

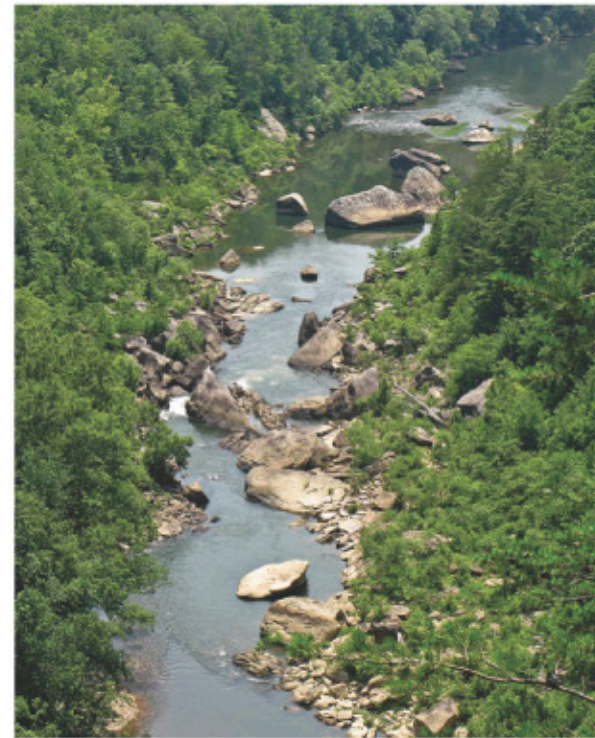
OLD-GROWTH FORESTS

Old-growth forests are much more than groups of large, old trees. KSNPC recognizes two basic kinds of old-growth forest: those that have never been logged (primary forests), and second-growth forests with limited disturbance for at least a century. Some experts suggest 150 to 200 years as a minimum age indicator of old growth.^{98,99} Old-growth forests are characterized by a scattering of old trees of relatively large diameter with spreading crowns, a good representation of unevenly aged younger trees, undisturbed soil, and an understory of native species. Over time, natural disturbances and maturity result in an increasing number of large snags, pits, and mounds from fallen trees; rotting logs in various stages of decay; natural gaps; and generally a more complex forest structure.^{98, 100}



KSNPC photograph by Ellis L. Lauderdale

of any type are rare. Today, only 7,200 acres of old-growth forest are known in 67 scattered tracts in Kentucky.¹¹ Less than half of Kentucky's forest and woodland communities (15 of 34) have at least one known representative old-growth stand.¹¹ Most of these are small stands of old trees, but a few larger examples still exist. Blanton Forest State Nature Preserve in Harlan County, with approximately 2,300 acres of old growth, is the largest old-growth remnant known in Kentucky. Other large, protected old-growth tracts include Lilley Cornett Woods in Letcher County, Big Woods in Mammoth Cave National Park, Obion Creek Wildlife Management Area in Hickman County, and several stands scattered throughout Daniel Boone National Forest.



The majority of Kentucky's native freshwater species are found in natural, free-flowing streams. The Big South Fork Cumberland River supports a diverse aquatic community upstream from the impounded section of Lake Cumberland, including several rare fishes and mussels. Sabrina Christian

AQUATIC COMMUNITIES

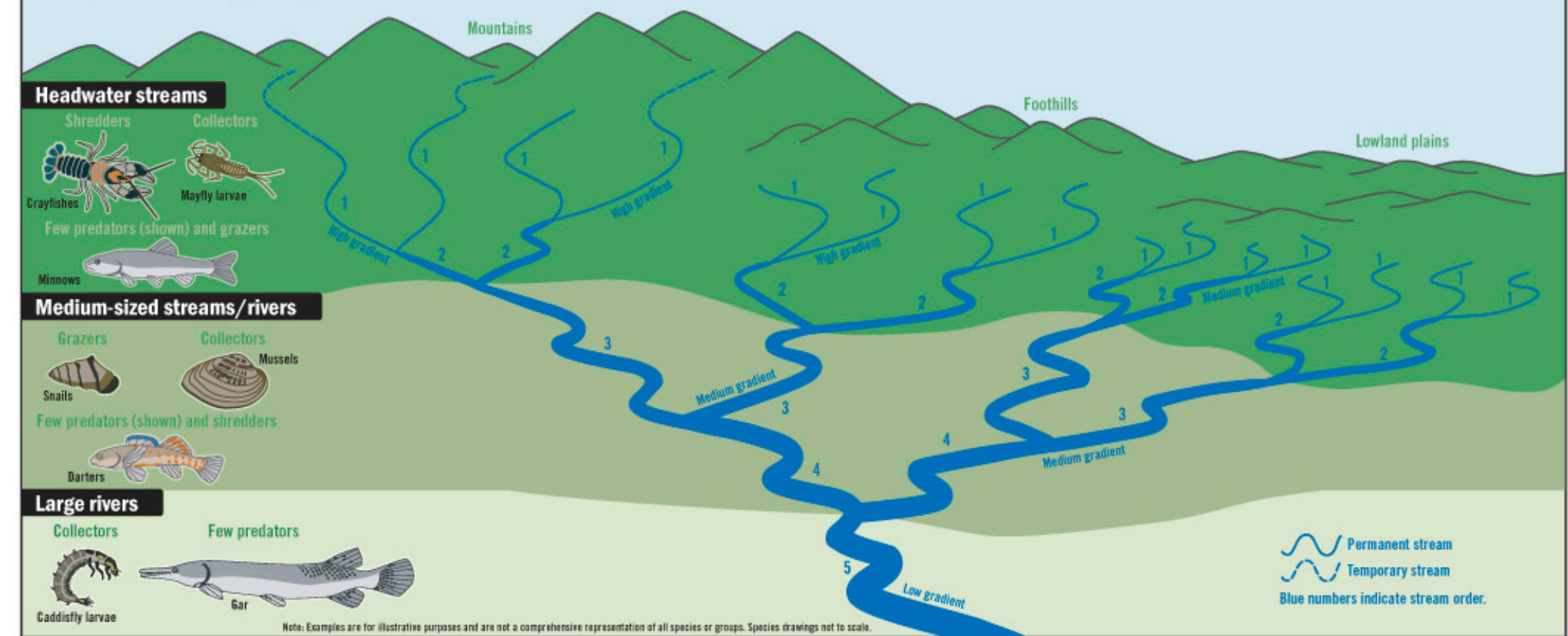
Aquatic systems are classified as running water (lotic), such as creeks and rivers, or standing water (lentic), which includes ponds, lakes, and wetlands.¹⁰¹ Aquatic animal communities are found in similar habitats within each system, occurring within the bottom sediments (worms and water mites), upon the bottom (many macroinvertebrates), among vegetation (dragonflies and beetles), in the water column (fishes), and on the surface (water striders). However, different physical and chemical characteristics in each system lead to distinct plant and animal communities. Some species (e.g., large-mouth bass) are generalists capable of living in either system, but the majority of darters, freshwater mussels, stoneflies, and many others can live only in streams. Native species that live in natural (i.e., unimpounded, unchannelized) stream communities are the primary reason for Kentucky's exceptional aquatic biodiversity.

Running Water

Streams may be roughly classified as temporary or permanent (perennial).^{101, 102} Temporary streams flow intermittently (after a rain), or they sink below ground at some point. Small streams with no tributaries (other streams flowing into the original stream) are called first-order streams. Two first-order streams unite to form a second-order stream, two second-order streams combine to make a third-order stream, and so on. They can further be classified into three sizes or segments within a river system: small headwater streams, medium-sized streams, and large rivers.

Species in creeks and rivers have adapted to a unidirectional water flow, high dissolved oxygen levels, and lower water temperatures, especially in the headwaters (first- or second-order segments). Constant flow transports food from upstream to downstream, so the animals in each stream or river

Lotic Communities (streams and large rivers)



segment use specialized feeding mechanisms to perform a role or function based on available food resources (see text box). For example, some caddisflies are "collectors" because they filter minute food particles carried in slower currents by constructing tiny, fine-mesh nets made of silk. From a river's headwaters to its mouth, physical and chemical changes occur that lead to a continuous change in the aquatic community. This interaction, as described in more detail below, is called the river continuum concept.¹⁰³

In general, first-order or headwater streams have cool- or cold-water-adapted species that rely

GENERAL CLASSES OF AQUATIC SPECIES

Here is a general classification of aquatic species by feeding method and ecological role in an aquatic system:⁶⁴

- **Shredders** shred organic material (e.g., plants, leaves, and sticks) into smaller sizes.
- **Collectors** collect or filter small organic particles.
- **Scrapers or grazers** graze on algae or plant material attached to surfaces such as rocks and logs.
- **Plant piercers** pierce plants and suck out their fluids.
- **Predators** are carnivores that eat other animals.
- **Parasites** live on or in other organisms and feed on the host's tissues.
- **Scavengers** eat dead and decaying organic matter.