

## ***Beaver: pest or protector of water resources?***

***Author: Cows and Fish***

Water ... we can't live without it. No substitute exists for this precious and beautiful resource, which has been scarce in Alberta. In the future, the availability of water may decline as we face more variability in weather and precipitation patterns, along with more demands, as our population increases. With growing uncertainty about less snowpack in the mountains, earlier spring melting and runoff, and diminishing stream flow earlier in the summer, by late summer when we need water the most, it may be in short supply. Many people believe that water will be the new gold of the future.

As the reality of the impacts to our water becomes ever more apparent, we will need to catch and store water more effectively. We've given water lots of advice on this issue, in the form of expensive dams and big reservoirs, but is that always the best solution? Have we overlooked a natural ally in our efforts to conserve and manage water? Maybe. Consider our Canadian icon, the beaver!

For more than 10,000 years, beaver have been building dams and storing water across the landscape. Historically, tens of millions of beaver were busy in nearly every watershed across the North American continent. The cumulative effect of their ponds on water storage, both above and below ground, was enormous. In simple terms, more beaver on the landscape means more water supply. University of Alberta biologist, researcher and author of the *Beaver Manifesto* Glynnis Hood, found that by scanning historical records of beaver populations and climate data, ponds with active beaver lodges had 9 times more water during droughts than ponds without dams. "In times of drought they [beavers] may be one of the most effective ways to mitigate wetland loss," said Hood. "Some people believe climate is driving everything, but the presence of beaver has a dramatic effect on the availability of open water in an area. Beaver are helping to keep water in areas that would otherwise be dry." The study, published recently in the online edition of *Biological Conservation* journal, also found that temperature, precipitation and other climate variables were much less important than beaver in maintaining open water areas in the wetlands of the mixed-wood boreal forest in Alberta.

In addition to impacting water quantity, beaver ponds contribute to an impressive list of valuable goods and services for humans - including cleaner sources of domestic water, more reliable water for irrigation and livestock, forage, opportunities for watching wildlife, hunting and fishing. Ponds trap and store tons of sediment which improves water quality downstream for people and livestock alike. This natural filtering and buffering of possible contaminants and recycling of excess nutrients (like phosphorus) assure cleaner water for all. And lastly, their ponds create diverse, productive and unique habitats for creatures great and small. This can enhance the biodiversity and connectivity of the overall landscape.

Beaver dams and ponds check the velocity of streams and dissipate water energy laterally, creating speed bumps for streams. This decreases the risk (and costs) of major flooding and slows erosion. Sediment captured by beaver ponds broadens stream valleys over time with rich deposits of soil and higher water tables to build productive riparian zones, wetlands, and meadows. The diverse mosaic of vegetation, particularly willows, in these areas, protect and

stabilize stream banks. Beaver ponds store surface water and re-charge ground water. This increases water supply and releases water more steadily throughout the year - especially vital during droughts. Much of the stream water captured by ponds is stored underground in shallow aquifers and may re-enter the channel downstream. This keeps water temperatures cooler in summer and warmer in winter to the benefit of sport fish such as trout.

In the 1800s, European fashion prized beaver pelts for hats, which spurred a westward wave of exploration as trappers searched for beaver. Excessive trapping eliminated beaver from most areas by the early 1900s. This was followed by intensive use of the land and drained watersheds. Without beavers, streams cut downward and some dried up, water tables dropped, woody vegetation disappeared and wildlife declined. The impacts on us have been considerable - including uncertain water flow, higher costs for water treatment and increased likelihood of erosion and flooding.

Thanks to improved management and recolonization, beaver populations have rebounded over the past 50 years but only to 10-20% of their original numbers. Full recovery has been stymied ... partly because we have not understood and appreciated the many services provided by beaver and the benefits for us.

Life is all about water - a substance more precious than gold and likely more scarce as we move into a climatically uncertain future with more people needing water. With their ponds serving as natural water reservoirs, beaver can help us but only if we accommodate their activity and find a balance between the work of this sometimes pesky bucktoothed rodent and our land-use to sustain both on the land. Will we partner with nature's engineer to help store more water for free? The health of our watersheds, from headwaters to drinking tap, depends on our answer.

**For more about beavers and the Cows and Fish program visit [www.cowsandfish.org](http://www.cowsandfish.org).**