2016

Engaging Students in Conservation: Beaver Restoration - Lesson Plan

Facing the Future, Western Washington University

TEACHER

Facing the Future

BEAVER RESTORATION
IN THE PACIFIC NORTHWEST

The North American beaver (*Castor canadensis*) is a social, mostly nocturnal mammal well adapted to survive in – and create – wetlands. Balanced with a broad, flat tail and powered by webbed hind feet, adult beavers can swim underwater for as long 15 minutes, staying warm with dense, dark brown fur coats that are waterproofed with secretions from special oil glands. Beavers are perhaps best known for their ever-growing, sharp incisors' capacity to fell entire trees. Though nourished by the thin cambium layer of living cells beneath the trees bark, beavers use most of the branches and stems (along with mud and many other materials) to construct lodges for dwelling and dams for expanding aquatic habitat.

Between the 16th and 19th centuries, the North American fur trade reduced beaver populations from over 60 million to nearly 100 hundred thousand animals. Because of the beavers' unique roles as ecosystem engineers, this drastic reduction in their numbers significantly impacted the hydrology of our continent. Scientists are now beginning to recognize that beavers are a keystone species whose wetland alterations can increase the biodiversity of plants and animals and provide significant ecological benefits to water conservation in human communities. In the face of climate-change induced drought, fire, and concerns with declining salmon habitat in the American West, beavers are proving to be valuable partner in restoration. This lesson explores specific instances detailing how their restoration to their formerly inhabited landscapes may be one of the most promising conservation opportunities of the twenty-first century.

KEYWORDS

- beaver
- watershed
- restoration
- biodiversity
- stakeholders
- food web
- ecosystem engineer
- keystone species

RESOURCES

Methow Beaver Project One of the flagship projects in beaver reintroduction throughout the American West. Includes provocative videos and an enlightening list of Project Accomplishments.
>> *http://methowsalmon.org/beaverproject.html*

"The Beaver Whisperer" (by Ben Goldfarb in High Country News)
A fine piece of journalism describing the Methow Beaver Project and its context for a leading environmental magazine of the American West.
>> *https://www.hcn.org/issues/47.19/the-beaver-whisperer*

RESOURCES *continued*

The Beaver Restoration Guidebook An in-depth, comprehensive guide with several case-studies and approaches for inquiry.
>> *https://www.fws.gov/oregonfwo/ToolsForLandowners/RiverScience/Documents/BRG%20v.1.0%20final%20reduced.pdf*

Beaver Solutions A Massachusetts-based organization specializing in the non-lethal resolution of human-beaver conflicts. In addition to some instructional videos and information about the biology and benefits of beaver, this website outlines some of the successful flow devices that offer cost-effective and long-lasting solutions to unwanted flooding problems. >> *http://www.beaversolutions.com/*

Worth A Dam: Martinez Beavers Based in Martinez, California, this community-based organization formed to support human-beaver coexistence. This dynamic website and forum is for those curious about the latest news articles, videos, and research in beaver restoration.
>> *http://www.martinezbeavers.org/wordpress/*

Once They Were Hats: In Search of the Might Beaver (Frances Backhouse, 2015) Recounted with engaging tone for wide public appeal, Backhouse offers an immersive exploration of the beaver's ecology and dynamic connections to human culture.

"The True History Behind Idaho's Parachuting Beavers"
The fascinating rediscovery of beaver restoration in the 1940s.
>> *http://time.com/4084997/parachuting-beavers-history/*

The Beaver: Natural History of a Wetlands Engineer (Dietland Müller-Schwarze and Lixing Sun, updated 2011) The classic and most comprehensive text on beaver history, ecology, and management.

Specifically on Urban Beavers
"Vancouver's former Olympic Village is now home to urban beavers"
>> *http://www.pri.org/stories/2016-06-03/vancouvers-former-olympic-village-now-home-urban-beavers*

"Portland Area Learns to Live With Beavers"
>> *http://www.opb.org/television/programs/ofg/segment/portland-area-learns-to-live-with-urban-beavers/*

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Off the eastern slopes of the North Cascades in Washington State, in the wild and working landscapes of the Methow Valley, water is very important. The Methow River is a tributary to the Columbia River, and it stays clear and cold when snow from the previous winter gradually melts down from the mountains. This watershed not only supports some of the state's best ranchland and fruit tree orchards, but also many wild plants and animals, including endangered spring runs of chinook salmon. Before the fur trade, even more of this biodiversity was supported by the wetlands that beavers create. Today the Methow Valley has 10-15 percent of its historic beaver populations, but increasing drought and fire is causing many people to consider whether beaver restoration might help conserve water on the landscape.

Beaver restoration in the American West is not a totally new idea. In the 1930s, the federal government used 600 beavers upstream of Civilian Conservation Corps crews to help reduce erosion in wheat fields near Spokane, WA. By 1948, the state of Idaho even sponsored a plan to parachute beavers to high mountain streams. Incredulous as it seems today, it was mere practicality for those dealing with conflicts in the expanding farmlands of post-World War II town of McCall. Some people still see the beavers' knack for flooding land as a threat to homes, livestock, and crops, but there is growing support to find new strategies to cooperate and coexist with these industrious rodents.

The Methow Beaver Project – a partnership of the US Forest Service, the Washington Department of Fish and Wildlife, and the Methow Salmon Recovery Foundation – believes that beavers can help restore watershed function and mitigate the effects of climate change. They do this through their dams, which effectively slow, sink, and spread the water's flow. The short-legged beavers are vulnerable to predation on land, and for them, the withheld water means security and increased access to the trees they use for eating and building. But their work moderates the release of water through the year, and it creates a great diversity of habitats, including deep pools where fish can hide or shallow edges that are crucial for countless insects, plants, amphibians, and birds.

Recognizing these benefits, the Methow Beaver Project is helping to turn beaver problems into solutions. Instead of killing beavers that are causing flood problems in residential or agricultural areas, the Project's scientists and volunteers live-trap them for relocation on the land of the US Forest Service or willing private landowners. Because beavers are such cooperative workers, the Project aims to move all members in the family together, holding and feeding them in tanks at the local fish hatchery when necessary. While Project staff monitor the health and condition of the beavers, they offer educational opportunities for the public and ensures they are well fed with aspen and cottonwood boughs, their favorite treats. Release sites are then carefully selected for their food availability and water storage capacity, often along relatively flat tributaries of the Methow River where beavers lived before the fur trade. When the big day finally arrives, beavers are released with ready-cut supply of branches to welcome them home. The Methow Beaver Project has moved over 300 beavers since 2008, and the rodents can be thanked for adding over 780 acres of wetland habitat to the Methow Valley watershed.

The reintroductions of the Methow Beaver Project are just one way that people are restoring beavers in the Pacific Northwest. And sometimes, where reintroduction is not possible or even necessary, people are developing non-lethal ways to live alongside beavers. Some people are using special caging to protect trees or drainage pipes from being cut or clogged, while others are using innovative "pond-levelers" to keep water flowing through the dam while allowing the beavers to build. Beavers have even become residents in cities like Portland, Oregon and Vancouver, British Columbia, where their behaviors and changes have been sources of endless fascination. The effects of any beaver family are impossible to generalize, but we can be sure they have much to teach us about conserving watershed health.

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DISCUSSION QUESTIONS

1. What is the name of the watershed you live in?

Do you know where your drinking water comes from?

What are the important stakeholders who have rights and responsibilities of your water use?

2. Visit your nearest wetland. Do you see active signs of beaver (chewed trees, a dam or lodge)?

DISCUSSION QUESTIONS *continued*

Can you draw a food web of this wetland?

How would the biodiversity of your food web change if beavers were absent or present?

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3. What can you learn about the fur trade?

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DISCUSSION QUESTIONS *continued*

What made beaver fur especially valuable, and how did its pursuit effect the settlement of North America?

4. Do you know of any human-wildlife conflicts where you live?

How are they typically handled?

How might they be improved?