

BEAVER ACTIVITY MONITORING

Bank Den: An entrance into the side of the bank that a beaver uses for shelter.



Beaver Activity: Beaver observation or activity at a survey location is an indication of beaver presence.

Beaver Observation: A visual observation of a beaver(s) at your survey location.



Beaver Dam: A beaver dam is a dam built by beavers made out of logs, twigs, branches, organic material, etc., that is creating a pond behind the dam. Dams can be 1-2 feet long secondary dams or larger primary dams.



Canal: Beavers construct channels or canal systems leading to their ponds, using them to float food—such as small, trimmed trees—from cutting sites. Canals are also safe travel ways for swimming instead of walking. Channels often look man-made, have soft, muddy bottoms, and are filled with 15 to 25 inches of water.



Chew Sticks: A wooden stick, about the length of a human forearm, being gnawed on for the nutritious cambium layer.



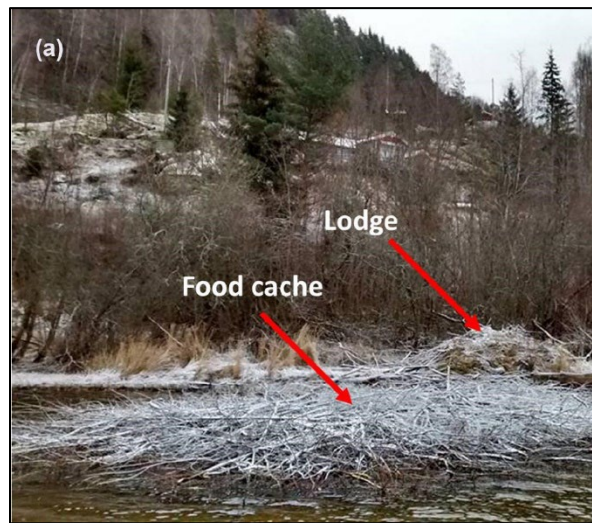
Clipped Vegetation: Small Twigs, branches, and sticks cut by beaver for foraging or building material.



Felled Tree: A tree that has fallen down because a beaver has been chewing around the base, beaver chew marks clearly shown at the breakage point. Trees or stems of larger bushes are felled by double-conically gnawing the stem if the stem diameter exceeds 10 centimeters. Large stumps are pointed, 1-2.5 feet high, and sometimes the tree trunk is still attached. Tooth marks look like twin grooves, each groove measuring 1/8 inch or more. A pile of wood shavings may be present at the cut.



Food Caching: A pile of bark, twigs, and leaves that beavers use as a winter store of food. This is usually found in the pond behind a dam.



Lodge: There are two types of lodges beavers can build. One is a bank lodge and the other is what you might typically think of when you think of a lodge. A typical lodge can be found in the large pond that forms behind a primary dam. Bank lodges are close to the bank and include tunnels dug through the bank.



Scat: Beaver droppings are seldom found on land; those that are will commonly be found in the early morning at the water's edge. Individual beaver droppings are usually cylindrical, up to 2½ inches long (sometimes shorter) and look as if they were formed of compressed sawdust. The color of fresh deposits is dark brown, with lighter-colored bits of undigested wood, all turning pale with age.



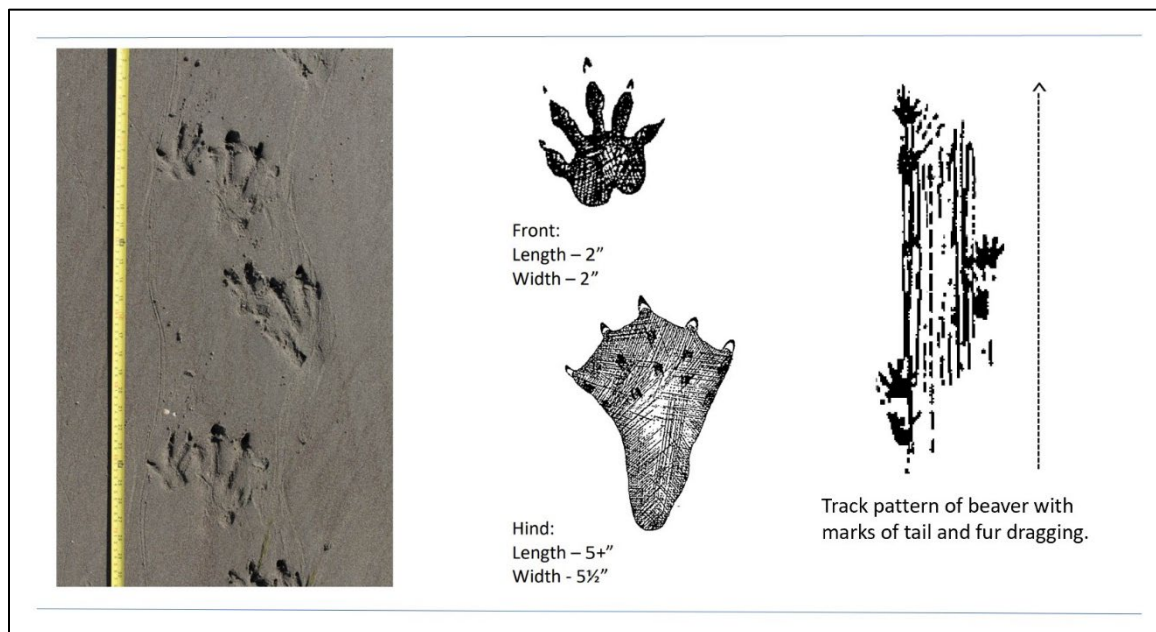
Skid Trail Usage: Skid trails are little paths of packed down grass or compacted dirt or mud that beavers use to drag materials into the pond.



Scent Mound: Otherwise known as a castor mound, these are piles of mud around beaver ponds that are used to mark territory. Beaver secrete castoreum from a gland onto these piles. The scent has been described as a musky vanilla or leathery.



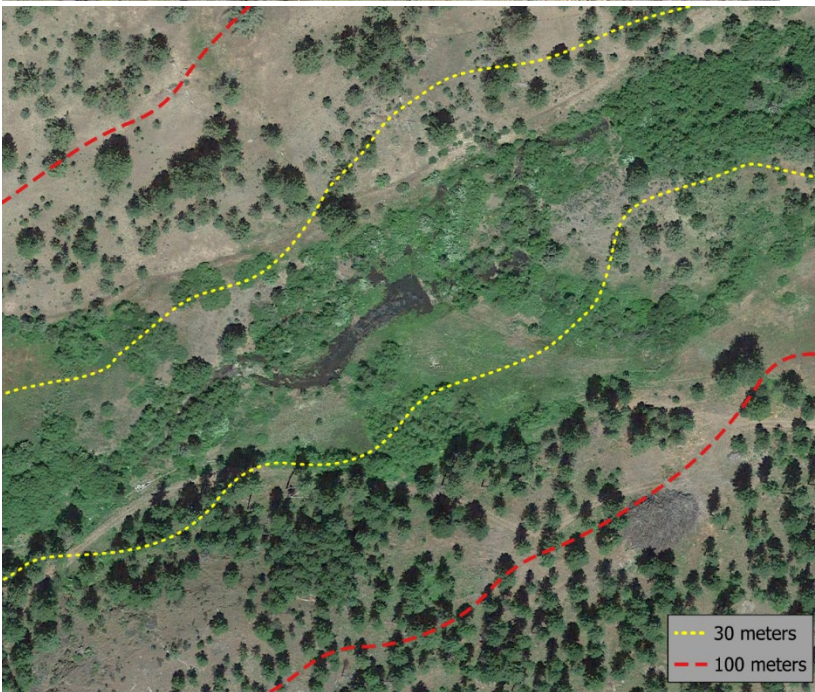
Tracks: Beaver tracks in snow or mud are distinct due to the webbed hind feet that leave behind triangular prints. As they move, their front paws create hand-like indents. Additionally, a beaver's flat tail may drag through its prints and obscure them, especially beaver tracks in snow.



VEGETATION SUITABILITY KEY

Streamside Vegetation: The vegetation located within 30 meters of the water's edge that is the primary area for beavers to forage and acquire dam building material.

Riparian/Upland Vegetation: The vegetation located up to 100 meters from the water's edge that is approximately the maximum distance beaver are willing to travel to acquire dam building material and some foraging material.



Vegetation Suitability Options

Unsuitable (Barren, Developed, Agriculture, Grassland)



Barely Suitable (Invasive Dominant i.e. Blackberry, Reed Canary Grass, Herbaceous Wetland)



Moderately Suitable (Alder, Conifer Plantation, Invasive Riparian)



Suitable (Mixed Conifer/Deciduous i.e. Maples, Hazelnut, Ash, Hawthorn, etc.)



Preferred (Willow, Cottonwood, Wapato)



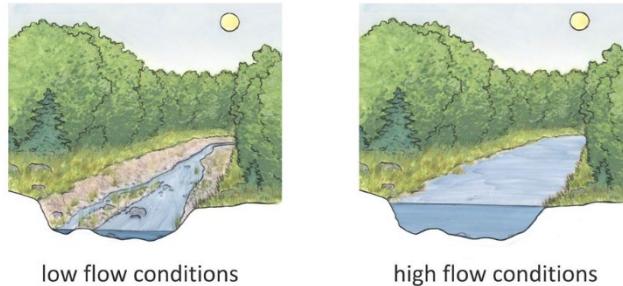
STREAM SUITABILITY ASSESSMENT KEY

Annual Flood: The period in a given year where elevated stream flow driven by runoff is the highest. Typically associated with the flow at which banks begin to overtop onto the floodplain.

- Annual Flood Stream Power: The slope of the reach and dam structure will impact how the dams can survive the annual flood. So, the question becomes, are dams likely to withstand typical annual floods?

Baseflow: A stream's specific minimum flow that is a result of groundwater seepage rather than runoff.

- Baseflow Stream Power: Beavers can build dams on streams with low to moderate baseflow. *So, the question becomes, can beaver build a dam at base flows?*



Drainage Area: The area of land upstream of a given point that contributes runoff to that point. A larger drainage area tends to produce more runoff volume than a smaller drainage area.

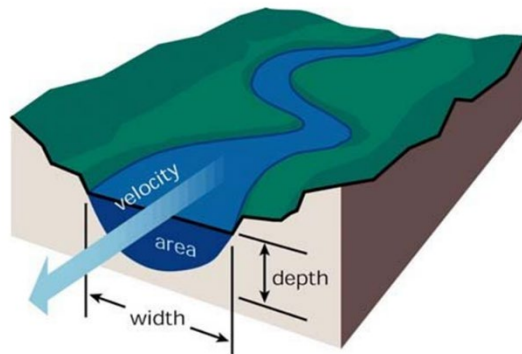
- A region's drainage area impacts the ability for beavers to build a dam on the reach. Streams with large upstream drainage areas are very big and are beyond the size that beaver can effectively build a dam across a stream channel.
- Beavers tend to try not to build dams across rivers wider than about 30 meters. The BRAT model filters out all rivers larger than 30 m wide as having no dam building capacity.
 - In the field you should also make sure that large rivers are assessed as have no dam building capacity.
- As a rough rule of thumb, a drainage area up to approximately 10,000 km² means a beaver *can likely* build a dam (for reference 10,000 km² is equivalent to 26 times the size of Portland, Oregon). A drainage area >10,000 km² means a beaver *can likely not* build a dam.

Incision: Downcutting of the channel to a lower base level than existed previously (i.e., the stream is narrower and deeper than it has been/could be). This results in disconnection from the channel to the floodplain,

Slope: The extent that a soil surface has an incline relative to the horizontal (rise/run). In percentage terms, slope represents the elevation that occurs between two different points.

- Beaver dams can be built on most slopes including very steep slopes when the stream power is low. Dams are less likely to persist on extremely steep. When a reach has an extremely low slope, dam density is low as a single dam inundates long stretches of the stream.

Stream Flow Discharge (cfs): Estimated by multiplying the water's mean velocity (ft sec) with the stream cross sectional area (ft²).



Stream Power: A function of stream flow and slope (stream flow x slope).

- For example, a steep slope with low stream flow may support dam building, whereas a steep slope with greater stream flow likely will not support dam building.

Typical Flood Flow: The stream flow that occurs approximately once every two years, or has a 50% probability of occurring in a given year. Typically associated with the flow at which banks begin to overtop onto the floodplain.



Annual Flood Flow



Baseflow