CLAYTON'S COPPER MANAGEMENT SYSTEM

FINAL DRAFT

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INTRODUCTION

This document describes the process used by the Maine Department of Inland Fisheries and Wildlife (MDIFW) to implement management, research, and outreach programs for recovering the Clayton's copper (*Lycaena dorcas claytoni*). Listed as endangered under Maine's Endangered Species Act (12 MRSA, Section 7753) in 1997, this butterfly is currently known from only ten sites worldwide -- nine in Maine and one just over the border in New Brunswick. With nearly the entire global population contained within its borders, Maine holds the primary responsibility for conserving this rare subspecies and its habitat for the future.

To begin this process, MDIFW completed a species assessment for Clayton's copper in February 2001 (Swartz et al. 2001). The assessment summarizes all currently known information about the butterfly and includes reviews of past, present, and future habitat condition, population status, research, and management. In March 2001, a public working group established goals and objectives for Clayton's copper management over the next 15 years. The Commissioner's Advisory Council approved these goals and objectives in October 2001.

The following Management System outlines MDIFW's strategy for achieving the goals and objectives established for managing and recovering Clayton's copper. Management actions are enumerated, and a decision-making process is outlined, based on the assumption that adequate funding will be available to accomplish these

objectives within the current 15-year management cycle. It is also assumed that suitable, willing partners exist locally and sufficient MDIFW staff and resources will be allocated to Clayton's copper management, research, and outreach. Currently, however, adequate funding and resources are **not** available to MDIFW and, unless they are secured, most objectives cannot be met within the expected deadlines.

Management actions for Clayton's copper are prioritized in Appendix 1. Potential partners, estimated costs, and realistic time frames for accomplishing these actions are also suggested. This information should serve as a guide to MDIFW for meeting the goals and objectives established by the public working group.

MANAGEMENT GOALS AND OBJECTIVES

The strategic planning process employed by MDIFW solicits public input in the development of goals and objectives for species management. The following were developed for the Clayton's copper:

GOAL: Ensure the long-term viability of Clayton's copper and its habitat in Maine, and determine the criteria necessary for recovery of the species.

Population Objective 1: By 2002, develop and implement a monitoring plan to determine an approximate baseline population of Clayton's copper in Maine.

Assumptions

- Existing methodologies for inventorying butterfly populations can be applied to develop statistically valid estimates of population size.
- All populations of Clayton's copper in Maine can be identified.
- Landowner permission for implementing a monitoring program will be obtained at all sites.
- The monitoring plan and implementation schedule will include considerations for annual fluctuations in population size.

Population Objective 2: By 2005, complete a statewide survey to identify all Clayton's copper populations in Maine.

Assumptions

- Host plant (shrubby cinquefoil) stands large enough to support viable populations of Clayton's copper are very limited in number and distribution. Occurrences are already largely documented, and additional, naturally occurring stands are not likely to be discovered.
- Some host plant stands unoccupied by Clayton's copper could become occupied or re-occupied in the future, particularly in the vicinity of existing populations.

Population Objective 3: By 2006, determine a tentative, working minimum viable population (MVP) for Clayton's copper and establish population objectives.

Assumptions

- A tentative, working MVP can be developed despite incomplete knowledge of Clayton's copper's life history characteristics and requirements.
- Existing MVPs for similar species of butterflies are appropriate to use as a template for developing a model for Clayton's copper.
- Population models can incorporate the metapopulation concept to address relationships between populations.

- Meaningful population objectives can be established despite the absence of historic data, and without a complete understanding of life history, limiting factors, risk of extinction, and recovery potential.

Habitat Objective 1: By 2006, determine the amount and quality of potential habitat for Clayton's copper in Maine.

Assumptions

- Potential habitat for Clayton's copper is identified by an extant occurrence of shrubby cinquefoil large enough to support a viable population of the butterfly, and includes both upland and wetland sites.
- Specific locations of historic (extirpated) occurrences of Clayton's copper, or shrubby cinquefoil stands large enough to support viable populations of the butterfly, are unknown and cannot be identified as potential habitat.
- Shrubby cinquefoil stands large enough to support viable populations of Clayton's copper are very limited in number and distribution. Occurrences are already largely documented, and additional, naturally occurring stands are not likely to be discovered.
- Factors determining which host plant stands are potential habitat for Clayton's copper can be identified.
- Factors determining the quality of potential habitat can be identified.

- The amount and quality of potential habitat for Clayton's copper can be increased or decreased as a result of both natural and human-influenced events.

Habitat Objective 2: Protect and manage all habitats supporting Clayton's copper in Maine through 2016.

Assumptions

- All habitats supporting Clayton's copper populations can be identified.
- Habitat protection can be achieved using a variety and combination of land protection tools specific to the needs of each site.
- Landowners, user groups, municipalities, and the public will support protection and management initiatives.
- Protection and management of Clayton's copper habitat will be a high priority for conservation organizations and agencies with ownership or management authority on sites supporting the butterfly.
- Habitat protection initiatives will ensure each site can support a viable population of Clayton's copper over the long-term.
- Habitat protection includes providing adequate upland buffers around wetlands, and managing these buffers to maintain or enhance shrubby cinquefoil populations.
- Habitat protection includes monitoring for and mitigating events (natural or human-influenced) occurring in the watershed that might negatively affect

Clayton's copper or its habitat (i.e. beaver impoundments, irrigation drawdowns, fire, etc).

- Adequate upland buffer distances can be determined.
- Maintaining habitat at some sites may require only monitoring, and little or no management actions.
- Limiting factors affecting Clayton's copper and its host plant can be identified and incorporated into effective management strategies.
- Best management practices for maintaining or enhancing shrubby cinquefoil stands can be identified and incorporated into effective management strategies.
- Factors defining the quality and significance of an individual site to Clayton's copper can be identified and incorporated into effective habitat protection strategies.

Research Objective: By 2002, identify strategies to determine limiting factors, population dynamics, genetic variability, dispersal capability, and habitat dynamics affecting Clayton's copper in Maine.

Assumptions

- Existing strategies for similar species can be used as templates to develop methods for researching Clayton's copper.
- Local expertise will be available outside of MDIFW to help identify these strategies and pursue research objectives.

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

Assumptions

- Increasing awareness and understanding of the Clayton's copper and its habitat requirements is essential to the species' recovery.
- Support from both the local and statewide public is necessary.
- Within the Clayton's copper's limited distribution, key partners and audiences for outreach can be identified and will be receptive to an outreach plan.

MANAGEMENT DECISION-MAKING PROCESS

The following four-part management system provides the framework for managing populations and habitats of Clayton's copper in Maine. Further, it identifies a system for determining research strategies to fill key knowledge gaps about Clayton's copper, and for improving public understanding and appreciation of this endangered butterfly.

POPULATION MANAGEMENT SYSTEM

Decision Criteria

The following criteria determine the sequence of procedures used to conserve Clayton's copper populations in Maine and establish recovery objectives (Fig. 1).

Criterion A: *Has a monitoring plan to determine an approximate baseline population been developed and implemented?*

This criterion addresses the need for reliable population estimates at each site supporting Clayton's copper populations, and for a baseline, statewide total population estimate. These population estimates are essential to determining meaningful population objectives and recovery goals, and to monitoring future trends, responses to management actions, and progress towards recovery. Estimates of population size are also critical to understanding the relative importance of each site to species recovery, and to developing long-term, site-specific habitat management plans.

An affirmative response will require that a reliable, long-term monitoring plan has been initiated at each site currently known to support Clayton's copper populations.

Criterion B: *Has a statewide survey been completed?*

This criterion addresses the need to identify all populations of Clayton's copper in Maine, as well as all sites with potential to support Clayton's copper populations. A complete, statewide understanding of the occurrence, distribution, and status of both butterfly and host plant is basic to the realization of all other population and habitat management objectives established for Clayton's copper.

An affirmative response will be achieved when all shrubby cinquefoil stands with the potential to support viable populations of Clayton's copper have been identified to the best ability possible and surveyed to determine presence or absence of Clayton's copper.

Criterion C1: *Has a tentative, working MVP been determined?*

This criterion addresses the need for a measure of Clayton's copper's risk of extinction in Maine, from which population recovery goals can be defined. It also recognizes that all of the life history data necessary to establish a MVP may not yet be available for Clayton's copper, and a provisional model might be developed based on current knowledge and existing MVPs for similar species. This tentative MVP could then provide an adequate understanding from which population objectives could be established.

An affirmative response will require that a working MVP has been developed, using the most appropriate current models and the best available data on Clayton's copper or related species.

Criterion C2: *Have population objectives been established?*

This criterion addresses the need for numerical population estimates on which to base recovery goals and objectives.

An affirmative response is only possible after Criteria A, B, and C1 have been met, and population recovery goals and objectives have been developed.

Criterion D: *Have all population objectives been met?*

An affirmative response will be achieved when all components of the population objectives have been realized.

Management Actions

The following management actions are the recommended procedures for accomplishing the population objectives. Specific management actions result from responses to decision criteria identified in Figure 1.

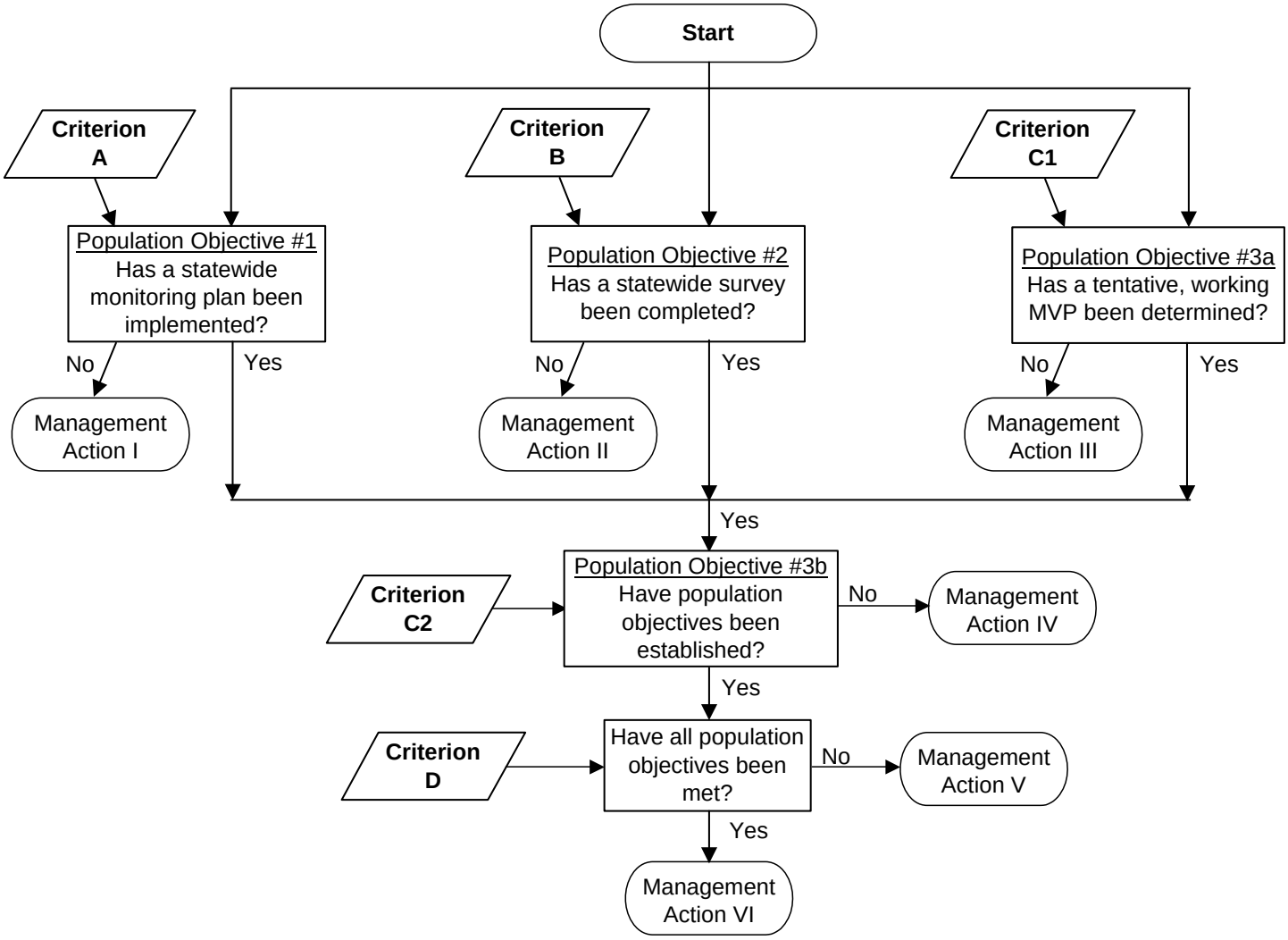

Figure 1. Flow diagram depicting decision criteria for Population Management System for Clayton's copper in Maine.

Management Action I

1) Identify and map each site in Maine known to support a population of Clayton's copper.
2) By consulting with experts and current literature, develop a monitoring scheme that will yield a reliable and statistically valid population estimate for each site, and from which a statewide population estimate can be determined. Survey methods should accommodate the need for measuring long-term trends, annual fluctuations, responses to management actions, and progress towards recovery over the long-term.
3) Obtain landowner permission to initiate a long-term monitoring program at each site.
4) Establish survey plots and/or transects at each site, and design a monitoring schedule.
5) Initiate monitoring program at each site.

Management Action II

6) Identify and map each shrubby cinquefoil stand in Maine with the potential to support Clayton's copper populations by:
    a) compiling documented occurrences, reports, and rumors
    b) researching herbarium logs and field notes
    c) querying field personnel and local sources
    d) if possible, predicting potential occurrences using GIS to analyze soils, hydrology, and vegetative cover types

e) aerial surveying high probability areas (based on soils, hydrology, vegetative cover types, and proximity to existing stands)

7) Survey every shrubby cinquefoil stand identified to determine presence or absence of Clayton's copper. Accomplish via statewide ecoregional surveys, contract positions, and/or ET group staff time.

8) Determine the amount and quality of potential habitat at each site in order to simultaneously accomplish Habitat Objective #1 (Habitat Management System, Criterion A, Management Action I).

Management Action III

9) Compile all currently known, relevant data for Clayton's copper and related species (i.e. life history, limiting factors, environmental influences, etc).

10) Research scientific literature and recovery plans of similar species for existing MVP models that could be used as a template for Clayton's copper.

11) Develop a model for and determine a tentative, working MVP from which reliable population objectives can be determined.

Management Action IV

12) In conjunction with the public working group, establish population recovery goals and objectives.

Management Action V

13) Continue work to meet all objectives.

Management Action VI

14) Convene a public working group to develop new population goals and objectives.
15) Develop a new Population Management System based on revised goals and objectives.

HABITAT MANAGEMENT SYSTEM

Decision Criteria

The following criteria determine the sequence of procedures used to conserve Clayton's copper habitat in Maine (Fig. 2).

Criterion A: *Have the amount and quality of potential habitat in Maine been determined?*

This criterion addresses the need to identify, quantify, and evaluate all potential habitat for Clayton's copper in Maine. This baseline habitat data is essential to understanding the butterfly's current status, habitat management needs, and recovery potential.

An affirmative response will be achieved when all potential habitats in Maine have been identified and surveyed for Clayton's copper (Population Criterion B), and the amount and quality of habitat present at each site has been assessed.

Criterion B1: *Have all sites supporting viable populations of Clayton's copper in Maine been protected?*

This criterion addresses the need to protect all sites supporting Clayton's copper populations to ensure long-term viability of this endangered butterfly and its habitat in Maine.

An affirmative response will be achieved when every site known to support viable Clayton's copper populations in Maine is permanently protected from habitat loss and degradation.

Criterion B2: *Are all sites supporting viable populations of Clayton's copper being managed?*

This criterion addresses the need for site-specific habitat management plans, including habitat monitoring, to be implemented at each site supporting Clayton's copper populations. It recognizes that habitat management intervention may be critical to maintaining the long-term viability of shrubby cinquefoil stands, and that management actions may also enhance existing habitat for Clayton's copper.

An affirmative response will require that each site supporting viable populations of Clayton's copper has been assessed for both short and long-term habitat management needs, and a comprehensive, site-specific management plan has been developed and implemented for each site.

Criterion C: *Have all habitat objectives been met?*

An affirmative response will be achieved when all components of the habitat objectives have been realized.

Management Actions

The following management actions are the recommended procedures for accomplishing the habitat objectives. Specific management actions result from responses to decision criteria identified in Figure 2.

Management Action I

16) Develop a system to evaluate the quality of shrubby cinquefoil stands for Clayton's copper.
17) For all shrubby cinquefoil stands identified in the Population Management System (Criterion B, Management Action II), estimate the amount (acreage) and quality of potential habitat available to Clayton's copper. These measurements should be made in conjunction with the statewide population survey objective.

Management Action II

18) Identify landowners of all sites supporting Clayton's copper populations. Include landowners whose properties provide upland buffers, or who hold land or water rights that could influence the quality or availability of habitat for Clayton's copper.
19) Assess current protection status of each site, based on ownership types and existing land protection measures, including regulatory oversight.

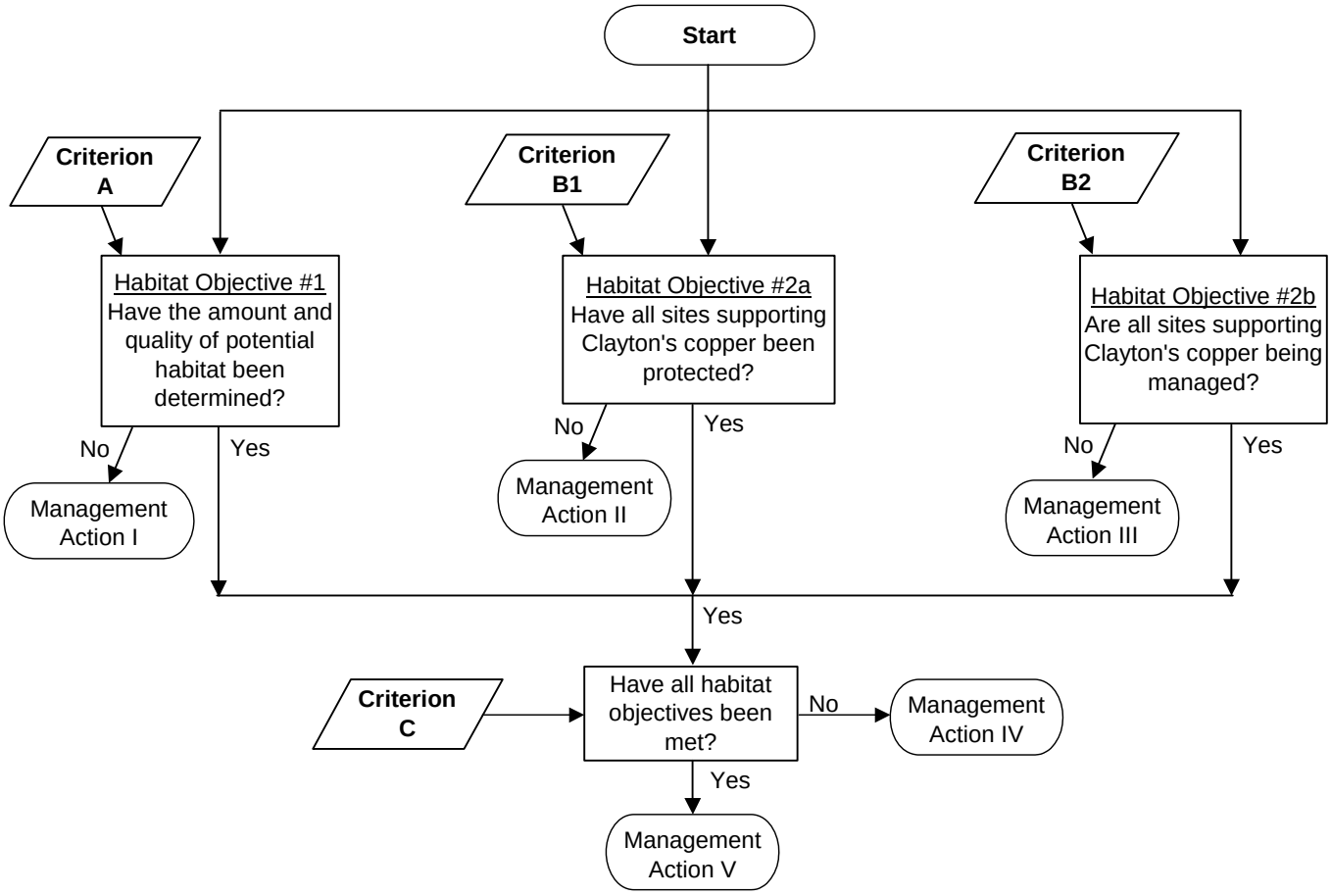

Figure 2. Flow diagram depicting decision criteria for Habitat Management System for Clayton's copper in Maine.

20) Prioritize sites based on current protection status, and considering element occurrence rank, vulnerability, threats, management needs, current and future land use demands, opportunities for protection, etc.
21) Develop site protection plans for each site where permanent habitat protection for Clayton's copper is not already secured. Protection plans should ensure habitat is protected from loss or degradation, and consider all appropriate land protection tools, including fee acquisition, acquisition of land and water rights, conservation easements, management authority, cooperative management agreements, designation of Essential and/or Significant Wildlife Habitat, and municipal and state zoning and permit review processes.
22) Implement site protection plans in order of prioritization.

Management Action III

23) Assess the short and long-term habitat management needs of each site supporting Clayton's copper populations.
24) Develop a site-specific, habitat management plan for each site. Shrubby cinquefoil management guidelines recommended by Rooney and Weber (2002) should be consulted, and potential conflicts with other rare species management, as well as with existing and future land use objectives, should be considered .
25) Prioritize sites based on their element occurrence rank and the immediate need for habitat management to ensure long-term viability of the host plant.
26) Obtain landowner permission to conduct habitat management activities.

27) Implement site-specific management plans in order of prioritization.

Management Action IV

28) Continue work to meet all objectives.

Management Action V

29) Develop a new Habitat Management System based on revised goals and objectives.

RESEARCH MANAGEMENT SYSTEM

Decision Criteria

The following criteria determine the sequence of procedures used to identify strategies to determine key factors affecting Clayton's copper recovery in Maine (Fig. 3).

Criterion A1: *Have strategies been identified to determine limiting factors affecting Clayton's copper in Maine?*

This criterion addresses the need to determine key limiting factors affecting recovery of Clayton's copper in Maine. It recognizes that, while funding and opportunities for research are limited, progress towards filling the knowledge gap about Clayton's copper is essential to developing an effective recovery plan.

An affirmative response will require that research partners, when necessary, have been identified, appropriate research strategies have been developed, and adequate funding has been secured.

Criterion A2: *Have strategies been identified to determine the population dynamics of Clayton's copper in Maine?*

This criterion addresses the need to document the dynamics within and between populations of Clayton's copper in Maine, and determine their significance to recovery. It recognizes that, while funding and opportunities for research are limited, progress towards filling the knowledge gap about Clayton's copper is essential to developing an effective recovery plan.

An affirmative response will require that research partners, when necessary, have been identified, appropriate research strategies have been developed, and adequate funding has been secured.

Criterion A3: *Have strategies been identified to determine the significance of genetic variability in Clayton's copper populations in Maine?*

This criterion addresses the need to verify the genetic uniqueness of Clayton's copper as a subspecies and better understand the resulting conservation implications, including MDIFW's level of responsibility for the butterfly as either a unique, near-

endemic subspecies or an isolated population of the more common nominate species.[1] This criterion also addresses the need to document and understand genetic variability between populations to advance knowledge of recovery potential and risk of extinction. It recognizes that, while funding and opportunities for research are limited, progress towards filling the knowledge gap about Clayton's copper conservation genetics is essential to developing an effective recovery plan.

An affirmative response will require that research partners, when necessary, have been identified, appropriate research strategies have been developed, and adequate funding has been secured.

Criterion A4: *Have strategies been identified to determine the dispersal capability of Clayton's copper in Maine?*

This criterion addresses the need to document dispersal capability in Clayton's copper, and to document its significance to population dynamics, genetic variability, recovery potential, and risk of extinction. It recognizes that, while funding and opportunities for research are limited, progress towards filling the knowledge gap about Clayton's copper is essential to developing an effective recovery plan.

An affirmative response will require that research partners, when necessary, have been identified, appropriate research strategies have been developed, and adequate funding has been secured.

[1] The genetic status of this butterfly would not independently alter its listing status in Maine. Because of the animal's extremely limited distribution and abundance, MDIFW's current listing criteria would still classify even the nominate species (*Lycaena dorcas claytoni*) as endangered or threatened.

Criterion A5: *Have strategies been identified to determine the habitat dynamics affecting Clayton's copper populations in Maine?*

This criterion addresses the need to document host plant and community dynamics affecting recovery of Clayton's copper in Maine. It recognizes that, while funding and opportunities for research are limited, progress towards filling the knowledge gap about Clayton's copper is essential to developing an effective recovery plan.

An affirmative response will require that research partners, when necessary, have been identified, appropriate research strategies have been developed, and adequate funding has been secured.

Criterion B: *Has the research objective been met?*

An affirmative response will be achieved when all components of the research objective have been realized.

Management Actions

The following management actions are the recommended procedures for accomplishing the research objective. Specific management actions result from responses to decision criteria identified in Figure 3.

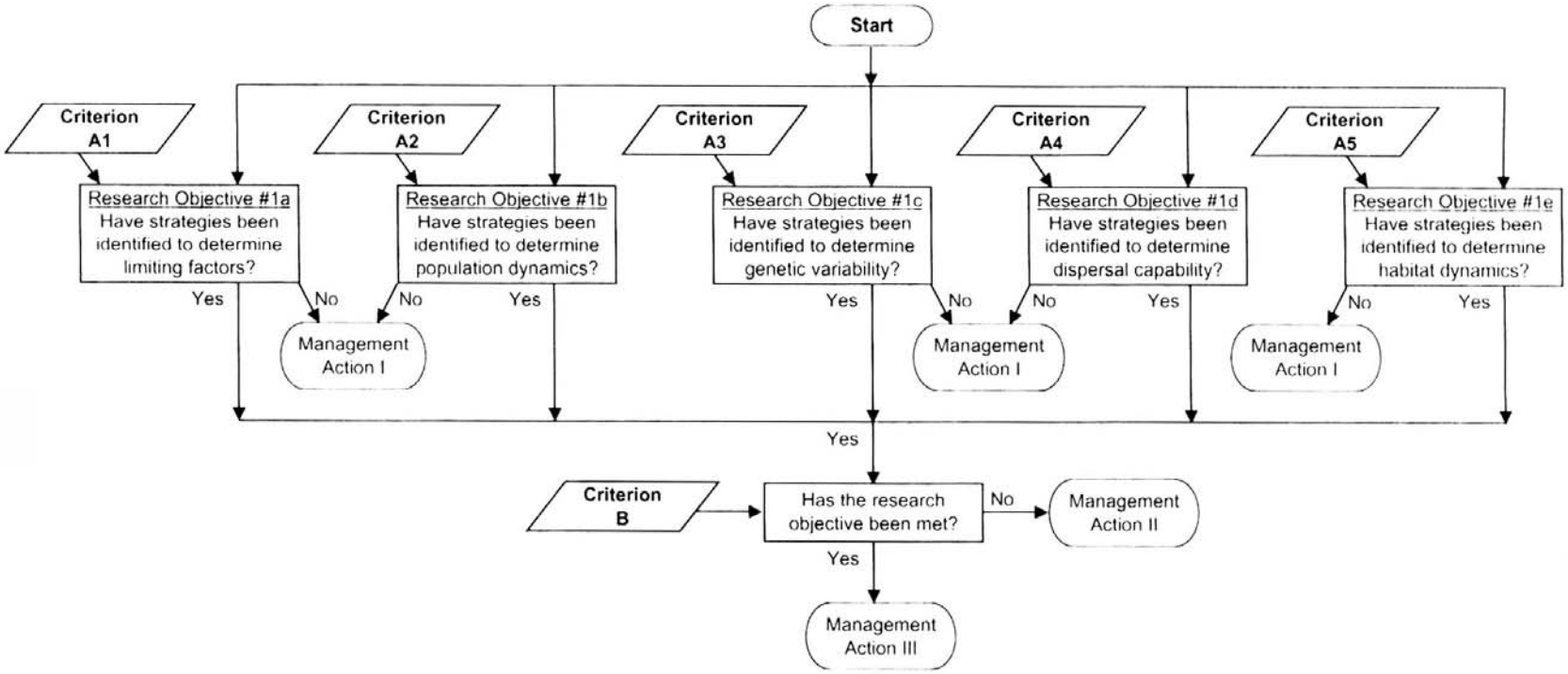

Figure 3. Flow diagram depicting criteria for Research Management System for Clayton's copper in Maine.

Management Action I

30) Identify and engage research partners, either through graduate positions at the University of Maine or via contracts.

31) In conjunction with partners, develop research proposals to determine objectives. Recognize the importance of the New Brunswick population to understanding key factors of population dynamics, dispersal capability, and genetic variability in Maine, and include in research proposals wherever appropriate. Combine objective components wherever feasible.

Management Action II

32) Continue work to meet objective.

Management Action III

33) In conjunction with the public working group, develop a new Research Management System based on revised goals and objectives and considering updated information on the butterfly and its host plant.

OUTREACH MANAGEMENT SYSTEM

Decision Criteria

The following criteria determine the sequence of procedures used to increase awareness and understanding of Clayton's copper and its habitat requirements in Maine (Figure 4).

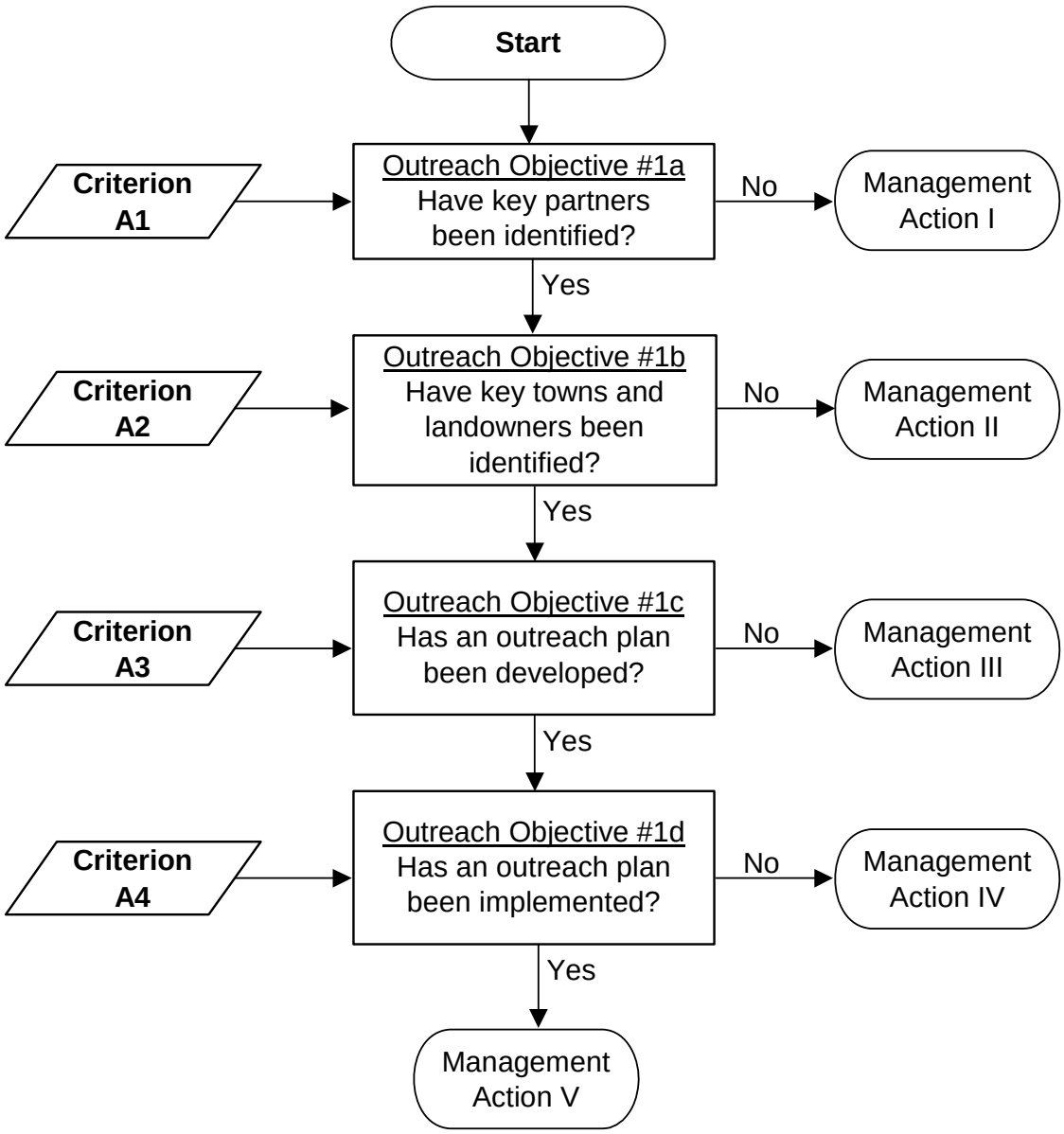

Figure 4. Flow diagram depicting decision criteria for Outreach Management System for Clayton's copper in Maine.

Criterion A1: *Have key partners been identified?*

This criterion addresses whether key cooperators, at both a local and statewide scale, have been identified for the outreach initiative.

An affirmative response will be achieved when all appropriate partners have been identified and contacted to invite support for and participation in the development and implementation of an outreach plan for Clayton's copper.

Criterion A2: *Have key towns and landowners been identified?*

This criterion addresses whether municipalities and landowners having the greatest potential to affect recovery of Clayton's copper have been identified.

An affirmative response will be achieved when all municipalities with jurisdiction over sites supporting or potentially influencing Clayton's copper populations, and all similarly related landowners, have been identified.

Criterion A3: *Has an outreach plan been developed?*

This criterion addresses whether a strategy for increasing awareness and understanding of the Clayton's copper and its habitat in Maine has been devised.

An affirmative response will require that a brief document outlining outreach objectives, proposed actions, informational materials to be developed, and an implementation schedule, has been produced.

Criterion A4: *Has an outreach plan been implemented?*

This criterion addresses whether a program for increasing awareness and appreciation of Clayton's copper and its habitat in Maine has been initiated.

An affirmative response will be achieved when outreach actions have been initiated and informational materials have been developed and distributed to all target audiences.

Management Actions

The following management actions are the recommended procedures for accomplishing the outreach objective. Specific management actions result from responses to decision criteria identified in Figure 4.

Management Action I

34) Identify landowners, municipalities, conservation entities, and user groups who are potential partners in an outreach initiative for Clayton's copper. Consider all parties, on both a local and statewide scale, whose support, interest, and expertise would benefit recovery goals and objectives.
35) Engage support and involvement from MDIFW's Public Information and Education Division.

Management Action II

36) Identify all municipalities with jurisdiction over sites supporting or potentially influencing Clayton's copper populations, and all similarly related landowners. Include those towns and landowners whose properties provide upland buffers.

Management Action III

37) Produce a brief document which identifies cooperators, target audiences, and potential funding sources; and outlines the outreach objectives, proposed strategies and actions, participant roles, informational materials to be developed, methods and sites of delivery, and an implementation schedule.

Management Action IV

38) Develop and produce informational materials.

39) Distribute outreach materials and activate implementation plan.

Management Action V

40) Develop a new Outreach Management System based on revised goals and objectives.

LITERATURE CITED

Rooney, S. C. and J. E. Weber. 2002. Vegetation sampling and shrubby cinquefoil management at Dwinal Pond Wildlife Management Area. Report submitted to MDIFW, February 2002.

Swartz, B. I., McCollough, M. A., and M. Siebenmann. February 11, 2001. Clayton's copper assessment. Maine Department of Inland Fisheries and Wildlife, Wildlife Division, Resource Assessment Section, Endangered and Threatened Species Program, Bangor, ME.

APPENDIX 1. PRIORITIZATION AND ESTIMATED COSTS OF MANAGEMENT ACTIONS

ORDER WITHIN PRIORITY	PRIORITY	ACTION #	MANAGEMENT ACTION	POTENTIAL PARTNERS	TIME FRAME	ESTIMATED COSTS	COMMENTS
1	**HIGH**	6	Identify all sites with potential habitat.	private contractor; MNAP and USFWS/UMO COOP Unit assistance with identifying and estimating potential habitat	3-5 yrs	$12,000	costs include ~$4000/yr to hire a seasonal (6-8 weeks) contractor for up to 3 years; if surveys conducted via ecoregional surveys, the longer timeframe and matching funds may be required
	HIGH	7	Survey all sites with potential habitat.				
	HIGH	8, 17	Estimate amount and quality of potential habitat.				
2	**HIGH**	18	Identify landowners at all sites supporting Clayton's copper.	private contractor; MNAP assistance with identifying landowners; implementation may require partnerships with landtrusts, TNC, landowners, and/or state and municipal agencies	1 yr	$6000	cost to hire one temporary contractor for 8-10 weeks
	HIGH	19	Assess current protection status of each site.				
	HIGH	20	Prioritize sites for protection.				
	HIGH	21	Develop site protection plans.				
	HIGH	22	Implement site protection plans.			??	implementation costs unknown
3	**HIGH**	23	Assess habitat management needs at each site.	private contractor, landowners, USFWS Partners for Wildlife, federal ET landowner incentives programs; MNAP assistance with landowner contacts	1 yr	$6000	cost to hire one temporary contractor for 8-10 weeks; may depend on prior research results; could be combined with #18-21 for efficiency
	HIGH	24	Develop site-specific habitat management plans.				
	HIGH	25	Prioritize sites for habitat management needs.				
	HIGH	26	Obtain landowner permission to implement habitat management at each site.				
	HIGH	27	Implement habitat management plans.			??	implementation costs unknown
4	**HIGH**	1	Identify all sites supporting Clayton's copper.		current	$0	use current EOs tracked in BCD
	HIGH	2	Develop a statewide population monitoring plan.	private contractor or UMO graduate position; MNAP assistance with landowner contacts	3 yrs	$15,000-$20,000	costs include $5000/yr for seasonal (~4-6 wks) contractor; includes 1 year for set-up and 2 years for survey; ideally, 2 years survey data should be obtained for each site, which would increase costs by ~$12,000
	HIGH	3	Obtain landowner permission to implement population monitoring plan at each site.				
	HIGH	4	Establish population survey plots and transects, and design monitoring schedule.				
	HIGH	5	Initiate population monitoring program at each site.				
5	**HIGH**	30	Identify and engage research partners.		4 yrs	$200,000	costs include funding to implement 3-4 graduate projects
	HIGH	31	Develop research proposals.	UMO and/or private contractor			
1	MEDIUM	16	Develop system to evaluate quality of potential habitat.	private contractor, possibly with USFWS/UMO COOP Unit	<1 yr	$6000	cost to hire one temporary contractor for 6-8 weeks; may depend on prior research results, which would extend timeframe
2	MEDIUM	9	Compile all relevant data input for MVP.	private contractor	<1 yr	$7000	cost to hire one temporary contractor for 6-8 weeks
	MEDIUM	10	Research existing MVPs for template.				
	MEDIUM	11	Develop a tentative, working MVP.				
3	MEDIUM	12	Establish population goals and objectives.		<1 yr		staff responsibility; requires completion of #1-11
4	MEDIUM	34	Identify and engage outreach partners.	private contractor	2 yrs	$15,000	costs include ~$5000 to hire one temporary contractor (6-8 weeks) and ~$10,000 to produce outreach materials and implement plan
	MEDIUM	35	Engage support and involvement of I&E.				
	MEDIUM	36	Identify outreach targets.				
	MEDIUM	37	Develop outreach plan.				
	MEDIUM	38	Develop and produce outreach materials.				
	MEDIUM	39	Implement outreach plan.				

MINIMUM TOTAL ESTIMATED COSTS = $273,000 - $278,000
(costs of site protection and habitat management not included)