# Mussels Enjoy the Waters of White Sulphur Springs

by Craig Springer

Rivers can be seen as conduits, expressing in their content the character of the land they drain and the ways that land is treated. Land use practices within the watersheds are manifest in the presence or absence of aquatic life forms such as fish, bugs, and mussels. Because mussels are filter feeders, the river literally runs through them, making water quality a vital concern.

Some of the Fish and Wildlife Service's important mussel conservation work is taking place at White Sulphur Springs National Fish Hatchery, a facility tucked away in a small West Virginia town of the same name. The hatchery is on the leading edge of freshwater mussel conservation in the United States, and its work ripples waters well beyond this quaint place.

***Northern riffleshell***


*Craig Springer/USFWS*

The White Sulphur Springs facility has enjoyed a consistent and reliable source of water since it was built in 1900. Good water makes for a good place to research and culture imperiled freshwater mussels. The names of these mollusks speak to their looks and their habitats: threeridge, purple wartyback, mucket, and riffleshell. Conservation of these imperiled mussels is important for the services they provide to other animals, and eventually to people.

Freshwater mussels begin their lives as larvae that parasitize specific species of host fish. After they morph into juveniles, the small mussels drop to the river bottom where they continue to grow, spending the rest of their days paying back their hosts by helping to clean the water. Mussels feed by filtering river water and silt, gleaning tiny plankton, fecal matter, and the detritus of biological matter produced within the stream and its watershed. Remarkably, a bed of 10,000 mussels will filter 60,000 gallons (22,500 liters) of water per day, free of charge.

Freshwater mussels function as keystone species in many streams and rivers, benefiting a host of aquatic life. It should be no surprise to find more bugs and fish around mussel beds. But the very way mussels make a living makes them vulnerable to habitat alterations and pollution. Dams have altered stream flow and inhibited the natural dispersal of host fish species. Dredging and channeling activities result in higher levels of suspended sediment and siltation, which can smother mussel beds and degrade water quality faster than the mussels can improve it. Invasive zebra mussels also pose a serious threat to native species by competing for food and living space.

Because of habitat loss associated with a bridge replacement in Pennsylvania, two endangered species, the northern riffleshell (*Epioblasma torulosa rangiana*) and clubshell (*Pleurobema clava*) are being held at the hatchery until the aquatic habitat heals and the mussels can be returned. Meanwhile, biologists at the hatchery are conducting studies on surrogate species to promote mussel recovery. Through work on these common species, hatchery biologists have tested a variety of water types—well water, spring water, and dirt ponds—to develop captive rearing techniques. They've also examined mussel rearing densities to maximize occupied space while keeping the animals in good condition. Juveniles of the common species will be released in advance of the endangered mussels. The strategy is that the beds of common mussels will stabilize the river bottoms and improve the water quality, creating a more hospitable environment for the imperiled species.

Hatchery biologists closely watch the captive endangered mussels, monitoring how much algae they consume over given time periods. The algal feed is produced on-site with a space-age looking device that concentrates the excess into a paste for delivery to other state and federal hatcheries to feed their mussels.

Information gathered on common and endangered mussels at White Sulphur Springs is being parleyed into a controlled propagation plan to direct propagation of federal and state-listed species for release in Virginia and West Virginia waters. But the conservation expertise at White Sulphur Springs extends well beyond the confines of this part of the Blue Ridge.

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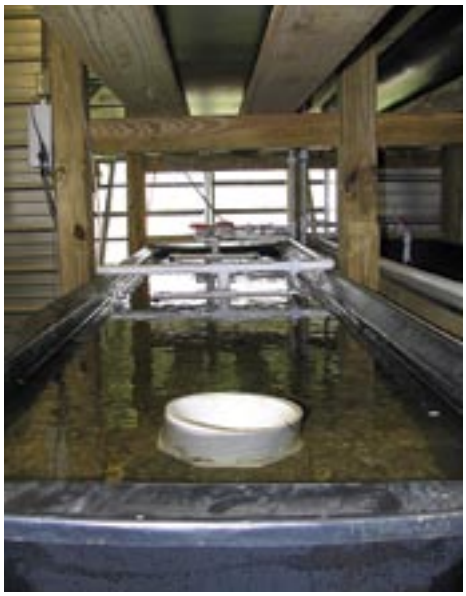

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***Mussels are grown at the hatchery in large rearing trays.***

***Julie Devers pours an algal solution that will be fed to the mussels, which filter their food from the water.***