

The Nature and Limits of Bank-Digging Behavior by Beavers

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Largely instinct-driven, beaver behavior is usually efficient and logical, and rarely counter-productive. Digging in banks is not done randomly or compulsively, but to make tunnels and dens as protection from predators and the elements. Although this activity can pose a serious threat to property, the danger is often exaggerated. Perhaps, because these burrows are underground and invisible, it is easy for one's imagination to conjure up a subterranean world riddled like Swiss cheese. In reality, tunnels and burrows are not dense, deep, complex, or interconnected systems. They are usually isolated from one another, simple, and shallow. A typical tunnel is just wide enough to accommodate beavers and begins immediately below the water's surface, angling upwards into a bank where it ends in a living chamber. The increase in elevation helps ensure that the den stays dry during high-water events. Most tunnels are relatively short. Once a reasonable elevation is reached there is little to be gained by expending energy going any farther. Chambers vary in size depending on their age and the number of beavers using them. Beavers keep chambers as small as possible to maximize roof strength (predator protection) and to minimize heat and energy loss during winter. As with beaver lodges, air needs to be able to permeate through the roof, so chambers are usually close to the surface of the ground. "Upland digging" of this type is common in habitats where soils are fine and easy to excavate, and where banks are present; it is uncommon where soils are very rocky and in flat areas with thin soils.

Beavers often have a few extra lodges or bank cavities in their territories to retreat to in the event that a predator breaks into the one they are occupying. However, they don't need many for this purpose. It could even be a disadvantage to greatly increase the number and density of cavities. In addition to being an unnecessary expenditure of energy, it could reduce the structural integrity of individual chambers, and possibly make the entire bank—an important habitat feature for the beavers—more susceptible to erosion during floods. Consequently, as a simple matter of beaver self-interest, banks usually retain their structural integrity.

By damming, beavers do much to mitigate floods, reduce erosion and—by capturing and holding fine, suspended sediments—ameliorate its more negative effects. This more than compensates for whatever minor erosion is caused by digging behavior. Moreover, it cannot be emphasized enough that beavers are a native species and all of their activities are "native phenomena." With the exception of the Fur Trade (ca. 1600-1900) and its aftermath, beavers have been digging into the banks of North American lakes, wetlands, and waterways for thousands of years.

If digging presents a genuine threat, the best defense is to armor banks with large rocks or steel-wire mesh. In respect to these and other human-wildlife conflicts, non-extirpative strategies are usually more reliable, long-lasting, economical, and ecologically friendly. Considering only the last category, there are a wide variety of beaver behaviors that continually make ecosystems healthier, more complex, and more vibrant. These include the construction of tunnels, which are important microhabitats for numerous species. With extirpation, however, these are lost along with all nearby beaver-created wetlands, and the potential for any new ones to develop.