



Reference SON: *Multiple freshwater mussel SONs submitted in FY15*

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Project Development

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[Wiki](#)

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Developing community-based models for freshwater mussels¹

Research Need

Freshwater mussels are one of the most imperiled taxa in the US. Endangered mussels occur across the nation and every USACE district must plan for the potential of their endemic mussels to be placed on the endangered species list. Endangered species models are generally developed for a single-species, but given that there are over 300 mussel species in the US, new methods must be developed that focus on community-based approaches. A standardized general methodology is needed for endangered freshwater mussel community modeling that meets the guidelines set in EC 1105-2-412 (or subsequent policies) and allows models to be developed in a faster, more efficient manner, while maintaining scientific integrity and transparency throughout model development process.

Project Objectives & Plan

This work will focus on conceptual modeling for multiple species - involving stakeholders – and will include quantitative model development, spatially explicit index-based modeling approaches, model application, model certification, and technology transfer. The primary products of this effort will include a series of Technical Notes and webinars illustrating the steps involved in community-based modeling. Additional major deliverables will include a conceptual and actual ecological model(s) that have been applied and can be used for future ecosystem restoration and planning projects for mussel communities.

Payoff

The payoff for this effort will be a standardized methodology for modeling mussel communities that can be used by the USACE planning community of practice. Standardizing the approach for endangered freshwater mussel modeling will provide an advancement over current ad-hoc approaches and will enable Corps managers and planners to more effectively and efficiently support the Corps ecosystem restoration

project life-cycle from planning to construction and into operations and maintenance.

Products

Technical Notes (TNs)

Herman, B., Slack, T., and T. Swannack. (2021). Developing conceptual models for assessing benefits and impacts of USACE activities on freshwater mussel communities, (RDC/TN EMRRP-EBA-25) Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Model Certification:

(2023). General Freshwater Mussel Habitat Model - Eco-PCX Certification for National use. <https://ecolibrary.sec.usace.army.mil/resource?title=General%20Freshwater%20Mussel%20Habitat%20Model%20National%20Certification%20Memo&documentId=5cc76ac9-e9e2-40c0-f5b8-0de42e52fda4>

Conference Presentations/Webinars/Workshops

(2017). The critical species mussel modeling team was invited to give a workshop to the mussel team of the Upper Miss River Commission. Red Wing, MN. The team presented a workshop on innovative community based modeling approaches developed at ERDC.

(2024). Overview of the General Freshwater Mussel Habitat Model. This presentation will describe the development and application of a general freshwater mussel habitat model. The objectives of the model are to be applicable throughout the range of the North American freshwater mussel species, be sensitive to differences in proposed restoration actions or sites and contain parameters that reflect system-level functions that provide suitable habitat for freshwater mussels. <https://emrrp.el.erdc.dren.mil/webinars.html>

¹**Project Alias – Work Unit Documentation Title:** *Developing models for endangered mussel communities: formalizing and quantifying approaches for ubiquitous threatened taxa*