Community Science and Coexistence with Beaver

Shea Fuller

Community Engagement Manager, The Wetlands Conservancy

sheafuller@wetlandsconservancy.org

Beavers in urban wetlands

1. Why did we start a program looking at beaver dams?

1. How do we mitigate problems caused by beaver activity?

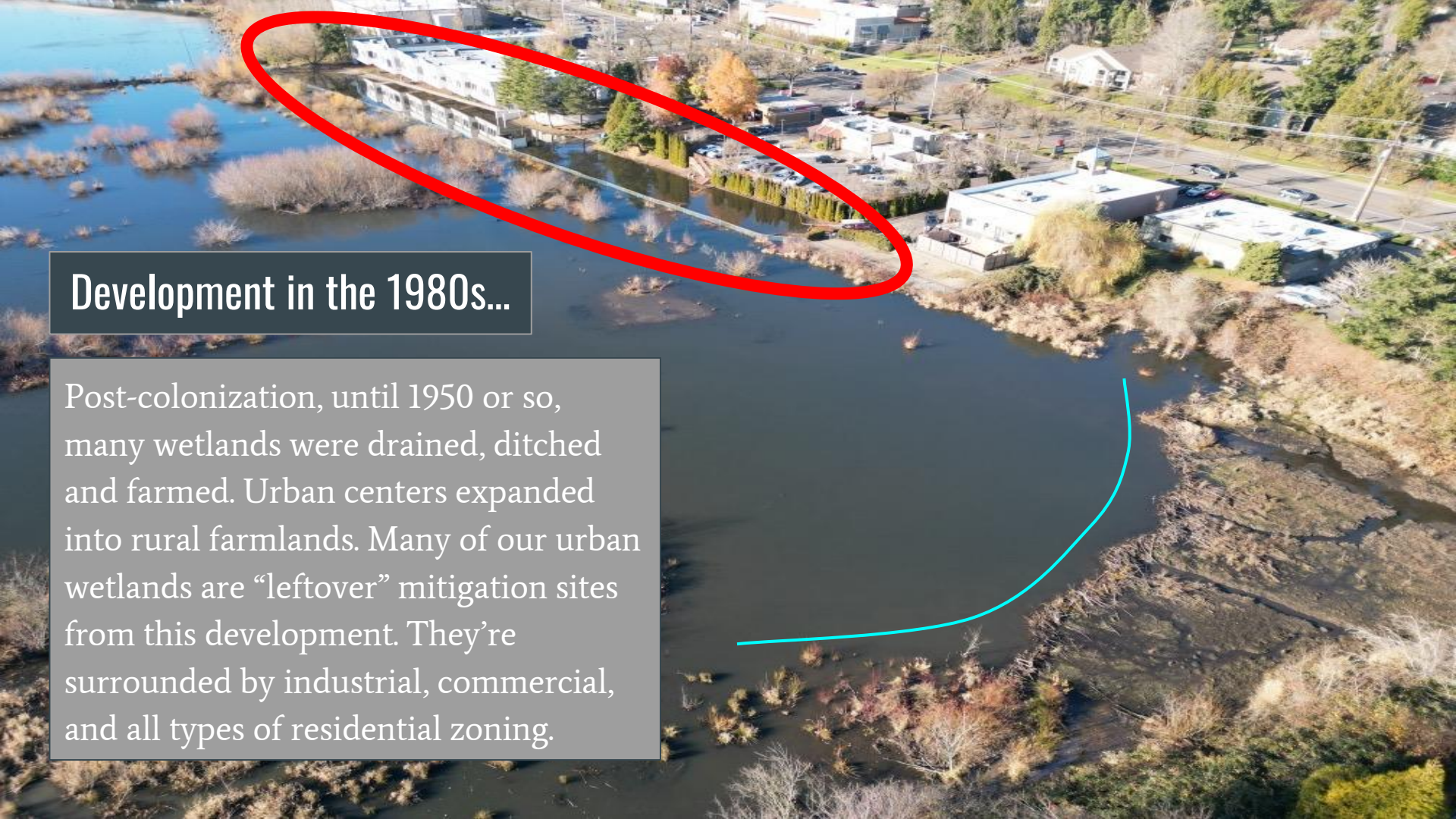
1. How have our goals changed over time?

Why Did We Start a beaver survey Program?

- In **2016...**
- We already had a popular community science amphibian egg mass survey which is conducted in the spring.
    - This taught us the joy/value of having trained help in the field.
- We knew the importance of having beavers in our wetlands.
- Regional water managers were interested in maximizing the ecological functions of our urban wetlands - water storage, water cooling, sensitive species habitat, sediment accumulation, flood attenuation...
- **But the real catalyst was CONFLICT!**

Human - Beaver Conflict

- Cultural norms and misinformation
- Flooding (streets, yards, trails, farm fields)
- Girdled/cut trees
- Crop Browse



Development in the 1980s...

Post-colonization, until 1950 or so, many wetlands were drained, ditched and farmed. Urban centers expanded into rural farmlands. Many of our urban wetlands are “leftover” mitigation sites from this development. They’re surrounded by industrial, commercial, and all types of residential zoning.

Non-coexistence Management

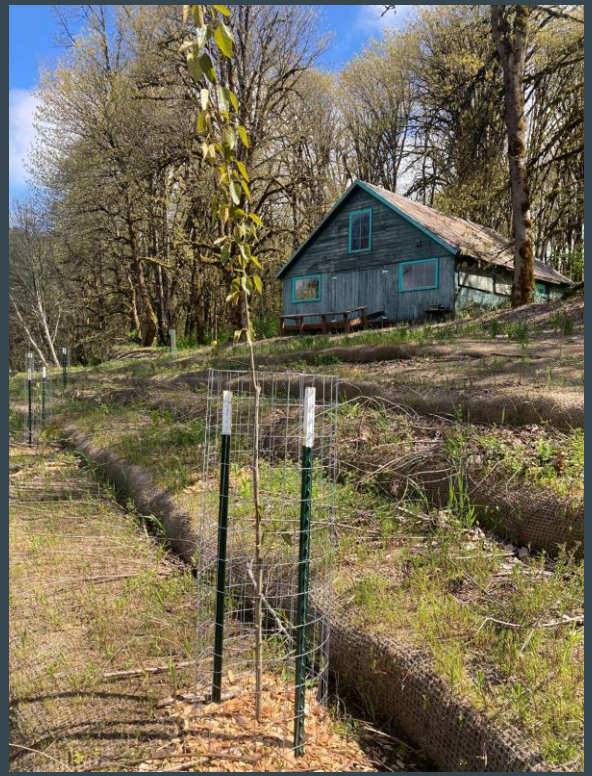
- Dam Removal & Notching
- Trapping & Relocation
- Lethal Trapping

Beaver Management in the Tualatin Basin

- Coexistence Solutions
- Lethal Trapping
- Dam Removal & Notching
- Trapping & Relocation

Sand Painting

Individual Tree Caging



Credits: TSWCD

Credits: beaversolutions.com

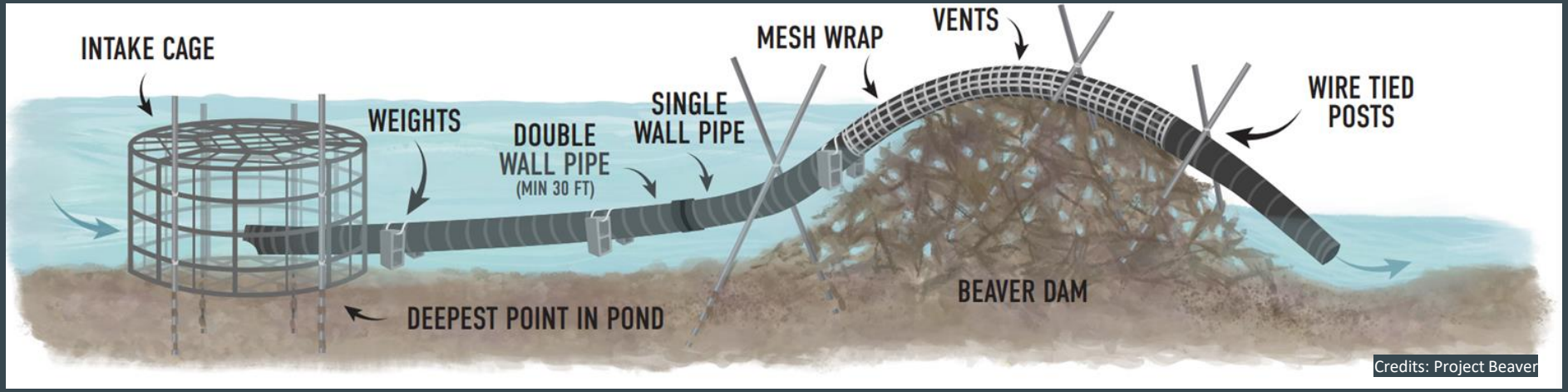
Fencing Out to Prevent Browse

Credits: TSWCD

Credits: TSWCD

Selective Planting

Flow Devices - Pond Levelers



Flow devices - Culvert Fencing and More

Credits: TSWCD

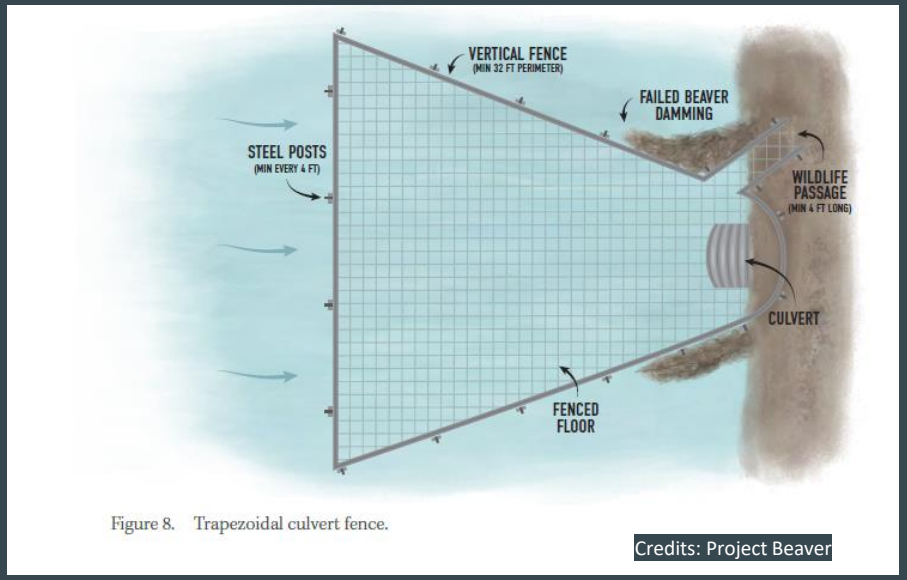
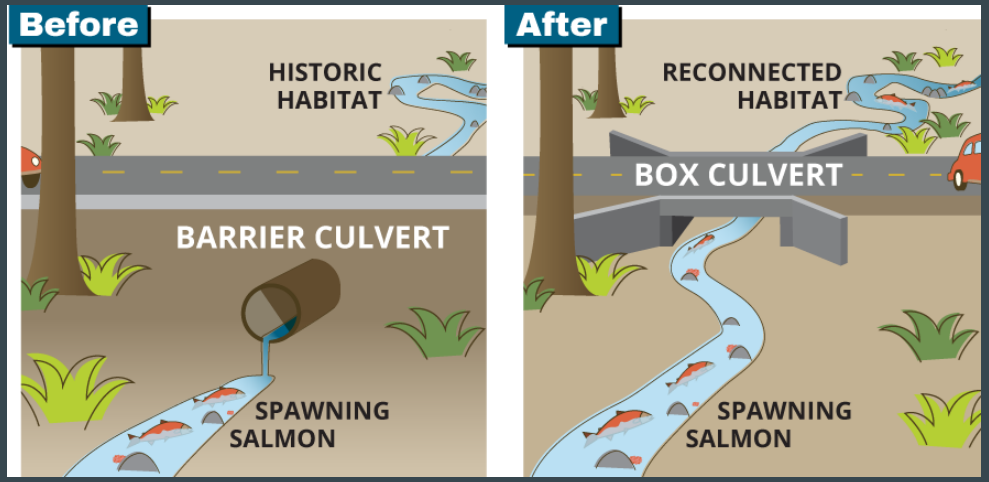


Figure 8. Trapezoidal culvert fence.

Credits: Project Beaver

Infrastructure Modifications



- Upgrade culverts or replace with bridges, decommission redundant crossings
- Move roads and trails out of the floodplain
- Control water using drainage and/or berms to limit extent of flooding

Back to Community Science!

Locating, measuring, mapping, and tracking the maintenance of beaver dams/lodges over time allows us to

1. Estimate population numbers

1. Anticipate hydrologic changes

1. Take a proactive approach to management and intervention

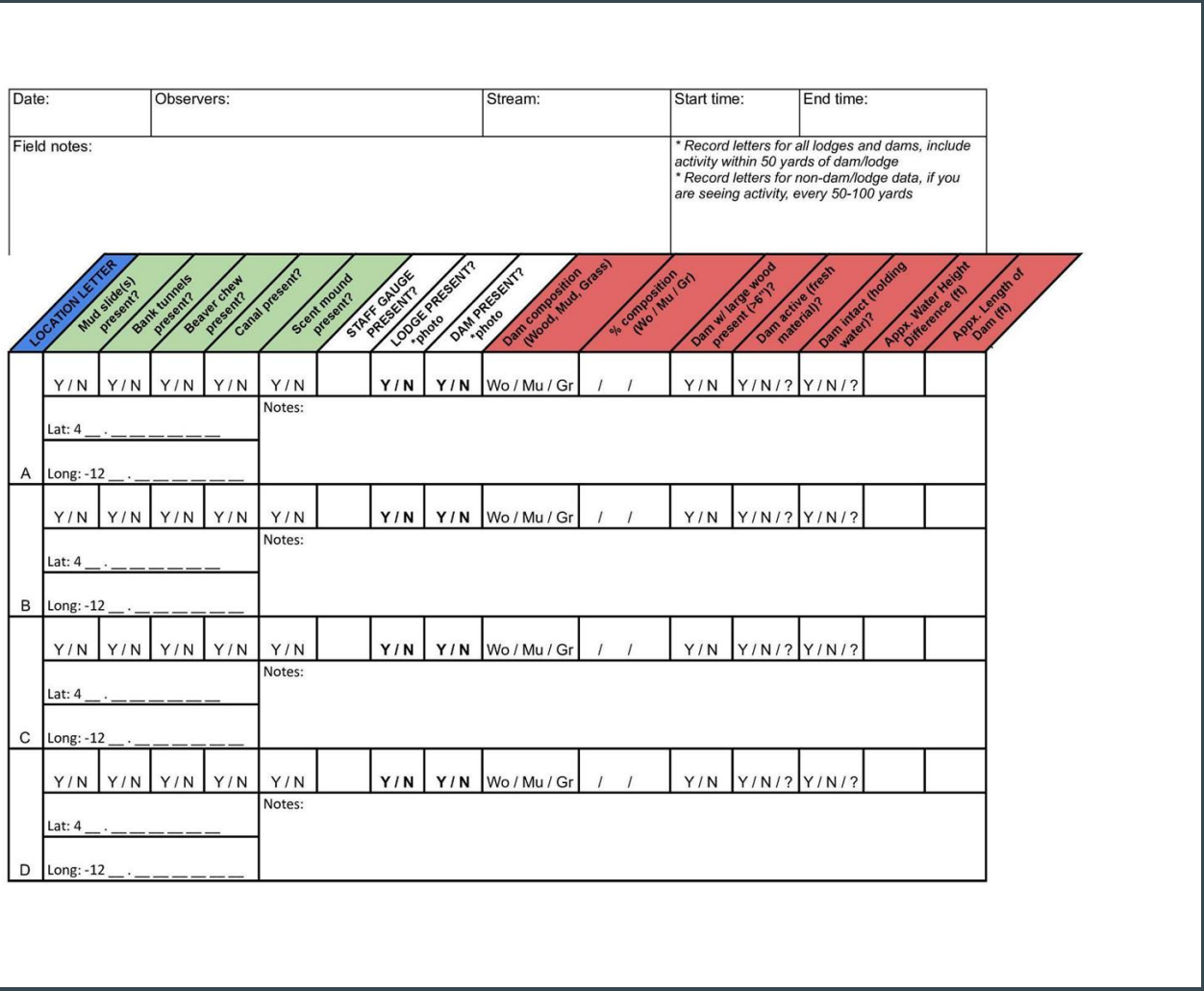
Surveys entail

- Train and equip groups of about 5 volunteers at a time
- Search about 1.5 miles of stream at a time
- Log details and photos of every beaver structure we find

Paper Version of TWC General Survey

Key info:

- Dam location
- Is it active?
- Is it intact?



Date:	Observers:	Stream:	Start time:	End time:
Field notes:			* Record letters for all lodges and dams, include activity within 50 yards of dam/lodge * Record letters for non-dam/lodge data, if you are seeing activity, every 50-100 yards	

LOCATION LETTER	Mud slide(s) present?	Bank tunnels present?	Beaver chew present?	Canal present?	Scent mound present?	STAFF GAUGE PRESENT?	LODGE PRESENT? *photo	DAM PRESENT? *photo	Dam composition (Wood, Mud, Grass)	% composition (Wo / Mu / Gr)	Dam w/ large wood present (>6")?	Dam active (fresh material)?	Dam intact (holding water)?	Appx. Water Height Difference (ft)	Appx. Length of Dam (ft)
A	Y / N	Y / N	Y / N	Y / N	Y / N		**Y / N**	**Y / N**	Wo / Mu / Gr	/ /	Y / N	Y / N / ?	Y / N / ?		
	Lat: 4 __ . _ _ _ _ _ _ _	Notes:													
	Long: -12 __ . _ _ _ _ _ _ _														
B	Y / N	Y / N	Y / N	Y / N	Y / N		**Y / N**	**Y / N**	Wo / Mu / Gr	/ /	Y / N	Y / N / ?	Y / N / ?		
	Lat: 4 __ . _ _ _ _ _ _ _	Notes:													
	Long: -12 __ . _ _ _ _ _ _ _														
C	Y / N	Y / N	Y / N	Y / N	Y / N		**Y / N**	**Y / N**	Wo / Mu / Gr	/ /	Y / N	Y / N / ?	Y / N / ?		
	Lat: 4 __ . _ _ _ _ _ _ _	Notes:													
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D	Y / N	Y / N	Y / N	Y / N	Y / N		**Y / N**	**Y / N**	Wo / Mu / Gr	/ /	Y / N	Y / N / ?	Y / N / ?		
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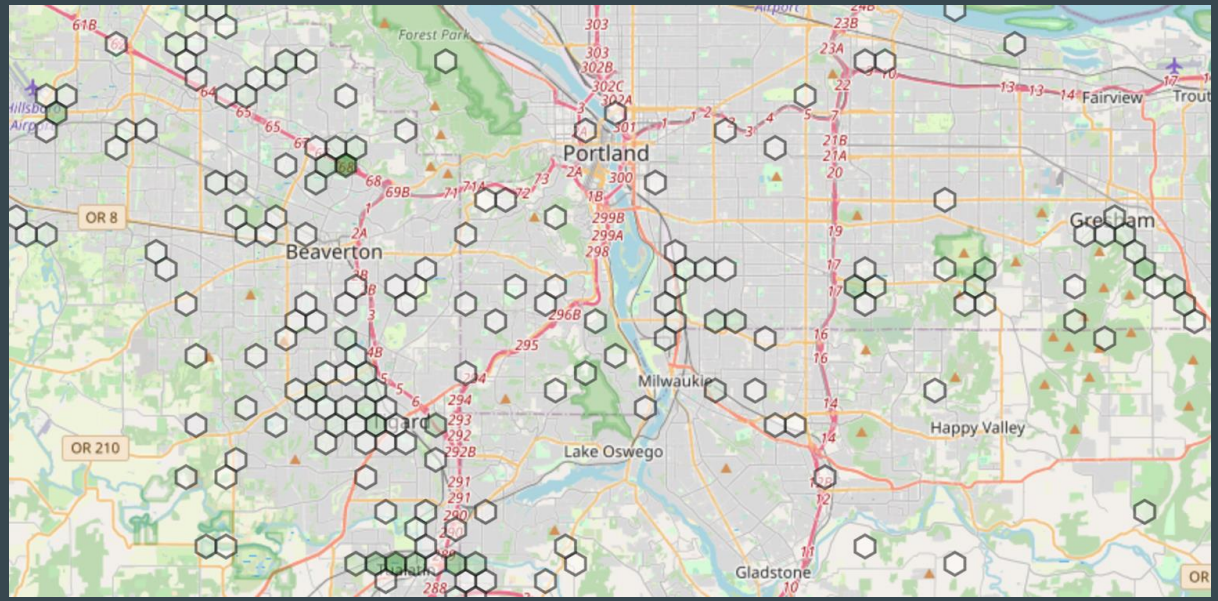
Exportable Data - through free app: Anecdata.org



Data shared for use by:

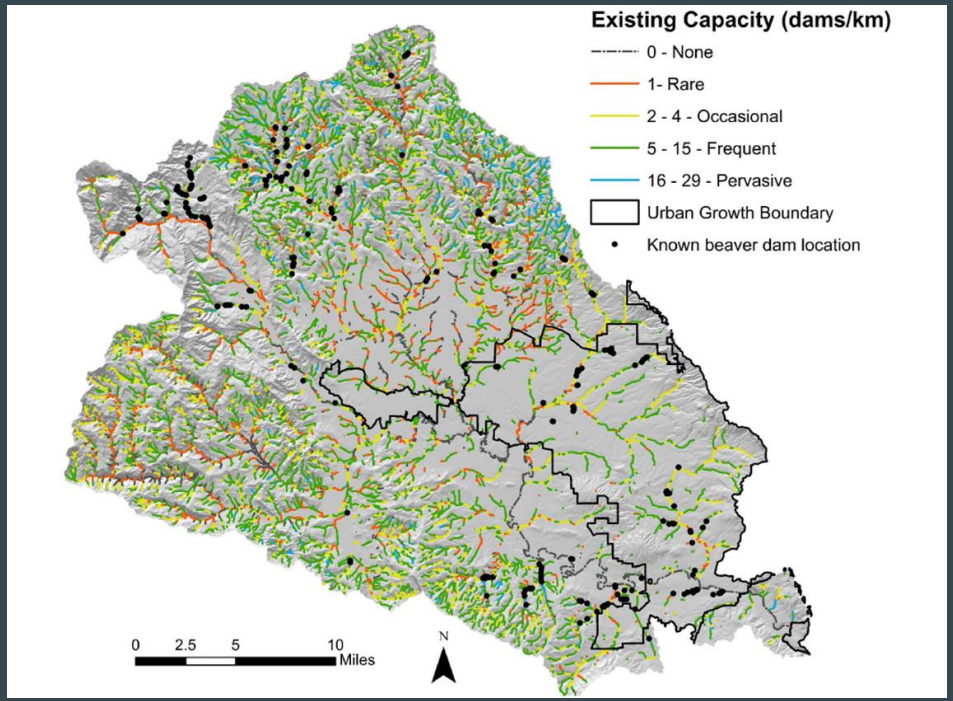
-USGS: regional Beaver Restoration Assessment Tool (BRAT, 2018)
-Tualatin SWCD for local beaver presence mapping
-Coastal beaver dam assessment in select estuaries
-Graduate and Undergraduate studies

Fast Forward to 2021

- Community Science program is thriving
- Joined a new statewide (and beyond) partnership to calibrate the Beaver Restoration Assessment Tool (BRAT) in Oregon.
- Started conducting SECOND beaver field survey, designed by Utah State University and the Mid-Willamette Beaver Partnership

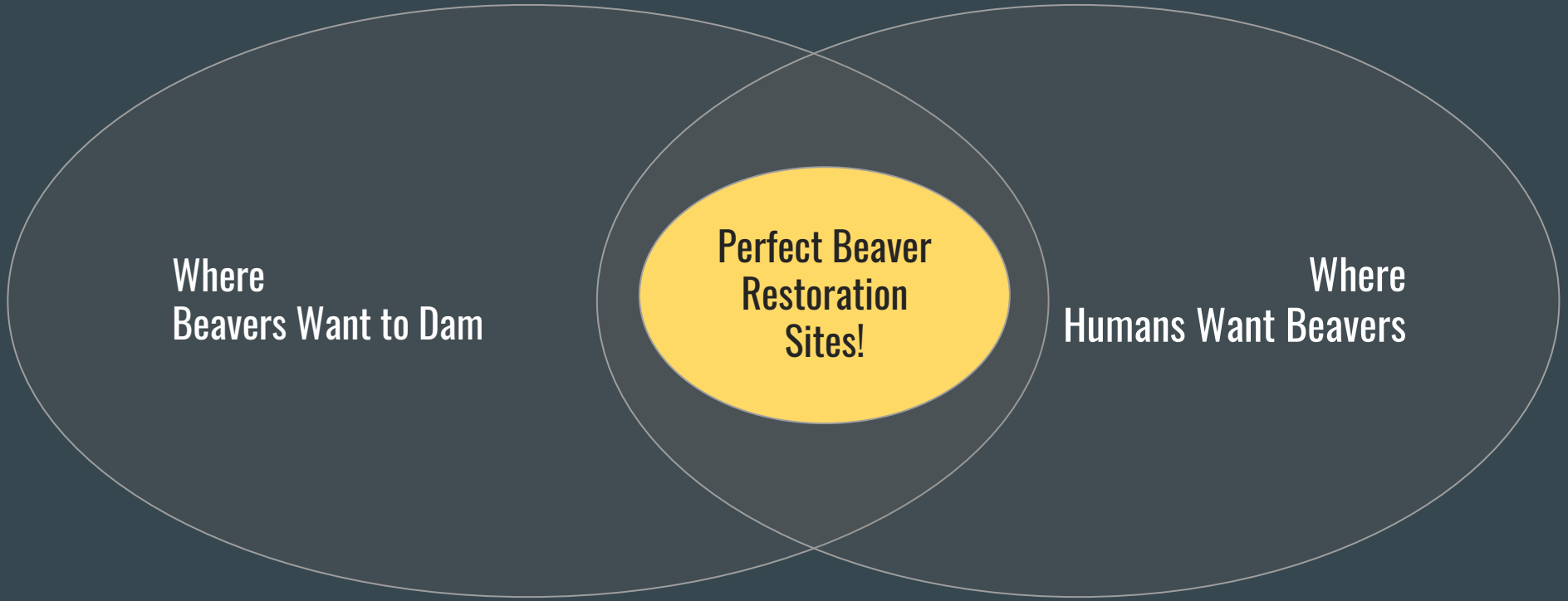
Advancing Beaver-Related Restoration

- Where can beavers dam?
  - GIS BRAT model gives us a rough estimate of dam density
    - Enough water (to make pond?)
    - Stream Power (build at base flow?)
    - Building materials and food
- Where do we want beavers to dam?
  - On the ground surveys give us a better estimate.
    - BRAT, in real life
    - **Additional information on potential conflicts**



Tualatin Basin, Oregon

GOAL: Find the Ideal Beaver-Focused Restoration Sites



Community Science Benefits

- Increases accuracy of GIS model
- Educates voters and builds local environmental literacy
- Green Workforce training
- Increases connection and access to natural areas
- Networking for job seekers and community
- Cost-effective
- Repeatable program
- It’s FUN.

Some of our Friends and Partners...

Metro

USGS

Tualatin Soil and Water
CONSERVATION DISTRICT

Clean Water Services

TUALATIN HILLS
PARK & RECREATION DISTRICT

McKENZIE RIVER TRUST

Portland
Community
College®

BONNEVILLE
JOINT SCHOOL DISTRICT NO. 93
"Student Success by Design"

NOAA

Questions?

Shea Fuller - Community Engagement Manager
sheafuller@wetlandsconservancy.org