



## USING CONSERVATION PLANNING TO CREATE THE PERFECT HOME FOR DUCKS

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### YOUNG REVIEWERS



SCUOLA  
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AGES: 11–12

Did you know that many birds use the San Francisco Estuary like a hotel, to rest during their long migrations? The Estuary is a major stopover on the Pacific Flyway—a huge path for migrating birds that runs from South America to the Arctic Circle! Tons of waterfowl (ducks, geese, and shorebirds) make this journey every year. On this long, harsh journey, birds need to find food and safe places to rest. In the U.S., many groups work together to manage habitat to help these birds have a successful journey. Surprisingly, each species of bird has different needs, so managers must make plans for the whole landscape to take care of them all! In this article, we will explore the concept of conservation planning for waterfowl using the San Francisco Estuary, with special focus on the unique needs of mallards, canvasbacks, and surf scoters.

## CONSERVATION

Care and protection of plants, animals, and the environments in which they live.

## SPECIES

A group of living things that share the same name and can reproduce with each other.

## HABITAT

The home of an animal, which provides the animal with everything it needs to live: food, water, and a place to rest/sleep.

## BIOLOGIST

Someone who studies living things like plants, animals, or bacteria.

## WHAT IS CONSERVATION AND WHY IS IT IMPORTANT?

**Conservation** is the care and protection of nature and wildlife. The goal of conservation is to ensure a healthy environment for all living things, far into the future. You may have already heard of conservation of endangered **species** like polar bears, sea turtles, and tigers. We also conserve animals to ensure that they never *become* endangered. We can protect animals, for example by putting cages around sea turtle nests to prevent other animals from eating the eggs. Other times, conservation requires protecting **habitat**. Habitat is the place an animal gets food, water, and shelter.

Humans conserve things for three main reasons. The first reason is that we believe that what we are conserving is valuable and deserves to exist. We want polar bears to exist because we think their lives have value, even though many of us will never see them in the wild. Second, we might want to conserve something that provides us with a service. For example, we can protect the wetlands near the ocean because they can prevent floods as sea levels rise. Third, humans protect things because they can use them. For example, we conserve national parks like the Florida Everglades so we can visit and enjoy them.

Conservation is complex, so it requires detailed planning. There are many possible solutions to a single conservation problem. For example, to conserve polar bears, we need to conserve their habitat, so they have a place to live. We also need to conserve the seals they eat, and the fish that seals eat! Conservation involves many steps and many decisions must be made along the way. Planning helps conservation **biologists** use as much information as possible to make decisions [1]. When we protect animals over large areas, it is easy to make a mistake. Planning helps us avoid those mistakes.

## WHICH ANIMALS SHOULD WE CONSERVE IN THE SAN FRANCISCO ESTUARY?

The San Francisco Estuary and surrounding wetlands are filled with unique wildlife and their habitats. Some animals, like the salt marsh harvest mouse, live only in the Estuary and nowhere else in the world. Others, like ducks and geese, use the Estuary like a hotel during their long migration journeys. In fact, the Estuary is a major stopover on the Pacific Flyway—a huge migratory path that runs from South America to the Arctic Circle! Millions of ducks, geese, and shorebirds make this journey every year. On this long and harsh journey, birds need to find food and safe places to rest. Biologists work together to give these birds what they need for a successful journey [2].

Mallards, canvasbacks, and surf scoters are three types of ducks that use the Estuary and the connected rivers and wetlands. Conservation planning can ensure that each species of duck gets enough food to

survive their long migrations. We will use these three species as our example of how to do conservation planning.

## WHAT DO THE DUCKS NEED?

It might be obvious to you that ducks and other animals, like turtles, eat different things. But did you know that different kinds of ducks eat different things (Figure 1)? We will focus on *winter* foods and habitat. When using the San Francisco Estuary as a winter migration stop, ducks focus on building energy to continue their journeys [3]. To get enough energy, mallards hunt for seeds in shallow wetlands by dabbling, or “tipping up” with their tails in the air, to reach seeds on the bottom. Canvasbacks stuff themselves with plant parts like stems and seeds, by diving in deep water. Lastly, surf scoters dive in the ocean for crabs, mussels, and fish eggs.

**Figure 1**

Mallards, canvasbacks, and surf scoters prefer different habitats and different kinds of food.

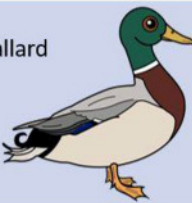
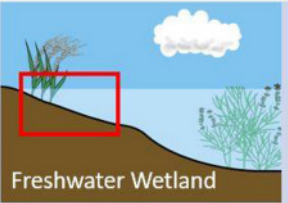



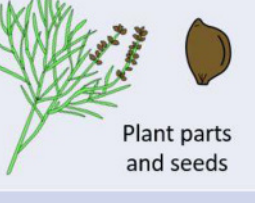
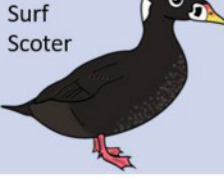

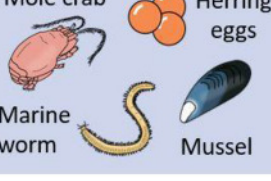
This duck...	hunts for food here...	...and eats this.
 <p>Mallard</p>	 <p>Freshwater Wetland</p>	 <p>Rice Wheat</p>
 <p>Canvasback</p>	 <p>Freshwater Wetland</p>	 <p>Plant parts and seeds</p>
 <p>Surf Scoter</p>	 <p>Ocean Shore</p>	 <p>Mole crab Herring eggs Marine worm Mussel</p>

Figure 1

## HOW DO WE MAKE A CONSERVATION PLAN?

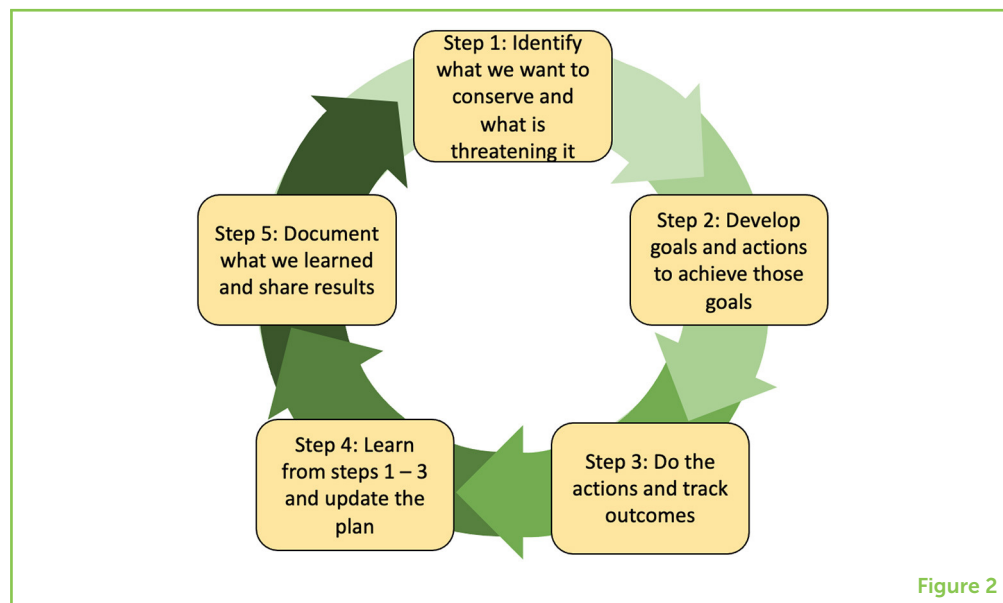
We can plan for all the complex needs of different species by using conservation planning tools. One tool is called the **Conservation Standards** [4]. This tool was created by scientists from many organizations. The Conservation Standards has a special vocabulary that conservation scientists can use even if they work in different areas with different species. There is also a special software designed to help scientists use the Conservation Standards and share their conservation plans with others. This tool has only five steps (Figure 2).

### CONSERVATION STANDARDS

Guidelines for conservation to help identify goals, develop and implement a plan, and share results.

## Figure 2

Summary of steps involved in conservation planning, adapted from the Conservation Standards.



## THREAT

Something that can cause harm, or the ability to cause something harmful.

## POPULATION

A group of animals of the same species that live in a certain place.

The first step in the Conservation Standards is to identify what we want to conserve and what is threatening it. In this step, it is important to clearly determine how **threats** are affecting the species we want to conserve. In our example, we want to conserve mallards, canvasbacks, and surf scoters that use the San Francisco Estuary and nearby wetlands. Remember that each duck eats different foods. One threat to each species is the loss of these foods. Mallards prefer seeds and some agricultural foods like rice and wheat. Their food is affected by which crops farmers grow in and near wetlands. Canvasbacks prefer plants like pondweed, which depend on the amount of water in a pond or wetland. Surf scoters love clams and mussels, which can be managed in protected marine areas.

The second step is to develop goals and actions we can take. Our goal is to have healthy **populations** of these three species. Many actions can accomplish that goal. We can work with wetland managers to ensure they grow the right foods at the right times, to provide food like rice and wheat for mallards. In California, water is precious. Wetland managers can control water depth in their wetlands. In Figure 1, you can see that canvasbacks dive in deep water to eat. To support canvasbacks, we can work with wetland managers to provide deeper water and lots of plants. To support surf scoters, we can protect the areas of the San Francisco Estuary that contain their favorite foods, like herring eggs. When boats use these areas too much, the birds avoid them and miss out on yummy food! These different actions benefit the needs of each species during winter in the Estuary.

The third step is the fun part! We get to do those actions. This part can take a lot of time. Sometimes people must work together to build new habitat, by sculpting the earth and planting the right plants. In this third step, we also create a plan to keep track of how well we are meeting

our goals. In our example, biologists would track changes in mallard, canvasback, and surf scoter population sizes.

The fourth step is to learn from the first three steps. In this step, we look back at our actions and check how well they helped us meet our goals. We also look for ways to improve, by coming up with ideas for new actions we could take.

The last step is to share what we learned. We can also think about other actions that might help grow or maintain the populations of these species. Then we can repeat all the other steps again! The steps take us in a big circle because each action is a chance to learn and improve. Also, by sharing what we learned about conservation in our area, we can help other scientists with their conservation projects!

This whole process could never be completed by one person! A major part of conservation planning is teamwork. In fact, solving conservation problems often requires several teams with different expertise, working together. This is like a soccer team: each member of the team has a different role. Only by working together can the team be successful. In the end, the more people helping, the better the outcome will be!

### IF YOU PLAN IT, THEY WILL COME: CONSERVATION PLANNING IN THE ESTUARY

Hopefully, you have learned that not all ducks need the same things to survive. Although they have similar needs, there are differences. A planned landscape can support more kinds of ducks, and larger numbers of them, too (Figure 3)! Conservation planning is beneficial to the three duck species we discussed—the mallard, canvasback, and surf scoter. The cool thing is, this tool is not only for ducks! It can be used for other species and habitats throughout the San Francisco Estuary.

#### Figure 3

(A) An unplanned landscape does not support very many ducks or very many types of species. (B) Conservation planning helps support greater numbers of animals and more types of species.

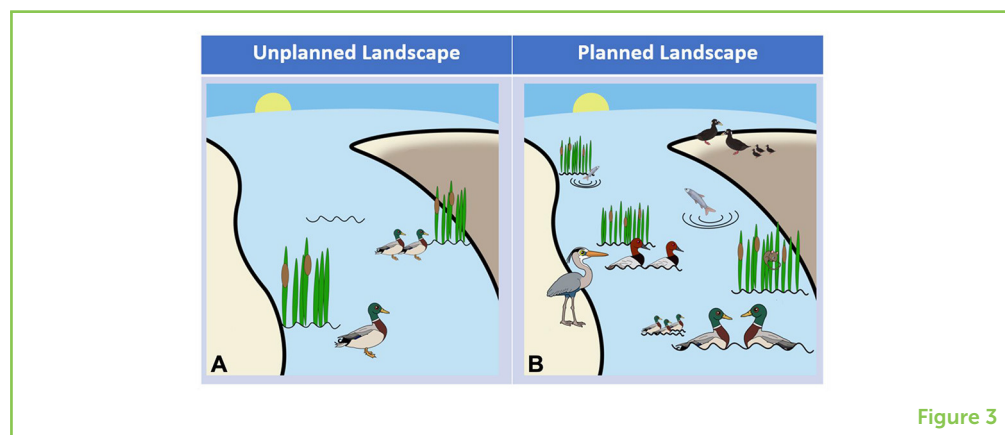


Figure 3

The San Francisco Estuary is a complex place. Many different teams are working on various projects to create a healthy environment. Conservation planning helps managers choose the best actions and test the success of those actions. Remember, people conserve things for various reasons. Conservation planning helps recognize different values and ensure that all needs are met. In the San Francisco Estuary, this method can be used to conserve habitats like tidal marshes, endangered species like the salt marsh harvest mouse, and migratory birds like the three ducks in our example! Conservation planning can help biologists make the best decisions as efficiently as possible. In the Estuary, conservation planning helps improve habitat and wildlife populations, and it can also help conserve species and habitats across the world!

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## YOUNG REVIEWERS

### SCUOLA EUROPEA DI VARESE, AGES: 11–12

These young, very international, and a little crazy scientists love to discover the world around them! They are a great team and managed to collaborate successfully on the manuscript.



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Keiko Mertz is a native Californian with a passion for the environment. She has a master's in environmental policy and management and is working to get her second master's in avian science at the University of California, Davis. She is passionate about making science accessible to everyone, and she is interested in the connection between policy and science. She believes conservation relies on our ability to collaborate, inspire, and communicate effectively. In her free time, she likes to read, do yoga, be outdoors, and express her creativity. \*kbmertz@ucdavis.edu

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