

PROBLEMS AND STRATEGIES FOR FRESHWATER MUSSEL MANAGEMENT IN MAINE

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Problem 1: Current funding and staff resources are inadequate to accomplish all of the objectives within the approved deadlines.

- Strategy 1.1: Supplement MDIFW's limited annual budget for freshwater mussel conservation by pursuing outside funding sources (e.g., State Wildlife Grant, Outdoor Heritage Fund, USEPA).
- Strategy 1.2: Develop partnerships with local/regional user and conservation groups (e.g., watershed associations, Trout Unlimited, The Nature Conservancy), as well as with industrial landowners or water managers, to secure support and, possibly, supplement funding.
- Strategy 1.3: Promote a broadened public awareness of, and support for, freshwater mussel conservation to facilitate increased programmatic funding.
- Strategy 1.4: Combine MDIFW funding resources with University of Maine graduate research opportunities and faculty expertise to advance research objectives.
- Strategy 1.5: Provide long-term habitat protection by utilizing conservation easements, cooperative management agreements, and regulatory tools when fee acquisition is not feasible.
- Strategy 1.6: Secure funding to hire seasonal employees and contract outside expertise to assist with developing and implementing surveys, monitoring programs, habitat and population assessments, outreach plans, and research strategies.

Problem 2: Information is lacking on the life histories, fish hosts, population demographics and dynamics, habitat requirements, threats, limiting factors, conservation needs, and recovery potential of freshwater mussels in Maine. This lack of information may impede accomplishment of some or all conservation objectives for freshwater mussels by the 2023 deadline.

- Strategy 2.1: Determine and investigate priority information needs by optimizing opportunities for grant work or graduate research partnerships at the University of Maine, or other institutions.
- Strategy 2.2: Apply comparable data for freshwater mussel species in other parts of their range to inform conservation strategies for Maine.
- Strategy 2.3: Where comparable information is lacking, prioritize and secure funding to determine the most important information needs for

Freshwater Mussels Problems and Strategies

conservation of native freshwater mussel populations, their habitats, and fish hosts.

Strategy 2.4: Develop and implement effective population and habitat monitoring schemes applicable at local, watershed, and/or statewide scales.

Problem 3: Knowledge of the distribution and occurrence of native freshwater mussel species is incomplete.

Strategy 3.1: Continue surveys to fill gaps in currently known species' distributions, document species presence in un-surveyed water bodies, and extend known distributions up and down watersheds. Prioritize surveys for rare species.

Problem 4: Habitats previously or currently supporting rare freshwater mussels or exemplary native freshwater mussel communities are subject to both natural (e.g., beaver impoundments, flood events, ice scour) and human-induced (e.g., dam construction or removal, contaminants) alterations, which may affect populations of both the mussels or their fish hosts, or degrade habitat quality on a temporary or permanent basis. The ability to manage or affect some of these habitat changes may be beyond MDIFW's jurisdiction (e.g., water quality) or capability (e.g., global warming).

Strategy 4.1: Identify and map known, high-value freshwater mussel sites (i.e., for rare species and exemplary native mussel communities).

Strategy 4.2: Inform landowners, water managers, state resource agencies, and municipalities of the presence and conservation needs of state-listed freshwater mussels and exemplary native mussel communities. Encourage compatible use, site monitoring, and stewardship.

Strategy 4.3: Develop guidelines and protocols for key management and conservation issues (riparian buffers, water level and flow management, relocation and reintroduction, etc).

Strategy 4.4: Provide long-term habitat protection of sites with state-listed species or exemplary native mussel communities through cooperative management agreements, easements, acquisition, or regulation.

Strategy 4.5: On sites owned by MDIFW or other conservation partners, identify habitat conservation for high value mussel habitat as a top priority, and implement necessary management actions as soon as possible.

Strategy 4.6: Develop a strategy to assess habitat quality or suitability for both individual species of mussels and the native fauna as a group.

Strategy 4.7: Develop a site-monitoring program to verify habitat status and determine management needs at sites with historical or extant populations of state-listed species or exemplary native mussel communities.

Problem 5: Management or restoration efforts for native freshwater mussels or their fish hosts may alter habitat quality for other species, or conflict with current and future resource management or land use priorities.

Freshwater Mussels Problems and Strategies

Strategy 5.1: Prior to planning and implementing habitat management or restoration actions for freshwater mussels or their hosts, conduct comprehensive surveys for rare species, including plants and natural communities, and identify potential conflicts.

Strategy 5.2: Work with landowners, user groups, and other resource managers to address potential conflicts with other species and land use priorities, and build support for freshwater mussel conservation. Where needed, develop cooperative management agreements to ensure long-term habitat protection.

Problem 6: A lack of public awareness and support of freshwater invertebrates may impede conservation initiatives for freshwater mussels.

Strategy 6.1: Identify and prioritize key outreach needs.

Strategy 6.2: Develop effective outreach and stewardship programs and products for industries, municipalities, user groups, and the general public – particularly in watersheds with listed species.

Strategy 6.3: Develop outreach partnerships with local user and conservation interest groups.