

FEASIBILITY STATEMENTS FOR TOMAH MAYFLY GOALS AND OBJECTIVES

Prepared by: Beth I. Swartz
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The desirability, feasibility, habitat capability, and possible consequences of the recommended Tomah mayfly objectives are presented below. To achieve the stated objectives, survey and monitoring programs, habitat management activities, research, and outreach will all have to be increased significantly. The necessary financial and staff resources to meet these objectives are currently unavailable to MDIFW. Significant new funding will have to be generated, and outside expertise and short-term contract personnel will need to be hired. Over the next fifteen years, a minimum of \$275,000 are needed to adequately address the proposed objectives.

Goal: Ensure the long-term viability of the Tomah mayfly and its habitat in Maine; and determine the criteria necessary for recovery of the species.

Population Objectives 1: By 2002, develop and implement a monitoring plan to determine a statewide population index (i.e. presence, absence, relative abundance).

Desirability: Acquiring baseline population information for the Tomah mayfly in Maine is essential to understanding the species' current status and its potential for recovery; and to monitoring and documenting future trends and responses to management efforts. Currently, there are little to no population data available. At several sites, presence has not been reconfirmed in more than a decade. An understanding of the approximate baseline population will allow MDIFW to move forward with effective conservation and recovery measures.

Feasibility: Currently, there are thirteen sites where the Tomah mayfly has been documented in Maine. It is possible additional populations will be discovered. Although effective methods of measuring mayfly abundance have not yet been developed, implementing a monitoring plan to determine the presence, absence, and relative abundance at each site is feasible by 2002. At least one seasonal person would have to be contracted to survey and assess populations at known sites. The development of a monitoring plan would also require assistance from an outside expert knowledgeable about mayfly survey techniques. Tomah mayfly distributions may be extremely variable within and between sites, and the techniques used may be insufficient to compare the relative population measures. Approximately \$6,000 would be needed to contract the necessary resources to determine a statewide population index for Tomah mayfly. Current MDIFW funding available for Tomah mayfly research is not adequate to meet these needs.

Tomah Mayfly Feasibility Statements

Capability of Habitat: N/A

Possible Consequences: A reliable index of the Tomah mayfly population statewide, and at each site, would provide MDIFW with a better understanding of this threatened species' status, and a baseline from which to monitor trends, success of conservation efforts, and progress of recovery.

Population Objective 2: By 2007, complete a statewide survey to identify all Tomah mayfly populations.

Desirability: Despite extensive surveys of potentially suitable habitat, the Tomah mayfly has been documented at only thirteen sites in Maine. It is possible, however, that additional populations will be discovered as surveys continue. Completing a statewide survey would provide MDIFW with a thorough and up-to-date understanding of the occurrence, distribution, relative abundance, and status of the Tomah mayfly in Maine.

Feasibility: The Tomah mayfly inhabits seasonally-flooded sedge meadows - a common wetland type in Maine. It's distribution has been documented as nearly statewide, ranging from northern to Downeast to western portions of the state. Locations of potentially suitable habitats can be identified using GIS mapping tools to overlay National Wetlands Inventory and other wetland habitat type maps. MDIFW has already initiated surveys for new Tomah mayfly occurrences through its statewide ecoregional surveys for rare species. However, these surveys are not complete, and some portions of the state have not been searched adequately. At least two seasonal employees would need to be contracted over the course of the next six years (~\$60,000 total) to complete a comprehensive statewide survey by the 2007 deadline. While some funding will likely be available from the ecoregional project and Section 6, significant additional funding would have to be procured in order to meet the objective.

Capability of Habitat: N/A

Possible Consequences: A comprehensive, statewide survey for the Tomah mayfly would provide MDIFW with a complete and current understanding of this threatened species' occurrence, distribution, abundance, and status in Maine.

Population Objective 3: Through 2016, maintain existing populations at all sites occupied by the Tomah mayfly.

Desirability: Of the thirteen sites where the Tomah mayfly has been documented in Maine, it is believed to be abundant at only one site, common at seven sites, and

Tomah Mayfly Feasibility Statements

rare at five sites. Maintaining these existing populations is critical to ensuring recovery efforts for the Tomah mayfly are not jeopardized.

Feasibility: The future of this species likely depends largely on the ability to maintain the natural productivity and ecological integrity of suitable, seasonally-flooded sedge meadows. Federal, state, and municipal regulations exist for protecting wetlands, and, at present, are the most important tools for protecting the Tomah mayfly and its habitat. Procuring the long-term protection of these sites is feasible by 2016 (see habitat objective #2).

Specific details of the life history, habitat requirements, and population dynamics of the Tomah mayfly are unknown at this time. Likewise, the environmental variables, limiting factors, and wetland management techniques affecting the mayfly's populations are also undocumented. Maintaining and ultimately recovering this species will also be dependent on identifying those critical factors potentially affecting populations on a site or statewide basis (see research objective).

Capability of Habitat: It is assumed the habitat at extant sites is adequate to support existing populations as long as these wetland systems are protected from alteration or degradation.

Possible Consequences: see habitat objective #2

Habitat Objective 1: By 2007, assess the amount and quality of suitable habitat at priority sites (occupied and unoccupied) as identified by population objective #1.

Desirability: The status and recovery potential of the Tomah mayfly likely depends primarily on the availability, distribution, and long-term persistence of suitable, seasonally-flooded sedge meadows. Completing a statewide assessment of all priority habitats would provide MDIFW with a comprehensive understanding of both the existing and potential distribution, abundance, and capacity to support viable populations of the Tomah mayfly. This information would be essential to developing Tomah mayfly population and habitat management goals, as well as identifying sites for long-term conservation.

Feasibility: The use of computer mapping tools to select for vegetation type, hydrology, and other habitat parameters identified to characterize suitable sedge meadow habitats, could probably be used to quantify suitable habitat at each site. Assessing habitat quality will likely be more difficult. The Tomah mayfly is not found in every seasonally-flooded sedge meadow - it is probable there are other as yet unknown factors or habitat parameters that determine the suitability of a site for the mayfly. Identifying these factors, and effective management tools to improve habitat quality, would require research and significant funding (see population objective #3 and research objective). MDIFW does not currently have monies to initiate these types of studies. Until then, determining the quality of habitat would have to rely on

Tomah Mayfly Feasibility Statements

more subjective parameters such as proximity to existing populations, wetland integrity and size, management and conservation potential, and likelihood of long-term persistence. Field visits to quantify and qualify suitable habitat at priority sites should be combined with efforts and funding to meet the statewide Tomah mayfly survey objective.

Capability of Habitat: N/A

Possible Consequences: It may be discovered that there is inadequate quantity and quality of habitat available to recover the Tomah mayfly, and that long-term management efforts will be necessary to maintain or create habitat for the species. Until specific habitat parameters or limiting factors are identified, only the presence or absence of the Tomah mayfly, or its prey species, can describe with any certainty the suitability of a site. The quality of a site could become altered – either positively or negatively - on a temporary, long-term, or even permanent basis by management actions or natural events, such as flow regulation or flooding by beaver. The potential for a site to become degraded or improved should be considered when assessing potential habitat quality for the Tomah mayfly.

Habitat Objective 2: By 2016, protect and manage all habitats supporting the Tomah mayfly in Maine.

Desirability: In the past fifty years, the Tomah mayfly has been collected from only seventeen sites worldwide - thirteen of which are in Maine. With nearly the entire known population contained within its borders, Maine has a responsibility to conserve this rare invertebrate and its habitat for the future. Providing long-term protection and management of its limited habitat is likely the single most important recovery action for the Tomah mayfly. Without habitat protection and management efforts, recovery will be continuously jeopardized by both natural and human-induced events that may directly harm the mayfly or degrade its habitat.

Feasibility: All of Maine's extant Tomah mayfly sites have the potential to support viable populations, and should be protected. Of the thirteen sites, three have some level of management authority or ownership by a conservation agency, and possess the greatest potential to be managed for the mayfly. Most of the sites, however, are in unorganized townships and under private industrial forest ownership. Procuring their long-term protection, either through fee acquisition, easement, cooperative management agreements, or regulatory protection is feasible by 2016. All of these privately owned sites are wetland/riparian in nature, with negligible development and timber harvest potential. Landowners may be quite willing to transfer either ownership or management rights, or develop working management agreements to protect the mayfly and its habitat. Fee acquisition of sites would require funding that is not currently available to MDIFW. However, outside funding sources (i.e. OHF, LMFB, etc) could be sought to supplement limited MDIFW monies in those cases

Tomah Mayfly Feasibility Statements

where cooperative management agreements or regulatory protection would not meet habitat protection needs.

Appropriate wetland management actions beneficial to Tomah mayfly, and specific site needs, are unknown at this time (see research objective and population objective #3). Once this information is acquired, management objectives, feasibility, and potential costs may be better understood. Potential human-induced changes in habitat (i.e. via irrigation, impoundments, etc) also need to be monitored and prevented.

Capability of Habitat: It is possible that statewide surveys for Tomah mayfly will discover additional sites that require protection and management.

Possible Consequences: It is possible some private landowners may not want to cooperate with MDIFW in protecting the Tomah mayfly on their lands. This may effect recovery efforts, and, ultimately, require habitat protection through regulation (i.e. Essential or Significant Habitat designation). Management practices in favor of the Tomah mayfly could potentially alter habitat for other rare species. Long-term protection and management of Tomah mayfly habitat might conflict with existing management plans for conservation lands (i.e. waterfowl impoundments) or with current use and demand of public and recreational lands. Staff time and funding, particularly from MDIFW Regional offices, may be diverted from competing priorities.

Research Objective 1: By 2002, identify strategies to determine prey population dynamics, habitat requirements, long-term population dynamics, historic habitat and hydrological changes at each site, and global distribution.

Desirability: Very little is currently known about the life history, population dynamics, specific habitat requirements, limiting factors, and historic occurrences of the Tomah mayfly in Maine. An understanding of the species' global distribution is also incomplete. All of these factors are essential to determining the best management strategies and recovery potential for the Tomah mayfly.

Feasibility: Because the Tomah mayfly is nearly endemic to Maine, answering many of the unknowns about this mayfly will fall solely on MDIFW. Developing strategies to determine these unknowns is feasible by 2002, but will require intensive literature search and contacts with other professionals, as the expertise is currently lacking at MDIFW. A series of 3-4 graduate studies at the University of Maine would be the most effective method of obtaining information to better understand the life requirements and management needs of the Tomah mayfly. Funding to help support these types of research projects would require a minimum of \$50,000 per project, and is currently unavailable to MDIFW.

Capability of Habitat: N/A

Tomah Mayfly Feasibility Statements

Possible Consequences: A lack of existing information could complicate the development of effective strategies. It may be determined that implementing these strategies would require funds beyond the capability of MIDIFW.

Outreach Objective 1: By 2002, and in conjunction with partners, develop and implement an outreach plan to increase awareness and understanding of the Tomah mayfly and its habitat requirements in Maine. Outreach should be targeted at towns, landowners, and the general public.

Desirability: Prior to its listing as a threatened species in Maine, the Tomah mayfly – like most rare invertebrate species – had largely gone unnoticed by the general public. Even today, the mayfly is still unknown to most of Maine’s citizens due to its extreme rarity and inconspicuous nature. Support of Tomah mayfly recovery by the general public, and by affected landowners and towns, in particular, is essential to a successful recovery program.

Feasibility: Developing an outreach program to increase awareness and appreciation of the Tomah mayfly on both a local and statewide level is essential to building support for habitat protection and management actions necessary to recover the species. The number of landowners and organized towns directly linked to Tomah mayfly occurrences is relatively small. Some outreach materials for the Tomah mayfly are already being developed by MDIFW. Funding (~\$10,000) would be necessary to develop and produce additional materials, and to contact and work with landowners and municipal officials. Partnerships (i.e. with industrial landowners, local watershed or civic groups) could be developed, where appropriate, to assist with outreach efforts.

Capability of Habitat: N/A

Possible Consequences: No adverse consequences are anticipated from an increased outreach program for this species.