Lessons Learned: Beaver Coexistence Tools

Since our inception in 1992, Cows and Fish has promoted the importance of beavers as keystone species in riparian areas. From that work, we quickly learned there was a desire from land managers and partners for co-existence solutions to beaver challenges. The intent of co-existence tools is to maintain the ecological benefit of beavers while reducing the conflict between their activities and human activities or land uses. Although these solutions have been used more broadly in the United States and other parts of Canada, there was very little use of them in Alberta as of 2016, leading to our Working with Beavers collaborative's efforts to demonstrate these techniques in Alberta.

Many of our co-existence sites have focused on pond-levellers and culvert exclusion, or a combination of the two, as well as some tree wrapping to deter or prevent conflicts with beavers. The basic techniques are very effective although applying them requires meeting individual site needs.

Of nearly 40 demonstration sites in Alberta, there are a variety of reasons beaver coexistence devices fail and are removed: lack of maintenance resulting in beaver getting around them or blocking them; co-existence structure could not withstand extreme flows; debris and sediment build up at intake end (either from direct beaver activity or release of sediment / sticks from upstream); and downstream beaver damming resulted in a back up of water to the pipe outlet, making the installation ineffective. These lessons from nearly a decade of experience should increase success and support further beaver coexistence efforts.

Lessons Learned Implementing Beaver Co-existence Tools

- Evolution and adaptive management of these tools is often needed, so plan to include maintenance and monitoring in your initial plan to make adaptation possible. Recognise that if funding is not multi-year or ongoing to allow monitoring and maintenance, it can result in issues with the tools working as intended.
- Tool size must fit the watershed area and volume contributing to the site. For example, pipe size and number in pond levellers used to lower pond water levels need to consider volume of incoming flows, particularly in developed urban areas or areas scheduled for development with buildings, roads or other hard surfaces that increase runoff yield.
- Selecting the right materials for the site conditions is important. A small variety of materials may be used depending on the site conditions and tool design. For example, the green sewer style pipe could work in a shallow system that does not require much, if any, flexibility and if you have the machinery available for securing the pipes together without a coupler.
- For pond levellers, protect the outlet pipe at installation if there is a beaver dam complex (i.e. ponds in succession) or if beavers may have previous experience with pond leveller pipes or nearby culverts. If not done at installation, there is increased likelihood beavers will block the pipe outlet.
- When joining long pond leveller pipes, couplers can crack in deep water, so ensure slow submersion of both pipes to reduce that risk. Adding more fine wire mesh around the coupler before, or even after installation, can provide support in these situations.
- Having partners is valuable and necessary to provide labour, equipment and supplies for planning, installation, monitoring and maintenance. This can include other organizations, landowners and volunteers. Often sites are not readily accessible to everyone, but someone will be close enough to monitor and report on the site occasionally – plan for this.

- Beavers may move, change or learn new behaviours to adjust to the tools we humans put in, so the issue that is being addressed due to their presence may also move or change, requiring adaptation or adjustments.
- Getting regulatory approval for these tools may seem daunting, because it can be complex, yet it is possible, including within streams listed as critical fish habitat. The regulatory process often does require considerable time; having this time can be a challenge when dealing with emergency issues such as flooding of infrastructure.
- Implement best practice techniques and use recommended materials, the first time, as these are based on experiences from many other sites and practitioners. Addressing beaver co-existence challenges requires ongoing adaptation but should still be based upon using key principles of appropriate techniques and beaver ecology, adjusting the installation to fit the specific site details and beaver behaviour.

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<tr><td colspan="3">Evolution of beaver co-existence tools at one road-side culvert site, previously prone to plugging by beavers.</td></tr>
<tr><td>May 2019. Due to narrow area, beaver returned and began damming on culvert exclusion fence. This can be acceptable if a clear culvert is the goal and ponded water can be tolerated, but that was not the case here next to a road. Clearing of the dam materials occurred several times until a pipe could be added.</td><td>August 2019. Exclusion fence adapted into a fence-and-pipe combination. Beaver can continue to dam the fence, since water still moves through the pipe and the pond water level is maintained. The grate and cone were removed from inside the culvert and the sound of water moving into the culvert lessened.</td><td>April 2023. Although not plugged by the beaver, elevated water levels from downstream beaver activity allowed the beaver to chew on the wooden header, resulting in need for repair.</td></tr>
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