

LTPBR WORKSHOP



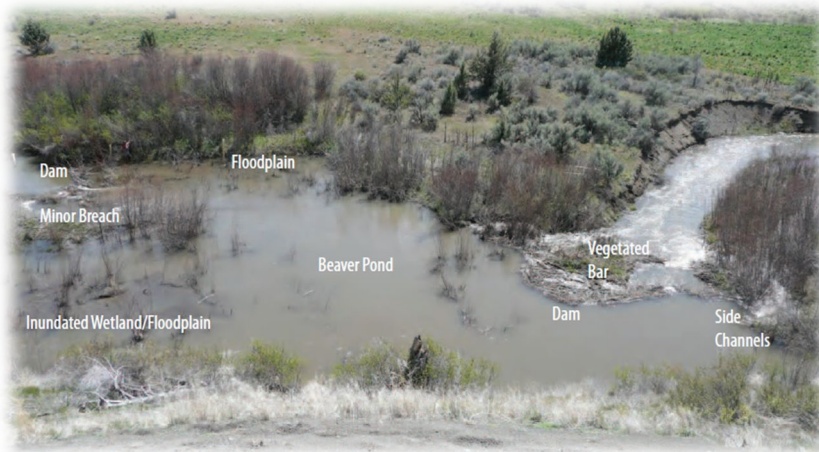
BEAVER ECOLOGY, BEAVER DAM ACTIVITY, BEAVER MANAGEMENT



I. Beaver Biology/Ecology

II. Ecological Responses

III. Beaver Management Strategies



Bridge Creek © Wheaton

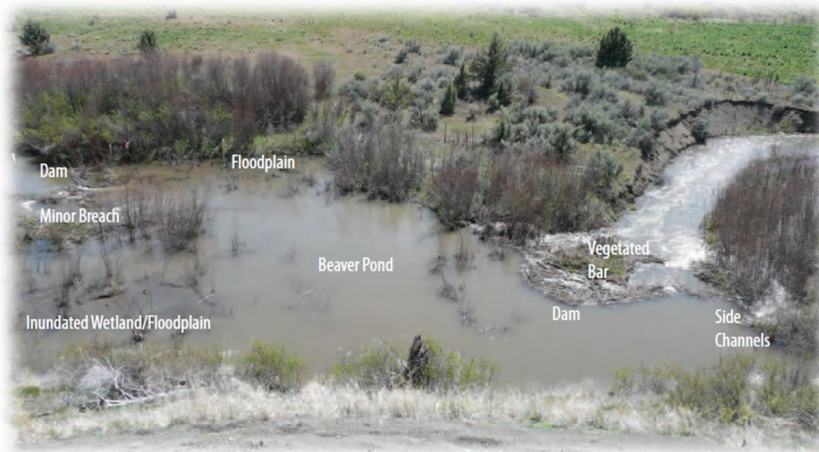


From: <http://www.howstuffworks.com/beaver-dam.htm>

I. Beaver Biology/Ecology

II. Ecological Responses

III. Beaver Management Strategies



Bridge Creek © Wheaton



From: <http://www.howstuffworks.com/beaver-dam.htm>

Adapted to Aquatic Life



Photo credit: Louis-Marie Preau



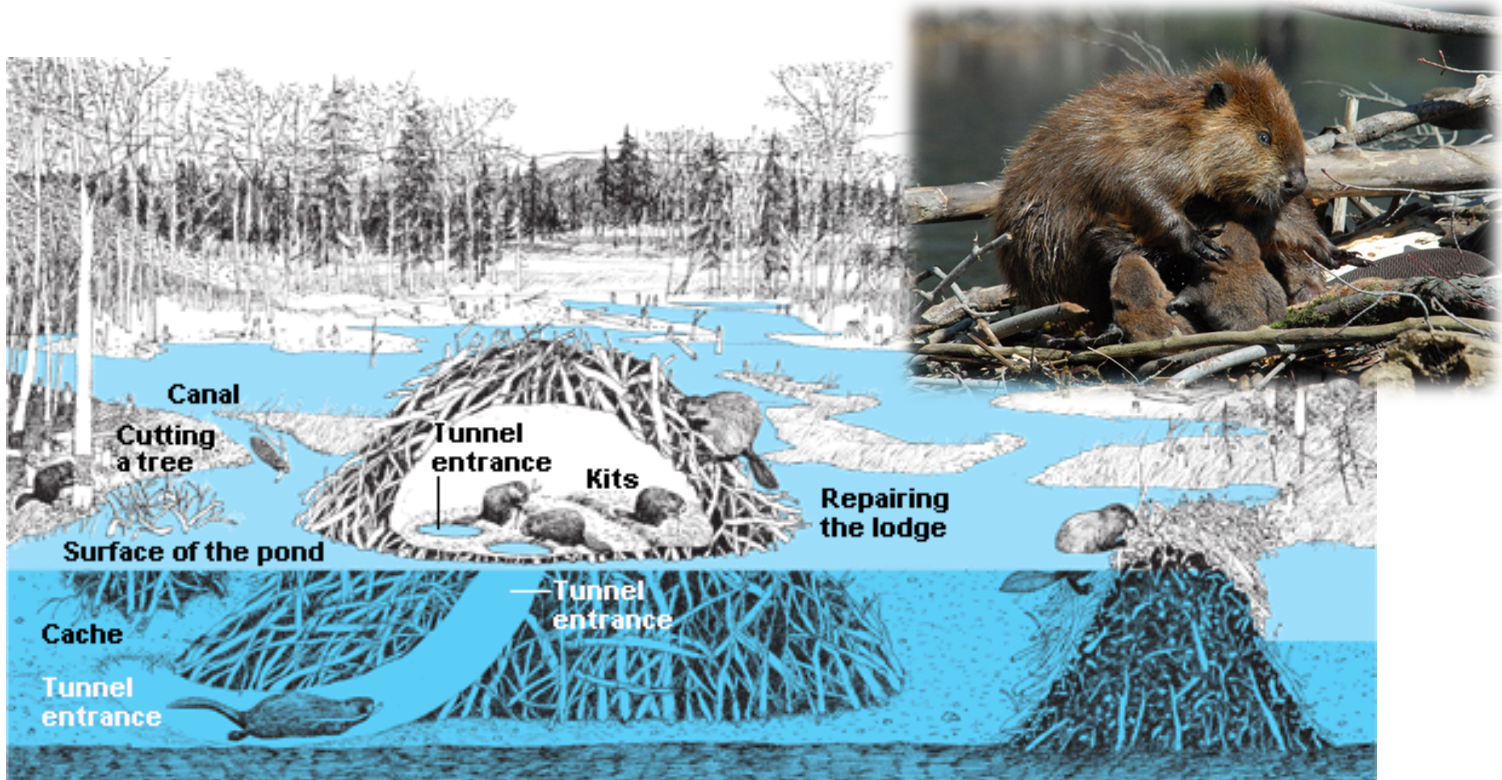
What Do Beaver Eat?

- Fall/Winter: cached woody plants, tubers
- Spring/Summer: herbaceous plants
- Woody plants ~85% of winter diet; ~15% of summer diet
- Prefer aspen/cottonwood, willow
- Incisors (big front teeth) grow continuously



Beaver Colony

- Mate for life
- Litters = 2–5 kits
- Stay for 2 years
- 5–8 in family



A Habitat Generalist

- Lakes
- Rivers and streams
- Abandoned channels on floodplains
- Wetlands



from Boreal Forests....



Fred Hirschmann—Science Faction/Getty Images



Slide from John Stella

...to Deserts



<http://www.rv-boondocking-the-good-life.com/>



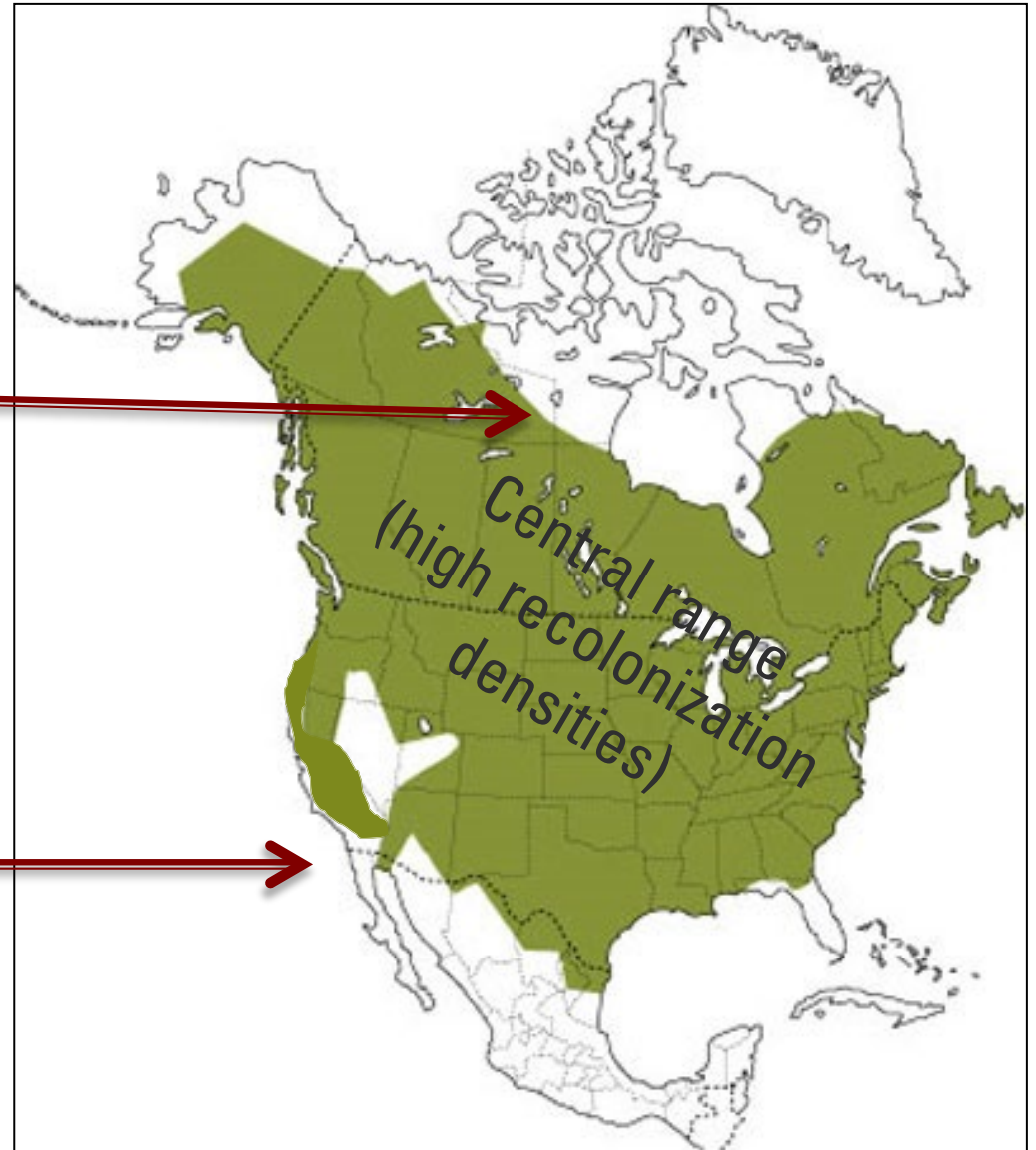
Common Habitat Ingredients:

Water + Wood

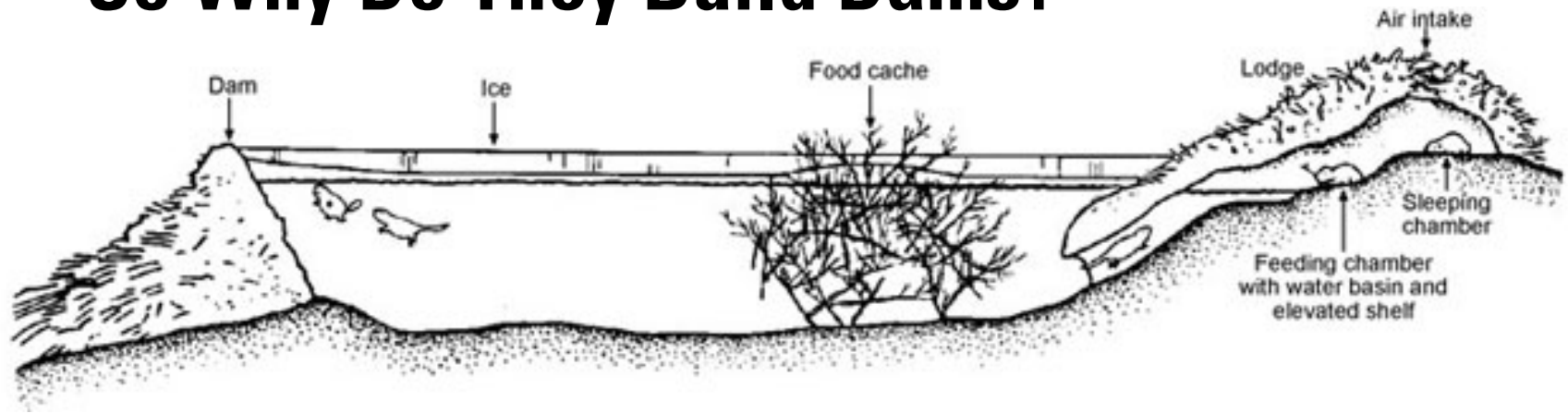
- Northern tundra

water
or wood
limitation

- Southern Deserts



So Why Do They Build Dams?



Dam = Deep Water

- Beaver more agile in water
- Predator refugia
- Extend foraging area
- Deep water ponds do not freeze in the winter



Photo credit: Jeff Hunter

Dams Complexes



Why so many dams?

- Further extend foraging area
- Easier to move wood around
- Not all eggs in one basket

Primary and Secondary Dams



Lodges



- Lodge includes underwater entrance, safe rest and feeding area above water

Photo by Anna M. Harrison

Lodges



Bank den *(Colorado Natural Heritage Program)* © CNH



Bank lodge

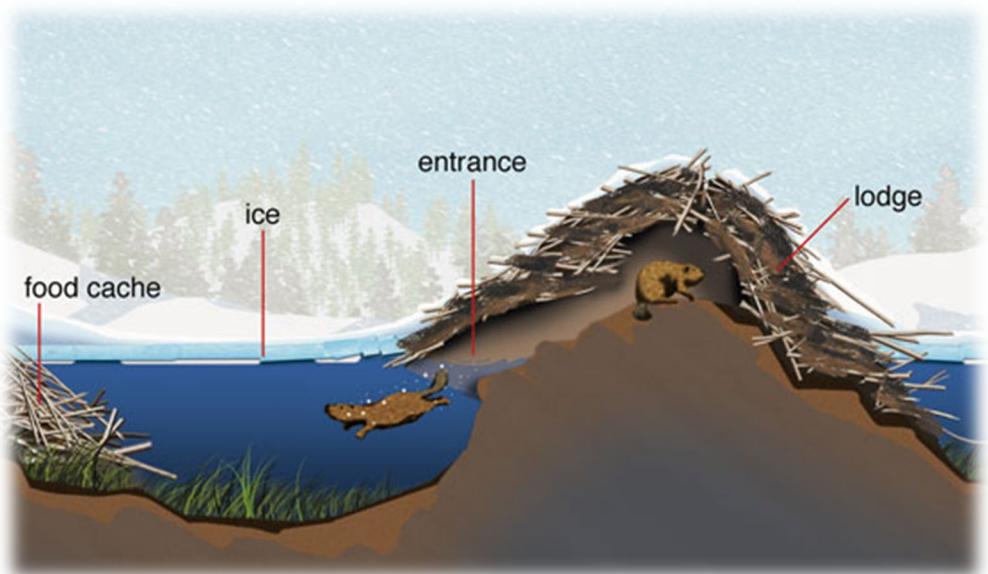


Mid-stream lodge
(Colorado Natural Heritage Program)

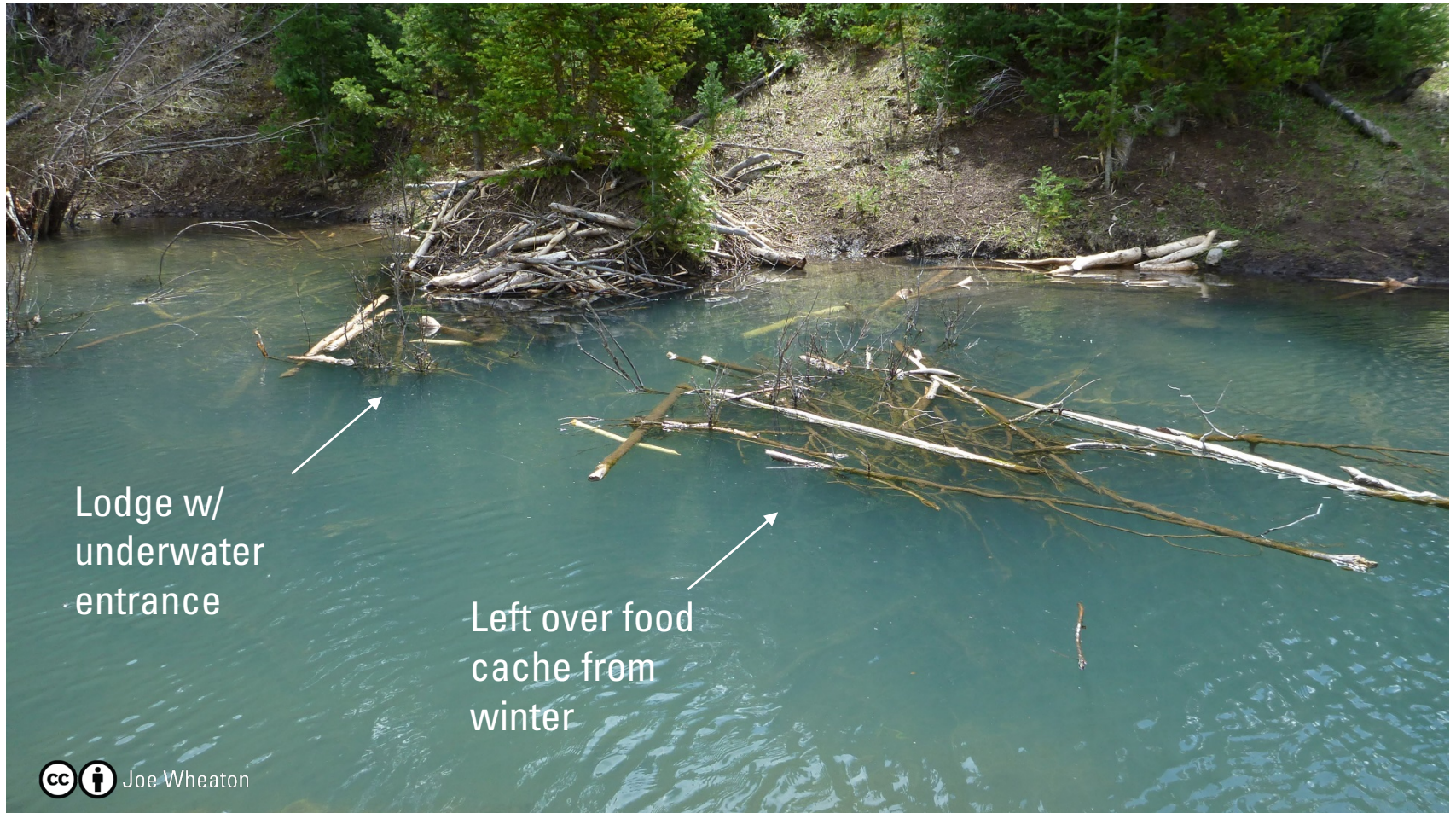


Mid-lake lodge

A Beaver Food Cache...



Left Over Food Cache...



Lodge w/
underwater
entrance

Left over food
cache from
winter

Beaver Dig

a lot of tunnels...

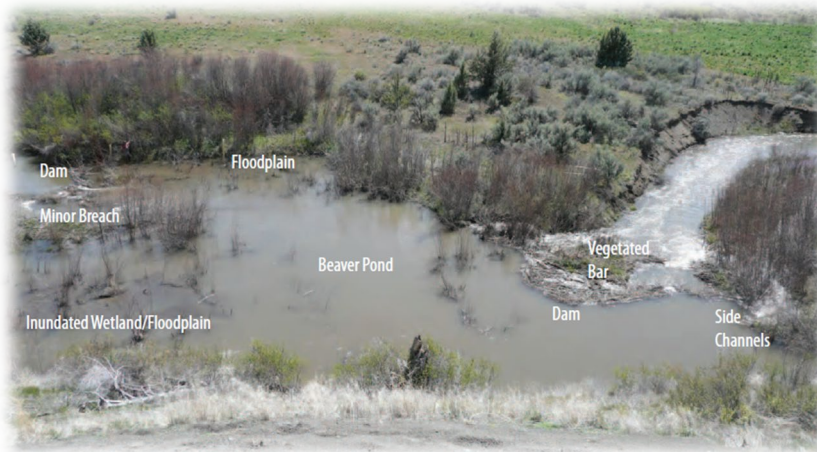


...and channels

I. Beaver Biology/Ecology

II. Ecological Responses

III. Beaver Management Strategies



Bridge Creek © Wheaton



From: <http://www.howstuffworks.com/beaver-dam.htm>

Direct Changes to the Environment

- Channel Modification: dams, channels, tunnels, lodges
- Vegetation: harvest, consume, store



Review: Beaver Dam Activity

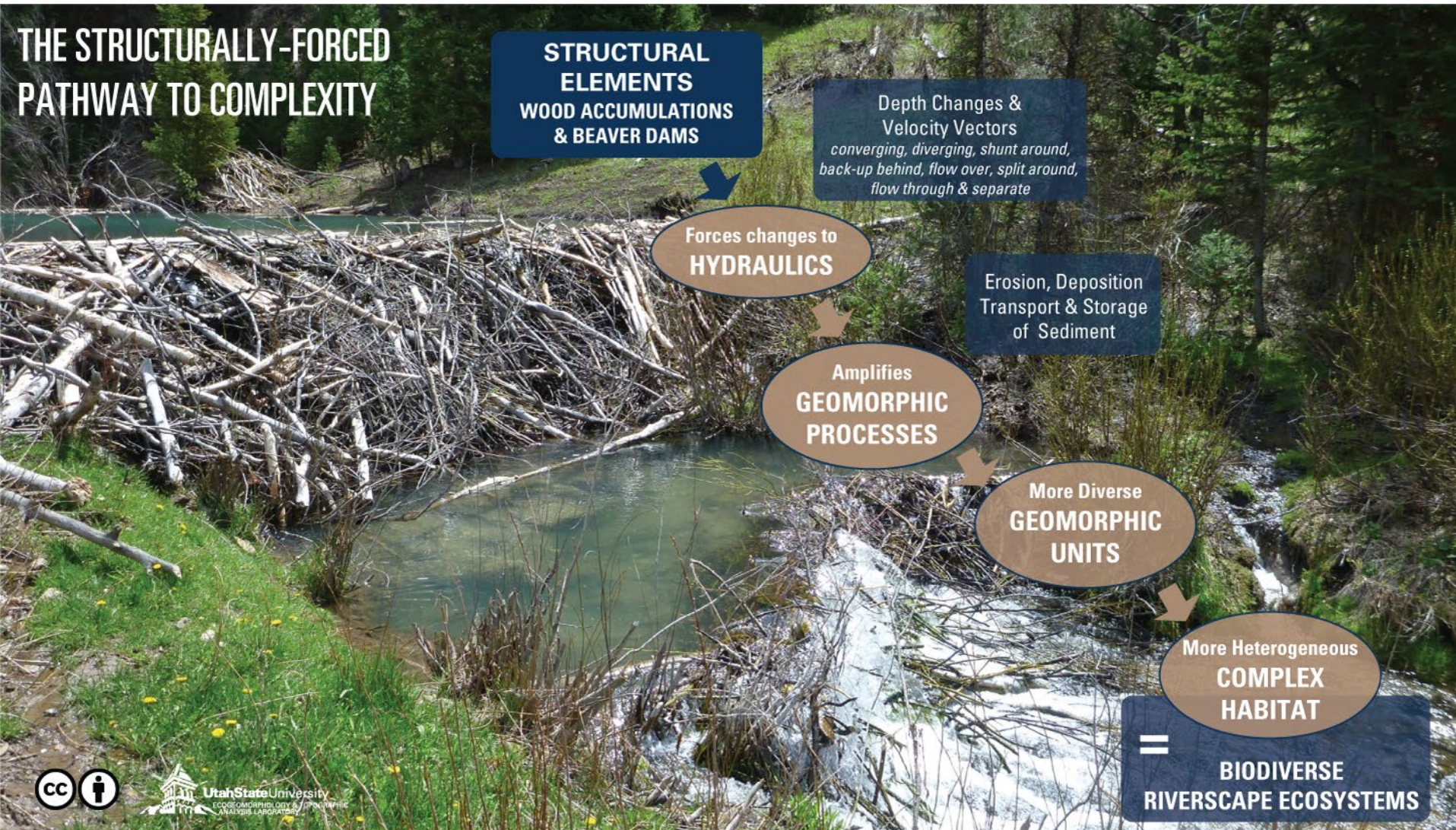


Figure 2.4 from Wheaton et al. (2019a) Chapter 2 LTPBR Manual

DOI: [10.13140/RG.2.2.34270.69447](https://doi.org/10.13140/RG.2.2.34270.69447)

Dams

- Slow water
- Raise water



Dams

– Slow water

- Change hydraulics → Deposition/Erosion
 - Increase geomorphic unit diversity
 - Aggradation/floodplain reconnection
- Change water residence time
- Water quality
 - Decomposition
 - Nutrients sink/source
 - Sediment storage
 - Heavy metals



Dams

– Raise water

- Increase surface area and volume
 - Increase surface water storage
 - Increase sunlight input
 - Increase hyporheic and groundwater storage
 - Temperature
- Indirectly alter vegetation
 - riparian expansion



Beaver Are Central Foragers



Beaver Are Like Rotational Crop Farmers

- *Selectively* work an area 2-3 years
- Let it recover, and move nearby



*1-3 Years of
Regeneration*



Beaver harvest → Coppicing



Aspen Clone

Beaver – Aspen Feedbacks



D. Bartos (<https://www.fs.fed.us/wildflowers/beauty/aspen/grow.shtml>)

Beaver – Aspen Feedbacks



D. Bartos (<https://www.fs.fed.us/wildflowers/beauty/aspen/grow.shtml>)

Beaver – Aspen Feedback



Beaver – Aspen Feedbacks



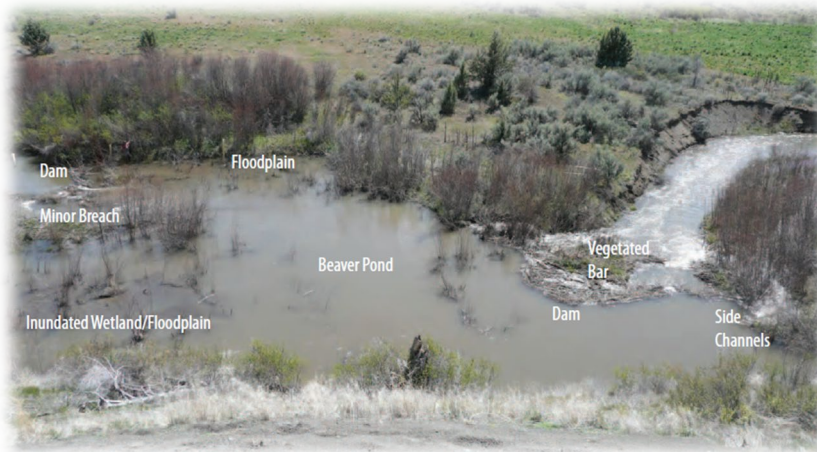
Beaver Footprint Much Larger in Aspen Communities



I. Beaver Biology/Ecology

II. Ecological Responses

III. Beaver Management Strategies



Bridge Creek © Wheaton



From: <http://www.howstuffworks.com/beaver-dam.htm>

But Beaver Can Also Be Pests!

- they can cause flooding
- block culverts, which wash out roads
- chop down our ornamental landscape trees
- impact irrigation diversions



Beaver Management/Restoration Strategies

- Conservation / Promotion (leave them alone)
- Living with beaver
- Translocation to areas with suitable capacity
- Restore riparian -> Followed by Translocation
- Help beaver out – Beaver Dam Analogues
- Mimic Beaver



Passive Beaver Strategies

Beaver protection- work with wildlife departments to get closures for trapping in targeted areas



UTAH BEAVER MANAGEMENT PLAN 2010 – 2020



Developed in consultation
with
BEAVER ADVISORY COMMITTEE

DWR Publication 09-29

Utah Division of Wildlife Resources
1594 West North Temple
Salt Lake City, Utah 84114

Approved by the Wildlife Board January 6, 2010

Living With Beaver Strategies...

- Beaver Deceivers
- Pond Levelers
- Caging trees

Figure A - Side View

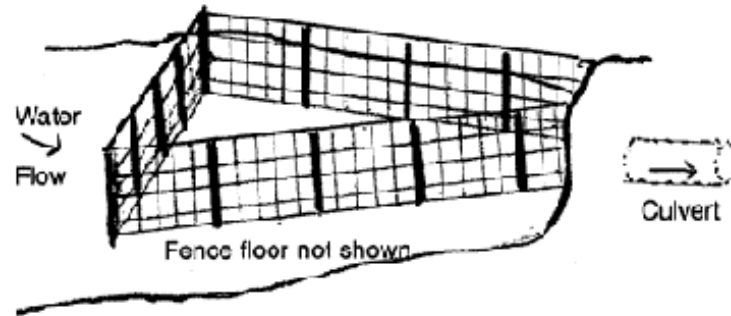
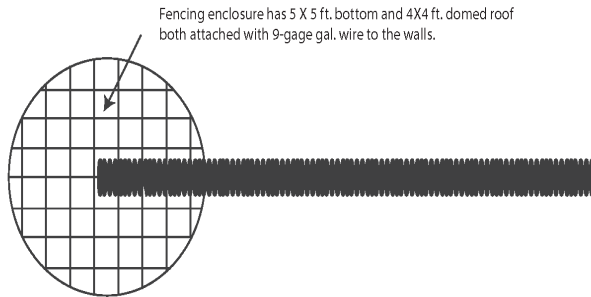
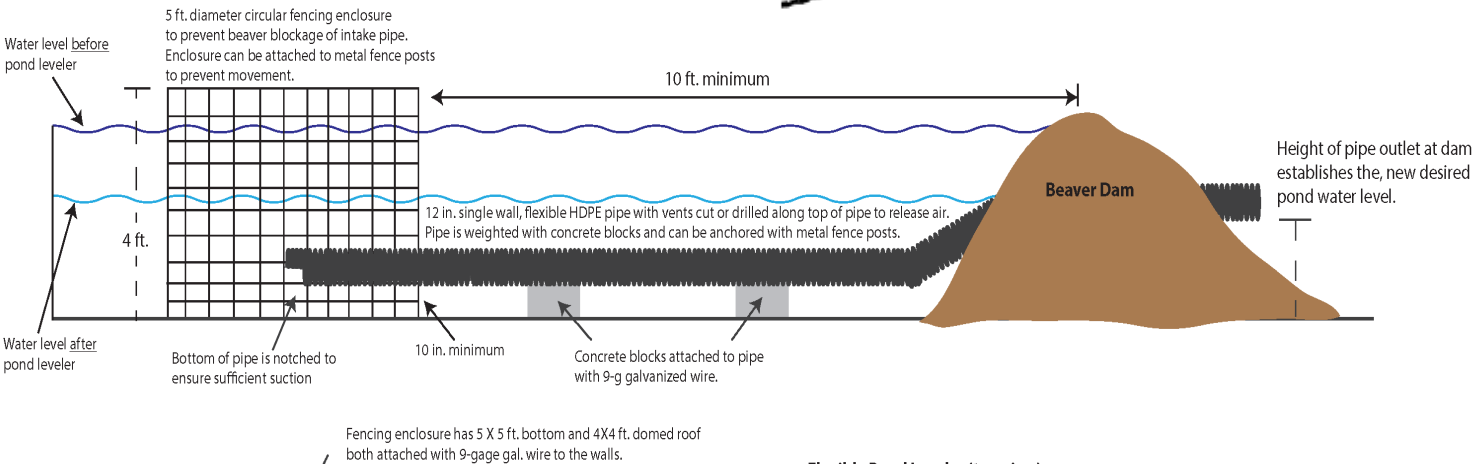
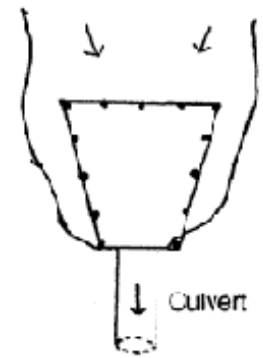
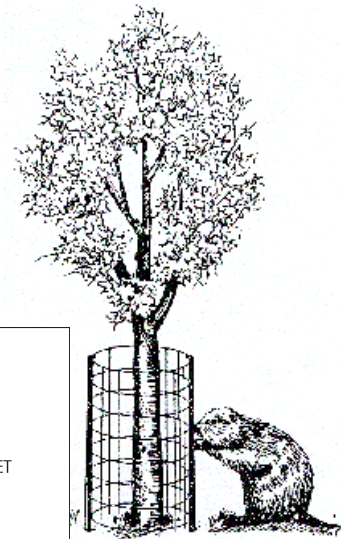
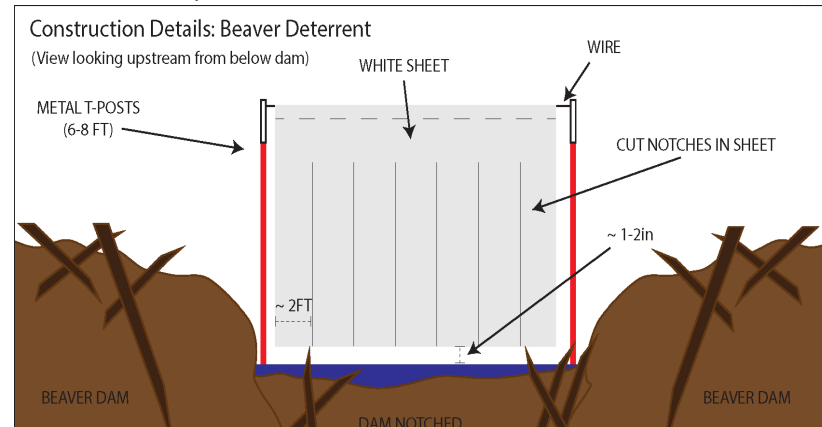


Figure B - Top View



Flexible Pond Leveler (top view)



Relocation

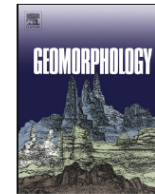
- Find a source population of nuisance beaver OR area with ample population...
- Relocate to areas with no or limited population & high capacity



Contents lists available at [ScienceDirect](#)


Geomorphology

journal homepage: www.elsevier.com/locate/geomorph




Modeling the capacity of riverscapes to support beaver dams

William W. Macfarlane ^{a,*}, Joseph M. Wheaton ^{a,b}, Nicolaas Bouwes ^{a,c}, Martha L. Jensen ^a, Jordan T. Gilbert ^a, Nate Hough-Snee ^{a,b}, John A. Shivik ^d


**Utah State University**
ECOGEOGRAPHY & TOPOGRAPHIC
ANALYSIS LABORATORY

BEAVER RESTORATION ASSESSMENT TOOL

**BRAT**

BRAT Resources

- BRAT
- Vision
- ▼ Documentation
 - Manual Implementation of Capacity Models
- Workshops
- Escalante Pilot Project
- Beaver Restoration Information
- © 2013 Copyright & Disclaimers



Welcome to the BRAT website. The **Beaver Restoration Assessment Tool** will be a decision support and planning tool intended to help researchers and resource managers assess the potential for beaver as a stream conservation and restoration agent over large regions and watersheds.

The BRAT models can be run with widely available existing data sets, and used to identify opportunities, potential conflicts and constraints through a mix of assessment of existing resources and scenario-based assessment of potential futures. The primary backbone to BRAT are some spatial models that predict the capacity of riverscapes to support dam-building activity by beaver. These models have been tested in a pilot project in Utah and are ready for broader implementation. The rest of the decision support tool is under development (read [Vision here](#)).

The Beaver Ecology and Relocation Center (BERC) USU



Help Beaver Out – BDAs and Lodges

The new homestead – Temporary lodge 



Photo courtesy of William Meyer (WDFW)

Temporary Lodge and small pond



“After a desirable planting site has been located, it is necessary to choose the place to build a house and dam.”

BEAVER MANAGEMENT IN THE NORTHERN BLACK HILLS OF SOUTH DAKOTA

Dave Harris and Shaler E. Aldous

South Dakota Department of Game, Fish and Parks,
Deadwood, South Dakota, and
U. S. Fish and Wildlife Service, St. Paul, Minnesota

JOURNAL OF WILDLIFE MANAGEMENT, VOL. 10, No. 4, OCTOBER 1946

Take Aways...

- Beaver need water and wood... not dams
- Beaver can survive in many different environments
- Most critical requirements:
 - Deep water
 - Herbaceous or woody vegetation for nutrition
 - Adequate vegetation to wear down incisors
- Where streams or rivers don't provide habitat they need, they build dams (ecosystem engineers)
- Their dam building activities can lead to positive ecological feedbacks
- They can be pests- but there are strategies to making living with beaver possible
- Sometimes they need our help to get established