Beaver Dam Analogs

History

Prior to colonization and the introduction of fur trapping, much of the North American landscape was shaped by beavers. Accounts from early explorers describe thousands of successive beaver dams climbing every branch of every river, forming wide ponds and wetlands, wherever the geography allowed. Current estimates suggest that up to 250 million beaver ponds once puddled the continent, impounding tremendous amounts of water late into the dry season, and trapping sediment which would otherwise have been washed away. And they'd been a part of that ecosystem for so long that many surrounding species had adapted to thrive in these habitats.

European colonists saw beavers as a resource to be exploited, and did so as unsustainably as they extracted everything else they found in North America. They killed thousands of beavers per year and shipped their pelts across the ocean for use in clothing. By the end of the massacre, an estimated 1% of the continent's original population was still alive.

Even after the fur trade became unprofitable, successive generations of colonists continued the killing. Beavers need winding, flood-prone wetlands, but the colonists and their descendants wanted wide open, dry fields for farms and cattle, roads, and straight, tidy rivers that never flooded their banks. They cleared the forests beavers relied on, filled in wetlands because they saw them as wasted ground, straightened the rivers, and killed beavers whenever they clogged the flow of water or flooded roads or property.

The loss of the beavers reshaped the land in ways the colonists and later Americans never imagined. Many streams and rivers became 'incised' meaning they carved their way deeper into their banks. As the surface water level dropped, the water table underground dropped with it. Less water was retained in the surrounding land and the region became drier, especially later in the summer and fall. Many aquifers became depleted, and streams once fed by groundwater springs stopped flowing seasonally or altogether.

The nature of rewilding work depends on the region, climate, and current condition of the land. In some areas, where beaver populations are already established, they will naturally resume work when left to their own devices. But some of the more deeply-incised streams are difficult for beavers to re-establish in on their own. They need slow moving streams, wide ponds where they can shelter from predators, and these steep-sided, fast moving, shallow rivers are a hard, dangerous place for them to start.

Design

Beaver Dam Analogues (BDAs) are simple structures built in streams using logs and branches, meant to mimic the placement and function of real beaver dams. Nearby trees are cut and delimbed to form short posts two-to-four inches wide. One end is sharpened and the posts are driven vertically into the stream bed like a sort of fence with each post roughly one foot from its neighbors. Limbs from the cut tree are then woven between the uprights to add support, and leafy or evergreen branches are packed in to form a sort of natural sieve which traps sediment and silt. Usually a large log is added at the top to pack everything down and prevent movement.

Depending on the velocity of the water, a crew may build a BDA with one or two rows of posts for

support. If they build a double row, the two fences are interwoven with branches and leafy brush gets packed between them. It's common practice to build one large BDA that can withstand more force upstream from several smaller ones. This helps form deeper pools of water and slows the overall movement of the water through the dams. It also mimics the kind of environment beavers tend to build.

Often once the BDAs have begun to work and the shape and flow of the river has started to mimic a beaver habitat, beavers will return and begin shoring up the BDAs with branches and mud, and building dams of their own.

In this way, BDAs represent a sort of system humans can use to collaborate with beavers - to suggest locations for dams and to combine our perspective and planning with their relentless drive to build and maintain these structures. The end result is a strange mix - too organic for a manmade project, but a bit more regular than something a rodent might build. And unlike other manmade dams, these both fit the ecosystem they exist in, and are guaranteed long term maintenance, as successive generations of beavers repair existing structures and add new ones. Once beavers return and re-establish the mazes of pools and side channels the river historically formed, the surrounding ecosystem can recover startlingly quick. Often unexpected species return to the area, water temperatures cool, plants re-establish, and seasonal streams flow longer into the year.

In a Solarpunk Society

If your setting is generally already pretty solarpunk, it's likely that these kinds of interspecies-collaborative restoration projects are generally known about and well-accepted.

That doesn't mean there isn't room for conflict:

- In more populated and developed areas, these projects may run into trouble with outdated laws (or regulators) concerned with water rights, or with construction in waterways. For example, many US States have existing laws meant to protect shorelines and bodies of water, which can, ironically, cause problems when humans try to get permits for their half of this work.
- Even in a more solarpunk world, humans often don't want to get their feet wet, or see their home or property flooded. Even people who steward land with good intentions may have plans for how the habitats in their care will take shape, and feel upset when a large rodent kills their trees or decides that their space will actually become a wetland. This is especially true in more densely-populated areas, where the land has been carved into many smaller parcels, and a new beaver's continued existence essentially depends on every affected human treating them decently.
- For their own safety, Beaver Dam Analogs and wetland restoration may not be achievable or worthwhile in some areas, and beavers in these areas may be caught and relocated to wild where they don't have to worry about dangerous human neighbors.