

Interested in a Low Cost, Nature-Based Climate Solution with Millions of Years of Experience?

Consider Partnering with the Persistent, Adaptive North American Beaver

NC STATE UNIVERSITY



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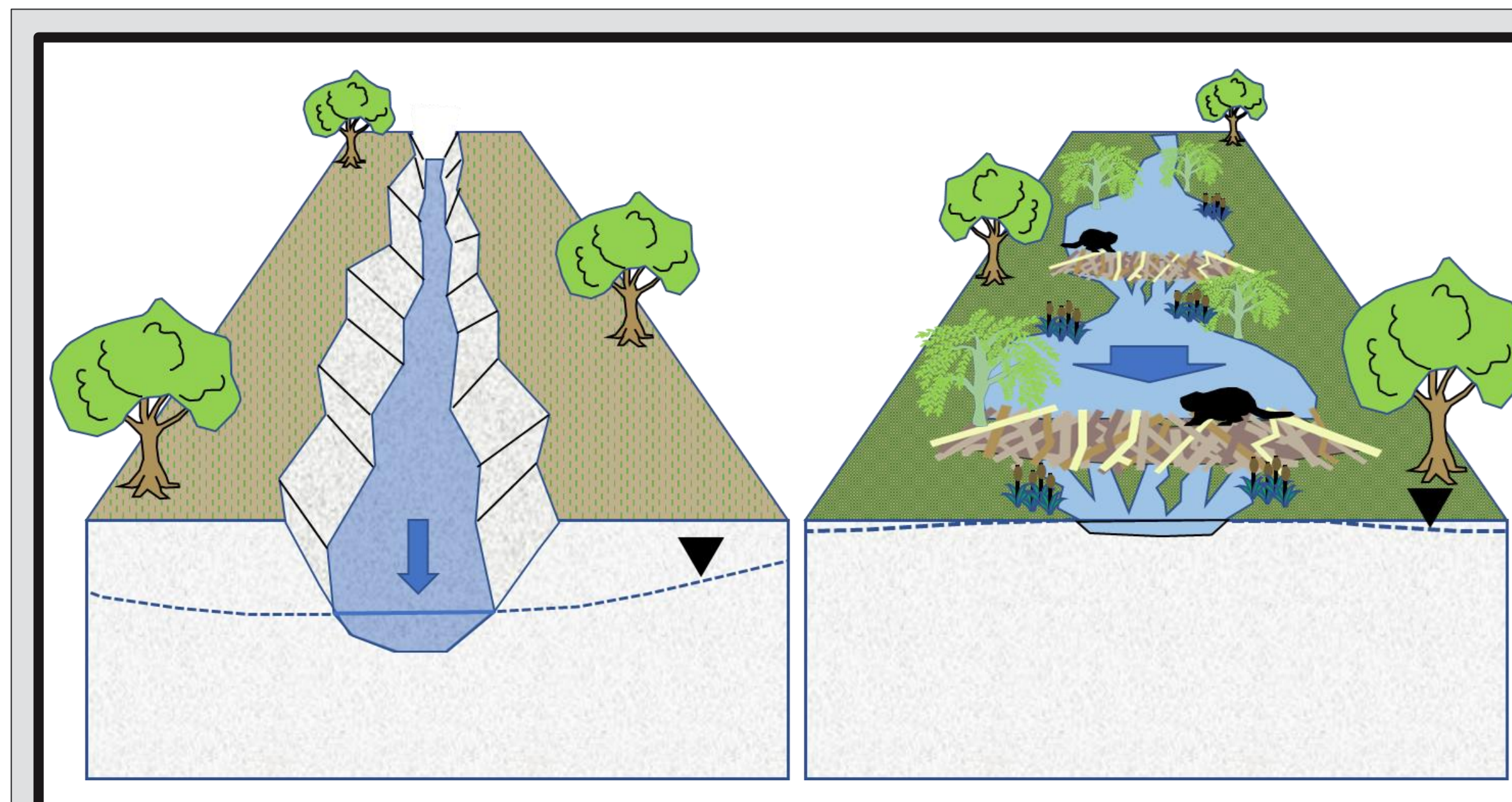


Beavers Build Benefits for People and Ecosystems

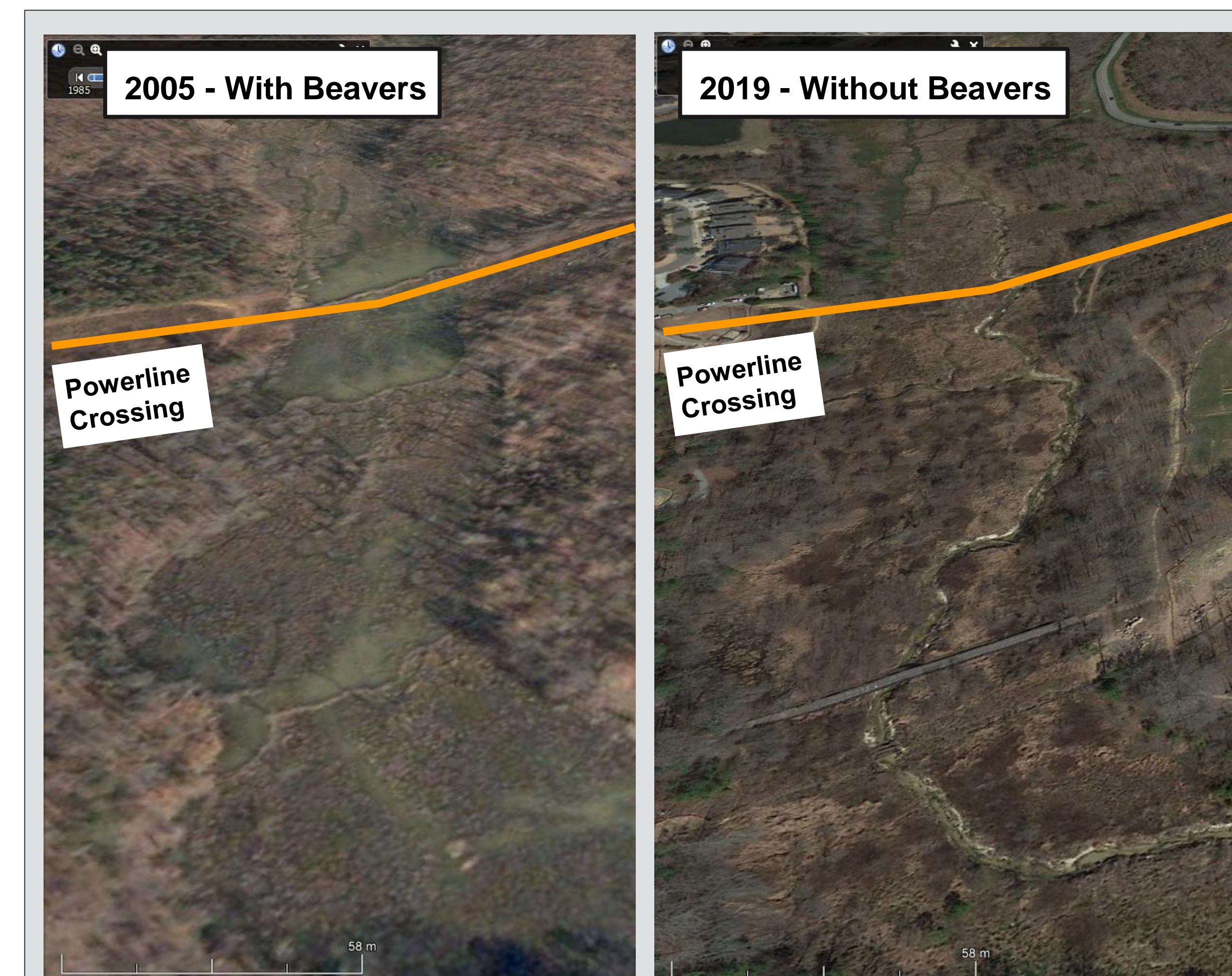
Not Just a Nuisance

Where they build dams, beavers:

- Increase **Water Availability** on the Land Surface
- Recharge **Aquifers** and Raise **Water Tables**
- Generate and Maintain Valuable **Wetlands**
- Reduce Suspended **Sediment** Loads
- Boost Local Utilization of Dissolved **Nutrients**
- Sequester Organic **Carbon** in Wetland Soils
- Improve **Habitat Complexity**
- Promote Greater **Biological Abundance and Diversity**
- Attenuate Downstream **Flood Peaks**
- Create **Wildfire Refugia**



Without Beavers	Parameter Comparison	With Beavers
Single Thread	Channel Planform	Anastomosing
Disconnected	Channel-Floodplain Hydrology	Connected
Less	Surface / Ground Water Storage	More
Lower	Water Table	Higher
Rapid, focused	Flow Rates	Slower, dispersed
Higher	Erosion Rates	Lower
Lower	Biological Abundance / Diversity	Higher



"Before and after" Google Earth images from Pokeberry Creek in Chatham County, NC. 2005 - beaver wetland complex intact. 2019 - dams and ponds are mostly gone. Channel is deeply incised, erosion levels are high. Water table is lower - wetland plants are mostly gone.

Our Local Research

We're interested in **beaver effects on Piedmont streams and ecosystems**. Our ongoing research interests and efforts include:

- **Mapping** beaver ponds and wetlands with **remotely sensed imagery**
- **Modeling** beaver habitat selection factors with **GIS-based approaches**
- **Hydrologic data analysis** to learn about beaver effects on water storage
- **Water quality analysis** with *in situ* field measurements and laboratory analysis to quantify beaver-mediated impacts
- **Field observations** around the Piedmont to learn about the ecological role of beavers in human-impacted landscapes

Mitigating Conflict

Human communities sometimes have conflicts with beavers:

- Humans and beavers are often **interested in the same real estate**
- Beavers **cut down trees** and **inundate low-lying riparian areas**, which their human neighbors don't always approve of

There are effective control measures:

- Pond leveller devices - "**beaver deceivers**"
- Protect trees from beaver gnawing with **wire mesh** or **sand-paint mixtures**
- **Beaver Dam Analogs (BDAs)** mimic some beaver dam effects without actual beavers

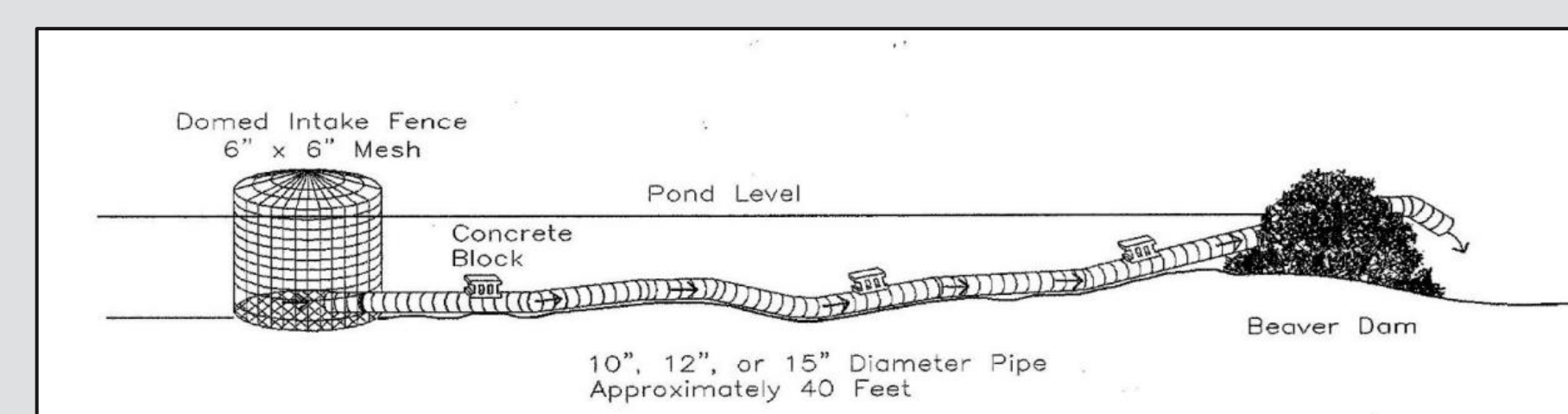


Diagram of a pond leveller, AKA "beaver deceiver" flow device



Beaver dam analog (BDA) constructed near Yates Mill Pond by Adam Lee (2017).

Beaver-mediated wetlands with high water tables survive wildfires.



After the 2018 Sharps Fire in Idaho, the Baugh Creek landscape is charred except for the beaver pond complex.

Future Directions

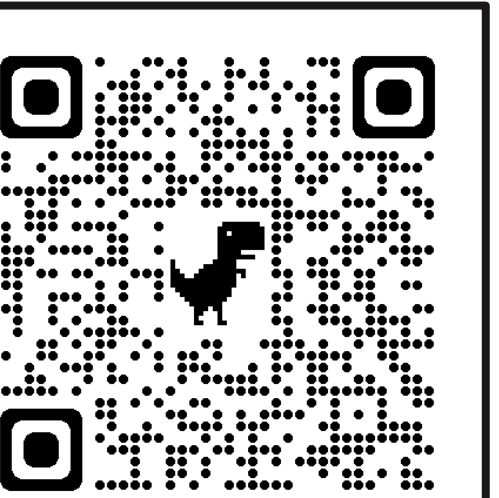
We want to know more about:

- **Why do beavers have different habitat patterns in urbanized watersheds?**
- **How much carbon can be stored in beaver-mediated wetlands?**
- **How can human-beaver relationships be improved for greater mutual benefit?**

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References:



BIG IDEA: Beavers provide valuable ecosystem services if we let them do it.

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