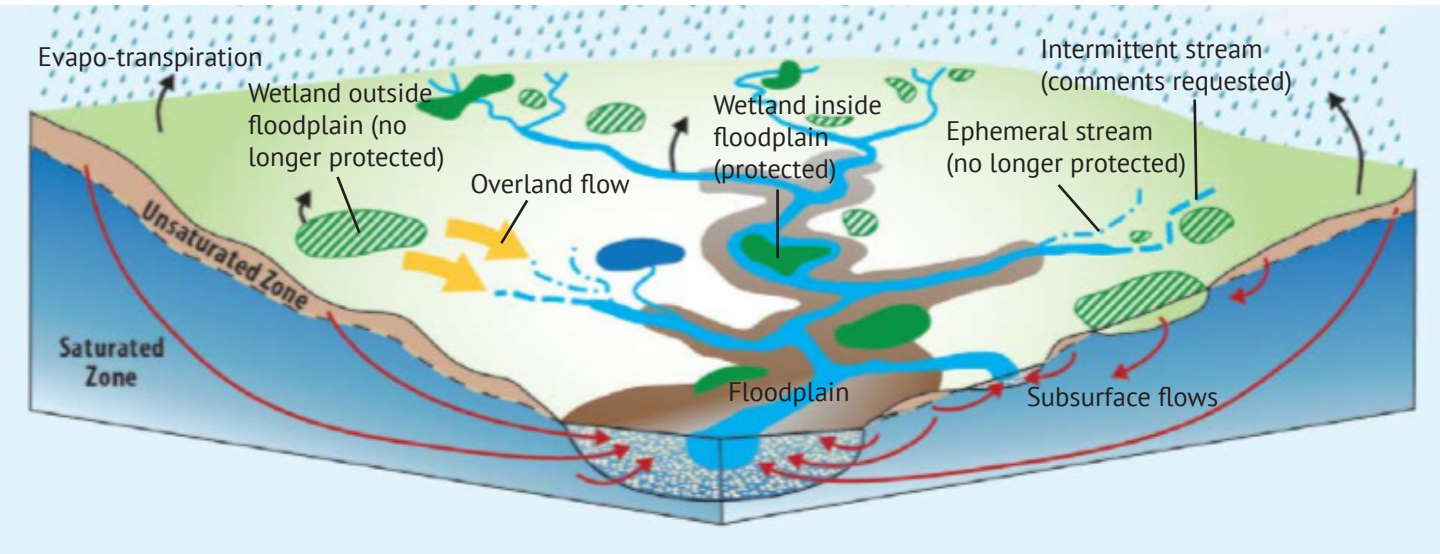
Headwater Streams and Wetlands Are Critical for Sustaining Fish, Fisheries, and Ecosystem Services

Efforts are underway to roll back Clean Water Act protections for our nation's streams and wetlands. The newly released Waters of the U.S. Rule (WOTUS) proposes to exclude many wetlands and headwater streams, which make up just under 80% of the length of the river network in the lower 48 states. In 2015, the EPA finalized a rule that based Clean Water Act protections on the degree of connectivity between navigable waters, wetlands, and headwater streams. The rule was informed by the best scientific information available. The new rule proposes to eliminate protections for all ephemeral streams and wetlands that do not have a surface connection to navigable waters, and opens the door to removing protections for intermittent streams. Activities such mining, industry, and development could move forward in these waters without federal safeguards.



Biological, chemical, and physical connections—such as the hydrologic connections shown here—link streams and wetlands to downstream waters. These connections are critically important for the functioning of watersheds and the fish they support. Adapted from 2015 EPA graphic.

Headwaters are broadly defined as portions of a river basin that contribute to the development and maintenance of downstream navigable waters including rivers, lakes, and oceans. Headwaters include wetlands outside of floodplains, small stream tributaries with permanent flow, tributaries with intermittent flow (e.g., periodic or seasonal flows supported by groundwater or precipitation), or tributaries or areas of the landscape with ephemerflows (e.g., short-term flows that occur as a direct result of a rainfall event). When headwater habitats are polluted or destroyed, fish, fisheries, and ecosystem services are compromised. Headwaters are key to the sustainability of fish stocks in both upstream and downstream waters. Threatened and endangered species will be harder to recover, and more species will be at risk of becoming imperiled. Loss of protections for headwaters would have grave consequences for fish and fisheries and would have far-reaching implications for fish, wildlife and their habitats, as well as economies dependent on those systems.

Cottonwood Creek is an intermittent tributary of the Gunnison River in western Colorado that provides critical spawning habitat for three imperiled fish species, despite being dry much of the year. (Photos: Kevin Thompson)

AMERICAN FISHERIES SOCIETY

For more information, see fisheries.org/WOTUS or contact AFS Policy Director Drue Winters at dwinters@fisheries.org.

ECOSYSTEM SERVICES

Ecosystem services from headwater systems in the lower 48 states and Hawaii are valued at $15.7 trillion per year. Headwaters support a variety of activities that are important to the functioning of entire ecosystems.

The chemical and physical processes in headwaters are critical to the functioning of entire watersheds. These processes form the base of the food web that supports fish and invertebrates in upstream waters, which in turn sustain a host of fish and wildlife downstream. Headwaters also provide vital spawning and rearing habitat for migratory fishes, offer important thermal refuge for many species in regions susceptible to climate change, and are key to aquatic and riparian biodiversity. Wetlands and headwaters provide flood control, sustain aquifers, and supply clean water for more than a third of the U.S. population.

Brook Trout depend on cold, clean, well-oxygenated water often found in headwater habitats from Appalachia to Michigan. Activities such as harvesting timber and clearing land reduce habitat complexity and remove shade trees. Fallen trees form pools and provide cover. Under a new rule, these activities could proceed in headwaters without a permit, threatening fish and fisheries. (Photo: D. Herasimtschuk, Freshwaters Illustrated)

IMPERILED SPECIES

Habitat loss and pollution are the primary causes of extinction of aquatic animals. Protecting headwater habitats is critical for recovery and delisting of threatened and endangered fishes. Headwaters serve as spawing and rearing habitats for imperiled fish and can serve as the last refuge for a species from harsh conditions like floods, high temperatures, and non-native species. Headwaters also support threatened species that may not exist elsewhere in river networks.

Juveniles of federally listed populations of Coho and Chinook Salmon occupy intermittent headwater tributaries and seasonal floodplain wetlands in winter. These waters play a critical role in ocean survival rates for young migrating salmon. A narrower rule would allow pollution and destruction of important habitat, threatening recovery of salmon and other imperiled species. (Photo: Lance Campbell)

RECREATIONAL & COMMERCIAL FISHERIES

Commercial and recreational fisheries contributed over $208 billion in economic impact and 1.62 million jobs in 2015. Recreational fishing alone included 12 million participants in 2011 and created 439,000 jobs in 2015.

Headwaters both directly and indirectly affect commercial and recreational fisheries. Decreased protections for headwaters threaten for downstream fisheries. Development can inhibit stream connectivity and affect water quality. Industrial pollution from mining can have an impact on prey availability, spawning, and access, all of which can significantly degrade recreational angling tourism for trout species nationally and commercial fishing for salmon in Alaska and the Pacific Northwest.

Clean, free-flowing headwaters are important to indigenous peoples and the recreating public, and have spiritual and cultural value that extends beyond economic measures.

Mining activities in headwaters pose threats to recreational fisheries. In 2015, the Gold King Mine in Colorado spilled 3 million gallons of untreated acid mine drainage into the headwaters of the Animus River closing a valuable trout fishery for the entire summer and affecting river guides, fly shops, and other ancillary businesses.