



WESTMINSTER

# Beaver Management Plan

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City of Westminster  
Open Space  
2008

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## Purpose of a Beaver Management Plan

In 1985, The City of Westminster initiated the Open Space program that began the purchase and preservation of undeveloped natural areas throughout the city. The Open Space Program Policy Statement (13-5-1) reads “In the broadest sense, the objective of the Open Space Program is to promote quality of life for the citizens of Westminster through the preservation and protection of the quality of the natural environment, which has given Westminster much of its character...” Open Space properties, therefore, are to be managed in a way that promotes the quality of the natural ecosystem. Establishing and maintaining wildlife habitat is a key goal in open space management, as is the protection of the natural resources. These two goals are at times in conflict with each other. Managers are sometimes faced with the choice of allowing beavers to inhabit an area with the knowledge that trees may be lost or protect the trees by eliminating the beavers in that area.

Beavers can be a valuable and desirable animal to have in an open space environment and at the same time they can be harmful to the existing natural resources. These benefits and detriments can often occur simultaneously at a single location. Because of the varying degrees of tolerance levels among people to beaver activity, there are bound to be disagreements on how best to deal with beaver conflicts.

This document is intended to be a foundation for future management decisions based on current scientific data and City of Westminster Open Space standards. This plan is not meant to provide a blanket policy for beaver management. Rather, this plan gives management options that staff can choose from when having to take action. Wildlife management is a fluid science and not every management option will work or be right for the given situation.



Beaver, (*Castor canadensis*)

### **Biology of the Beaver**

The beaver (*Castor Canadensis*) is North America's largest rodent. Adult beavers typically weigh 45 to 60 pounds, but have been known to grow to 100 pounds. Wild beavers live about 11 years, unless they are trapped or killed by predators. Beavers are aquatic mammals with large webbed hind feet ideal for swimming, and hand-like front paws that allow them to manipulate objects with great dexterity. They have excellent senses of hearing and smell, and rely on these senses more than their less developed sense of eyesight. When swimming underwater a protective transparent membrane will cover their eyes, and flaps close to keep water out of their nostrils and ears.

Beavers are monogamous and mate for life. They do not breed until they are two to three years old. They have a gestation period of 4 months and will have one litter of 1 - 6 kits per year. Each established beaver "colony" consists of adult parents, and two years of offspring. Only the adult female breeds. The average number of beavers in an established family is typically six or seven beavers.

Once a beaver reaches the age of two they will usually leave the colony to find a mate and establish a colony of their own. This is the most dangerous time in the life of a beaver. Not only can they be killed by predators or cars, other beavers will attack them if they enter their ponds. Beavers have been noted to travel ten or more miles searching for a place to live.

Beaver dams are created as a protection against predators and to provide easy access to food during winter. Beavers always work at night and are prolific builders, carrying mud and stones with their fore-paws and timber between their teeth. Beavers usually can re-build a dam overnight if it has been breached, thereby making this technique ineffective. Beavers predictably select sites to build their dams based primarily on topography and food supply. Preferred sites for damming will be in areas where the dam will flood a large flat area and there are plenty of desirable woody plants for food in the vicinity. Streams that are more than two feet deep or have strong currents are not generally dammed. Beavers often situate their dams where there are constrictions in the stream flow (natural or manmade).

Each beaver colony will usually establish one large pond where they will build their lodge. In addition to this primary pond, other smaller dams up and downstream are usually built to create smaller ponds. These smaller ponds permit safe travel for the beaver as it seeks out new food supplies of native trees and shrubs. The average beaver colony will dam a half-mile length of a small stream.

To obtain food and building materials, beavers are well known for their ability to topple large trees using nothing but their specially adapted incisor teeth and powerful lower jaw muscles. Beaver teeth never stop growing, so they do not become too worn despite years of chewing hardwoods. Their four front teeth (incisors) are self-sharpening due to hard orange enamel on the front of the tooth and a softer dentin on the back. Therefore as beavers chew wood the softer backside of the tooth wears faster, creating a chisel-like cutting surface.



Beaver felled trees along Big Dry Creek, 2008.

### **Benefits and Problems Relating to Beaver Activity**

The beaver is an important mammal to Colorado, as well as to North America, from both a historical perspective and from an aesthetic perspective. Beaver can be among the most beneficial of the City's wildlife. They create favorable wetland habitat for a variety of wildlife species including fish, birds, amphibians, reptiles, and mammals. This variety of wildlife is in turn valued for recreational, scientific, educational and aesthetic purposes. This increase in biodiversity of wildlife is a great asset to the open space ecosystem. Wildlife observation is an important product of the open space that is highly valued by trail users and the residents.

Beaver activity is also helpful in retaining storm water runoff and improves water quality by trapping sediment, nutrients, and pollutants. The dams act as natural check dams during floods and high water, reducing erosion and slowing the water enough to deposit solids. The higher water behind the dam also creates additional shoreline and enables water-loving plants and trees to grow and thrive.

Beaver activity can also have detrimental affects. Their actions can sometimes lead to flooding of roads and trails, the loss of trees and shrubs, and the destruction of both public and private property. Their impacts often occur suddenly and dramatically. Beavers are usually not noticed in an area until valuable trees have been felled or flooding along trails occurs. Often, when flooding occurs along trails, it is necessary to breach the dam. Although this can be a quick fix solution, the dams are usually rebuilt overnight.



Beaver dam on Big Dry Creek, 2008.

## Policy for Choosing Beaver Management Options

Beaver activity emanating from city-owned open space and resulting in conflict and/or natural resource damage will be evaluated by the Department of Parks, Recreation and Libraries for the existence of, or potential of:

- impact to public health and safety
- unacceptable loss of natural resources
- impact to public and private property
- impact to public infrastructure

The significance of these impacts will determine the type of management action taken. Any action taken will be based on proven wildlife management techniques, appropriate animal welfare concerns, and applicable laws and regulations.

One function of open space lands is to provide habitat for wildlife. These areas are one of the few places left in the metro area where wildlife can live. In most cases, some level of loss of trees on open space lands is an accepted consequence of trying to achieve a balanced ecosystem.

The City of Westminster recognizes beaver as a natural and desirable component of the environment because of their contribution to the quality and diversity of natural habitat. However, it is also recognized that conflicts between beaver and humans arise when beaver activity impacts public health and safety, natural resources, private property, or public infrastructure.

The Colorado Division of Wildlife (CDOW) has issued the following statement concerning the management of beavers. “All wildlife in Colorado is the property of the State and owned by the people. Beavers are defined as “furbearers” under the CDOW rules and regulations, therefore, allowing private landowners permission to manage beavers in accordance with state laws and CDOW regulations. CDOW rules and regulations allow for the “take” of beaver year

round as necessary to protect private property.” The City of Westminster Open Space will work cooperatively with CDOW personnel, and other officials, when necessary, to manage beavers according to Westminster’s Beaver Management Plan.

All instances of beaver activity that impact the Big Dry Creek corridor will be reviewed by the Open Space management staff. Reports may come from several sources including any open space staff, residents, trail users, public officials or private individuals. All reports will be investigated by staff to verify location and collect basic information. New data will be added to the Beavers and Big Dry Creek Inventory that was completed in 2008.

It is the aim of the beaver management plan to identify new areas of beaver activity as soon as possible. New locations will be checked for real and potential natural resource damage, potential for damaging floods, location in a “beaver-free zone,” and private/public property damage. Where existing or potential negative impacts are identified, open space staff will contact appropriate parties who are likely to be involved in resolving any conflicts. Those contacted may include: appropriate Department and Division Heads, POST committee, appropriate city staff, affected property owners, Division of Wildlife personnel, and any other affected personnel.

Discussions with affected parties will determine the level of impact that is acceptable. It will be the primary goal of the City of Westminster’s beaver management plan to coexist with beavers wherever this is possible while, at the same time, protecting the natural resources. Where significant damage to natural resources or threats to human safety are demonstrated or inevitable, staff will take action to modify or eliminate beaver activities.



Beaver damage along Big Dry Creek, 2008.

### **Beaver Management Actions**

The following actions and strategies may be used to resolve various kinds of beaver damage and conflicts, within and contiguous to the Big Dry Creek corridor. They are written in the form of guidelines to allow for flexibility as experience improves Staff's knowledge and abilities.

Problems between beavers, open space natural resources, and public or private property may be resolved by implementing one or more of the following actions.

The least intrusive actions will always be attempted first, where those actions fit the circumstances. More intrusive actions, up to and including live-trapping and euthanasia of the animal, will be done only when no other alternatives are available.

#### **1. Tree Protection**

Along Big Dry Creek, the most available and sought after tree by the beaver is the Plains Cottonwood. The semi-arid climate of Colorado makes it very difficult for trees to grow and thrive without supplemental irrigation. These trees along Big Dry Creek have managed to

survive over the years by tapping into the creek's water table. Because of the climatic factors and the overall small population of these native trees, any loss of trees along Big Dry Creek is dramatic.

Protecting trees is not 100% fool-proof all of the time, but the elimination of the beaver's food source is one of the most effective means of beaver control. Tree cutting by beavers can be prevented by the placement of hardware cloth or fencing fabric around the base of trees. Although not fool-proof, this technique has shown to be relatively effective and inexpensive, with only a small visual impact. Individual trees can be spared from beaver gnawing by placing wire cylinders around the base of their trunks. The purpose of this heavy wire cylinder is simply to keep the beaver from getting to the tree. The cylinders can be made from 3 to 4 foot tall galvanized wire mesh. The fencing should extend 2 feet above the highest snow level to prevent winter chewing. It generally does need to be anchored to the ground. The bottom is cut to fit a sloping ground, or to protect prominent roots from chewing, leaving a few inches of space between the tree and the wire allows for tree trunk growth. The fencing is replaced as needed with a larger diameter cylinder to allow for trunk expansion.

Although this method is relatively effective in protecting trees, it is very labor intensive. Location of the tree along the bank, size of tree, and accessibility are all factors that present challenges of effectively applying the tree wrap. As the tree grows, this wrap then needs to be manually widened to allow for the natural growth of the tree.



Protected trees using tree wrap, 2008.

## **2. Beaver Tree Mitigation Policy**

The cottonwood trees that currently live along Big Dry Creek are the primary food source target for the beavers. Most of these trees are decades old and have established themselves despite a semi-arid climate. A tree mitigation, or replacement, policy would help offset the loss of trees by beavers. Although much smaller in size to the trees that are felled, these trees would provide the same benefits for future generations.

Any tree that is harvested by beavers along BDC would be replaced at a 1:1 ratio somewhere along the BDC corridor within a year. Example: A 6” cottonwood that is felled by a beaver would be replaced with 6 – 1” cottonwoods within 1 year in a suitable location along BDC. All trees that are planted would also be protected with wire mesh.



Felled cottonwoods along Big Dry Creek, 2008.

### **3. Establishment of Beaver-Free Zones**

There may be areas along the BDC corridor where staff determines that would not be acceptable for beavers to inhabit. These zones may be determined based on flooding potential, historical significance, visual impact from trail users, or other criteria.

Once these zones have been established, all trees located in these zones would be protected by the use of wire mesh. Any beaver activity within these zones would immediately be addressed using dam destruction, trapping, and/or euthanasia of the beavers.

#### 4. Water Level Control Devices

Water level control devices can be used in areas where the flooding of water behind the dam becomes an issue. Although this does not address the issue of losing trees, it is an option to be used regulating the water height in the beaver pond. A number of individuals and groups have developed a variety of devices that attempt to control the water level in beaver ponds. The devices consist of some type of conduit, either rigid PVC plastic, corrugated plastic tubing, metal pipe, or fabricated wooden box or steel mesh cylinder. The conduit is used in conjunction with metal screening or fencing that is arranged to prevent beaver from plugging the conduit. Depending upon its design, the device is placed in or near a culvert pipe, bridge, road ditch, or beaver dam. Beaver continue to dam against the device, however, the devices are designed to maintain water flow in spite of the beaver's efforts.

The success of water level control devices appears to depend upon site conditions, watershed size, and the persistence of individual beaver. Where an acceptable level of impounded water can be determined, and where site conditions are suitable, these devices provide a good means for coexistence with beaver. With experience, Open Space staff will develop criteria and techniques for the successful use of water level control devices in the open space.

This is most likely to be true where:

- a.) watershed size is relatively small,
- b.) the topography of the site is such that there is a sufficient elevation difference between the pond water level and the facility that requires protection,
- c.) the topography allows for the temporary storage of excess water near the beaver pond after heavy rains.

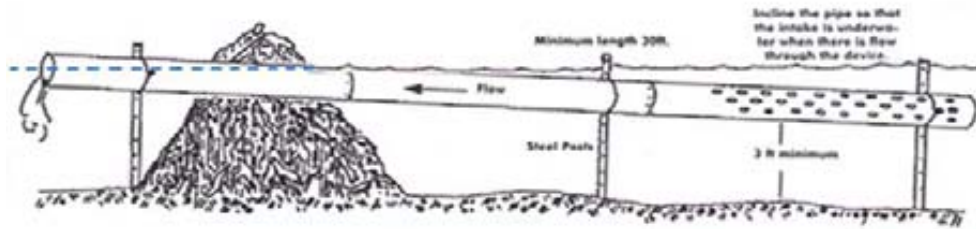


Diagram of water level control device for beaver dams, 2008.

## 5. Live Trapping and Relocation

Where it can be determined that a.) the impacts of beaver activity cannot be tolerated and, b.) other strategies or devices are not effective or appropriate, then the animal(s) will be removed from the site and relocated.

Relocation of beavers is accomplished by a state licensed contractor. The contractor usually has relocation sites for the beavers in the foothills and mountains. Relocations are only allowed by CDOW between June and September. Although this can be a good option for positive public relations, it can be expensive and is not reliable for large beaver population reductions. There are only a few licensed contractors in Colorado and they are usually in high demand for the services throughout the summer. Licensed contractors will be used to perform any relocation services. These contractors will be responsible for all aspects of relocation including finding appropriate relocation sites. To the extent possible, beaver family units will be relocated as a group. It should be noted that relocation of problem animals does not guarantee that new beavers won't re-inhabit the original beaver location.



Trapped beaver ready for relocation, 2008.

## **6. Euthanizing Animals**

Where it can be determined that a.) the impacts of beaver activity cannot be tolerated, b.) available strategies and devices have not proven effective or appropriate, and c.) live-trapping and relocation is not possible, then problem animals will be euthanized.

This decision will be made by the POST committee after a review of all the facts and data. If this management route is chosen, City Council will be notified prior to the control. The City of Westminster Open Space staff will be responsible for initiating this process with a licensed contractor and overseeing this operation. The most humane methods of euthanasia will be used by a licensed contractor.



Beavers live-trapped, 2008.

## **7. Monitoring Actions**

### **a.) Monitoring Beaver Activities in Problem Areas**

Beaver activity in such areas will be inspected at least weekly by Open Space staff or volunteers, so that required management actions can be properly planned and implemented.

### **b.) Monitor Water Level Control Devices**

Water level control devices will be inspected weekly following installation by Open Space staff or volunteers to ensure that they are functioning effectively. After a month of weekly inspections, monthly inspections will occur as long as beaver are active at a particular site.

### **c.) Monitor Beaver Population**

The current inventory will be updated every 3 years. Newly affected areas will be identified. Currently active sites will be evaluated for impacts on sensitive resources. Estimates of the beaver population will be made from the GIS system, if and when that becomes necessary.



Cottonwoods along Big Dry Creek, 2008

### **Summary**

The City of Westminster recognizes the value and importance that all wildlife brings to balancing the delicate eco systems in our preserved open spaces. As with other wildlife management policies, the Beaver Management Plan is intended to manage, not eliminate the City's beaver population. Only when all other options are exhausted will euthanizing of these important animals take place.