

# What is a Waterfall?

When water flows vertically over one or more steep drops in a river or stream, it is called a waterfall. These natural geological features are created through processes like erosion and glacial or tectonic movement, as well as in areas where the land varies in height such as on mountains or plateaus.

Waterfalls form and recede extremely slowly on a geological timescale, and unlike man-made dams, do not cause sudden and dramatic changes in ecological systems.

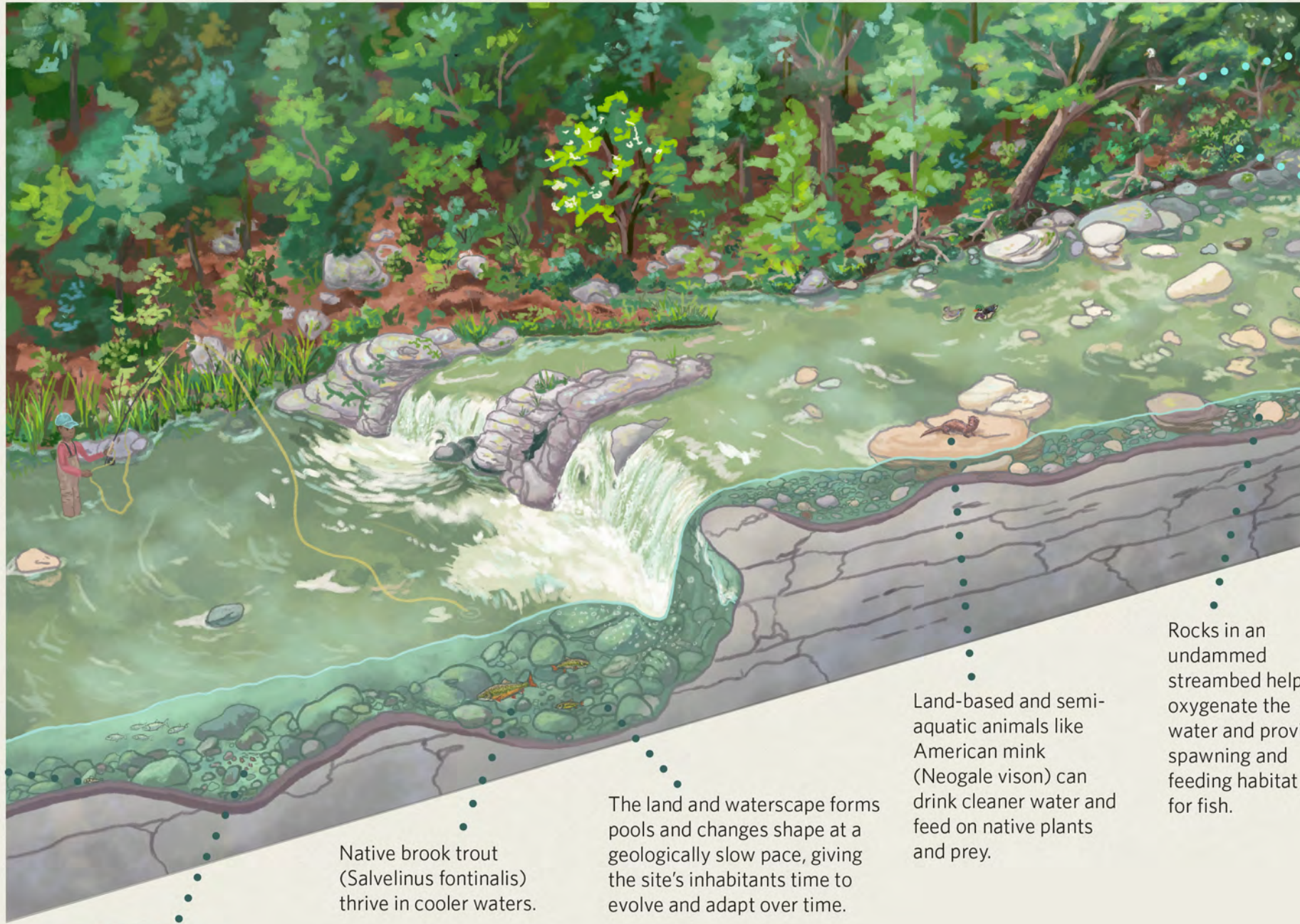
## NATURALLY FLOWING WATERFALL HABITATS:



Native slimy sculpins (*Cottus cognatus*) thrive among rocky stream beds and are less likely to have to compete for resources with invasive fish species.



Stream beds maintain a healthy, not-too-much-or-too-little sediment level where freshwater mussels can grow and filter the water.



Native brook trout (*Salvelinus fontinalis*) thrive in cooler waters.

The land and waterscape forms pools and changes shape at a geologically slow pace, giving the site's inhabitants time to evolve and adapt over time.

Land-based and semi-aquatic animals like American mink (*Neogale vison*) can drink cleaner water and feed on native plants and prey.

Rocks in an undammed streambed help oxygenate the water and provide spawning and feeding habitat for fish.

Trees provide shade and help to maintain cooler water temperatures.



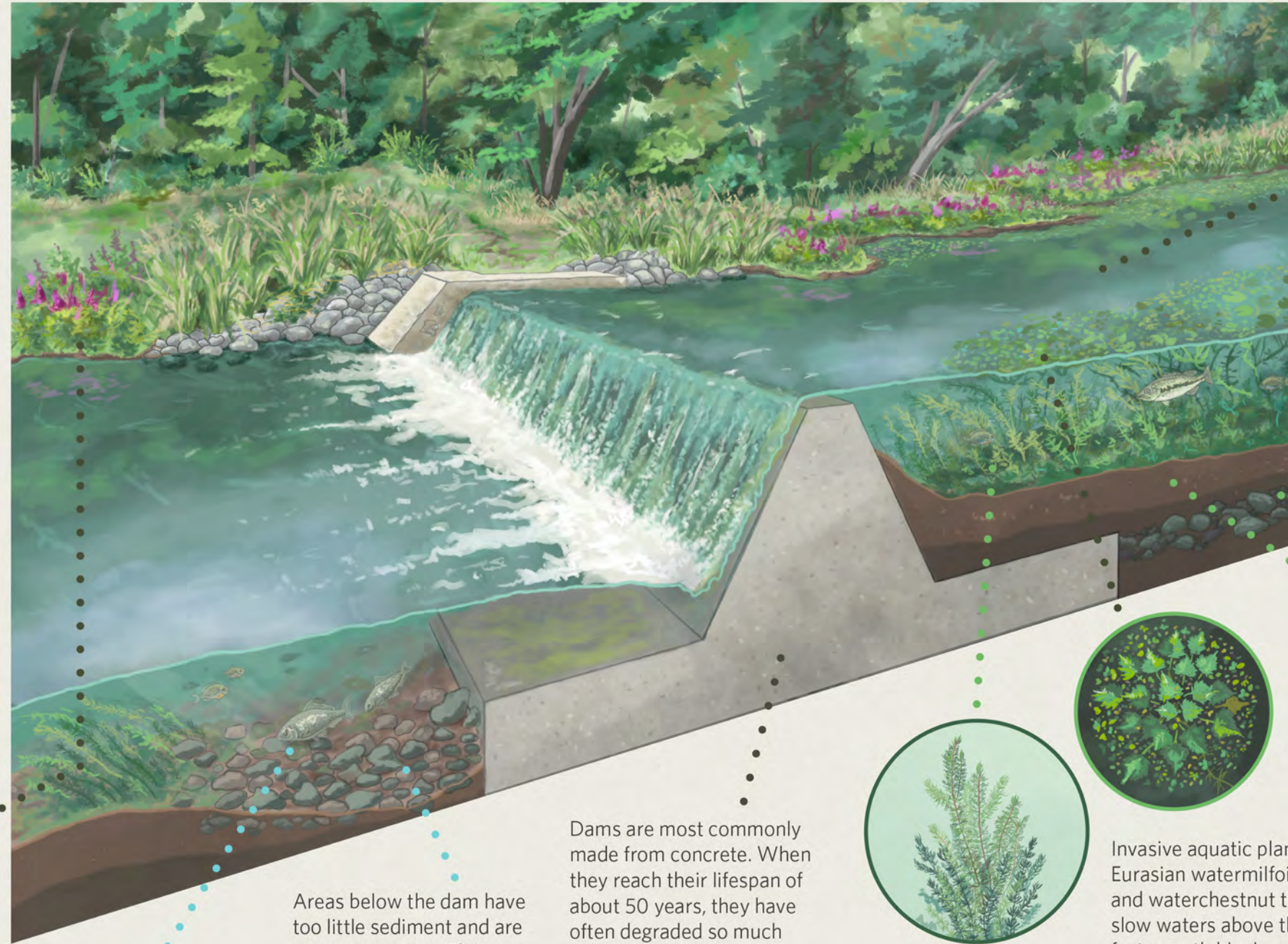
Native plants like spicebush (*Lindera benzoin*) provide food and shelter for many creatures such as spicebush swallowtail caterpillars, and these indigenous species are less likely to be pushed out by the invasive species that tend to proliferate in a dammed river.

# What is a Dam?

A dam is a manmade structure that spans and impedes the flow of a river or other moving waterway. They are built for many reasons, including agricultural management, energy production and in previous times, even ice harvesting.

When a dam is constructed, it instantly alters the riverscape, creating a still, lake-like impoundment upstream, and a turbulent and potentially dangerous pool at its base.

Species that survive in a flowing-water habitat become displaced in the artificially manipulated environment, and invasive species often take over. Low-head dams especially also create a recreational hazard. The water around them often appears to be calm and inviting to swimmers and anglers who may wade in and be overcome by an inescapably strong subsurface current. Kayakers and canoers, unable to see a dam from upstream, may tumble over its edge into that same current.



## HABITATS IMPEDED BY DAMS:



Purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*) and other invasive plants that grow on the riverbanks can take hold and push out the native vegetation that supports local and migratory wildlife.

Migrating fish like shad, eels and salmon are blocked from reaching historic spawning grounds. Sport fish that prefer warmer water, like carp, catfish and bass dominate the species mix.

Areas below the dam have too little sediment and are prone to erosion. The water appears calm but usually has a strong and dangerous subcurrent that has earned these structures the nickname "drowning machines."

Dams are most commonly made from concrete. When they reach their lifespan of about 50 years, they have often degraded so much that they risk failure. Maintenance costs for antiquated dams often become untenable.



Invasive aquatic plants like Eurasian watermilfoil, duckweed and waterchestnut thrive in the slow waters above the dam. Their fast growth blocks sunlight and can smother native plants.

Low head dams can be tricky for kayakers and canoers to spot from upstream. Paddlers unaware of the danger can fall over the dam and become caught up in the strong currents at its base. Too often they, and the responders that try to help them, become casualties of the difficult conditions.

The old river bed buried under sediment.

Slow-moving water behind the dam builds up sediment that fosters algae blooms and may hold contaminants from chemical runoff and natural decomposition. The warm, stagnant conditions are inhospitable to native aquatic wildlife.