

What's so Great About Beavers?

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My Goal



Photo Credit: Trish Heekin

Presentation Outline

- A little Beaver Biology and History
- Hydrology
- Geomorphology
- Restoration Engineering
- Peaceful Coexistence of Beavers and People

Biology

Beavers are a **Keystone Species**

A keystone species is a plant or animal that plays a unique and crucial role in the way an ecosystem functions.

Without the keystone species, the ecosystem would be dramatically different ...



Geomorphologic History



Extirpation

- 1630 and 1760 Beaver Pelts - French GNP!
- Trapping and Trade continued through mid-1800s
- Historically 50 – 400 million Beavers in N. America
- Now estimates 6 million to 12 million individuals



Beaver Ecology



Without Beavers



With Beavers

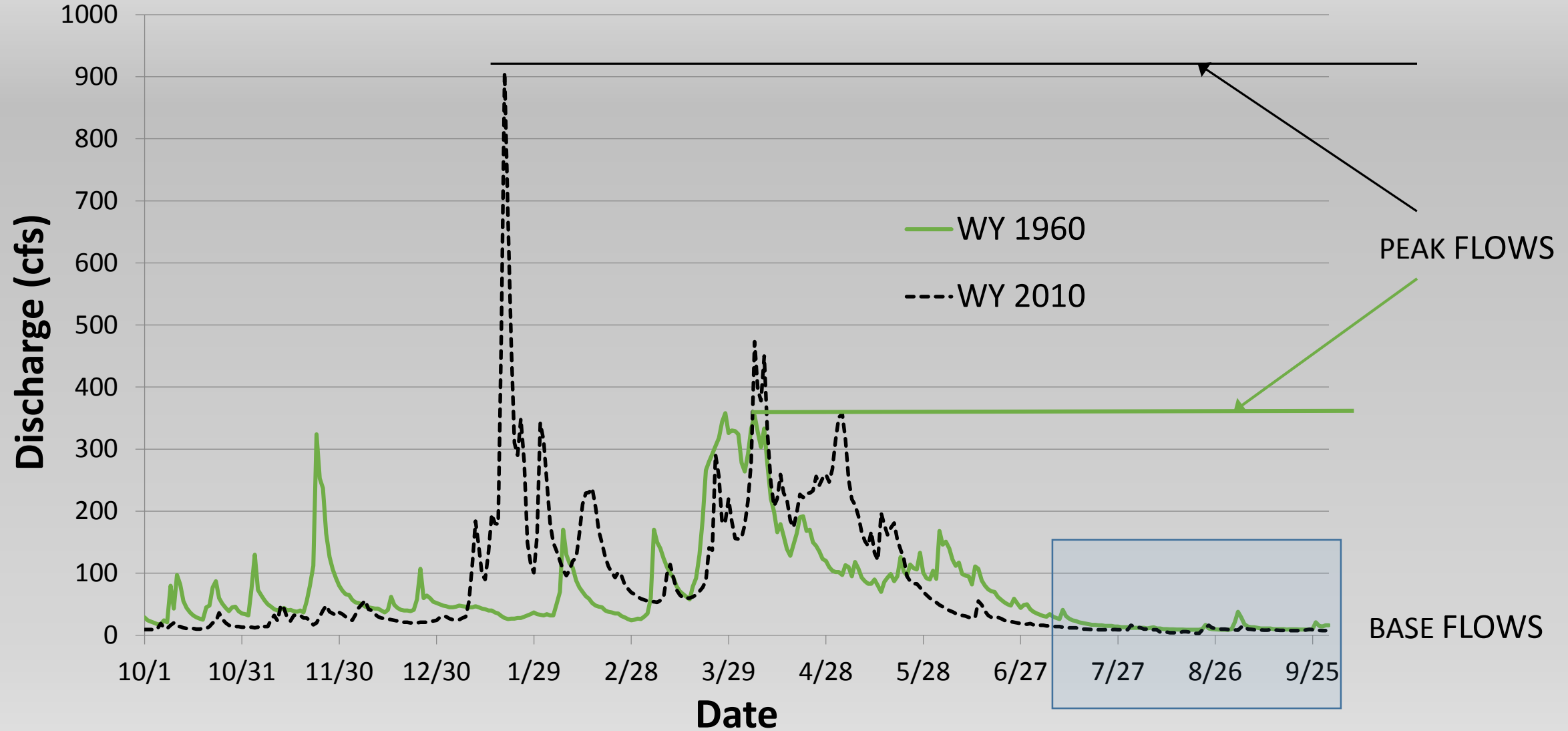
Beaver Ecology



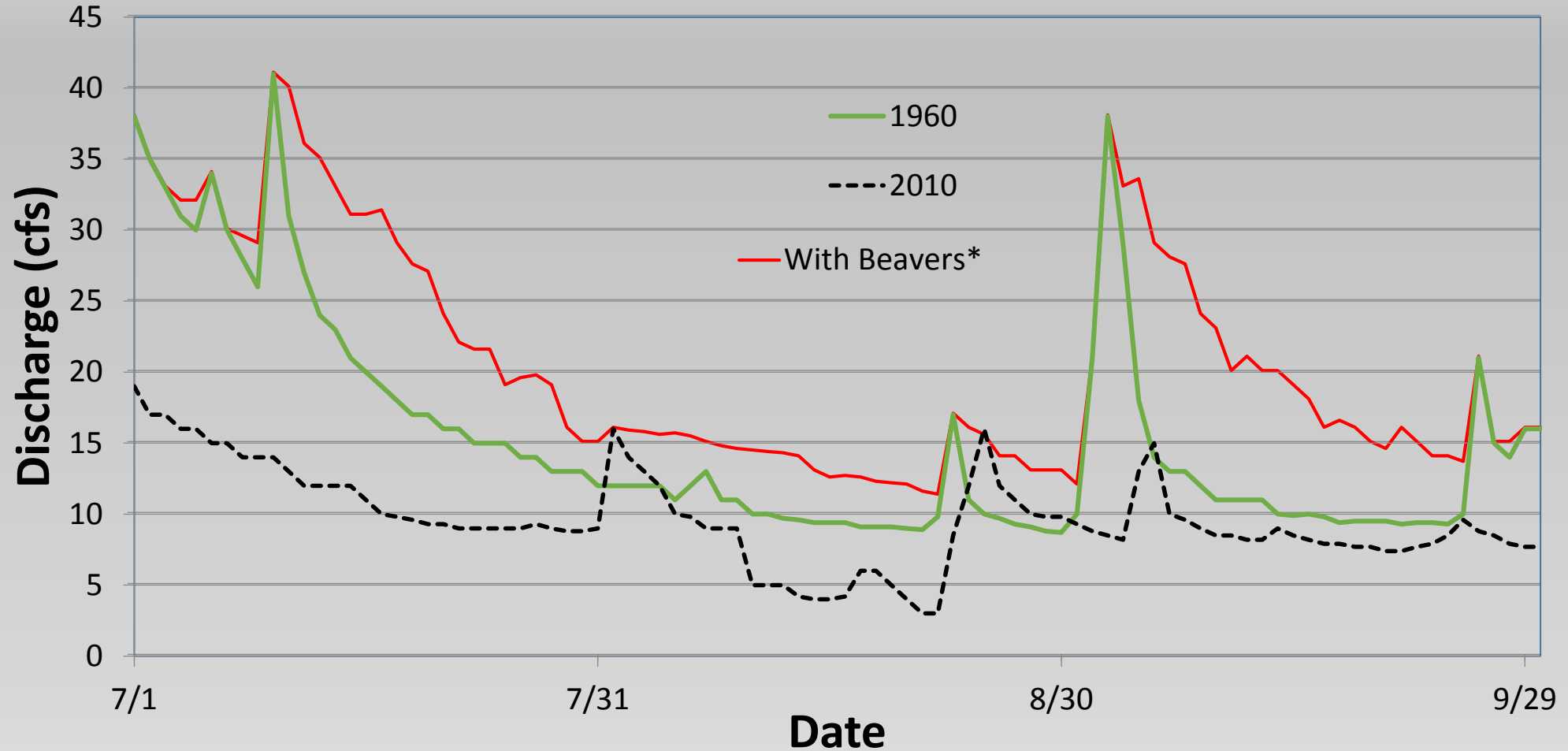
Healthy ecosystems
are messy.

It's not ALL about
water...

HYDROLOGY



BASE FLOWS



Impacts of Hydrologic Changes

High velocities and flow volumes cause

- Channel Incision
- Sediment Redistribution
- Wood Redistribution

Earlier, flashier peak flows cause

- Drier Summers
- Warmer Water
- Loss of BEAVER DAMS!



How do Beavers Help?

Flow Moderation

Water Quality and Quantity

- Sediment Retention – Nutrient Cycling
- Lower Water Temperature – Hyporheic Flow

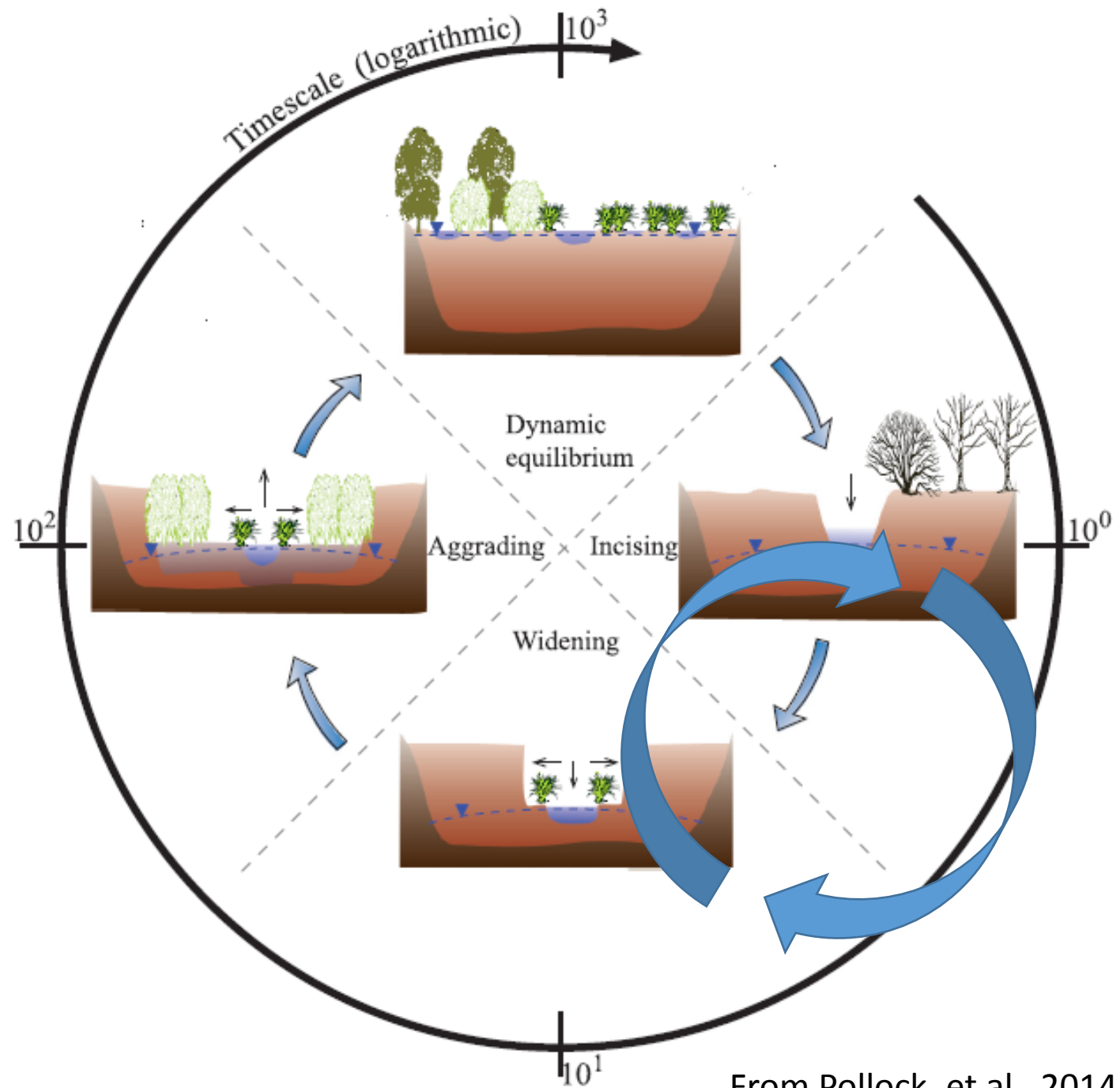
Flora and Fauna abundance and diversity

- Fish
- Riparian Vegetation
- Birds – shrub nesting species
- Amphibians
- Insects and Macroinvertebrates
- Microfauna



How do Beavers Help?

Treating Channel Incision



Incision - Happens fast!



Widening - Takes Decades



Aggradation - Takes Centuries

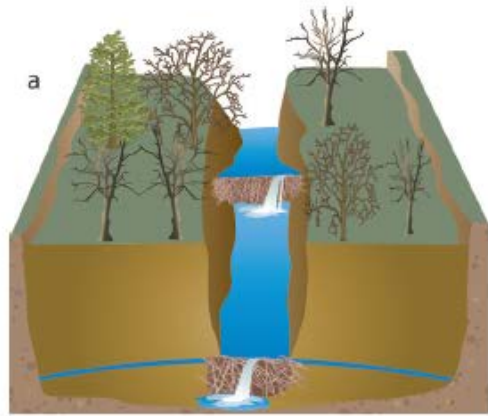


...and it's not always pretty

Dynamic Equilibrium



How do Beavers Help?



Restoration

The Goal is to have
Beavers do the Habitat
Restoration

But Beaver Recovery is
Slow...



Restoration for Beavers

Beavers need:

- **Hydrology** they can live with
- **Water** they can live in
- **Food** – woody and herbaceous plants
- **Building Materials**
- **Appreciation**



Hydrology



High Flows and Low Flows



Where did they go?

Restoring Hydrology with FBDs and BDAs

FBDs



BDAs



Water (Quality and Quantity)



Food and Building Materials



Everyone should know this word: **Coppicing**
And this Restoration Treatment: **PTHOI**

Peaceful Coexistence

The Reported Problems:

- Beavers Eat Trees
- Beavers Cause Flooding
- Beavers Block Culverts
- Beaver Dams Block Fish Passage**



The Solutions

Beavers Eat Trees

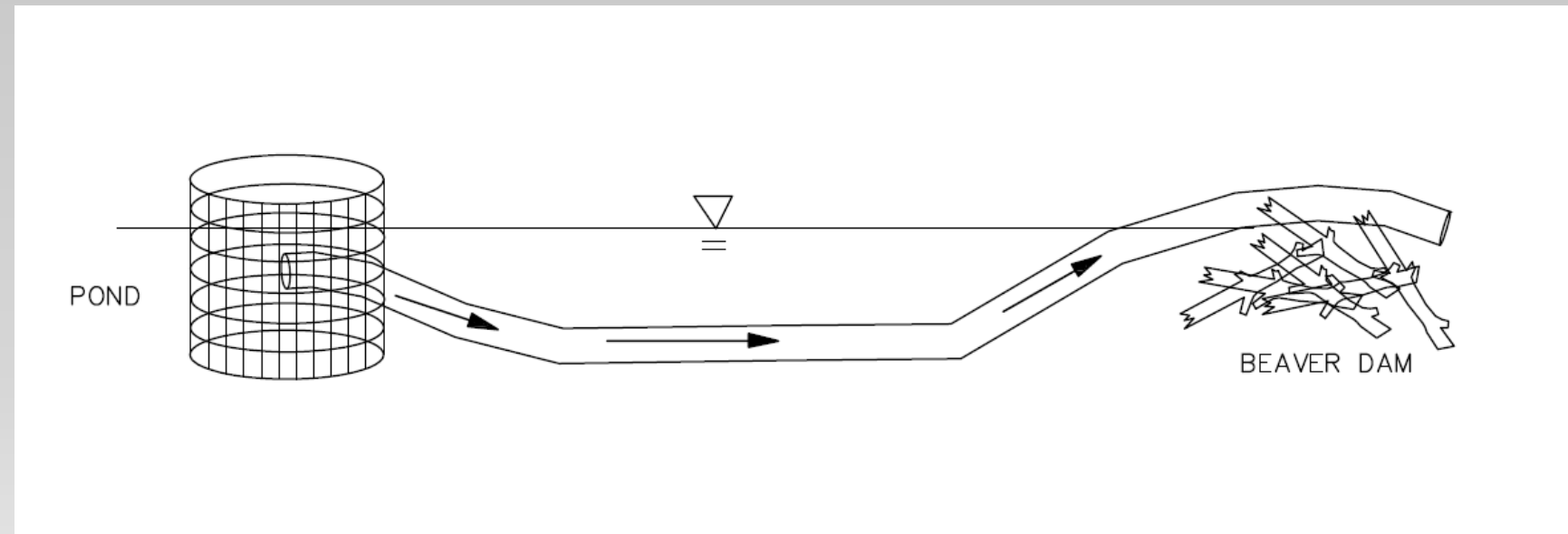
1. Tree Cages
2. Paint with Sand
3. Education



The Solutions

Beavers Cause Flooding

1. Education
2. Pond Leveler



The Solutions

Live Trapping and Relocation



Photo Credit: Trish Heekin



The Solutions

Beavers Block Culverts



The Solutions

Beaver Dams Block Fish
Passage**

**BEAVERS TAUGHT
SALMON TO JUMP!!**



Questions?

