



Propagation of Species At Risk Atlantic Pigtoe on Military Installations

Project # 09-450

Background:



Clean and healthy rivers and streams need freshwater mussels. Mussels actually work to improve water quality, and fill a host of important roles in aquatic ecosystems. But freshwater mussels have become the nation's most endangered group of animals.

The Department of Army has identified the Atlantic pigtoe mussel as a Species at Risk (SAR) with potential for detrimental impact on the military mission if federally listed as either threatened or endangered.

The Nottoway River on ARNG-MTC Fort Pickett, VA is home to one of only two known stable populations of the Atlantic Pigtoe mussel left in Virginia, and perhaps the world. Populations are in precipitous decline throughout the southeast, and expert consensus is that the species currently warrants federal listing.

Active propagation is the most proactive way to support declining populations and is the single best strategy to keep the species from federal listing, and prevent ensuing training restrictions. But current knowledge is incomplete pending further research into the species' unique reproductive cycle, including the identification of the host fish species upon which the mussels depend to complete their life cycle.



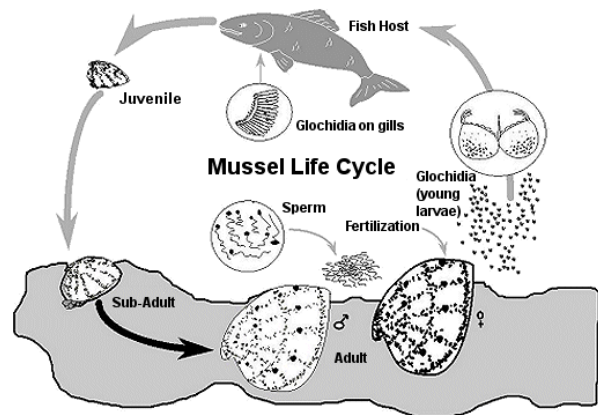
Objective:

Successful host fish trials will allow propagation and growth of juveniles that can then be released back in to the river. In this manor the population on the installation could serve to support overall population levels in the State, as well as other suitable areas throughout its original range. Identification of host fish species is critical to this process, and will form the foundation upon which all subsequent recovery work can be based.

This Legacy-funded project represents a uniquely cost-effective and time-sensitive opportunity to support existing populations and proactively avoid federal listing and subsequent encroachment of the training mission, while simultaneously building a working relationship with partners through which this same technique can be applied many additional Department of Defense (DoD) lands with mussel species at risk.

Summary of Approach:

The remarkable life cycle of freshwater mussels depends on a parasitic stage where larvae survive by attaching themselves to specific host fish.



For propagation, mussels carrying developing young and potential host fish species are collected and kept in specialized holding facilities where larvae are introduced into aerated containers to allow them to attach to the gills of the fish. Infested fish are then held until juveniles fall off their host, and the success

of each potential host fish species can be assessed. A “robust host” will consistently produce a large number of juvenile mussels while a “marginal host” will produce inconsistent or low numbers of juveniles. Juveniles can then be cultured, tagged, and released to the original collection site along with the adult mussels so as to assure no detrimental impacts to the original population.

Mussel Production



Biologists at the White Sulphur Springs National Fish Hatchery's Aquatic Resource Restoration Center in have broad experience propagating over 30 mussel species, including 16 federally listed species that have been used to augment existing populations and re-establish historic populations.

Benefit:

Training demands on military installation are currently increasing at the same time that freshwater mussel populations are declining dramatically, and Atlantic pigtoe (and many other mussel species) are very sensitive to the potential impacts. Supporting active propagation of this Species at Risk now is the best way to support the remaining population and keep the species from federal listing and subsequent encroachment of the training mission.

But the reach and benefit of this project are greater still. The Army SAR List currently contains 10 freshwater mussel species found on 11 DoD properties in 8 states, and with many more mussel species on the decline across North America, the potential for negative impacts to the military mission from additional listings is growing rapidly. This strategy, and the cooperative interagency relationships formed in this project,

can not only be used for any number of mussel Species at Risk on DoD lands, but can be used to propagate more common species to improve water quality as well as protecting and/or restoring mussels populations threatened or damaged by accidents or training impacts.

Accomplishments:

Our intensive sampling in previously abundant areas clearly demonstrates the urgent need for active propagation efforts as we encountered historically low numbers of individuals and none with viable larvae.

The lack of basic knowledge of a species' reproductive cycle is often cited as a fundamental impediment to recovery efforts. Even though the lack of viable larvae has forced a delay in the identification of host fish species, we have filled in some of the critical gaps in the life history of the Atlantic pigtoe, gaining greater understanding of the seasonal and environmental conditions required for reproduction, and the discovery that the species may not be reproductive every year, much needed information for any recovery effort.

This project has also strengthened interagency cooperation and is solidifying a lasting partnership, between the DoD, Virginia Tech, the Virginia Wildlife Action Plan, and the U.S. Fish and Wildlife Service to fill in vital information gaps that are currently inhibiting efforts to support rapidly declining freshwater mussel populations found on many DoD lands.

Building upon the information and relationships generated in this study we will make it possible to not only directly support populations of Atlantic pigtoe in Virginia, but throughout its range, as well as other mussel species in jeopardy.

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