

TaHome Nature Education: Native and Invasive Species



Grades 3-5

Reading: Frogs, Birds, Moths, and More

Have you ever wondered what Tahoe was like 400 years ago? You may be surprised to learn that back then many of the animals and some plants found at Tahoe today were not here before European settlers started moving to the area, about 200 years ago. The animals that were around back then, such as American Black Bears, Mountain Chickadees, and Sierran Chorus Frogs are animals that are **native species** to Tahoe. There were also many native plant species at Tahoe, such as Sugar Pine trees, Quaking Aspen trees, Snowplant, and native flowers.

Since European settlers first came to the western United States and Tahoe, many other animals and plants have showed up in the area, and new species continue to arrive. Species that are native to other places, but brought to Tahoe because of human actions are called **introduced species**. Non-native species brought to a new area usually lack the predators and diseases that help control their populations in their native lands. If those species aggressively outcompete native plants and animals in the new area, they are called **invasive species**.



White Satin Moth Caterpillar



White Satin Moth



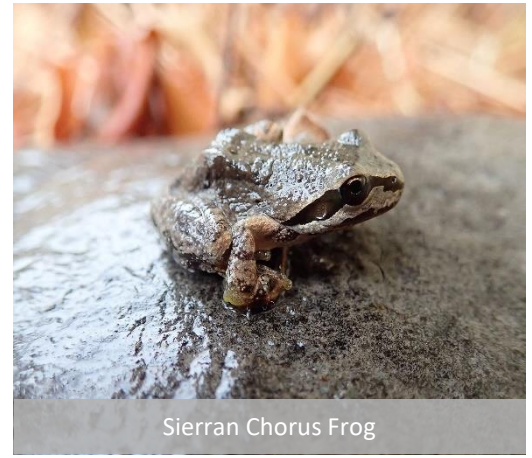
Young Dusky Flycatchers in aspen leaves

White Satin Moths first arrived at Lake Tahoe around 2012, originally from Europe and Asia. They lay eggs in many of the few stands of native Quaking Aspen trees around Tahoe. Once those eggs hatch, the caterpillars feast on aspen leaves. This causes problems for native bird species who nest in the aspen trees, including American Robins, Warbling Vireos, Dusky Flycatchers, and Western Wood-Peewees. As their leaf cover gets eaten by invasive caterpillars, the nests, bird eggs, and baby birds become exposed and suddenly are easier for predators to find. In TINS' research, wherever these moths have eaten the leaves, the nests of these birds are more likely to be destroyed before the baby birds can successfully grow old enough to leave the nest. This causes several problems. First, the native bird populations can become very low. Also, because their predators, such as jays and squirrels, can find food more easily, more predators will be born and eat even more eggs and baby birds.



American Robin

American Bullfrogs are another invasive species at Tahoe. These large frogs are native to the eastern United States, but have been introduced further west, in California and other states west of the Rocky Mountains. A species can be introduced to a new area on purpose or by accident. Many of Tahoe's invasive species were brought here intentionally: non-native trout and Kokanee Salmon were purposely brought to Tahoe for fishermen to have more species to catch and American Bullfrogs and Signal Crayfish were brought to Tahoe for food. Both intentional and unintentional introduced species can be harmful to native species. American Bullfrogs will eat anything they can get their mouths around, including rodents, birds, snakes, salamanders, and native Sierran Chorus Frogs. The many introduced species of fish in Lake Tahoe eat and outcompete native fish, like the Lahontan Cutthroat Trout.



Sierran Chorus Frog



Signal Crayfish

It is hard to know how a small mistake of introducing just a few new species will affect a whole ecosystem. Crayfish have been released into the Lake Tahoe watershed at least four times, starting when 50 were first put into Marlette Lake in 1895. Today, there are an estimated 300 million crayfish who have made their way all over the watershed, including Lake Tahoe, the Truckee River, and our many creeks. The full impact of crayfish on Tahoe's environment is unknown, but they are a major food resource for invasive warmwater fish species such as largemouth bass and bluegill. Leeches were likely left at Spooner Lake by fishermen using them for bait. Because of that small decision, the lake is now so infested with leeches that you would not want to swim there.

We also have lost some of the native species that once lived here. For example, California Grizzly Bears once lived in the Sierra Nevada mountains. However, when settlers began moving to our area they brought livestock such as cattle and sheep.

Settlers started hunting and killing thousands of grizzlies either for sport or because they were eating their livestock animals. That hunting resulted in these bears being **extirpated** from Tahoe, meaning that although they may live in other habitats, there are none left locally. Grizzly Bears haven't been spotted in California since 1924, nearly 100 years ago. Other native species extirpated from Tahoe include Sierra Nevada Red Fox, Bighorn Sheep, Canyon Mouse, and Heather Voles.

Sometimes animals move into an area all on their own. This usually happens slowly over time as the climate of an area changes, and as a result the habitat may start to change. A changing habitat welcomes new species that were not there before. At Tahoe, our climate is becoming warmer and drier over time. As a result, plants and animals from warm, dry places surrounding us, like Reno, may start to move into Tahoe. Currently, Canyon Live Oak trees at Tahoe are found only near the lake's shoreline, but they are likely to increase in the coming decades. Rattlesnakes are one example of an animal that was unknown from the Tahoe basin, but has recently moved into the area in small numbers. Wolves living north of the Sierra Nevada, in the Cascade mountains, also have been spotted moving further south toward Tahoe in recent years. Bufflehead, a species of small duck, also came to Tahoe from the north, only breeding here for the last 20 years.

Whether these animals are driven to Tahoe by natural forces or by humans, new species to an area will always have some effect on life for native plants and animals.

Activities for Grades 3-5

Resource Race

In this game, you will either be a native Sierran Chorus Frog, or an invasive American Bullfrog. Both of these animals need certain resources to survive in Tahoe, including a habitat, food, and space to raise their young. Play this game in three rounds with a group of six or more people.

To play, you will need paper of three different colors, green, yellow, and red, that have been cut into hand-sized pieces. In this game, different colors represent different resources needed by both frog species. The green pieces represent habitat, the yellow pieces represent food, and the red pieces represent space to raise young. You should have about ten pieces of each color (if you have more than ten players you will need a couple more pieces than players in each color).

Next, establish the area where you will play the game. The area should have open space to run in, but also spot to serve as “base”, such as a tree, fence, or side of the building. Scatter all of the pieces of colored papers you have cut in the play area.

In the first round, every player is a native Sierran Chorus Frog. When the round starts, everyone must race to collect as many of the “resources” (pieces of scattered paper) as possible. Try to get at least one of each of the colors of paper, to make sure you have all of the resources you need to survive. Everyone who has all three colors of paper wins that round.

Re-scatter the resources for Round Two. In the second round, choose two players to be American Bullfrogs. Other players are still Sierran Chorus Frogs. American Bullfrogs will try to gather the same resources as the Sierran Chorus Frogs. However, American Bullfrogs can also “eat” the Sierran Chorus Frogs by tagging them. If these native frogs are tagged by the invasive frogs, they must give up all their collected resources to the American Bullfrog. The only place Sierran Chorus Frogs are safe from being eaten is on base. Play the round with both frog species for 60 seconds. Once again, everyone who has all three colors of paper at the end of the round wins.

Re-scatter the resources. In the final round, more American Bullfrogs are introduced. This time, half of all players will be American Bullfrogs, and half will be Sierran Chorus Frogs. Everyone has 2 minutes to try and collect the resources they need. Sierran Chorus Frogs must try to do this without being eaten (tagged) by the American Bullfrogs. Everyone who has all three colors of paper at the end of the round wins.

After playing all three rounds, discuss what happened in the game:

- How many Sierran Chorus Frogs won in the first round? Did it take them very long to win?
- How many Sierran Chorus Frogs won in the second round and how many American Bullfrogs? Was this round longer or shorter than the first round? Why do you think so?
- How many Sierran Chorus Frogs won in the third round and how many American Bullfrogs? What was difficult about this round when compared with the first and second rounds?
- Did either of these animals have an advantage in the game? What was the advantage?



20 Questions

Review the invasive animals in the above reading, including American Bullfrog, White Satin Moth, Crayfish, Kokanee Salmon, and other fish. With a partner, individually choose which of these invasive animals you would like to be for the game. It may help to spend some time researching in books or online more information on your chosen animal, such their habitat or diet. Be sure not to tell which animal you have chosen, or give away hints.



Going back and forth, take turns asking each other questions about which animals they are. You may not ask “Are you an American Bullfrog?”, but you could ask “Are you an amphibian?” or “Are you smaller than a cat?” Keep track of how many questions you have asked your partner. Whoever can correctly guess which invasive animal the other person is in the fewest questions wins the round.

Next, play another round of this game with native animals. Review the native animals in the reading, including the Sierran Chorus Frog, Lahontan Cutthroat Trout, and the bird species who nest in aspen. Choose which of these native species you will be and try to guess which species your partner is using questions about the type of animal it is, its size, letters in its name, its habitat, or other things you might know about your chosen creature.

Bonus Round: Choose either an invasive OR native animal from the reading. Play charades by taking turns acting out your chosen animal for a group of people. The first person to guess which animal you are acting out get to act out their animal next.



Native Species Observations

One of the best ways to learn more about the native animals of Tahoe is to observe them in their own habitat. Visit some of these spots for a chance to find the native species listed below. At each spot, bring a journal and writing materials to make a note page about what you observe. These notes might include:

- Your location and the date
- What the weather is like
- Which senses you observe a native animal with
- What tools you are using, such as binoculars
- A drawing of the habitat and native animal you are searching for

Sierran Chorus Frogs: Search for these amphibians in the spring and summer in rock crevices, under bark in burrows, or in the meadows and plants growing along a stream, such as in Tahoe Meadows. Frogs are often out at dusk. Be sure not to touch them with hands covered in sweat, sunscreen, or soap.

Native Birds: Search for these animals during the spring and summer in aspen groves, especially large ones, like around Marlette Lake. Be sure not to disturb these birds around their nests. Watch from a distance instead. Birds are easiest to find early in the morning.



Words to Know

Native Species: animals or plants that live or grow naturally in a region

Invasive Species: animals or plants that are not native and harmful to a region

Introduced: an animal that has been accidentally or deliberately transported to the new location by human activity

Extirpated: when a species no longer exists in a particular area, but still exists elsewhere

Palabras para conocer

Especies nativas

Especies invasoras

Especies exóticas invasoras

Especies extirpada

Further Learning

Read more about aquatic invasive species [here](#).

[Watch](#) this TED video on invasive species.

Many endangered animals are threatened because of the negative effects of invasive animals. Learn about some of the world's most endangered species in this [digital exhibit](#).

