



NATURE BOWL 2024

Coach Packet



WHAT IS NATURE BOWL?



Initiated in 1986, Nature Bowl is a fun, science-based team competition for third through sixth grade students in the California Department of Fish and Wildlife's North Central Region, which covers portions of the Sacramento Valley, Delta, Sierra Nevada foothills and mountains.

Teams of students participate in five activities at Semi-Final events held in March and April at various outdoor regional Nature Bowl partner sites. A Finals event is set for May 4 at Camp Pollock.

Nature Bowl activities focus on regional ecology, natural history, and conservation. The program's purpose is to motivate students with hands-on science, to reinforce environmental concepts, to connect science to their own environment and to involve students in community conservation projects. Nature Bowl also serves as a model for teachers to use in their classroom's environmental education instruction and meets current educational standards.

A virtual **Coach Workshop on January 24** introduces Nature Bowl's five activities, their format and resources. This year, a virtual **California Natural History Class for Coaches on February 7** has been added. These coach workshops are held so that coaches are fully prepared and confident to teach and lead their Nature Bowl teams.

How does Nature Bowl work?

Any school or organized group may send one 3rd/4th grade team and one 5th/6th grade team to the Nature Bowl games. Teams are limited to 10 students each.

Teachers, parents, or any youth leaders may coach a team. Coaches choose which Semi-Final site to participate. Teams with the highest scores advance to the Finals.

LET THE GAMES BEGIN



- Nature Investigations
- Nature Relay
- Team Problem Solving
- Speedy Ringers
- Enviromercial

NATURE INVESTIGATIONS

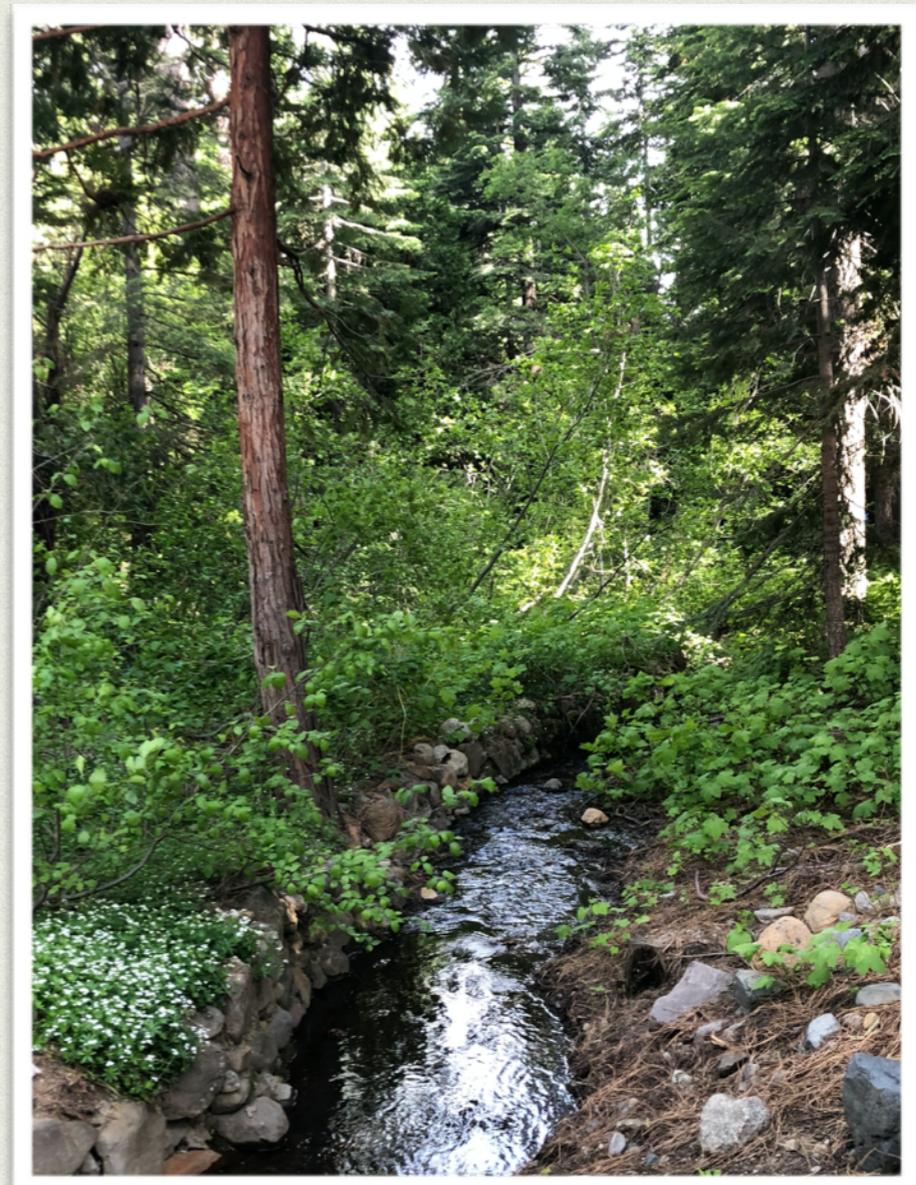
Theme: “Think like a Plant”

Team of 4, with the remaining team members following/listening. Teams may substitute players midway. Coaches are not allowed to follow teams.

Each team answers questions at 4 stations along an outdoor trail. Each question has a time limit. Each station has a short learning lesson before the main question(s).

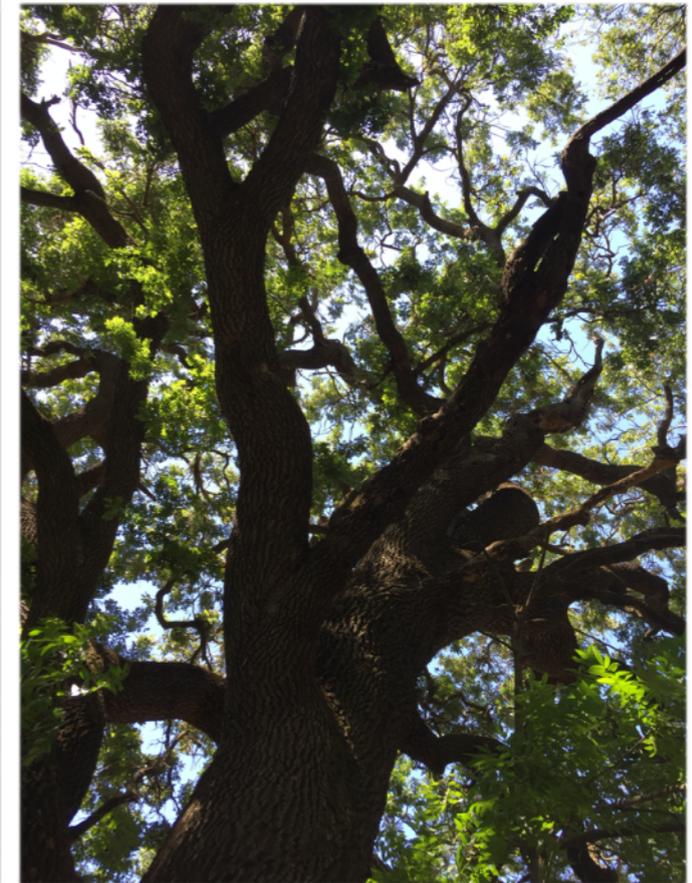
Stations include questions about plant science, or botany, with topics such as how plants function, what they look like, how they are related to each other, where they grow, how people make use of plants and how plants adapt and evolve, as well as questions specific to the habitat types and wildlife found at the Semi-Final site. Emphasis is placed on observation skills, natural resource knowledge, and teamwork.

The judge asks, monitors, and records answers. The judge announces the correct answers to teams after the final station.



Nature Investigations- Sample Questions

1. Identify plant objects and answer the following questions:
(4 minutes)
 - A. In what habitat(s) would you find this item?
 - B. What is the function of this item?
 - C. Name three ways this seed could travel to a new area.
 - D. Name three wildlife species that rely on this plant and/or its seeds, and how?
2. What are two adaptations this plant seed or leaf has?
(90 seconds)
3. Look around you. Name three specific habitats present in this ecosystem. (90 seconds)
4. Use a field guide to determine the species name of these five plants that live here. (4 minutes)
5. Use a field guide to identify three pollinator species that live here by exact species name. (3 minutes)
6. Examine and identify this plant. List two things this plant tells you about the environment in which it lives.
(90 seconds)
7. Plants spread their seeds in a variety of ways. In front of you are four different kinds of seeds. Tell us how each plant seed is spread around. What is one other way that seeds of plants are scattered?
(2 minutes)
8. Name five plants humans regularly use, and how?
(2 minutes)
9. What is a herbivore and name three that could live here.
(60 seconds)
10. Locate two trees: a deciduous tree and an evergreen tree.
(2 minutes)
 - A. What's the advantage of being deciduous?
 - B. What's the advantage of being evergreen?



NATURE RELAY

All team members participate. Items representing environmental concepts (from the Nature Bowl Glossary) are placed in a large saucer. Team members line up opposite the saucer. A judge announces a concept.

Students rotate one at a time to the saucer to retrieve an item that represents that concept. Each student has 20 seconds to review items in the saucer and return with an item to the front of his/her team line. The judge announces the correct item answer. Teams with the correct item answer get full points.

If a student selects another item, that student may defend/explain their rationale for that selection to the entire group. The judge determines if student's defending rationale of that item deserves points: half or full.

As a tie breaker or the final question, the judge places a different item from the saucer in front of each team line. Teams have 30 seconds to together brainstorm 3 concepts describing their item. Judge gives 3 points for 3 correct answers.



Nature Relay

Sample questions for third/fourth grade:

amphibian (frog)
decomposer (fungus)
nocturnal mammal (bat)
migration (salmon) seed (cone)
herbivore (mouse) wetland plant (tule)
webbed feet (duck) predator (snake)
aquatic animal (fish) pollution (oil)
metamorphosis (butterfly)

Sample questions for fifth/sixth grade:

lichen (lichen) not native (tiger)
invertebrate (spider) feral (cat)
commensalism (gall) spawning (salmon)
raptor(hawk) reptile (snake)
riverine (smooth rock) coniferous (pinecone)
terrestrial mammal (deer)
renewable (water)



TEAM PROBLEM SOLVING

Team of 4 students, with substitution of team members midway, so all team members can play.

The judges read a nature question. The teammates quietly discuss, agree upon an answer, and write it on their answer sheet--all within a time limit.

Often pictures, puppets, skulls, bones, or other ecological props are used to find the answers. Team problem solving might also include charades or songwriting, as well as questions where teams propose solutions to existing ecological problems.

Judges call upon one team member to present his/her team's answer. All answers must be written on the answer sheet provided, unless otherwise specified. Answer sheets are turned into judges at the end of activity.



Team Problem Solving- Samples

Sample questions for third and fourth grade:

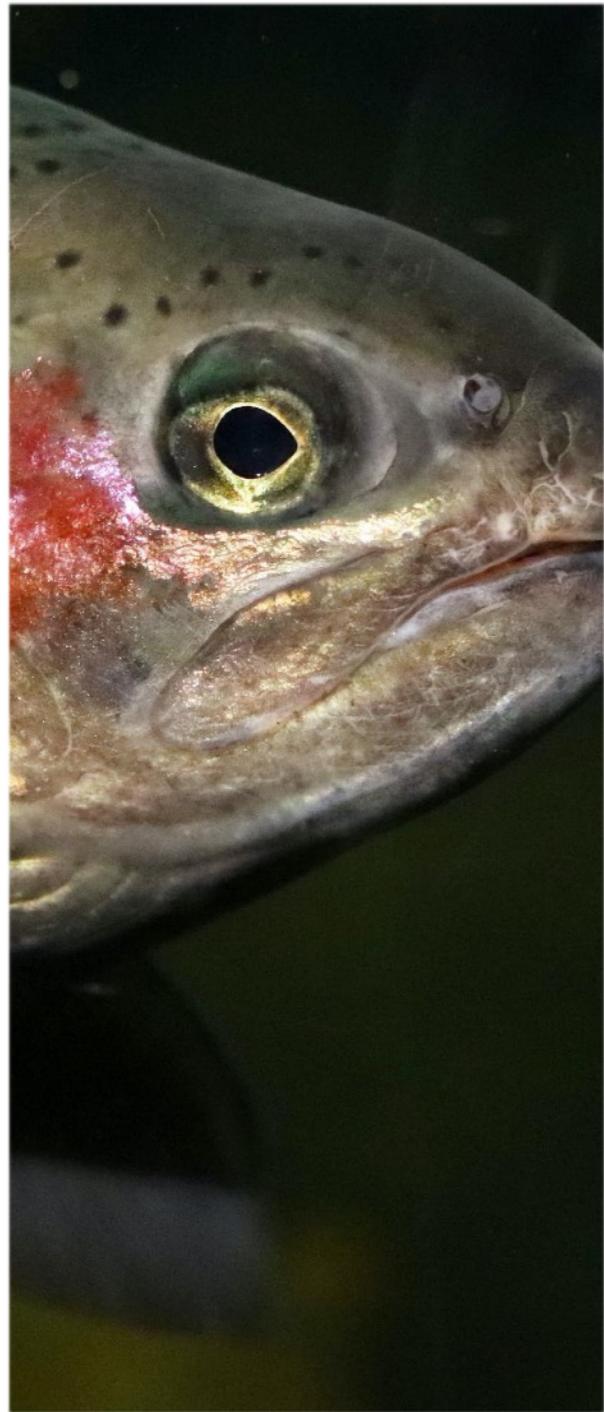
1. Using at least four of the animal puppets in front of you, create a food web found in our region. Write down the animals of your food web. Identify a local habitat type where your food web occurs. (90 seconds)
2. On the card in front of you, there are several native animals listed. Quietly choose one animal and write it down. You will act out this animal as a team for the other teams to guess. No sound effects are allowed. You have 45 seconds to prepare and 30 seconds to act out the animal. The other teams write down their animal guess, and then team reveals answer. (2 minutes)
3. You are a researcher tasked to estimate the population of a breeding colony of birds. You surveyed the site and took several pictures. The picture in front of you captured nearly the entire flock in the air. Using the picture—but without counting every single bird—what is one way you can estimate this breeding colony population?
(2 minutes)
4. You are reporters. Write a simple but complete caption for this nature photo. Include who, what, where, why and how. (2 minutes)

Sample questions for fifth/sixth grade teams:

1. On the card in front of you, there are several ecological concepts listed. Quietly choose one concept and write it down. You will act out this concept as a team for the other teams to guess. No sound effects are allowed. You have 45 seconds to prepare and 30 seconds to act out the concept. The other teams write down their guess, and the concept is revealed. (2 minutes)
2. Using at least five animal puppets in front of you, create a food web found in our region. Write down the animals of your food web. Identify a local habitat type where your food web occurs? (90 seconds)
3. Name three types of wetlands found in California, three values of wetlands to wildlife, three values for people, and three current threats to wetlands. (2 minutes)
5. On the map, pick a California river. Follow the flow of that river from its origin to its drainage into the Pacific Ocean. Name three towns or cities it passes by. (90 seconds)
6. Match the animals with the term that most accurately describes their current status. (At-risk, native, invasive, resident, migratory) (60 seconds)



SPEEDY RINGERS



In group of 3 students--with substitution of team members, so all team members can play.

Teams are presented with short answer questions and answer on a "first-ring" basis. Each team has a light or other contraption with sound to signal in. The team who signals in first is called upon to answer. One student answers the question for his/her team.

If the answer is incorrect or if that student can't come up with the answer within three seconds, the team that rang in second is called upon. An individual from that team can then answer the question. Most answers are supplied within the Nature Bowl Glossary.

Speedy Ringers

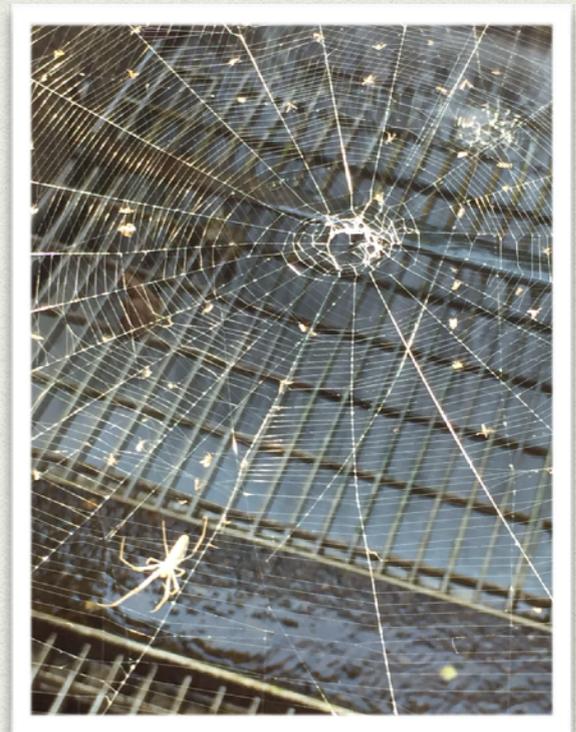
Sample questions for third/fourth grade teams:

1. Name two reasons animals migrate. (Climate, food, to live)
2. Name one animal species that migrates on the Pacific Flyway. (Tundra swan, pintail duck, sandhill crane, fox sparrow)
3. Wildlife needs four basic things to survive. Humans need these things too! What are they? (Food, water, shelter, space)
4. Name two of the mountain ranges that border the Great Central Valley. (Sierra Nevada, Coastal Range)
5. Name two natural resources and the reasons why we should conserve them.
6. I am a wild animal native to California. I will read a series of clues. As soon as you think you know what animal I am, ring in.
7. Name a grassland mammal and one of its adaptations.
8. Name the California state tree.
9. Describe your current geological location.

Sample questions for fifth/sixth grade teams:

1. What is a biologist?
2. Name two renewable energy sources. (Solar, wind, geothermal, hydro)
3. I am a wild animal native to California. I will read a series of clues. As soon as you think you know what animal I am, ring in.
4. What is a major cause of air pollution in California? (Automobile, wildfires)
5. Name two benefits and two problems of dams. (Recreation, power, irrigation, flood protection; disrupts natural migrations, prevents sediment distribution, alters and constricts wild rivers)
6. Name an endangered or threatened species in our region. Name two reasons this species is at-risk.
7. What are two functions of feathers? (Flight, warmth, camouflage)
8. Habitat loss is the most serious threat to our native plants and animals. Identify two other current threats to our native plants and animals. (Pollution, poaching, invasive species, competition, human disturbance)
9. Describe your current geological location.

*Teams can practice Speedy Ringers with Kahoots games. (Links in the attachment section)
Kahoots is also recommended for use after each learning session.*



ENVIROMERCIAL

One enviromercial for each team, *prepared in advance* of Nature Bowl. Team presents a Judges' Packet to judges, prior to team presentation.

Each team has 2 minutes to present commercial. All team members must participate, with each having a specific role: actors, researchers, prop makers, screenwriters, etc.

Enviromercials must focus on a local environmental problem and must propose a viable solution to this problem. Teams are provided a general list of topics to choose from and to narrow down to their own local issue.

After each presentation, judges ask each team questions about their subject and commercial. Commercials may be videotaped by the coach or parent at the event.

Enviromental Samples:

https://www.youtube.com/watch?app=desktop&v=bXe4yVmCN_8

<https://www.youtube.com/watch?v=djnFZ7di7iA>

<https://www.youtube.com/watch?v=vHlcoyehdoo>

Topic List:

Air quality

Drought

Water quality

Habitat loss

Population growth

Recycling

Pollution

Endangered species

Consumer choices

Urban wildlife

Sustainability

Pollinators

Non-native species

Open space

Climate change

Enviromercial



What to put in the Judges' Packet:

- One to two sentences explaining why team chose this topic.
- Identify each student and his/her role in preparing commercial
- List of research sources used, at least 5. One source must be from a person in an agency or project currently working on the issue. A variety of up-to-date sources is required, versus using only website-based sources.
- Effectively describe any conservation actions taken by students.

Each Enviromercial should:

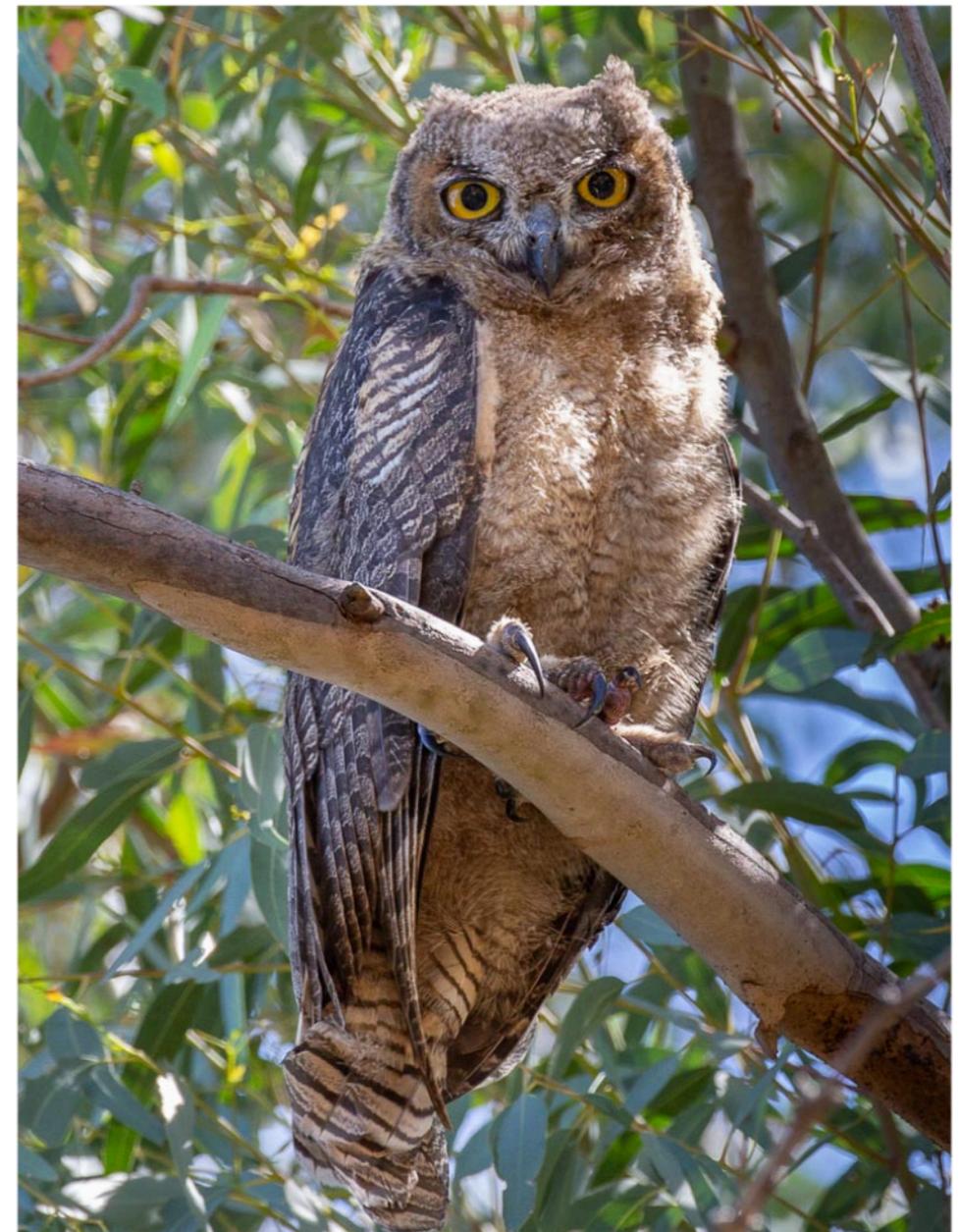
- Describe a local or regional environmental issue, its cause(s) and effects. Be specific in topic and focus.
- Describe what, if anything, is currently being done about the issue in your community.
- Suggest a practical solution that would help correct the issue.
- Students are encouraged to gain first-hand information by visiting a site, interviewing people, attending a meeting and/or being part of a solution.
- Students may write presentation notes on the back side of a 3x5 inch card. Students do not need to memorize their presentation.
- Students beforehand can create visual aids and other props to use during the presentation. Judges prefer students' homemade props over those purchased or created by adults.

Enviromercial Judging Criteria:

- Choice of Topic: Is it relevant, is it or regional local, is it important?
- Thoroughness: Covers problem, impacts, solutions, depth of research
- Creativity: Artistry, creative approach, originality
- Resources: Diverse, credible, local or regionalized, different perspectives
- Response to judges' questions: Demonstrates strong comprehension of material
- Overall: Communication abilities, grasp of subject, persuasiveness, enthusiasm, took appropriate action to reduce problem, direct or indirect
- Time: Under the two minute time limit

GENERAL PARTICIPATION RULES:

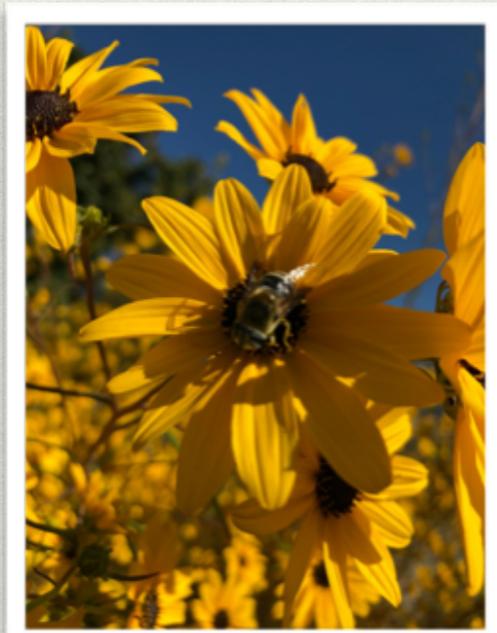
1. Up to ten children may be on a team.
2. Teams can earn 100 points in each activity, with 500 points total.
3. Team members should listen to the complete question before answering and must wait for the judge to call on them for their answer. Other participants must remain quiet, while other teams are giving answers.
4. Team members or coaches are not allowed to attend any other session of the Nature Bowl Semi-Finals except the one in which his/her team is competing. Doing so may result in disqualification. Voice or video recording is also prohibited at the event, except during Enviromercial.
5. Nature Bowl strives to de-emphasize the competitive nature of the games, instead the intent is to maximize cooperation, learning, and self-esteem.
6. Students are positively reinforced for correct and partially correct answers.
7. At the Semi-Final awards ceremony, all students and teams receive the same prizes. Teams are called in random order. Each team's strengths are announced and praised.
8. After introducing all the teams, the top scoring teams are recognized and advance to the Nature Bowl Finals on May 4.
9. Coaches can privately request more detailed feedback about their team.



DATES TO REMEMBER:

- ♦ January 24: Nature Bowl Coach Workshop
- ♦ February 7: California Natural History Class for Coaches
- ♦ February 16: All Coach/Team Registration deadline
- ♦ Semi-Finals:
 - * March 20 Nimbus Fish Hatchery
 - * April 3 Placer Nature Center
 - * April 10 Yolo Basin
 - * April 17 Stone Lakes National Wildlife Refuge
 - * April 23 American River Conservancy
 - * April 25 New Melones Visitor Center
- ♦ May 4: Finals at Camp Pollock

ATTACHMENTS



- Overall Preparation Timeline
- Team Preparation Timeline
- Resources
- Photo Release Form
- Wildlife Viewing Tips
- Kahoots Games
- Nature Bowl in your Neighborhood
- Nature Bowl Glossary

OVERALL PREPARATION TIMELINE



Before the Event (January/February):

- Attend a coach workshop and register your team
- Assemble a team
- Meet with your team regularly
- Acquaint team with Nature Bowl activities, rules and format
- Emphasize teamwork
- Supply activities that apply knowledge of California ecology
- Focus learning on regional and local natural resource conservation
- Choose a Nature Bowl Semi-Final site and date, and arrange transportation
- Receive permission for students to be off campus and arrange for a substitute teacher if needed
- Practice sample questions and enviromercials
- Two weeks before event, contact your school district's public information officer and send a press release to local media for coverage

Day of Event (March/April):

- Dress for the weather
- Bring snack and lunch

- If you are late arriving or unable to attend, please contact your site
- Arrive early to register, use restrooms and get comfortable
- Review format and rules
- Stress teamwork
- Compete enthusiastically and with sportsmanship
- Stay for the awards ceremony

After the Event

- Write a story for your school newsletter about your Nature Bowl experience
- Recognize your team at a school assembly
- Share enviromercials with schoolmates and media
- Continue to keep teams engaged in hands on nature and science
- Remind students they can make a difference by getting involved in local ecological issues and activities--and encourage them to do so
- Put next year's Nature Bowl on your calendar!

TEAM PREPARATION TIMELINE

January (1-2 meetings)

- ◆ Provide overview of Nature Bowl
- ◆ Focus on learning glossary words and increasing observation skills
- ◆ Make flashcards, have team members come up with examples
- ◆ Discuss native/non-native plants and animals
- ◆ Start Nature Bowl in your Backyard lessons
- ◆ Students create nature scavenger hunt
- ◆ Play charades with local native wildlife
- ◆ Discuss habitat, microhabitat, niche, adaptations

February (4-8 meetings)

- ◆ Start enviromercials
- ◆ Discuss food web, life cycle, water cycle
- ◆ Identify food webs in different habitats-woodlands, rivers, foothills, grasslands
- ◆ Practice Speedy Ringers
- ◆ Play charades with environmental concepts from glossary
- ◆ Practice teamwork
- ◆ Give public speaking opportunities

- ◆ List or illustrate examples from the glossary
- ◆ Examine skulls, bones and tracks

March (2-6 meetings)

- ◆ What is conservation? What is preservation?
- ◆ Finish enviromercial—and practice, practice, practice
- ◆ Apply what you've studied and go on a field trip
- ◆ At the park or on the school grounds, find an animal sign, a stage of a life cycle and a non-native plant
- ◆ Practice nature relay using glossary terms
- ◆ Practice teamwork

Mid March-April (2-6 meetings; Semi-Final competition)

- ◆ Enjoy the Nature Bowl Semi-Final competition

May 4

Finals at Camp Pollock



RESOURCES

Nature Bowl Partners:

American River Conservancy www.arconservancy.org

California Department of Fish and Wildlife www.wildlife.ca.gov

New Melones Lake www.usbr.gov/mp/cao/newmelones/

Placer Nature Center www.placernaturecenter.org

Sacramento Valley Conservancy <https://sacramentovalleyconservancy.org>

Stone Lakes National Wildlife Refuge www.fws.gov/refuge/stone_lakes/

Sutter County Resource Conservation District www.suttercd.specialdistrict.org

Yolo Basin Foundation www.yolobasin.org

Nature websites:

Ask Nature <http://www.asknature.org/>

California Academy of Sciences <https://www.calacademy.org>

Project Wild <https://www.projectwild.org>

California Education and the Environment Initiative (EEI)

www.californiaeei.org

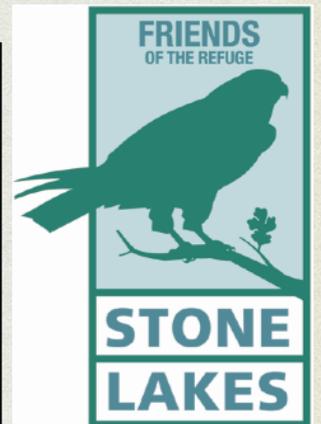
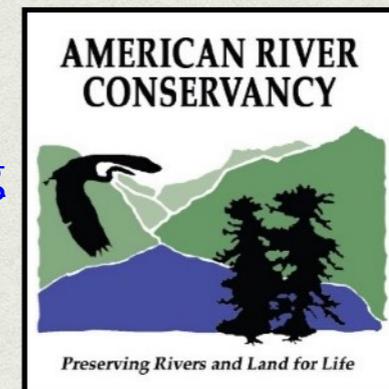
California Regional Environmental Education Community (CREEC)

www.creec.org

Local field guide:

Outdoor World of Sacramento (id and natural history; available locally)

Nature Bowl coordinator: genelle.treaster@wildlife.ca.gov





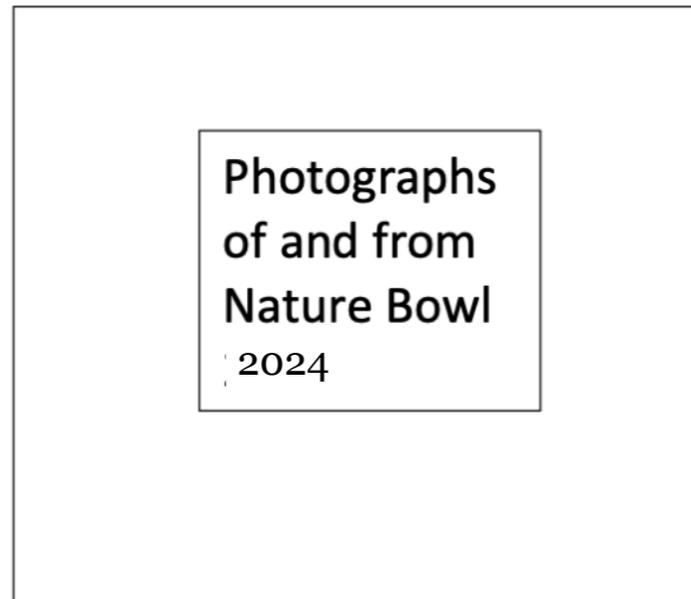
California Department of Fish and Wildlife

Release of Rights to Intellectual Property and Conditions of Use

Date: _____

I certify that my child may be photographed during Nature Bowl 2024 and I grant the California Department of Fish and Wildlife (CDFW) permission to use the images in digital and/or printed form for public information, education, and outreach, as needed.

Photographer/Videographer Credit: Nature Bowl Staff, Coaches, Parents and Volunteers



Metadata (photo/video File Info)

Date Taken Spring, 2024

Photographer: various

Description: | Nature Bowl, 2024

Copyright Status: © _____
 Public Domain Unknown

Signature _____

Name _____

Address _____

Phone(s) _____

E-mail _____

Date _____



Wildlife Viewing Tips:

- * Keep your pets at or inside home
- * Sit down somewhere comfortable
- * Avoid making too much noise
- * Try to blend into your surroundings
- * Be patient and respectful
- * Use all your senses to listen and look for wildlife
- * Stay a safe distance from and do not approach wildlife
- * Avoid sensitive habitats, such as nests and dens
- * Use binoculars and field guides
- * Wildlife is most active at dawn and dusk
- * Find edges of different habitats, or ecotones, where wildlife is most plentiful
- * Don't forget to notice the micro-world of insects
- * Enjoy yourself and be happy!

KAHOOTS GAMES

3rd/4th Game 1:

<https://create.kahoot.it/share/cdfw-nature-bowl-3rd-4th-game-1/9d832653-879c-4545-baea-aa16cf365451>

3rd/4th Game 2:

<https://create.kahoot.it/share/cdfw-nature-bowl-3-4th-game-2/747811fa-bf34-4a1a-846e-edb3322ab8ca>

3rd/4th Game 3:

<https://create.kahoot.it/share/cdfw-nature-bowl-3rd-4th-game-3/2aa935b4-e2bc-4b5d-ad80-dec5374cfbe2>

3rd/4th Game 4:

<https://create.kahoot.it/share/cdfw-nature-bowl-3rd-4th-game-4/ecb9ea77-5ff4-4285-9af3-b3468822750c>

5th/6th Game 1:

<https://create.kahoot.it/share/cdfw-nature-bowl-4th-5th-game-1/ado2387f-f907-4bb7-865b-266bb5f64b63>

5th/6th Game 2:

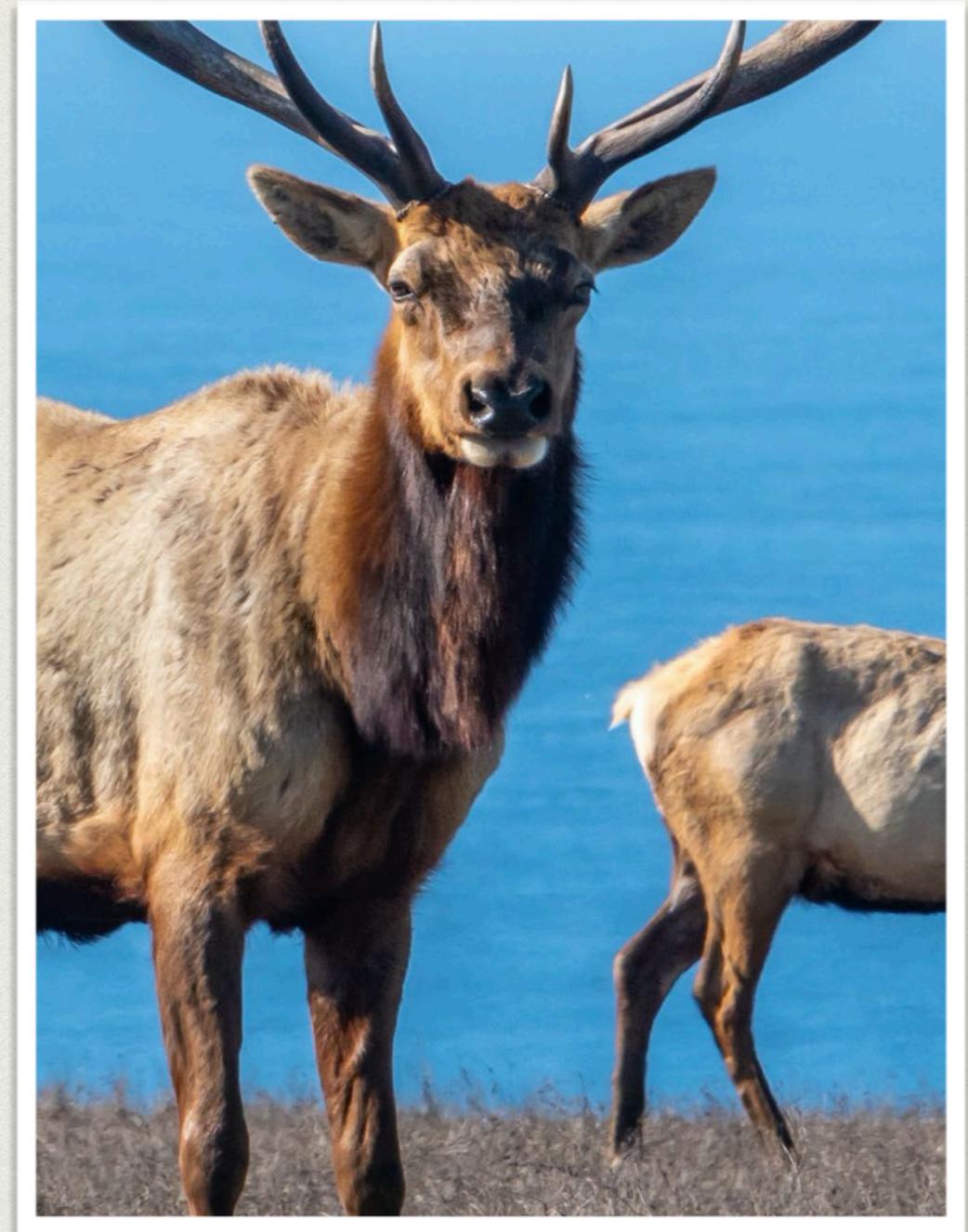
<https://create.kahoot.it/share/cdfw-nature-bowl-5th-6th-game-2/e78a9aa8-4947-4be8-830a-1578acfd03ao>

5th/6th Game 3:

<https://create.kahoot.it/share/cdfw-nature-bowl-4th-5th-game-3/587117be-03c6-440f-9b10-b6583454ee07>

5th/6th Game 4:

<https://create.kahoot.it/share/cdfw-nature-bowl-4th-5th-game-4/e9daof2b-fbfd-4534-8911-f733d60f8d39>



NATURE BOWL IN YOUR NEIGHBORHOOD

- Let's Look at Life
- Bird Talk
- We Are Here! Here We Are!
- Nature Relay Match Up
- Count Them Up

Link at [https://wildlife.ca.gov/
Regions/2/Nature-Bowl](https://wildlife.ca.gov/Regions/2/Nature-Bowl)



NATURE BOWL GLOSSARY

Abiotic: Not alive, or not derived from living organisms.

Adapted: Living organisms change over time to become best suited, or adapted, to their environment. These adaptations can be **structural, behavioral, or physiological.**

Agriculture: Human practices of raising crops and/or livestock mainly for consumption by people or livestock. Many types of agricultural practices also provide habitat for wildlife, especially in areas where native habitats are missing.

Amphibian: Cold-blooded vertebrates. Adults breathe air with lungs and through moist skin and live on land and in water.

Anadromous: Certain aquatic species, such as salmon and steelhead trout, that live in, and can breathe, both freshwater and saltwater

Aquatic: Growing, living in and/or associated with water.

Biodegradable: Materials that can decompose, or decay.

Bird: A warm-blooded vertebrate covered with feathers and having wings.

Biodiversity: The variety and abundance of different species of plants and animals. (Biological diversity)

Biology: The scientific study of life.

Biotic: Of, relating to life and/or by living organisms.

Biotic Zone: Specific location of a specific community, or ecosystem, of inter-related life forms. Also called **Floralistic Province.** California has the most of any state.

Botany: The scientific study of plants.

Camouflage: An adaptation that enhances chances of survival for both predators and prey by allowing wildlife and plants to blend stealthy in their environment.

Carnivore: A meat eating wild animal.

Carrion: The body and flesh of a dead animal.

Carrying capacity: The maximum number of plants and animals that can be supported by a habitat or environment. The healthier the habitat, the higher number of species it can support. Healthy habitats occur when native plants and animals have all the food, water, shelter, and space they need to survive.



Central Valley: Also called the Great Central Valley, it is the second largest valley on earth! Its low elevation between mountain ranges serves as the major drainage for most of California's rivers. This landscape includes a mosaic of native habitats as well as agriculture.

Chaparral: An unusual foothill habitat, or biotic zone, of the Sierra Nevada and Coastal Range. Mostly covered by scrub of entangled evergreen bushes and few trees. With long dry summers and wet winters, plants here are adapted to fire and drought.

Climate Change: Refers to any significant change or pattern of change in the measures of Earth's climate. Climate includes temperature, precipitation, wind patterns, among others. The leading cause of climate change is the increased release of greenhouse gases, or **carbon dioxide**, in the Earth's atmosphere by the burning fossil fuels.

Colony: Individual organisms of the same species living or breeding closely together usually for the benefit of all, such as for a stronger defense.

Competition: The struggle between two or more plant or animal species for a common resource. Plants compete for sunlight, while animals compete for food.

Coniferous: Evergreen trees bearing cones full of seeds to reproduce.

Conservation: The responsible stewardship of lands to protect, preserve and enhance natural ecosystems—while at the same time considering human needs and impacts. Land can be conserved yet still allow a careful amount of managed public uses, like hunting, fishing, hiking and/or livestock grazing.

Consumers: Organisms that eat other organisms to get their energy. There are three types: Primary (herbivores), Secondary (omnivores) and Tertiary (carnivores).

Consumption: The using up of a natural resource, or the amount of resource used up.

Deciduous: Plants that shed their leaves and go dormant to survive extreme weather conditions.

Decomposition: The breaking down of dead organisms, so they can be used by plants.

Decomposers are those invertebrates that help with this process.

Delta: An area where rivers meet and join. In California, the Sacramento-San Joaquin Delta is where the Sacramento and San Joaquin rivers meet to eventually drain into the Pacific Ocean through San Francisco Bay. This region hosts a mix of permanent habitats: riparian, marsh, river, agriculture and estuary, as well as several towns.

Desert: A geographical area of land with low precipitation, poor soil and adapted flora and fauna. In California, we have three types of desert: Mohave, Sonora and high desert.

Development: When wild natural land is permanently converted to urban or agricultural land.

Diurnal: A wildlife species active during the day.

Domestic: Wild animals (and plants) tamed and bred over time for human use. They are now dependent on humans for survival.

Ecosystem: A biological community of interacting, interdependent organisms and their physical environment.

Ecotone: The edge, or transitional zone, between two habitat types. Ecotones are highly frequented by wildlife.

Endangered: A species of plant or animal in immediate danger of extinction throughout all, or a significant portion of, its current range. Other at-risk classifications are **Threatened** and **Species of Concern**.

Endemic: A plant or wild animal occurring only in a certain geographic location on Earth.

Energy: The matter that drives all life processes, and the capacity of all life forms. Animals make energy from food and water. Plants use photosynthesis and root systems. Energy in the form of heat and electricity is created from power sources like solar, wind, biomass, hydro, geothermal and by burning fossil fuels, like coal. Energy sources are either **renewable** or **nonrenewable**.

Environment: The air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time.

Erosion: The wearing away of soil or rock by water, wind or other natural and unnatural forces or processes.

Estuary: The calm, marshy bays where rivers flow into the sea. An essential and rich habitat for fish and wildlife. Here there is a mixing of saltwater and freshwater, called **brackish**. In California, estuary water is more salty than fresh due to limited outflow.

Evergreen: Plants that do not lose their leaves annually.

Exoskeleton: Any hard, external supporting body structure of an invertebrate.

Extinction: The condition of having been removed from existence. An animal or plant is extinct when it has vanished permanently from Earth.

Fauna: Animal life.

Feral: Refers to a domesticated animal or plant that escapes, or is released, into the wild. These domesticated animals try to survive but often do not survive long.

Fertilizer: A chemical or natural substance added to soil to improve its quality for plants' growth and yield. Natural fertilizers are made from composted manures and plants, from dying animals like salmon and/or extracted from minerals in the earth.

Flora: Plant life.

Food Web: The transfer of food energy among plants and animals in an interconnected web-like manner.

Foothills: The lower hills of a mountain range, usually under 2000' elevation. Habitats include oak and pine woodland, grassland, savannah, riparian, and chaparral.

Fossil Fuel: Fuel such as coal, oil or natural gas formed in the earth millions of years ago from plant and animal remains. Non-renewable energy resource.

Fungus: A plant-like organism, such as a mushroom, that gets energy and matter primarily from other dead organisms.

Game species: The legal designation for animals managed and hunted under the regulation of a government agency.

Generalist: A species that lives in, and can adapt to, many types of habitats. (Examples: American crow, coyote)

Geography: The study of the physical features of earth and its atmosphere, and of human activity there on.

Geology: The study of earth's physical structure and substance, its history and processes.

Grassland: A large open habitat covered with grasses and forbs. No trees. Can be flat or rolling.

Groundwater: Freshwater held underground in the soil, or in pores and crevices of rock. Humans pump it out by wells to supply water. Natural springs bring up and hold freshwater on the surface. Geological formations called **aquifers** also hold and contain groundwater.

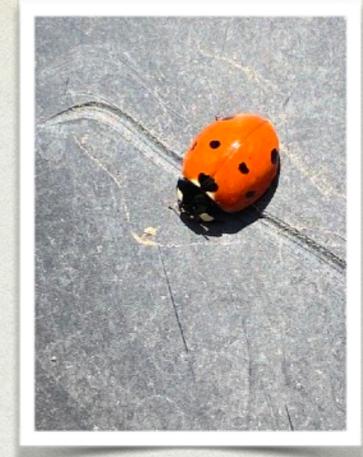
Habitat: A defined place, or type of place, where an organism lives. Meets plants and wildlife essential needs by providing suitable **food, water, shelter, and space.**

Harvest: The process of catching and killing fish and wildlife for human food.

Hatchery: A facility that raises fish, usually from eggs.

Hazardous Waste: A waste product that's potentially dangerous or harmful to human health, wildlife and/or the environment. **Toxic wastes** are harmful or fatal when ingested or absorbed.

Hazard (Wildlife)—Any item or obstacle that can injure or kill wildlife through physical contact, or through absorption and ingestion. An example is power lines.



Herbicide: A toxic chemical substance used to kill plants.

Herbivore: A plant-eating wild animal.

Hibernation: The act of passing the winter (or a portion of it) in a deep sleep or resting state. A physiological adaptation for survival.

Hydroelectric (Hydro): Electric power converted from water flows. Dams generate hydroelectric power.

Inorganic: Not composed of organic, or living, matter.

Insect: A small invertebrate animal.

Invasive species: An introduced, non-native plant or animal whose population growth threatens to cause harm to native plant and animal populations, the environment, the economy and/or human health.

Invertebrate: An animal with no true backbone.

Lichen: A simple, slow growing plant-like organism made up of an alga and a fungus that grow in **symbiotic** association on a solid surface.

Lifecycle: A series of growth stages in the lifespan of every living organism.

Mammal: A warm-blooded vertebrate animal with hair or fur, has live birth, and milk for young. **Marine:** Of, or relating to, the sea or ocean.

Marsh: A permanent freshwater wetland with few trees and many aquatic plants, like tule.

Metamorphosis: A series of changes in shape and function that certain wildlife go through: egg, larva, pupa, adult. Caterpillars become butterflies; tadpoles become frogs.

Microhabitat: A smaller habitat within a larger one, in which environmental conditions differ from those in the larger one.

Microorganism: A very small life form that can be seen by humans only with the aid of a microscope.

Migration: The seasonal journey of groups of wildlife from one region to another--for food, water, shelter, space, or for breeding. Most of California's migrating birds travel up and down the

Pacific Flyway, a continental highway in the sky for birds. Other species seasonally travel up and down the mountains to different elevations, called **altitudinal migration.** Some fish migrate back to their native rivers and streams to **spawn,** or breed.

Native: Refers to wildlife and plants that naturally occur in an area. Native species are fully adapted to their environment.

Natural Resource: An area appreciated for its beauty and recreational value, like a river, lake, or mountain. Also used to describe materials, such as water, gold, energy, wildlife, and topsoil--that humans use from our natural systems.

Niche: The exact ecological role of an organism within a community of organisms. Each species is adapted to a specific niche, so that there is no direct competition with other species within the same habitat.

Nocturnal: Wild animals active during the night.

Non-native: A species originally from somewhere else, but now resides in California. Many non-native species are invasive and harmful to native species.

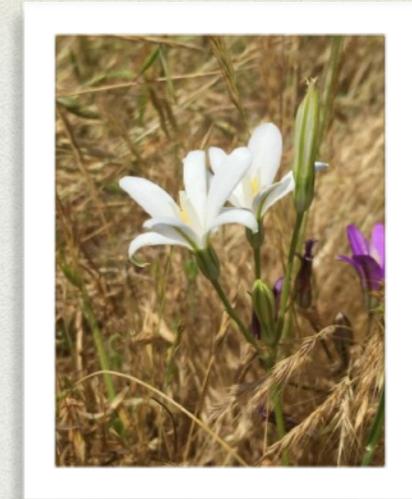
Omnivore: A wild animal with a varied diet of both plants and animals.

Organic: Composed of matter from plants and/or animals.

Organism: A living thing, such as a plant, animal or other life form that can grow and reproduce.

Parasite: An organism which feeds upon the tissues or fluids of another animal, or host. It is harmful to the host, but generally does not kill host, as that would destroy its food supply.

Pesticide: A chemical agent used to kill any organism people do not want around--insects and rodents, for example. Toxic to pests and to the environment.



Photosynthesis: The amazing process by which green plants make simple sugars, or food, in the presence of sunlight, water and carbon dioxide. Plants are the only organisms directly utilizing the energy of the sun to make their own food.

Plant: A tree, vine, shrub, or herb that uses the energy of the sun to make their food, called photosynthesis.

Poaching: The act of unlawfully and recklessly killing wildlife and/or destroying nature. **Poacher** is the person breaking the law by not being in compliance with state hunting, fishing and/or ecological regulations.

Pollination: The transfer of pollen within a flower, or between flowers. This fertilizes the flower, necessary to make a seed. Pollen is carried by wind, water, insects, hummingbirds, and bats.

Pollution: Harmful substances deposited on the landscape, leading to a state of dirtiness, impurity, unhealthiness, hazards and/or toxins.

Population Density: The actual, or estimated, number of a particular type of organism living in a defined area.

Predator: An animal that seeks, kills and eats other animals. The act of seeking and killing live prey is predation. Prey: Wild animals killed and eaten by other wild animals.

Preservation: When nature is protected and maintained in its original natural form. Its natural resources and processes are not interrupted. Any public use is passive.

Producers: Green plants that make their own food using the sun's energy and photosynthesis.

Product: Something made from natural resources. Can be renewable or nonrenewable.

Raptor: A bird of prey with sharp bills and talons. Adapted for hunting and/or scavenging prey animals.

Recycle: The process of transforming waste materials back to products suitable for reuse.

Refuge: An area of land, or of land and water, set aside to preserve and protect native plant and wildlife species, both common and rare.

Reptile: A cold-blooded, air-breathing vertebrate with scales or bony plates covering the skin and true claws on the toes. Reproduces by laying soft-shelled, leathery eggs.

Renewable Resource: A plant, animal, or substance that can renew and sustain itself over time, like trees and soil.

Reproduction: The process by which plants or animals create offspring, or new organisms of themselves.

Restoration: The process of returning an area to its historic natural condition, using native plants and habitats to attract and hold native wildlife.

Riparian: Of, pertaining to, along, or associated with freshwater rivers and streams.

Runoff: Waterflow, from rain or snow, that is draining on the surface of the land.

Savanna: A habitat with widely spaced mature trees, usually adjacent to grassland. Prized by nesting raptors and all sorts of wildlife.

Scat: Scientific word for feces, or poop.

Scavenger: An animal that sustains itself by eating dead organisms or stealing caught prey from others. Most carnivores and omnivores are opportunist scavengers, while turkey vultures are full-time scavengers.

Scrub: Midsized bushes and trees. Also, the middle layer of riparian habitat. Highly valuable to birds and wildlife.

Science: The fact-based approach to discovering, and figuring out, what things are--on earth and in the universe--and how they work.

Scientific Method: The systematic procedure by which scientists observe, measure, experiment, formulate, test, modify and validate their discoveries.

Sierra Nevada Mountains: The big granite mountain range in northern and central California. The range boasts many habitat types, changing as elevation and precipitation rises.

Silt: The dirty sediment that suspends in stagnant water, and/or is carried in moving water. Too much is harmful to aquatic life.

Solar: Of, or related to, the sun.

Specialist: A species that can only survive in the certain habitats it has already adapted to. (Examples: sandhill crane, western meadowlark)

Stewardship: The job of taking care of a natural place, responsibly.

Terrestrial: Of, or referring to, living or growing on dry land.

Territory: The certain geographical area belonging to, and defended by, an animal or a group of animals against others of the same sex or species.

Vernal Pool: A rare seasonal wetland habitat occurring on grassland, where an impenetrable layer of soil ponds rainwater in winter and spring. Highly adapted plant and animal species live here.

Vertebrate: An animal with a backbone.

Water: The liquid that descends from clouds and forms rivers, streams, lakes, and seas. Essential to life and to all living things.

Water cycle: Earth's continuous circulation of water from oceans to air to land and back to oceans. The cycle involves **condensation, evaporation, run-off, precipitation,** and **transpiration.**

Waterbirds: Bird species that frequent lakes, rivers, oceans and other wetlands to feed, roost, and breed.

Weathering: The process by which weather breaks down rocks into smaller and smaller pieces that stay in the same location.

Wetland: Areas that are flooded or saturated by surface water for a sufficient time. Supports vegetation adapted for life in wet soil conditions. Wetlands generally include marshes, vernal pools, rivers, streams, and similar areas.

Wildlife: Animals and other life forms that are not tamed or domesticated by humans and are fully adapted for life in the wild.

Woodland: A multi-layered habitat of closed canopy trees, shrub, vines, and grasses. Supports a complex community of plants and animals. Also called **forest.**

