

A
Comprehensive Adaptive
Management Plan
for
Beaver Island's
Natural Resources

prepared by Beaver Island's
Natural Resource and Ecotourism Commission

This document is a draft of a "Comprehensive Adaptive Management Plan" for Beaver Island's natural resources, in which ecotourism will be emphasized as a means for both sustainably improving the Island economy and increasing the general awareness of the fragility and value of the Island's natural endowment. It represents over a year of work by the members of NREC, the Natural Resources and Ecotourism Commission.

One hundred copies are being printed for distribution to the organizations whose representatives compose NREC and to other interested parties. The purpose is to solicit comments to help guide the continuing evolution of a comprehensive plan. All comments gathered at this stage will be discussed, and some will be implemented. Then a new version of this document will be compiled and circulated, and new comments gathered and evaluated.

Hopefully this process will include open public meetings in the summer of 2011.

An average gestation time for a natural resources plan is three years. At this point no NREC member can estimate how long it will take to create the Beaver Island plan, but it would be nice to have some kind of preliminary document ready for the two township planning commissions to consider adding to the Island's Master Plan when it is revised next May.

This edition has been published on
March 15, 2011
and is being distributed to the
Natural Resource and Ecotourism Commissions's
member stakeholders and other interested parties
for comments and suggestions.
It has not yet been approved.

Introduction

In the past few years people connected with Beaver Island became aware that a voracious invasive known as *phragmites australis* had taken root and was a danger to our ecosystem. Previous ecological scrutiny had been focused on some of the Island's rare and endangered plants, but this was a different kind of threat. A citizens' group came together to fight it, and with the support of the two Island townships and the DNRE was quite successful.

This episode made people ask what new threats might appear next. Everyone agreed that the viability of the Beaver Island community depended on the vitality of its natural resources, the main component in its multifaceted appeal.

Several key threats to the biological diversity of the Island have been identified: water flow manipulation, landscape fragmentation, invasive exotic species, pollution of all kinds, forestry, and a moderate conservation ethic in the human population overall. The wetland natural communities of the region have been reduced in many cases to small, isolated fragments that harbor exotic species and have lost some of their integrity. The lakes, ponds, rivers, and streams that define this ecoregion are compromised by pollution. Deer, raccoons, rabbits, beaver, and groundhogs have been introduced to the ecosystem. Conservation of this region's biological diversity will be a challenge. Abating these threats will require creative approaches and hard work. Restoration of ecological systems, forests, and their component species is vital to success in conserving forest, wetlands, and aquatic features.

What is needed is a management plan for the Island's natural resources. Creating a plan to not only guide future battles but to take steps to reduce the likelihood of new threats arising would be better than fighting each one as it appears. To achieve this the townships unanimously moved to create a Natural Resources and Ecotourism Commission (NREC; for a list of members [see appendix 1, page nn](#)) to "protect, improve, and sustain Beaver Island's natural resources" in August and September of 2009.

The Commission was given an eleven-fold mandate:

1. Obtain an inventory and 'needs and assets' assessment for Island resources.
2. Identify areas for expanded and/or improved trails for nature walks; propose improvements which would enhance the experience in those areas, such as boardwalks, benches, viewing areas, picnic tables, maps, signage, trail markers, brochures, and other such improvements.
3. Identify bird-watching opportunities on the Island, locations where improvements such as viewing stations and viewing equipment could be located, and create informational brochures for distribution.
4. Identify potential forest trails where forest land could be preserved, and identify old growth access sites.

5. Advocate for preservation of areas where our natural resources should be preserved to enhance ecotourism opportunities and maintain the unique beauty of Beaver Island.
6. Provide opportunities to appreciate the ecology of wetlands.
7. Develop a plan for conserving Island biodiversity, working with state, county, federal, and local governments and private agencies engaged in preservation.
8. Develop a plan that incorporates biodiversity for promoting the Island as a unique opportunity for an ecotourism experience; such a plan might include opportunity for guided nature walks, self-guided trips, classroom study, and nature photography; and work with state, federal, and other agencies engaged in the promotion of tourism.
9. Share ideas and plans with the public and obtain public input.
10. Foster improved understanding of our sensitive natural resources and habitat by Islanders and visitors.
11. Engage in other activities as determined from time to time to further the purpose of preserving the Island's natural resources and promoting ecotourism.

In the fall of 2009 the initial seventeen NREC members began monthly meetings to consider their mission. Officers were elected, and ideas were discussed. Members studied management plans from other communities and the problems that had been faced. Research was looked at and reported to the group. Special meetings were called. Interested parties were invited to address the NREC. In July of 2010 a symposium was held at which several experts presented their views, after which the sizable audience broke into discussion groups. Opinions and suggestions were collated and circulated to the group.

The many ideas took two forms. On the one hand several action steps were suggested to help the environment, some immediately doable but others requiring more extended analysis, funds, and effort. On the other hand the group realized that an overall management plan would be helpful for organizing the action steps and deciding which agency could enact them, which ones should be undertaken first, what costs would be met and how funds could be raised, and how the results could be evaluated.

These two directions came together with the decision that what was needed was a Comprehensive Adaptive Management Plan for Beaver Island's natural resources, combining guiding principles, action steps, and methods for implementation and evaluation. This document represents the result of NREC's efforts over the past twelve months to create such a plan. It is the first one published for broad but preliminary circulation intended to generate comments and suggestions for the Commission to consider before publishing the next draft, which will be available to the general public. The hope is that a consensus will eventually be reached and the final plan will become an important document for guiding Beaver Island toward the future its friends and stakeholders desire.

All Islanders understand the relationship and value of wildlife and habitat to our health, social, and economic well being. Under the NREC's leadership, citizens, non-government organizations, and government agencies can partner to conserve forests, waterways, habitats, endangered species, and native wildlife populations, and promote responsible recreation to create a Beaver Island in which our native wildlife populations and habitats are robust, self sustaining, and in an appreciably better condition tomorrow than they are today.

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A Comprehensive Adaptive Management Plan for Beaver Island's Natural Resources

Section 1 Principles

When visitors arrive on Beaver Island, they are likely to be struck by its pristine natural beauty. The air is fresh, the fields and woods verdant. Deer graze alongside the road. Rabbits and turkeys scitter into the junipers. Hawks and eagles glide gracefully overhead, and songbirds swoop from tree to tree. There are fish in the lakes and streams. The surrounding waters of Lake Michigan present ample offerings. The changing colors provided by the sequence of wildflowers bursting into bloom are a veritable miracle. Other rare plants abound. The rich panoply takes our breath away. Residents are confirmed in their high valuation, and visitors want to return, or stay.

Nature is so resilient that we have taken its ability to sustain itself for granted for a long time. But year by year ever-stronger threats have arisen. So far they have been beaten back, but because this endowment is so important people have begun to feel we should not trust its continuing protection to chance. The two Island townships concurred, and in the fall of 2009 chartered the Natural Resources and Ecotourism Commission (NREC) to look into the best way to restore, protect, improve, and sustain this gift.

In considering how to proceed, the NREC felt an important step would be to create a Natural Resources Management Plan that fulfills several conditions:

- It should enumerate and describe our natural resources;*
- It should identify current threats to our natural resources and establish procedures for dealing with them;*
- It should suggest steps that could be taken to protect, improve, or sustain our natural endowment, and would include a schedule for their funding, sponsorship, and implementation;*
- It should create guidelines for making decisions about natural resource issues by clearly stating accepted principles;*
- It should contain means for evaluating each of its assertions and recommendations; and*
- It should include methods for modifying its contents as conditions change.*

The NREC discovered that natural resource management planning was being done all across America. Its members began to review guiding principles which had been adopted elsewhere. It knew any recommendations it might make would have to be compatible with the 2006 revision of the Beaver Island Master Plan ([see appendix 2, page nn](#)), which acknowledged Beaver Island to be a place which “reveres the natural environment and wishes to pass it along to future generations with little alteration.” That document hoped the Island would remain “a quiet, serene hinterland where the evidence of settlement is not visible to the passerby,” a place where “buildings and manmade things seem to be part of and integral to the natural landscape rather than superseding it.”

At the onset several possible actions were suggested which conformed to the tone of this Master Plan. Some supported but went beyond the specific initial mandates of the charter. While these suggestions were being analyzed to determine their viability, likely cost, method of funding, means of enacting, and methods of evaluation, the NREC began to examine the available literature for guidelines with which it concurred. The first ones espoused were those originating closest to home, particularly those embodied in the work of Central Michigan's biology station, the Nature Conservancy's biodiversity project, the Michigan Natural Features Inventory, Michigan's Natural Features and Environmental Protection Act, and the Conference on Biological Diversity (*see appendices 3, 4, 5, and 6, pages nm – nm*).

Two ideas gained weight early on, that biodiversity should be encouraged and invasives fought against. The members also realized that any plan would have to be comprehensive (taking *all* natural resource matters into consideration, as well as social, political, and economic concerns) and adaptive (it would not be inflexible, but would contain the means, methods, and triggers for changing as conditions changed). Once the ice was broken, other ideas began to accrue, and soon the NREC adopted fifteen principles to be met by any management plan:

- 1) *The character and natural beauty of the Island should be maintained;*
- 2) *All decisions should be based on science;*
- 3) *Populations of flora and fauna should be managed to maintain interdependencies and communities;*
- 4) *Biodiversity should be conserved and encouraged;*
- 5) *Rare and endangered species should be protected, and invasives attacked;*
- 6) *Native habitat for natural communities should be restored, protected, and improved;*
- 7) *Public enjoyment and use of the Island's natural resources should be supported;*
- 8) *Safe and enjoyable hunting and other wildlife-related activities should be provided and promoted;*
- 9) *Guidance should be provided for resolving human-wildlife conflicts;*
- 10) *Island residents and visitors should be educated about the value of all wildlife and habitat;*
- 11) *Partnerships to create and implement programs should be developed;*
- 12) *All activities should be performed in a professional manner;*
- 13) *Public opinion should be incorporated into the decision-making process;*
- 14) *Habitat and all wildlife should be preserved, used, and managed as a public trust; and*
- 15) *Social and economic factors should be taken into consideration.*

Any list of principles should be flexible, with methods prescribed by which its terms can be modified, rearranged, or removed, and new terms added. As suggested action steps are discussed and considered for implementation, new levels of understanding may arise which could affect the accepted principles. Then, too, conditions may change in a way that forces a reevaluation of principles.

Nature is a dynamic system. We are aware that any action taken related to our natural endowment may have unintended consequences. Methods of evaluating the results must be at the ready before any projects are undertaken, and we must be prepared to make the appropriate adjustments as our understanding grows.

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Section 2 Programs

When the NREC members first gathered, the challenge of restoring, improving, and sustaining the rich natural endowment was almost overwhelming. No one was sure how to start. Without a preliminary plan, the early dialogue consisted primarily of suggesting many action steps, little things (and some not so little) which could be done that would seem to be a positive step forward. Some gained immediate support, some met with reservations, and some were rejected.

As the “good ideas” accrued it was noticed that most of them gravitated toward five specific and somewhat independent categories. These categories were codified as five Programs to which all of the NREC's recommended actions could be assigned:

- a) defining the current state of and conservation challenges to Beaver Island's natural resources*
- b) focusing on immediate dangers by protecting the threatened rare and endangered species and identifying, monitoring, and inhibiting invasives*
- c) protecting, improving, and sustaining Beaver Island's ecosystems*
- d) promoting responsible and diverse recreation on Beaver Island, including hunting*
- e) seeking government and academic recognition and funding for the Plan*

Establishing these Programs enabled the NREC members to search for other possible action steps by asking, “What else should be done to make this particular Program more effective or complete?” Some possibilities arose which might not have come to light if the approach had remained one of enumerating independent ideas that sounded good.

The reasons for keeping the list of Principles flexible apply equally to the list of Programs. We can never be sure that a new organizing scheme or a new constellation of action steps will not arise, so we have to be aware that the list of Programs may change.

Each Program is intended to include several action steps (or projects).

The Programs are not meant to be successive. Projects within one program could be enacted simultaneously with projects within another program. At the same time, risks must be anticipated and analyzed. While the Programs are not meant to be successive, projects likely will be—both within a given Program and between Programs.

Projects can be organized within a Program. Programs can have a degree of independence; there are differences in the kind of manpower and funding their projects require. Yet there will be necessary prerequisites in which some projects cannot be completed or even initiated until other projects are undertaken—both within a given Program and over the gamut of Programs. A flow chart of all the interconnections would abound in arrows.

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Section 3

Methods of Evaluation

Since nature is so very delicate, anyone proposing to do anything to affect it should keep in mind the Hippocratic Oath, "Physician, first do no harm." Each proposed action must be accompanied with a means for evaluating the result—not just to measure the success of the action but to guard against unanticipated negative consequences.

There should also be a means for evaluating the effect of NREC as a whole; sometimes individual actions which are all positive in and of themselves can have a cumulative negative effect because of compatibility issues or the presence of extraneous forces. Periodic reviews are important.

An important method of evaluating action steps involves establishing Key Performance Indicators (KPIs) beforehand. Each KPI has two components, a "before" and an "after." To gauge the success or effect of an action step, the initial condition and the result have to be rigorously determined and compared. But the observed differences cannot always be attributed to a particular action step, because they are never taken in a vacuum; there are always multiple factors at play, not all of them obvious or easily discernable.

To judge whether the actions recommended by the NREC improve the Island's natural assets and economy, KPIs must be measured. Several have been suggested (pending expert critique and townships approval):

1. Number and dollar value of homes and properties sold per year
2. Number and dollar value of buildings constructed and renovated per year
3. Number of visitor days per year
4. Number of local families
5. Income per local family
6. Dollars of funding from academic and government sources
7. Number and degree of use of recreational environments/activities.
8. Level of quality and number of Beaver Island's "pristine" environmental areas
9. Percentage of the archipelago for which knowledge of natural habitat inventories has been gathered
10. Percentage of land being monitored for invasive species
11. Areas and acres of invasive species
12. Level of risk to habitat from invasive species
13. Level of pollution and species at risk
14. Percentage of the archipelago assessed for threats to biodiversity, habitat, and species, and mitigated

15. Level of connectivity and size of habitats to maintain biodiversity
16. Percentage of acreage of submerged vegetation for fish spawning documented
17. Percentage of wetlands and shoreline documented for pollution and species at risk, and mitigated
18. Buck to doe ratios
19. Estimated deer per square mile
20. Estimate of deer browse damage to habitat
21. Estimated numbers of game species
22. Number and types of bird habitats
23. Estimated number of coyotes and other predators
24. Areas and acres of endangered species
25. Level of risk to endangered species

Measuring these KPIs involves various degrees of difficulty. They also have varying degrees of importance. There is no precise formula for assigning a grade to any particular result. Chances are, if values are measured for all twenty-five at some point after an NREC activity has commenced, some will be up and some will be down. Some fluctuations might be natural. Learning how to judge when success is indicated will require experience, common sense, and an exchange of information with other communities.

Similarly to the list of Principles and the list of Programs, the list of KPIs must be flexible. Some may prove to be unnecessary, and others may be suggested which could be more germane. Also, measurability may change; some factors may become difficult or impossible to ascertain (such as those requiring academic involvement), and allowances and adjustments may be required.

Many of these twenty-five KPIs imply a shared philosophy of the nature of a desirable outcome for the community. They suggest it would be good for the sale of homes and land to rise and for the amount paid for each to also rise, that it would be good for building, visitors, residents, and local income to increase, that it would be good for funds to flow in, recreation to broaden and increase, and so on. This philosophy was derived from surveys taken around the turn of the previous century, and seems to most observers to still be valid a decade later. But it will not always be so; obviously the Island could have too many people, and homes could become too expensive. So while the KPIs are important evaluators, they must be periodically evaluated themselves.

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Section 4 Procedures

Establishing guidelines for its continuing operation (beyond those spelled out in the By-laws), particularly those which will guide its recommendation of particular action steps, is an important part of NREC's mission.

The NREC will create a list of prerequisites which will have to be determined before any action step (project) is suggested for implementation. They might include:

- detailed statement of purpose of the action;*
- supporting principle;*
- underlying program;*
- relationship to the NREC's mission – degree of compliance with the NREC's principles and the comprehensive Adaptive Management Plan;*
- risk evaluation;*
- degree of importance;*
- required pre- and post-requisites (what must come first; what can only come after);*
- possible conflicts (between a step and a stakeholder or other agency, or between two action steps);*
- proposed initiation date (a compromise between ideal and practical);*
- expected duration;*
- determinant of completion (how we can know when it's finished);*
- best enactor (the NREC itself, a member organization, or some other agency);*
- role of the NREC – initial, continuing, and post-completion;*
- likely cost;*
- method of funding – grants, donations, in-house, or other;*
- project KPIs and a determination of their "before" parts; and*
- methods for determining the "after" parts of its KPIs.*

The primary reason for insisting on such a thorough analysis of the situation being addressed by each potential action step before it is implemented is that nature is so precarious. History abounds with examples of well-intentioned meddling which produced disastrous consequences. It would be unforgivable to be added to that roll.

The compilation of this data and expectations will allow NREC to schedule various projects. Some combinations can be carried out simultaneously and others not. Many will depend on the favor of funders, enacting agencies, the accomplishment of prerequisites, and other factors.

It is not necessarily the NREC's job to assemble this information – although it cannot recommend a project for implementation until the data has been obtained. In many cases the NREC's job will be to gather the data, but in other cases it can act as a kind of clearing house for other parties which propose an action step *they* might like to undertake. In such a case the NREC can request that party to obtain this data before the process goes any farther.

Once this information has been gathered and considered for a particular project, and the means for enacting it are in hand, possible enactment could require additional steps:

approval by a majority of NREC members;
possible presentation to the public; and in all cases
approval by both townships.

If a project achieves these ratifications, it could be put into the overall schedule. The NREC may be the project manager, but chances are as time passes this duty will increasingly pass to other agencies and the NREC's role will shift to more oversight and tracking of the efforts of its member agencies, other partners, and independent parties. In that mode it will determine such things as:

scheduled date of initiation;
scheduled date of completion;
actual initiation;
actual completion;
unanticipated consequences;
retroactive analysis of degree of success and value – determination of "after" parts of KPIs; and
consideration of possible modifications to other projects, programs, principles, or the entire
Comprehensive Management Plan as a result of what is learned.

This is the path of responsible stewardship. It is labor intensive. Aspects of the work can be repetitive, frustrating, and thankless – but they are necessary.

On the other hand this is the kind of work being contemplated all across America as people notice the degree of accumulated depredation resulting from earlier unchecked activities. It has become an important field of study, and help is available from government and academic agencies, especially for those who demonstrate a willingness to rise up to the challenge.

Because of its concerned citizenry, as well as its unique and self-contained stature, Beaver Island's efforts may earn it attention and accolades, which may result in a net economic gain aside from that to be derived from the restoration, improvement, and maintenance of its natural endowment.

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Section 5.1

Action Steps: Program 1

Several actions steps are currently being investigated for possible recommendation. They fall under one of the five accepted Programs, each of which contains a constellation of interrelated projects.

The first Program involves **defining the current state of and conservation challenges to Beaver Island's natural resources**. It encompasses several general activities:

identify Beaver Island's natural resources – plants, animals, core wilderness areas, and geographic features, including game habitat, non-game habitat, and areas identified in the Beaver Island Recreation Plan

catalogue the origin, location, and current status of each item in each category; establish partnerships to help gather and update information and make it readily accessible assess threats to each of these resources, and develop measures to combat each threat

The projects within this program involve assembling and analyzing information about our natural endowment; before we can protect it, we have to know what it is. To do this, some specialized help will be required. All previous biological, botanical, and geological research should be assembled. Holes in the coverage of the entire gamut of the Island ecosystem should be noted and rectified. A complete data net is unrealizable, but is a valuable ideal.

Assembling data is a mammoth and never-ending job. Each set of data suggests more research that could be done to plumb deeper. The accumulation of information will grow and grow. Organizing it will become more and more difficult, and new organizational systems will be periodically implemented. The data base should be searchable.

Storing data presents problems of where and how. At the very least a website is required, with ongoing postings of data and commentary. This would provide access to anyone interested in the Beaver Island ecosystem. Experts will be required to interpret the gamut of data, but any observer might notice a curious situation or trend worthy of investigation. Shortcomings in data coverage might be observed, and this could help direct ongoing research.

Some of the currently available information is not in digital form, and paper storage and digitization must be addressed. Rules and procedures, and sources of funding, must be determined. Creating and funding a data manager position might be helpful or even necessary. Collecting all ecological data for an area of this size, in a single location, might be more feasible for Beaver Island than it is elsewhere because of its “closed system” nature. This could become a pioneering enterprise and serve as a model for other communities, providing secondary benefits.

These concerns lead to some specific initial action steps:

5.1a) *contact academic and governmental agencies that may have obtained ecological*

information about Beaver Island in the past, and find out how much there is, where it's located, and how difficult it would be to get copies

- 5.1b) develop a network of people who might be able to provide information about funding for the creation of an ecological data base
- 5.1c) form a data compiling committee to consider the requirements and challenges related to assembling this data; this committee could project costs, establish a procedure for applying for donations and grants to begin the collection of data, and determine the best procedure to follow when funding becomes available
- 5.1d) apply for funding to cover the costs of data collection
- 5.1e) begin collecting data; when funding arrives, create a website and determine how information should be organized and posted

As data is gathered, methods of review must be devised. There are several goals for the review of data: determining what kinds of data is being missed; suggesting how gathering methods might be improved; considering what modifications to existing principles, programs, and intended projects are indicated by the inflow of information; and recommending which projects would be most beneficial to undertake (perhaps new data should always be checked before any pre-determined project is instigated).

Just as the task of gathering data involves specific actions steps, so does the task of evaluating data:

- 5.1f) form a kind of publicity committee to make people (academics and Island visitors and residents) aware of the data-gathering project and the website
- 5.1g) determine how to get the gathered information reviewed and how to solicit comments and critiques about it and its implications, and begin doing so
- 5.1h) determine how to react to incoming comments and critiques and how they might modify planned action steps or lead to unplanned action steps

As data is assembled, other specific tasks could be undertaken, such as:

- 5.1i) study lists of general conservation challenges to see which might affect Beaver Island; evaluate the relative danger from these threats to establish priorities for remedy; rate the viability of possible remedies, considering such factors as cost and effort
- 5.1j) look for parallels between present Beaver Island and past situations elsewhere and extrapolate the present of these situations elsewhere to identify future threats to Beaver Island; look elsewhere for past instances of these threats to see what remedies have worked; list possible future Beaver Island remedies and the factors that would make them applicable and successful

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Section 5.2

Action Steps: Program 2

The second Program involves **focusing on immediate dangers by protecting the threatened rare and endangered species and identifying, monitoring, and inhibiting invasives**. It encompasses several action steps:

- 5.2a) *identify rare, unique, and endangered species and their specific threats, and develop a protection plan for each one*
- 5.2b) *educate Islanders and visitors to recognize and protect rare and threatened species; create a brochure depicting them and discussing methods of protection; release interesting articles about rare and threatened species to the media on a regular basis*
- 5.2c) *identify, monitor, and create rapid response options for eliminating invasive plants and animals, such as an invasive species SWAT team (including students, property owners, and experts); instigate a means for conducting a regular search for invasives; develop a network of informants to stay current on invasives and other threats cropping up in similar locations; consider ways to involve the public in the fight against invasives, such as by offering rewards or staging an annual scavenger hunt*
- 5.2d) *educate Islanders and visitors to recognize and properly remove invasive species; create a brochure discussing the dangers and remedies; release interesting articles about invasives to the media on a regular basis*
- 5.2e) *promote LEED certification for green construction; work with Charlevoix County Building Inspector to increase its implementation; publicize mortgage and tax benefits for green building; consider prizes for “greenest project” of the year*
- 5.2f) *educate Islanders in native plant landscaping, and promote the prevention of invasive plant use; investigate import embargos*

At the same time as the fight against invasives is taking place, a means should be developed for evaluating the degree of danger each new candidate presents—keeping in mind that not all invasives are necessarily harmful, and for some their positive aspects may outweigh their negatives.

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Section 5.3

Action Steps: Program 3

The third Program involves **protecting, improving, and sustaining Beaver Island's ecosystems**. An ecosystem contains "habitat" – the resources and conditions in an area necessary to occupancy, including survival and reproduction, by a given organism. Consideration of habitat as well as the organisms being supported provides a valuable perspective on ecosystem preservation.

Several geographic focal areas can be isolated:

5.3.1: *preserve and protect our inland lakes, streams, wetlands, and Lake Michigan shoreline*

5.3.2: *preserve and protect our dunes*

5.3.3: *manage our forests for wildlife, public enjoyment, and sustainability*

5.3.4: *take steps to insure preservation of non-game species and habitat*

Each focal area has its own set of action steps, which should be incorporated into the overall Plan. Committees might be formed to oversee projects within a given focal area.

5.3.1: *preserve and protect our inland lakes, streams, wetlands, and Lake Michigan shoreline*

5.3.1a): *locate, identify, and map our water resources*

5.3.1b): *consult experts to obtain information on potential threats; this should be done on a regular basis since threats change*

5.3.1c): *consult experts to determine possible remedies for each threat, and investigate their applicability to Beaver Island*

5.3.1d): *create a method for conducting regular field studies of our water resources to see if any of the potential threats, or any unanticipated threats, have materialized*

5.3.1e) *develop a process for responding to materialized threats through action steps*

5.3.2: *preserve and protect our dunes*

5.3.2a): *research dune threats to determine if they extend beyond ORV use and construction*

5.3.2b): *lobby to strengthen enforcement of rules governing ORV use relative to dunes*

5.3.2c): *create a brochure about proper ORV use explaining the consequences of dune degradation, and find a way to distribute it to ORV owners on or coming to Beaver Island*

5.3.2d): *investigate the feasibility of starting an "adopt a dune" program*

5.3.2e): *promote the acquisition of endangered buildable dune lots by conservation organizations*

5.3.3: *manage our forests for wildlife, public enjoyment, and sustainability*

5.3.3a): *develop guidelines for logging*

5.3.3b): *investigate establishing Core Wilderness Areas*

5.3.3c): *promote enjoyment and appreciation of our forests through an improved network of trails, camp sites, and signs*

5.3.4: *take steps to insure preservation of non-game species and habitat*

5.3.4a): *create a list of non-game species and threats to them and to their habitat*

5.3.4b): *investigate the interdependence and conflict between habitats of diverse non-game species*

5.3.4c): *guard against activities which produce habitat fragmentation*

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Section 5.4

Action Steps: Program 4

The fourth Program involves **promoting responsible and diverse recreation on Beaver Island, including hunting**. It encompasses several action steps:

- 5.4a): *create programs and promotions for hunting, fishing, wildlife viewing, hiking, biking, and simply enjoying nature*
- 5.4b): *support the Island's QDM deer management plan while ensuring that adequate monitoring be done to prevent habitat fragmentation*
- 5.4c): *identify potential kinds of and locations for recreation; search for additional appropriate types of recreation*
- 5.4d): *estimate costs and benefits of promoting new forms of recreation*
- 5.4e): *list methods of possible promotion; enact those promotions deemed unharmful and effective; and continuously evaluate the results of promotion and make appropriate adjustments*
- 5.4f): *balance habitat for game species and non-game species, including migratory songbirds;*
- 5.4g): *develop management guidelines for other game species, such as ruffed grouse, turkey, woodcock, hare, and beaver*
- 5.4h): *expand the Beaver Island Recreation Plan and protect the newly-included areas*

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Section 5.5

Action Steps: Program 5

The fifth Program involves **seeking government and academic recognition and funding**. It encompasses several action steps:

- 5.5a): *seek regulatory and academic recognition*
- 5.5b): *create effective partnerships in which our interests dovetail with those of academic, private, and governmental agencies*
- 5.5c): *publish articles about Beaver Island's natural resources and the ongoing efforts to restore, improve, and sustain them; seek other media outlets*
- 5.5d): *develop and submit proposals to solicit local, state, and federal funding*
- 5.5e):: *promote Beaver Island as a site for conferences and symposiums related to natural resource preservation and enhancement*

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Section 6

The Future of the NREC

It would be helpful to consider whether or not NREC might be dissolved some day, and, if not, what its future role might be. At its inception it experienced a surge of interest. Many of its members were the type to take a hands-on approach. Three projects were undertaken (creating a Trails brochure, creating a self-driving guide to the Island's features, and cleaning up part of the Garden Island garbage) by some of the volunteers.

In August of 2010 a criticism was leveled that the NREC wasn't necessary because CMU and the DNRE act as watchdogs of the Island's ecosystem, and are better equipped to recognize problems and suggest solutions. While it is true that both entities have been very helpful in the past, this is not their explicit mandate, and it might come to pass that a situation might arise which exceeds their purview or capability. It would be prudent to have a mechanism in place to handle it before it arises. So at the very least the NREC should continue to exist in order to deal with emergencies.

History shows that mankind supports itself by harvesting resources, and that the process for any valuable resource becomes rougher on the environment over time. Forests, game, and ground water have all been diminished by unregulated development. The more important the natural endowment of a community, the more important it is to have safeguards in place. So even if all of the NREC's action steps have been taken, it will be important for the NREC to continue to exist and embody methods for dealing with each new and unanticipated situation.

In addition, not all imposed remedies are self-sustaining, and their efficacy should be monitored on a regular basis. New KPIs might arise that require retesting, and measurements of previous KPIs also might need to be checked.

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Appendix 1 The NREC Members

The members appointed to the Natural Resources and Ecotourism Commission are:

Peaine Township shall name one member of the public to the Commission (**PAM GRASSMICK**).

St. James Township shall name one member of the public to the Commission (**DAN MARTEL**).

Additional members shall be appointed by the following organizations as their representative:

Central Michigan University (initially **JIM GILLINGHAM**, now **DAVE SCHUBERG**),

Beaver Island Wildlife Club (**JACQUE LAFRENIERE**),

Beaver Island Association (**JIM JONES**),

Peaine Township Trails Committee (**DOUG TILLY**),

Grand Traverse Band of Ottawa and Chippewa Indians (**DESMOND BERRY**),

Peaine Township Planning Commission (initially **KRIS LYLE**, now **DOUG TILLY**),

St. James Township Planning Commission (initially **JOHN FIEGEN**, now **JAYNE BAILEY**),

Michigan Department of Natural Resources (**BRYAN MASTENBROOK**),

Beaver Island Historical Society (**BILL CASHMAN**),

Little Traverse Conservancy (**TOM BAILEY**),

Little Traverse Bay Band of Odawa Indians (**BILL PARSONS**),

Beaver Island Chamber of Commerce,

Beaver Island Conservation Club.

ecotourist providers

ERIC MYERS

KEN BRULAND

MIKE WEEDE

CAROL BURTON

naturalist

SEAMUS NORGAARD