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Keystone Species Explorer Website

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Welcome Environmental Explorers!



Keystone Species
Explorer

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Keystone Species:

Some species have a bigger
impact than others...

.....

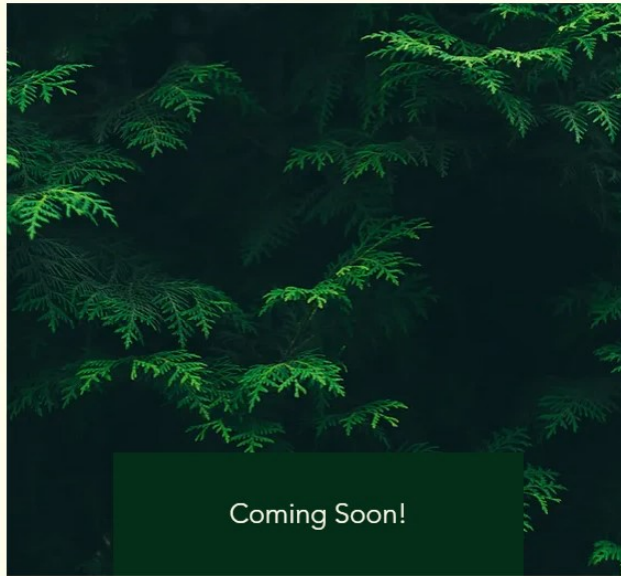
<https://keystonespeciesexp.wixsite.com/my-site/beavers>



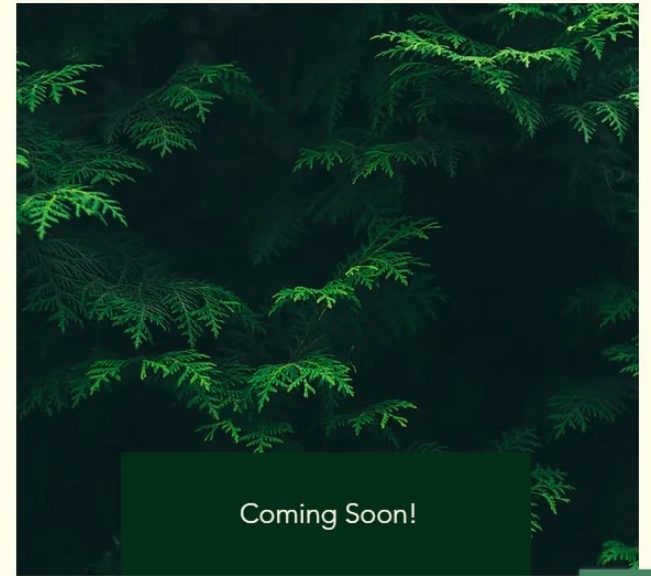
Species to Explore



The Beaver



Coming Soon!



Coming Soon!



The Key to our Ecosystems

A keystone species is a species that plays a critical role in maintaining the structure of an ecosystem. They are often the species that other organisms depend on for survival and without them, the whole ecosystem would collapse. Keystone species often have an outsized impact on their environment relative to their abundance. For example, some species of sea stars are known as keystone predators, as they keep populations of mussels and other organisms in check. By doing so, they create a balance in the ecosystem that allows other species to thrive. Environmental educators can use the concept of keystone species to teach students about the importance of biodiversity and the interconnectedness of all species.



The term "keystone species" was created by the zoologist Robert T. Paine. A keystone is a term for the wedge-shaped block at the top and center of a stone arch. Since ancient times, builders used the method of including a keystone to build their structures. With it, the way that the stones press against each other makes a sturdy arch without the need for cement between the stones. If the keystone is removed, the whole arch will lose its structure and collapse. The zoologist Paine made a comparison between the keystone and certain species in ecosystems, after seeing that the absence of some species led to the collapse of their ecosystem. One species can have such a large impact on its whole community because of how it interacts with all of the other creatures. A single type of plant or animal can be the

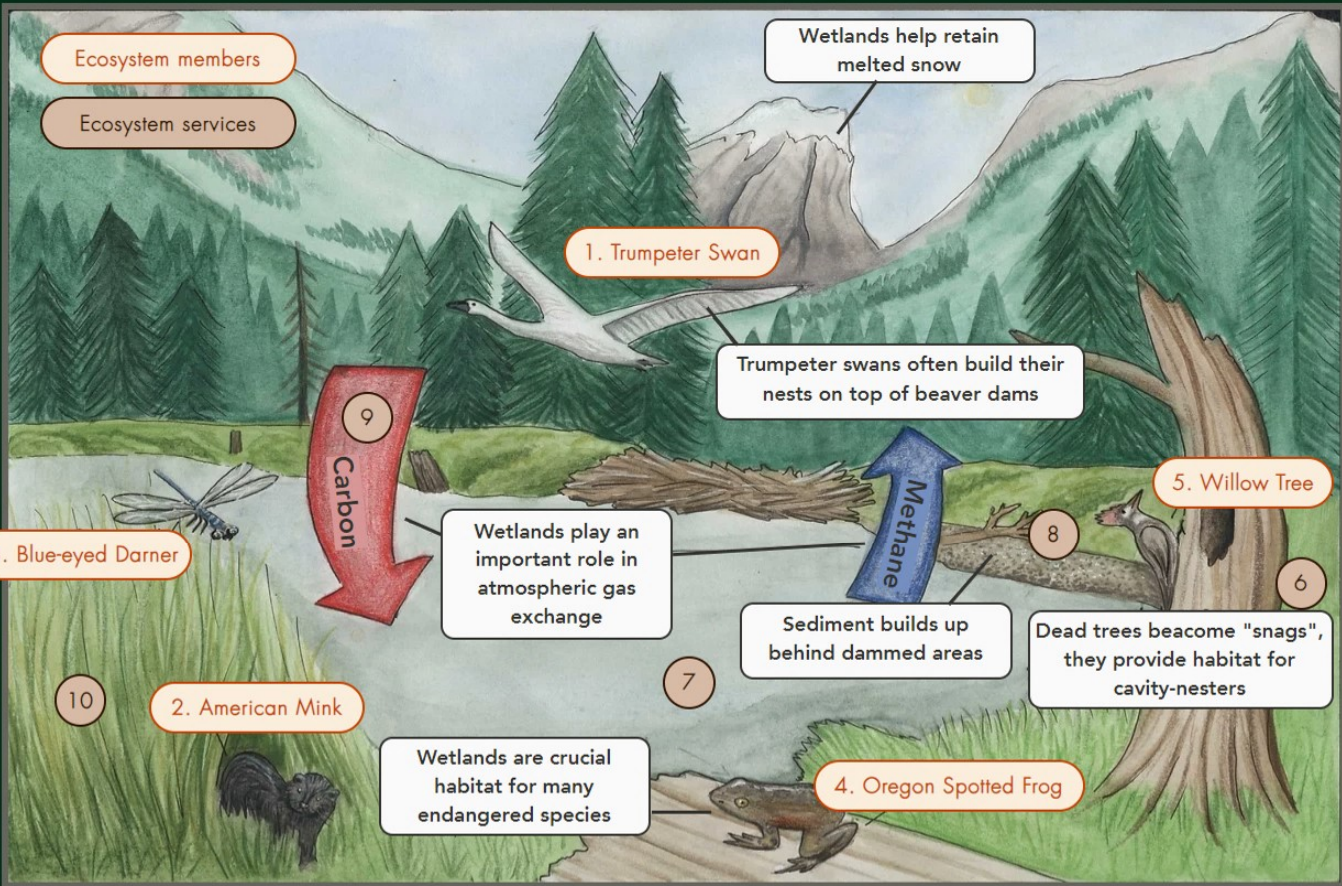




01 What is a beaver?

Beavers are a species of large rodent, related to animals like rats and the capybara. They have thick, waterproof fur. Only sea otter fur is denser than beaver fur, and the high quality of their fur led beavers to be heavily hunted. After European settlers came to North America, beavers were almost hunted





4. Amphibians

Amphibians are a group of animals that spend half of their lives underwater and half above the water. Uniquely, they are some of the only vertebrates capable of metamorphosis, where they completely change their body structure throughout their life to inhabit a different environment. Since they start their life in the water, it is essential for them to have water sources to survive. Even when they are adults, most amphibians need to keep their skin moist so they stay near water sources.



A green and spotted frog sits on top of a lily pad in a pond.

9. Carbon Storage

Carbon is a chemical element that is a part of every living thing. It is also a component in the gas carbon dioxide, which plays a large part in the global climate change we are currently experiencing. Plants transform carbon in carbon dioxide into tissue in their bodies. When plants decompose, the carbon is released back into the environment. In wetlands, decomposing plants often become buried in sediment. This traps the carbon and makes it less likely to leave the landscape as carbon dioxide gas. This process is also known as sequestering carbon, and is a possible solution to the excess amounts of the gas in the atmosphere.



Steep banks, high erosion,
little water access of and
water holding capability

Stream banks become less
steep with decreased water
speed and erosion

Plant colonization
of stream banks

Growth of diverse
plant community

1

2

3

4

Development of fertile
topsoil

TIME WITH
BEAVER
PRESENCE



A real-life example of river transformation

Susie Creek, a stream that runs through the northeastern corner of Nevada, has completed an amazing transformation in the last 30 years. Community members and members of the Bureau of Land Management became concerned that the stream was unhealthy around 1990. At this point, migrations of fish that had migrated through the stream were no longer seen, and the soil along the stream was hard and without much plant life. Drought, wildfires, and heavy cow grazing had damaged the stream.

How did they restore the stream?

Beavers and more sustainable grazing methods!

Ranchers used new strategies to graze their cows so that the plants trying to grow right along the river would not

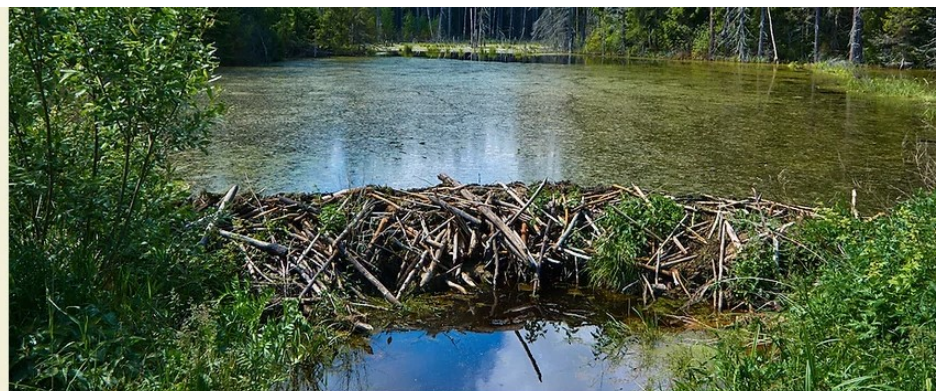




Beaver Deceivers

Photo credit: Beaver Deceivers LLC

Beavers living around important human structures can cause some issues. Beavers are great at plugging up water leaks, but this can be harmful if they end up living in areas that depend on water drainage for human safety. Beavers commonly will try to build dams in culverts-channels that direct water to drain in a specific way (often along or under roads). If these channels get blocked by dams, it can lead to flooding and damage to human structures, like roads and bridges. In recent years the great environmental importance of beavers has been better understood, so there is a desire to find ways to protect human structures while also letting beavers live on the land.



Climate Change Resilience

Photo credit: earth.com

In recent years our planet has been showing signs of a shift in climate from what historical records show. This global climate change has been noticed as causing hotter, drier, summers and more rainy and storm winters around the world. This means that many places have been at greater risk of suffering from drought or flooding. Amazingly, the way that beavers change the landscapes they live on can protect them from the dangers of both flooding and drought.

In many areas that experience drought, the soil is not healthy and cannot hold onto water well. It is important for many parts of the ecosystem that there is storage of water deep underground. When this



Vocabulary Glossary

If you have come across a word you don't know, no need to fear- it's all part of the exploration! Here is a glossary that provides definitions for some of the terms used on this site. Clicking on any underlined word on the site will bring you here to define it.

Most of the definitions have been drawn from the Merriam-Webster online student dictionary. [Click here to look up more definitions in their dictionary.](#)

Some definitions we wrote ourselves, these are marked with an asterisk (*)

Glossary

agriculture: the science or occupation of cultivating the soil, producing crops, and raising livestock

*amphibian: a cold-blooded vertebrate that lives part of its life in water and part on land

anecdote: a brief story about something interesting or funny in a person's life

aquatic: growing or living in or often found in water

*beaver dam analog: a human-made structure designed to act like a beaver dam

Biodiversity: the variety of life forms in an environment as indicated by numbers of different species of plants and

