

PROTECTING FRESHWATER MUSSELS

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WHY IT MATTERS

Freshwater mussels represent a great source of biodiversity, natural heritage, and ecological services and have significant cultural value to tribal communities. A single mussel can filter up to 15 gallons of water per day,¹ which in turn can prevent pollutants such as nitrogen from reaching downstream waters.² Unfortunately, mussels represent the most endangered class of organisms with 70% of species vulnerable to extinction.³

CURRENT LANDSCAPE

Virginia has 80 freshwater mussel species, many of which have incurred significant population losses. Many of these are listed in Virginia's Wildlife Action Plan as "Species of Greatest Conservation Need".⁴ Since the Endangered Species Act's adoption in 1973, the largest single loss of endangered species occurred in the Clinch River which is a biodiversity hotspot, due to a toxic chemical spill in 1998.⁵ Water quality, dams, and loss of habitat have degraded these resources and threats will be further exacerbated by climate change.

Freshwater mussels have elaborate reproductive cycles which are linked with fish populations, often associated with specific species. As such, restoration of mussels is complicated and challenging, as it requires consideration of both mussels and fish populations. Further, the diversity of mussels combined with a lack of robust historical surveys presents challenges to identifying restoration sites.⁶ Investments to protect mussels have largely been limited to mitigation dollars but restoring these beneficial organisms will require greater investments.

Fortunately, our ability to propagate and restore populations of mussels has significantly advanced in the past decade. Hatcheries have vastly improved their ability to propagate mussels by using fish hosts in recent decades and are very capable of restoring populations given available funding mechanisms. Still, very limited resources have been appropriated

and these funds have primarily come from mitigation events. Mitigation is only aimed at returning what was lost, not necessarily to restore species and rivers that require intervention to prevent local extinction or decline. Virginia has partnered with businesses and public organizations in Southwest and Central Virginia to create tributary-specific mussel restoration plans and to augment and monitor mussel populations in the Tennessee River and James River drainages of Virginia. These efforts have seen progress towards creating self-sustaining populations of endangered mussels. Further, Virginia's Department of Wildlife Resources (DWR) is embarking on a similar statewide planning process as a result of legislation from 2022.

Virginia has recognized the benefits of shellfish in previous conservation efforts, and freshwater mussel restoration offers an opportunity to extend those successful initiatives into the headwaters of the state. Virginia has a willing coalition of partners that can help with mussel restoration, but the Commonwealth needs to support the implementation of freshwater mussel restoration.

OPPORTUNITIES

To meet the needs that will be identified in the statewide plan, public and private programs that support hatcheries in efforts to grow and release mussels across the Commonwealth need sufficient funding from the Commonwealth.

Virginia's two hatcheries, the Aquatic Wildlife Conservation Center in Marion and the Virginia Fisheries and Aquatic Wildlife Center in Charles City, require a total of \$20 million in infrastructure and facility upgrades. The Virginia Department of Wildlife Resources also needs to maintain current funding to support staff for freshwater mussel restoration.

Restoration actions, including those identified in the James River Basin Mussel Restoration Plan⁷ and Clinch River Mussel Restoration Plan⁸ also rely on sufficient state funding.

TOP TAKEAWAYS

Mussels have significant ecological, water quality and cultural significance and represent the most endangered class of organisms with 70% of species vulnerable to extinction.

Our ability to successfully propagate and restore populations of mussels has significantly advanced in the past decade.

Restoration programs and VA DWR need sufficient state funding to be successful in implementing their mussel restoration programs.