each child picks out an animal, without telling anyone which one he or she has chosen.
2. One by one, each child acts out the characteristics of his or her animal.
3. The other kids try to guess which animal is being acted out.



From Sharing Nature with Children, by Joseph Cornell. 2nd Ed. Nevada City, CA: DAWN Publications, 1998.

Bat and Moth

Number of children: 9 or more

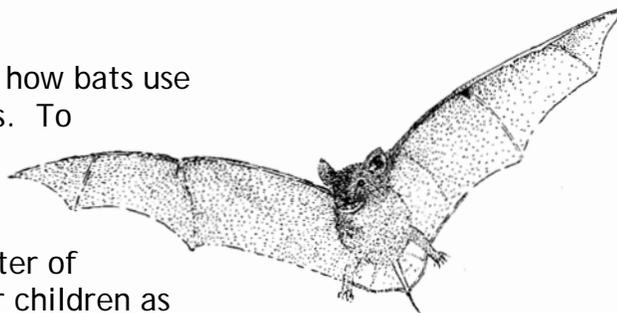
Environment: Open space

Equipment Needed: Blindfolds

Purpose of Activity: To illustrate how insect-eating bats catch prey in the dark

Activity:

1. In this game, the Junior Rangers can simulate how bats use echolocation to catch moths and other insects. To play, have the kids form a circle about 10 to 15 feet across. Choose one member of the group to play the role of a bat. Blindfold the bat, and have him or her stand in the center of the circle. Then designate three to five other children as moths and have them also come to the center. The object of the game is for the bat to try to tag as many moths as possible. Both the bat and the moths can move, but they must stay within the circle. (Once a moth is tagged, he or she should go outside the circle and sit down.)
2. Whenever the bat calls out "bat," the moths have to respond by calling back "moth." Tell the moths that every time they hear the bat call "bat," it simulates the bat sending out an ultrasonic pulse to see what's in its path. The pulse bounces off the moths and echoes back to the bat, simulated by the moths calling out "moth."
3. The bat must listen carefully, concentrate to find out where the moths are, and try to tag them. To add more excitement, you can designate two children to be bats at the same time. Just watch to make sure the two bats don't collide with each other. You might want to pick a short and tall child so they don't bump heads.
4. As a variation, you can add obstacles by designating several children to play trees. When the bat calls out "bat," the moths must call out "moth" and the trees must call out "tree." If a bat runs into a tree as it tries to tag a moth, the bat is out.



Note: The "environment" (kids in the circle) can't make too much noise or this won't work.

From Sharing Nature with Children, by Joseph Cornell. 2nd Ed. Nevada City, CA: DAWN Publications, 1998.

Silent Stalking

Number of children: 5 or more

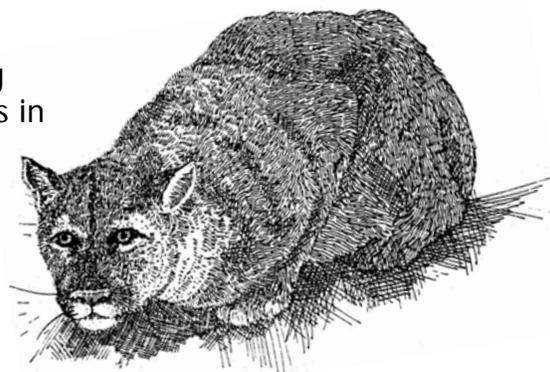
Environment: A clear area with a noisy walking surface—gravel, twigs, brush, etc.

Equipment needed: Blindfold

Purpose of Activity: To explain how a predator stalks its prey, and what it must do to keep the prey from being aware of it

Activity:

1. Choose a fairly level, open site, with a noisy walking surface. Mark off a stalking circle at least 10 meters in diameter for the group. Introduce the terms predator and prey. One member of the group is the prey; the rest are predators.
2. The prey stands in the center of the circle, and puts on the blindfold. The predators walk out to



the edge of the circle, while the prey spins around in place. After spinning 4 times, the prey yells "stop," and all the predators freeze. The predators stalk the prey by trying to tag him before he hears them. Each predator must pause between steps to see if the prey has heard him. If the prey hears a predator, he points at him. The leader should determine if the prey is pointing at a predator in case of close calls. If a predator is caught, he is out of the game.

The game ends when all predators are out, all predators have tagged the prey, or the prey has used up all the available detection attempts (two for each predator).



From Outdoor Biology Instructional Strategies (OBIS). Lawrence Hall of Science, University of California, Berkeley. 94720. Sets I, II, III.

Squirrels and Coyotes

Number of children: 5 or more

Environment: Open space

Equipment needed: 4 "bases"

Purpose of Activity: To illustrate the importance of maintaining natural predator/prey relationships

1. Two kids are coyotes and the rest are squirrels. Set out 4 "bases" or dens. Play a game of tag, in which the coyotes chase the squirrels. The last squirrel gets a poster!
2. After the game, explain that if humans kill off the coyote, the squirrel population will grow huge and eventually die off from starvation and exposure. Tell how state parks are here to preserve land and protect animals from human interference with natural predator/prey relationships.

From Stacey French's animal life Junior Ranger program at Turlock Lake S.R.A..

Support to Survive

Number of children: 12 or more

Environment: Any

Equipment Needed: None

Purpose of activity: To demonstrate how survival depends on support, not just individual effort

Activity:

1. Think of the different ways animals physically support each other (kangaroo babies in pouches; monkey, opossum, and scorpion mothers carrying their babies on their backs; dolphins pushing their newborn to the surface for their first breath; ambulance crews carrying injured people in stretchers).
2. Here is a new way we can support each other and relax at the same time. Form a close circle standing shoulder to shoulder. Turn 90 degrees to the right. At the same time, everyone should sit down on the knees of the person behind them. Now, try waving your hands and walking forward in a circle.
3. Pull one person out and the circle collapses!

From The New Games Book. Andrew Fluegelman, ed. New Games Foundation, The Headlands Press, 1976.

Animal Tracks

Number of children: 1 or more

Environment: Any

Equipment Needed: None

Purpose of activity: To identify animal tracks

Activity:

1. Have the Junior Rangers complete the Animal Tracks worksheet (Appendix B).
2. Discuss the worksheet together and then go for a walk through the park to see if they can find any similar tracks on the ground.

Background Information: Animal Life

Predator / Prey Relationships

Predators are animals that catch and eat other animals. Sometimes we think of predators as being incredibly strong, fast, fierce animals with super-keen senses, and we think of the prey as being the predators' helpless victims. But life isn't as easy for predators as it may appear. Many predators have to spend a long time learning how to hunt. Even after many tiring chases, a predator may still not be able to catch its swift prey. A tempting meal may stab or sting or bite the predator in self-defense, or it may outrun, out-fly, or out-swim its predator. Sometimes a predator has a hard time finding its prey because the prey uses camouflage to hide in the surroundings. Not to mention that predators may themselves be prey for another predator!

Some animals—such as hawks, snakes, alligators, frogs, and spiders—are full-time predators (carnivores). They get all their food from killing and eating other animals. Part-time predators (omnivores)—such as coyotes, skunks, raccoons, and catfish—eat both animals and plants.

Predators have different ways to hunt their prey. Some animals—such as frogs and egrets—stand absolutely still, and then snatch or pounce on their prey when it comes close enough. Coyotes and wolves, on the other hand, catch their prey by running it down. Mountain lions and bobcats try to sneak up on their prey, hiding behind rocks and trees. Then they make a quick dash and try to grab their prey.

Predation in natural communities is a step in the transfer of energy (the food web). The relationship between predator and prey is kept in balance by nature, so that neither the predator nor the prey overpopulates an area. If, for example, a predator population began to increase, these predators would consume a progressively larger

number of prey, until the prey populations begin to decline. As the prey diminishes, the predators are faced with less and less food. When there is not enough food to keep all the predators alive, some of them die or simply do not produce as many young. In time, starvation and reproduction will balance the number of predators with the number of prey. When the number of prey increases, the number of predators soon follows. This cycle, or oscillation, may continue indefinitely. The prey is never completely destroyed by the predators; the predators never completely die off.

Natural predator/prey systems keep each other "in check" by not allowing either to overpopulate. However, people sometimes ruin this equilibrium in any number of ways (hunting, construction that destroys habitats, etc.), throwing the natural system off balance.

Endangered Species

An endangered species is a kind of animal or plant that is in danger of becoming extinct if nothing is done to protect it.¹

Over millions and millions of years, ever since life began on earth, species have been forming and evolving, and then dying out naturally, so extinction is nothing new. However, in recent history species have been going extinct much more quickly. As of 2004, 129 species of birds, 103 species of mammals, and 56 species of reptiles and amphibians have become extinct.² These are just the ones we know about. It is possible that thousands of unknown species of animals and plants have also been lost.

Many animals are in no danger of extinction because they get along well in a world full of people. However, as people cut down tropical rainforests, 50 to 150 species may be wiped out each day.

The term "biodiversity" means all the different plants and animals that live in the same area. Tropical rainforests and California's redwood forests have more biodiversity than anyplace else on earth. Even small patches of rainforest contain species that are found nowhere else in the world. For every species we know about, there may be 30 more that we haven't discovered.

Biodiversity is important because each living thing contains a unique reservoir of genetic material that has evolved over eons of time, and cannot be retrieved or duplicated if lost. Scientists have investigated only a small fraction of the world's species to determine possible benefits to humanity.

¹ Information on endangered species is from *Ranger Rick* (April 1992) and "Why Save Endangered Species," a pamphlet published by the U.S. Department of the Interior, U.S. Fish and Wildlife Services.

² Statistics from the 2004 IUCN threatened list, www.iucnredlist.org.

It was “only a fungus” that gave us penicillin, and certain other plants have yielded substances used in drugs to treat heart disease, cancer, and a variety of serious illnesses. At least a quarter of all prescriptions written annually in the United States contain chemicals discovered in plants and animals. If these organisms had been destroyed before their chemistries were known, their secrets would have died with them.

As naturalist Aldo Leopold wrote, the first rule of intelligent tinkering is to save all the parts. Besides the loss of a unique species, we have to consider that all living things are part of a complex delicately balanced network called the biosphere, which is composed of ecosystems, the study of which includes the interrelationships between plants and animals and their physical environment. The removal of a single species can set off a chain reaction affecting many others. It has been estimated, for example, that a disappearing plant can take with it up to 30 other species, including insects, higher animals, and even other plants. The species that have become extinct due to natural causes have not usually left a “hole” in the ecosystem, since other species were able to adapt. Unfortunately, humans and human activity tend to accelerate the natural order to such an extent that ecosystems may be thrown off balance.

How do people endanger animals? One way is when we introduce new species of animals that are not native to a land. These new species may out-compete the native animal species. Predators of the new species which had kept their numbers in check in their original home usually are not introduced with them. Introduction of new species can thus result in over-predation of native plants or animals in the area.

Other actions which sometimes endanger animals are human settlement and agriculture. When humans turn wild land into land used for housing and farming, the change often disrupts or destroys animals' natural habitats. In addition, habitats can be harmed by pollution.

The conservation and recovery of threatened and endangered species is a tremendous and ever-increasing challenge. Through the efforts of the United States Fish and Wildlife service, California Department of Parks and Recreation, California Department of Fish and Game, National Park System, California Native Plant Society, National Wildlife Federation, the Nature Conservancy, local citizens, and other concerned groups, many jeopardized creatures now have a better chance of survival.

Most states have programs for protecting rare animals and plants. Check the website or write to the California Department of Fish and Game to find out which species are rare in your area and what is being done to conserve them.

The best thing to do to save animal species is to keep them from becoming endangered in the first place. One way to do this is to find and save the “hot spots,” or the places which are home to the greatest numbers of species. We can also try to restore habitats that have been destroyed so that the animals can live and reproduce

there. Increasingly, parklands serve as important “reservoirs” of habitats and “corridors” for animal migration. Whatever the strategy, planning ahead is more effective than waiting until a species is nearly gone, and then spending lots of time and money trying to save it. One way we can plan ahead is to start saving and recycling our resources. If that happens, species all over the world will have a much better chance of survival.

Suggested Resources: Animal Life

Alden, Peter, Fred Heath, Richard Keen, Amy Leventer, and Wendy B. Zomlefer. *National Audubon Society Field Guide to California*. New York: Alfred A. Knopf, Inc., 1998. A compact, yet detailed statewide natural history field guide.

Armstrong, Pam, Judith Connor, Chris Parsons, Judy Rand, and Jenny Vuturo-Brady. *Sea Searcher's Handbook: Activities from the Monterey Bay Aquarium*. Monterey, CA: Monterey Bay Aquarium, in cooperation with Roberts Rinehart Publishers, 1996.

Audubon Field Guide Series. New York: Alfred Knopf, 1977. This series includes all photographs for identification of numerous topics: birds, mammals, reptiles, etc.

Benyus, Janine M. *The Field Guide to Wildlife Habitats of the Western United States*. New York: Simon & Schuster Inc., 1989. Describes plants and animals found in various wildlife habitats throughout the western United States.

Berenbaum, May R. *Bugs in the System: Insects and Their Impact on Human Affairs*. Reading, MA: Addison-Wesley Publishing Company, Inc., 1995. A fascinating, entertaining mix of entomology and history, statistics and stories.

Brown, Tom, Jr., and Brandt Morgan. *Tom Brown's Field Guide to Nature Observation and Tracking*. New York: Berkeley Books, 1983. A philosophical and practical approach to observing things in nature.

Clark, Jeanne L. *California Wildlife Viewing Guide*. Helena, MT: Falcon Press, 1996. A guide to 200 of the state's best wildlife-viewing locations.

Cruickshank, Allan D. and Helen G. Cruickshank. *1001 Questions Answered about Birds*. New York: Dover Publications, 1976. Answers over 1000 questions common to birds' natural history, behavior, anatomy, etc.

Freedman, Russell. *Animal Architects*. New York: Holliday House, 1971.

Garth, John S., and J. W. Tilden. *California Butterflies*. California Natural History Guides: 51. Berkeley: University of California Press, 1986. With wonderful

Junior Ranger Program Handbook: Animal Life

illustrations and identification keys, this book identifies at least 235 species of butterflies.

Gray, Mary Taylor. *Watchable Birds of California*. Missoula, MT: Mountain Press Publishing Company, 1999. This book is packed with natural history facts, folklore, and observations on some 150 California birds that are “fun and interesting to observe.”

Hansen, Kevin. *Cougar: The American Lion*. In association with the Mountain Lion Foundation. Flagstaff, AZ: Northland Publishing, 1992. General natural history of cougars.

Herald, Earl. *Fishes of North America*. New York: Doubleday, 1972.

Hill, John E. and James D. Smith. *Bats, a Natural History*. Austin, TX: University of Texas Press, 1984. General natural history of bats, including the benefits of bat conservation.

Jameson, E. W. Jr. and Hans J. Peeters. *California Mammals*. Berkeley: University of California Press, 1988. A publication identifying all mammals found in California. Includes scientific names and nomenclature.

Johnson, Myrtle E. and Henry J. Snook. *Seashore Animals at the Pacific Coast*. New York: Dover Publications, 1955. Describes natural history of seashore invertebrates and fish. A good reference for general information on seashore creatures.

Klots, Alexander B. and Elsie B. Klots. *1001 Questions Answered About Insects*. New York: Dover Publications, 1977. This publication answers over 1000 questions commonly asked about all aspects of the insect world.

Love, Milton. *Probably More Than You Want to Know About the Fishes of the Pacific Coast*. 2nd Ed. Santa Barbara, CA: Really Big Press, 1996. Here’s a valuable source—a species-by-species compendium of natural history facts and interpretive lore about our coastal fish—illustrated with black-and-white drawings and some color photos.

Martin, Laura C. *The Folklore of Birds*. Old Saybrook, CT: The Globe Pequot Press, 1993. A combination of folklore, literary references, name origins, and natural history facts about nearly 100 birds.

Martin, Laura C. *Wildlife Folklore*. Old Saybrook, CT: The Globe Pequot Press, 1994. This book examines the cultural significance of more than 80 mammals, reptiles, amphibians, and invertebrates.

McGinnis, Samuel M. *Freshwater Fishes of California*. Berkeley: University of California Press, 1984. Describes all inland fishes found in California, including location, natural history, and photographs of all fish (many in color).

Junior Ranger Program Handbook: Animal Life

Moyle, Peter B. *Fish: An Enthusiast's Guide*. Berkeley: University of California Press, 1993. An introductory work on the natural history of fishes.

Moyle, Peter B. *Inland Fishes of California*. Berkeley: University of California Press, 1976. An excellent reference on the identification and natural history of California's inland fishes.

Murie, Olaus. *A Field Guide to Animal Tracks*. Boston: Houghton Mifflin 1975. A standard reference (in the Peterson series).

National Geographic Society. *Field Guide to the Birds of North America*. Washington D.C.: National Geographic Society, 1987. A common field guide in use today to identify birds in the field. Uses colored drawings, location maps, and narrative for a quick and accurate identification.

National Wildlife Federation. *Ranger Rick's NatureScope*. New York: McGraw-Hill. *Ranger Rick's NatureScope* is a popular series of publications "dedicated to inspiring in children an understanding and appreciation of the natural world, while developing the skills they will need to make responsible decisions about the environment."

"Peterson Field Guide Series." The first major field guide series, Peterson's has been updated somewhat over the years, particularly the *Field Guide to Western Birds*. All identification plates are drawn (no photographs) with narrative descriptions of each plant or animal.

Powell, Jerry A., and Charles L. Hogue. *California Insects*. California Natural History Guides: 44. Berkeley: University of California Press, 1979. Although less than ideal as an identification tool, this is still a handy, state-specific insect reference.

Project Wild K-12 Activity Guide. Bethesda, MD: Western Regional Environmental Education Council, Inc., 1992. www.projectwild.org.

Rezendes, Paul. *Tracking and the Art of Seeing: How to Read Animal Tracks & Sign*. Charlotte, VT: Camden House Publishing, Inc., 1992. With high-quality photographs and detailed descriptions of animal signs, this publication is a valuable identification tool.

Roa, Michael. *A Guide to the Side of the Sea: A Teacher's Guide for Field Trips to Rock Intertidal Areas*. Sacramento, CA: California State Parks, 2005.

Roth, Charles E. *The Wildlife Observer's Guidebook*. Englewood Cliffs, New Jersey: Phalarope Books, Prentice-Hall, Inc., 1982. A practical manual for wildlife watching.

Junior Ranger Program Handbook: Animal Life

Russo, Ron, and Pam Olhausen. *Pacific Intertidal Life: a Guide to Organisms of Rocky Reefs and Tide Pools of the Pacific Coast*. Berkeley, CA: Nature Study Guild Publishers, 1981. Easy to use and compact in size, this guide to seashore life is a good choice for beginners.

Shaw, Charles E. and Sheldon Campbell. *Snakes of the American West*. New York: Knopf, 1974. This book describes the natural history, location, and identification of snakes found throughout the Western United States.

Sibley, David Allen. National Audubon Society. *The Sibley Guide to Birds*. New York: Alfred A. Knopf, Inc., 2000. An up-to-date field guide to more than 800 North American birds.

Snyderman, Marty. *California Marine Life: a Guide to Common Marine Species*. Niwot, CO: Roberts Rinehart Publishers, in cooperation with Monterey Bay Aquarium, 1998. An excellent survey text of marine habitats.

Stebbins, Robert C. *A Field Guide to Western Reptiles and Amphibians*. 2nd Ed. Boston: Houghton Mifflin Company, 1985. A more specific reference than Shaw (above).

Steinhart, Peter. *California's Wild Heritage: Threatened and Endangered Animals in the Golden State*. Sacramento, CA: California Department of Fish and Game, 1990. Catalogues threatened/endangered animals of the state and tells their ecological stories.

Stienstra, Tom. *California Wildlife: A Practical Guide*. Emeryville, CA: Foghorn Outdoors, Avalon Travel Publishing, Inc., 2000. A general reference on the natural history of more than a hundred types of California wildlife. Identifies excellent observation places throughout California.

Stokes, Donald W. *A Guide to Observing Insect Lives*. Boston: Little, Brown and Company, 1983. Diverging from the focus of most field guides, this publication investigates the life cycles and behavior of common insects.

Storer, Tracy I. and Lloyd P. Tevis, Jr. *California Grizzly*. Berkeley: University of California Press, 1955. Details the natural history and extermination of the single animal most closely identified with California (appearing on the flag, park ranger patch, etc.)

Tuttle, Merlin D. *America's Neighborhood Bats*. Austin: University of Texas Press, 1988. Well-written book on some of the world's least understood animals, providing helpful information about bat behavior and biology, a key to the identification of common North American species, range maps, a glossary, color photographs, and an extensive list of sources for additional information.

Junior Ranger Program Handbook: Animal Life

Wexs, John B. *Zoo Books*. A series of publications by the San Diego Zoo educational association. Each publication deals with a specific group of animals, i.e. wild dogs, snakes, cats, sharks, etc. These books are written with children in mind and are an excellent reference for animal natural history.

Zimmer, Kevin J. *The Western Birdwatcher*. Englewood Cliffs, NJ: Prentice-Hall, 1985. Zimmer details biotic zones and identifies birds expected to be found in those areas.

Other Sources of Information

Animal and Plant Health Inspection Service, Department of Agriculture, Washington, D.C. 20250. Provides information about importing or exporting pets and federally regulated plant species. www.aphis.usda.gov.

California Department of Fish and Game. www.dfg.ca.gov.

IUCN: World Conservation Union. www.iucn.org.

The National Marine Fisheries Service, Department of Commerce, Washington, D.C. 20235. Good source of information about endangered whales, seals, and other marine species. www.nmfs.noaa.gov.

National Wildlife Federation. "The Conservation Directory."
www.nwf.org/conservationdirectory.

United States Fish and Wildlife Services. www.fws.gov.

INSERT *CALIFORNIA INDIANS* TAB HERE

