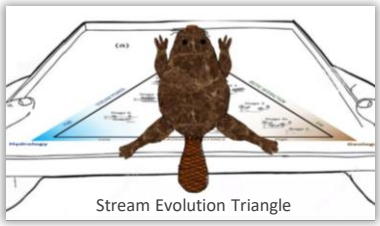
BEAVERHOODS – Planting the Seeds for Beaver Success

INTRODUCTION

This paper addresses riparian plantings on wadeable streams borne from nearly two decades of experience in planting projects on eastern Oregon landscapes.

Over the past decade, ONDA's riparian restoration strategy has developed to focus specifically on beaver as an "umbrella species"; addressing the factors limiting beavers' management of floodplains, by utilizing an in-house conceptual model referred to as "BeaverHOODs".


Stream Evolution Triangle

(Learn more at RRNW Youtube Speaker Series 3/16/21)

This beaver-based prioritization strategy was adopted because of the inherent ecological resilience and productivity achievable only from self-sustaining nature-based solutions: as opposed to relying on anthro-pogenic controls, or on actions that treat symptoms rather than root causes.

The strategy in 4 categories: BeaverHOODS helps a practitioner look at a riverscape "through a beaver's eyes": at the site's 1) hydrology, 2) vegetation, 3) morphology/topography and 4) cultural landscape.

Associated rules of thumb and guidance then help congeal these observations into a restoration design and set of expectations in an intentional and strategic way.

The Goal is to establish a "BeaverCould" - a 0.5 to 0.75-mile long reach where all four categories of the BeaverHOOD strategy (above) are addressed and beavers can then assume management by doing what they do to fulfill their own needs and drive for survival.

A lack of suitable woody riparian vegetation (size, species, location, density) is a frequently overlooked limiting factor preventing beaver long-term occupancy, and their ability to manage floodplains.

Understanding beavers as sentient creatures with their own agency, social structures, learned skills and preferences is essential.

Put your "beaver goggles" on and think like a beaver…

The BeaverHOOD Strategy encourages the establishment of 18,000 mature stems of suitable riparian plant species per ~half-mile reach: typically diverse willow species, aspen and cottonwood.

The guidance within this handout considers the intentional and repeatable suite of approaches which could meet these goals over short timelines utilizing low budget/tech tools.

Below you will find "prompts" for deeper discussions among restoration practitioners regarding just the vegetation portion of the BeaverHOOD Strategy: from "initial site assessments" to "post-implementation care".

Adapted from Jefferson Jacobs' (MS and Certified Riparian Restoration Professional) 2024 poster from River Restoration Northwest Symposium.

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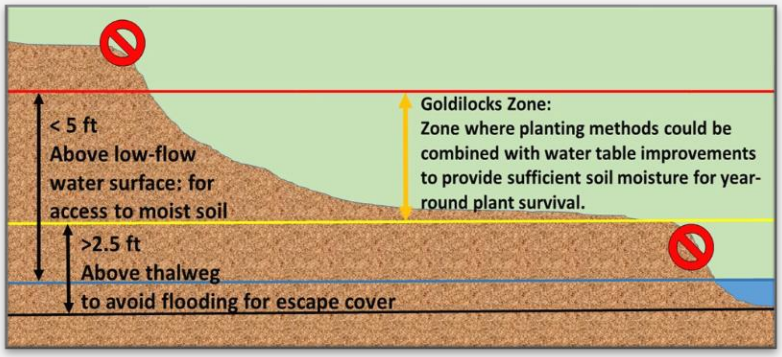
PLANNING

1 Plan for planting at least 1 year in advance!

- Potted plants often need to be ordered a year in advance.
- "Cuttings" are often harvested months before they can be planted. (Access to a walk-in cooler can keep cuttings dormant until planting)
- So need to work through steps 2-4 to have idea of how, what species, and where you will plant; informing the number and type of plants (potted/cuttings) to order or harvest.

Where to source cuttings?
Wild or nursery grown, cuttings vs. potted plants, stick length and time of year.

Species? Health? Diversity?
When cloning cuttings cut from willows or cottonwood from a wild (vs. nursery grown) source, consider the species, health of plant and harvesting from a variety of sources to improve diversity.



2 Find the Goldilocks Planting Zone

At less than 2.5 ft above the thalweg, your plantings may be flooded out over time by beaver dam building.

At less than 5 ft above surface of water of the lowest flows represents the practical upper limit where plants can be installed with low budget, low-tech techniques and *still reach suitable soil moisture*.

No more than 100 ft from the creek's current location means food is closer to escape cover where beavers feel safer and are less vulnerable to predation.

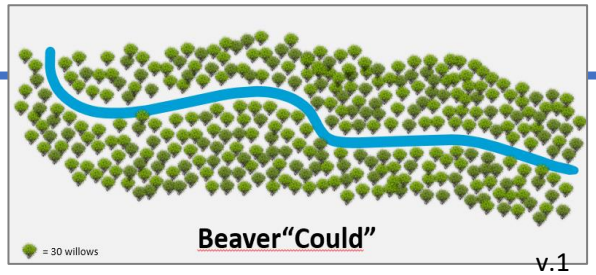
3 Of course, existing suitable vegetation counts toward the 18K stem goal

Map existing suitable beaver food in the Goldilocks zone. Suppressed vegetation might recover and spread on its own with the removal of browse pressure. Just make sure it is actually "preferred beaver food" species (willow, cottonwood, aspen highest value) and don't assume it actually exists. (p.s. *Alder* is not a preferred beaver food.)

Get acquainted with beaver signs. Beavers will maintain their teeth on, cut down, and build with, materials they don't actually eat. They will also "survive" on sub-optimal food sources. Understand what your beavers prefer to eat based on consumption vs. availability, (including aquatic vegetation like cattails) and what is not being eaten. Don't mistake occasional signs of beaver chew for beaver occupancy.

When thriving beaver families and long term beaver managed floodplains (BMFPs) is the goal, how much beaver food is needed Day 1 of occupancy to sustain long-term site persistence?

Between existing vegetation and new vegetation planted *the total size of larder should provide an average beaver family (of 5) beavers with enough food initially and also allow the willows to regenerate between beaver harvests.*



PLANNING (CONTINUED)

4 Map Soil Moisture and "Diggability" in the Goldilocks Zone

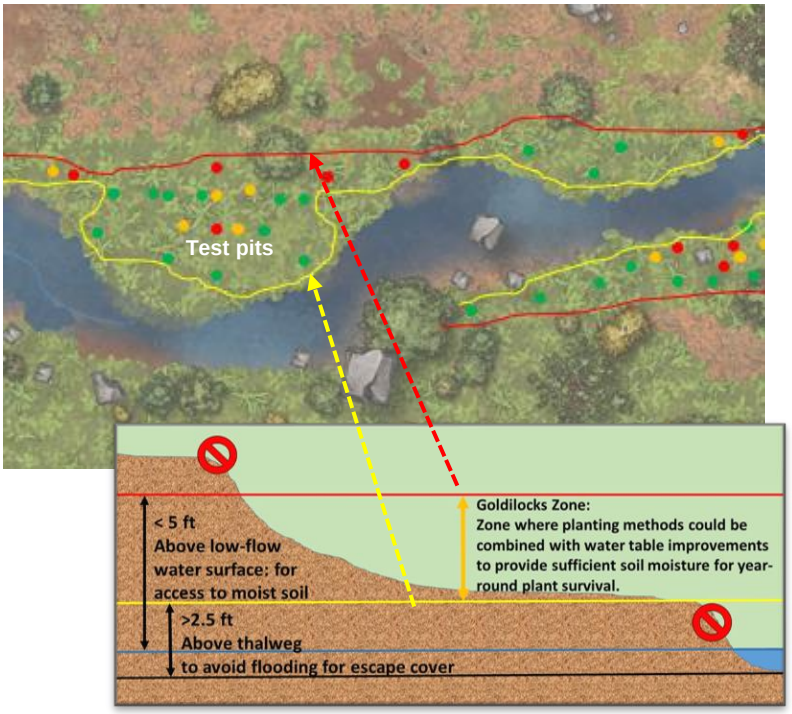
Spoiler: Plants need water year round, and you need to be able to make holes to plant them. Planting during the wet spring or fall seasons makes everywhere look suitable for planting: **you need to plan your planting locations for the dry season conditions those plants will have to survive**.

What and how you will be planting determines how near to the surface you need suitable soil moisture at the driest time of the year.

Accessibility, planting objectives and soil moisture and diggability will also determine what and how you hope to plant and where.

Consider the differences between a) deep planting "cuttings" with a mounted auger vs. b) hand-planting "cuttings" vs. c) hand-planting potted plants.

Map Soil Moisture and "Diggability" at the driest time of year using the "deepest" planting methods suitable at any given location (i.e. dig, auger or "pike" actual test holes throughout all potential planting sites).



In the Oregon high desert, planning your approach for the harshest, lowest-moisture season is key to survival and establishment

- Suitable moisture rules of thumb: Holes need the lower 75% to have soil moist enough to make a "snowball" in fine grains, or to be "visibly wet" in courser grains. A hole with more than 75% (for cuttings) or 30% (for potted plants) filled with standing water can drown out plants.
- Diggability: Gravel holes collapse, but have good water infiltration. Bedrock or embedded cobble may be undiggable, and prevent hyporheic benefits. Fine, uniform soil may be hydrophobic and prevent infiltration. Reed Canary Grass (RCG) root masses will hamper finding soil to backfill your plants. Source another soil supply away from RCG.

But what about . . .

- Beaver Dam Analogues (BDAs)? A means to an end, not an end to themselves. Temporary tool to address stream power or improve soil moisture, but thoroughly resurvey soil moisture months after install.
- Older veg as indication of soil moisture? Don't assume that older mesic or riparian vegetation present onsite is an indicator of current soil moisture. Mature plants have deeper roots and can often be present in conditions where your new veg establishment would be difficult.

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IMPLEMENTATION

5 Planting, Finally

Timing: Potted plants after senescence in fall, cuttings as early in spring as possible. Don't store cuttings in a cooler >2 months. It is possible to soak cuttings for too long.

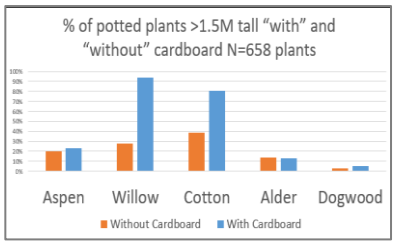
Densities 1 plant per <2.5 feet: Shades *Phalaris*. Discourages deer from jumping into exclosures.

Cardboard weed-mat for potted plants going into weedy areas, after weed whacking.

Cluster augered cuttings: 4 to 6 cuttings per 6-inch diameter hole won't compete if they are deep into moist soil.

Exclosure fence with skirt all the way around to exclude beaver, and discourage deer. Inexpensive 60" high of 2'X4' welded-wire fence balances effective with affordable and easy to handle.

Tips for planning the logistics: Soaking, staging, materials, order of operations, mental walk-through.



MONITORING / 'READY FOR OCCUPANCY'

6 The job's not over until beavers move in!

Maintain fences and BDAs: All that work is wasted if the plants get killed off before they can handle the stress of browsing and of fluctuating water levels.

Track what worked, and what didn't (and why) to better inform your next effort. Fail forward. If this is your first project, start small and learn from your mistakes. Everyone makes mistakes: They just don't publish them.

Remove exclosure fences 5 years after the last exclosure in the whole treatment reach was planted. Removing individual exclosure fences "piecemeal" will result in over-browsing of each one in turn. Established plants have more resilience to browsing and higher structural diversity and volume.

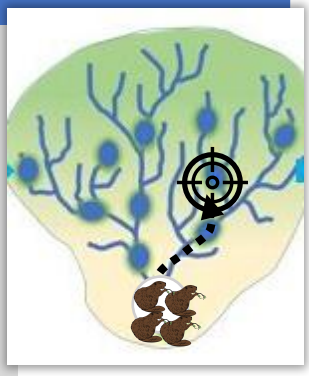
ADDITIONAL READING

- How much veg for beaver success? www.westernbeavers.org/beaverveg
- More about BeaverHOODs: www.westernbeavers.org/beaverhoods

For consideration:

- ***When might beavers arrive?***
- ***Where's the nearest growing beaver family?***
- ***In other words - how long might it be before beavers move in and settle?***

On connectivity:
What obstacles might exist in the distance between the nearest growing beaver family and your treatment site? For example: lack of water cover, trapping, etc.



Work to address these limiting factors to ease the path of travel and migration for dispersing 'source family' beavers to find your 'ready for occupancy' site.