



Aquatic

Plant

Management

In Wisconsin



Aquatic Plant Management In Wisconsin



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Preface

Understanding the role of aquatic plants in your lake's ecology is a corner stone to developing a sound lake management plan. Aquatic plants are as central to our lakes and rivers as the trees are to the forest. Loss or major changes in the make up of aquatic plant communities can cause an unmendable tear in the fabric of a water body's aquatic ecology. This guide is designed to help you navigate through the world of aquatic plant management in Wisconsin.

About The Guide

In this guide you will find information that should assist you in developing your plan and managing the plants in your lake. We believe the more effort you put into the plan the better the pay back. This guide helps you sort out various levels of planning from the absolute minimum in an Aquatic Plant Management (APM) plan to elements not crucial to the plan but that may help you with future management decisions. Decision-making will be easier with the added information gathered through monitoring and analysis.

This guide will:

- Help you decide if you really need to “do something” about your aquatic plants.
- Help you understand when the state rules, permits and laws apply to you and your lake.
- Describe the permits required for aquatic plant management (APM) activities.
- Walk you through the permitting process.
- Guide you through a seven step planning process.
- Help you discover plant mapping methods.
- Describe strategies for controlling plants.
- Define some technical terms.
- Give you a directory of assistance and a list of places to find more information about aquatic plants and their management.

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CHAPTER I

Aquatic Plant Management (APM) in Wisconsin

Chapter I describes the reasons and philosophies behind Wisconsin's aquatic plant management policies. It will help you decide if you need to manage the plants in your lake and clarifies the laws and permits needed to do the work.

A Tapestry of Life

The home for most aquatic plants is the shallow water area in a lake called the littoral zone. Much of a lake ecosystem depends on what happens in that zone. When a part of it is removed, it is like removing a house in the neighborhood, the residents that once lived there can no longer return, and when enough homes are removed, and enough residents are lost, the interactions that make the neighborhood a viable community cease, and the community fails. A community of aquatic plants is part of what makes a healthy lake ecosystem.

Wisconsinites recognize that aquatic plants at the lake edge are a beautiful, protective and nourishing component of the lake ecosystem. Emergent, floating and submersed plants are the binding thread in a watery tapestry of life. Aquatic plants help with soil stabilization and create a thriving habitat for animals.

Emergent plants can help filter runoff from uplands to protect lake water quality. Their roots create complex networks that stabilize sediments at the water's edge where buffeting waves might otherwise erode the lakeshore. These plant beds are essential to the spawning success of many fish species, and provide cover and nesting for marshbirds, songbirds and waterfowl. Purple flowered pickerelweed, delicate white duck potato and sedges and grasses of all textures add beauty to the lake upland interface.

Floating-leaved plants provide shade and refuge for the near shore animal community, giving invertebrates and small fish a place to live. They also serve as hunting grounds for larger predators. Yellow and white pond lilies and red watershield create a stunning ring of color around many lakes.

Submersed aquatic plants perform countless functions in the shallow, near shore area called the littoral zone. These plants photosynthesize, creating life-giving oxygen for the animals that live in the littoral zone. Submersed plants absorb phosphorus and nitrogen over their leaf surface and through their roots, decreasing the nutrient availability to nuisance algae. Plant roots stabilize soils and reduce the turbidity caused when sediments are resuspended. Submersed plants are also a key component of the intricate logic of nature humans call the "food web."

There is great variety in form and texture among submersed plants. Some, like water celery or bur-reed, have smooth ribbon-like leaves. Other plants, such as bladderworts, water-milfoils, water marigold and coontail, have finely dissected leaves. The pondweeds range from fine-leafed to broad-leafed. Rosette-type plants, with short, stiff leaves, are

common in sandy and nutrient poor sites. Together, these plants create a diverse and beautiful underwater garden.

Underwater plants are a home, safe haven, nursery and bountiful buffet for the diverse parade of creatures that need the water for life, and that make living near the water enjoyable for us. From moose to minute invertebrates, animals eat the foliage and seeds, or graze the algae that coat the plants. Fish communities, from minnows to musky, live and feed in the shade and shelter of lake plants. They are linked to the otter and mink. Plants slow water movement and provide cover for eggs and offspring. They are meshed with the dragonflies and water beetles that are bound to frogs and turtles that are vital to herons and loons.

THE ROLE OF AQUATIC PLANTS

- Ninety percent of a lake ecosystem depends on what happens in the littoral zone.
- Aquatic plants create a thriving habitat for animals.
- Aquatic plants filter runoff from uplands to protect lake water quality.
- Plant roots create networks that stabilize sediments at the water's edge where buffeting waves might otherwise erode the lakeshore.
- Plants are essential to the spawning success of many fish species.
- Plants provide shade and refuge for near shore animals.
- Plants photosynthesize, creating life-giving oxygen for the animals that live in the littoral zone.
- Submersed plants absorb phosphorus and nitrogen over their leaf surface and through their roots.
- Plant use nutrients, making them less available for nuisance algae.
- Native aquatic plants can limit aquatic invasive plant growth.
- Plants fruits and tubers provide food for mammals, waterfowl, insects and fish.

Wisconsin's Philosophy

The waters of Wisconsin belong to all of us. Their management becomes a balancing act between the rights and demands of the public and those who own property on the water's edge. This legal tradition called the Public Trust Doctrine dates back hundreds of years in North America and thousands of years in Europe. Its basic philosophy with respect to the ownership of waters was adopted by the American colonies. The US Supreme Court has found that the people of each state hold the right to all their navigable waters for their common use, such as fishing, hunting, boating and the enjoyment of natural scenic beauty.

In deciding to manage aquatic plants, keep in mind this great trust and tradition...our actions affect all people who use the waters.

In addition to the public trust doctrine, two forces have converged that reflect our changing attitudes toward aquatic plants in Wisconsin. One is a growing realization of the importance of a strong, diverse community of aquatic plants in a healthy lake ecosystem. The other is a growing concern with the spread of Aquatic Invasive Species (AIS), such as Eurasian water milfoil. These two forces have been behind changes in our aquatic plant management laws and the evolution of stronger support for the control of invasive plants.

To some, these two issues may seem in opposition, but on closer examination they actually strengthen the case for developing an APM plan as part of your total lake management picture. Planning sounds like a lot of work, but a sound plan can have long-term benefits for your lake and your community.

The impacts of humans on our State's waters over the past five decades have caused Wisconsin to evolve a certain philosophy toward aquatic plant management. This philosophy stems from the recognition that aquatic plants have value in the ecosystem, as well as from the awareness that, sometimes, excessive growth of aquatic plants can lessen our recreational opportunities and our aesthetic enjoyment of lakes. In balancing these, sometimes competing objectives, the Public Trust Doctrine requires that the State be responsible for the management of fish and wildlife resources and their sustainable use to benefit all Wisconsin citizens. Aquatic plants are also recognized as a natural resource to protect, manage, and use wisely. To assure we do not harm the lake ecology, it is important that plant management is undertaken as part of a long range and holistic plan.

To promote the long-term sustainability of our lakes, the State of Wisconsin endorses the development of APM Plans and supports that work through various grant programs. In many cases, the State requires the development of long-term, integrated aquatic plant management strategies to identify important plant communities and manage nuisance aquatic plants in lakes, ponds or rivers. See *Chapters II and III* for more details.

There are many techniques for the management of aquatic plants in Wisconsin. Often management may mean protecting native plants by selectively hand pulling. Sometimes more intensive management may be needed such as using harvesting equipment, herbicides or biological control agents. These methods require permits and extensive planning.

While limited management on individual properties is generally permitted, it is widely accepted that a lake will be much better off if plants are considered on a whole lake scale. This is routinely accomplished by lake organizations or units of government charged with the stewardship of individual lakes.

How Much Is Too Much...Is it Necessary to Manage the Plants?

There are two important questions to ask when planning aquatic plant management:

- 1) Do we really have nuisance levels of aquatic plants?
- 2) If we decide we do have a nuisance level, can we do anything to change the situation?

An important first step in the APM process is making sure there really is an issue with aquatic plants. Go through the following checklist. If you find you need more information, contact your DNR APM Coordinator (<http://dnr.wi.gov/water/wm/dsfm/shore/county.htm>).

<i>YES</i>	<i>NO</i>	<i>ASK YOURSELVES</i>
<input type="checkbox"/>	<input type="checkbox"/>	Do all user groups (anglers, bird watchers, water-skiers, etc) agree there are too many plants?
<input type="checkbox"/>	<input type="checkbox"/>	Are the plants limiting people's ability to use the lake for boating, fishing, swimming, etc?
<input type="checkbox"/>	<input type="checkbox"/>	Has this plant growth been increasing each year?
<input type="checkbox"/>	<input type="checkbox"/>	Is this plant growth a weather related anomaly?
<input type="checkbox"/>	<input type="checkbox"/>	Are the plants all of one species?
<input type="checkbox"/>	<input type="checkbox"/>	Have we found a new colony of aquatic invasive plants?
<input type="checkbox"/>	<input type="checkbox"/>	Are the plants changing the water's ecosystem in a negative way?

**DO WE REALLY HAVE
A NUISANCE LEVEL
OF PLANTS?**

If you and other lake users answered yes to many or all of these questions, you may consider taking action. Even if you have answered yes to many of these questions, there may not be much you can do, depending on the situation.

<i>YES</i>	<i>NO</i>	<i>ASK YOURSELVES</i>	CAN WE CHANGE THE CONDITIONS?
<input type="checkbox"/>	<input type="checkbox"/>	Does the lake have a history of excessive plant growth?	
<input type="checkbox"/>	<input type="checkbox"/>	Is the lake shallow?	<i>Some lakes are prone to abundant plant growth. Shallow lakes, lakes with rivers running through them, lakes with dams, or lakes with large nutrient rich watersheds may have few viable remedies for abundant plant growth.</i>
<input type="checkbox"/>	<input type="checkbox"/>	Is there a dam on the lake? Is there a river running through the lake?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a large nutrient-rich watershed draining into our lake?	
<input type="checkbox"/>	<input type="checkbox"/>	Are the lakeshore neighbors willing to accept the work and financial costs necessary to manage the lake's aquatic plant community?	
<input type="checkbox"/>	<input type="checkbox"/>	Are we willing to accept the consequences of our actions, such as possibly encouraging more algal growth or an altered fishery with decreased plant growth?	
<hr/> <p>If you and other lake users answered yes to some or all of these questions, you may not be able to do much to curb plant growth. Some lakes are prone to abundant plant growth. Shallow lakes, lakes with rivers running through them, lakes with dams, or lakes with large nutrient rich watersheds may have few viable remedies for abundant plant growth.</p>			

Aquatic Plant Laws and Rules

Who Is Affected?

Anyone involved in aquatic plant management should be aware that a permit may be needed to remove, add or control aquatic plants. Groups that may get involved in aquatic plant management can include lake associations, lake districts, contractors offering herbicide or harvesting services, lake management consultants, persons planning plant restoration projects, those proposing water draw downs for plant control, or others managing, controlling or planting aquatic plants. In addition all persons using our state waters need to comply with the "Boat Launch Law" which deals with the transporting of aquatic plants on boat trailers and other equipment.

Laws

In recent years, Wisconsin passed laws that represent some of the most significant changes to Wisconsin aquatic plant management in decades. Section 23.24 (<http://www.legis.state.wi.us/statutes/Stat0023.pdf>) of the Wisconsin State Statutes, relating to aquatic plants, required the Department of Natural Resources (DNR) to establish a program to, “Protect and develop diverse and stable communities of aquatic plants, regulate how aquatic plants are managed and provide education and conduct research on invasive aquatic plants.”

In a related action, Section 30.715 of the Wisconsin State Statutes was amended to state that "No person may place or use a boat or boating equipment, or place a boat trailer in navigable water if the person has reason to believe that the boat, boat trailer or boating equipment has any aquatic plants attached." The so-called “Boat Launch Law,” Section 30.715 of the Wisconsin Statutes, makes it illegal to launch watercraft or associated equipment if there are aquatic plants or zebra mussels attached. This law includes penalties under Section 30.175, which will result in forfeiture of \$120 for a first offense. Penalties under Section 23.24 include forfeiture up to \$200 for first time violations, and \$700 - \$2000 or prison time for second violations. The courts also have the ability to order restoration under this law (<http://www.legis.state.wi.us/statutes/Stat0030.pdf>).

Permits and Regulations

There are two primary permit programs regulating how we manage aquatic plants in Wisconsin. One is the program that covers cutting and harvesting, under Administrative Code Chapter NR 109 (<http://www.legis.state.wi.us/rsb/code/nr/nr109.pdf>), titled "Aquatic Plants: Introduction, Manual Removal, and Mechanical Control Regulations." The other permit program covers chemical treatment under Administrative Code Chapter, NR 107 (<http://www.legis.state.wi.us/rsb/code/nr/nr107.pdf>), and is called "Aquatic Plant Management.”

The Administrative Code Chapters NR 107 and NR 109 establish the criteria for the permit program authorized by the law. Nearly all activities used to control or manage aquatic plants require a permit. There are two general exemptions from permit requirements. One is for individuals who use manual methods to remove vegetation from an area not wider than 30 feet (the manual removal zone). This zone extends directly out from a use area such as a dock or swim area (see figure below). Manual removal means plant removal accomplished by a person's own muscle power, which could include using a rake or hand cutting tool. Another exemption is allowed for manual removal of aquatic invasive species from the shoreline of a riparian owner when these plants are removed in a manner that does not damage or eliminate native species. No person may intentionally introduce these plants into the waters in the state of Wisconsin. In addition, anyone cutting or raking plants of any species must remove the plants from the lake and shoreline.

Nearly all activities used to control or manage aquatic plants require a permit.

Where wild rice may be present, advice on whether a permit is required should be obtained from your DNR APM Specialist.

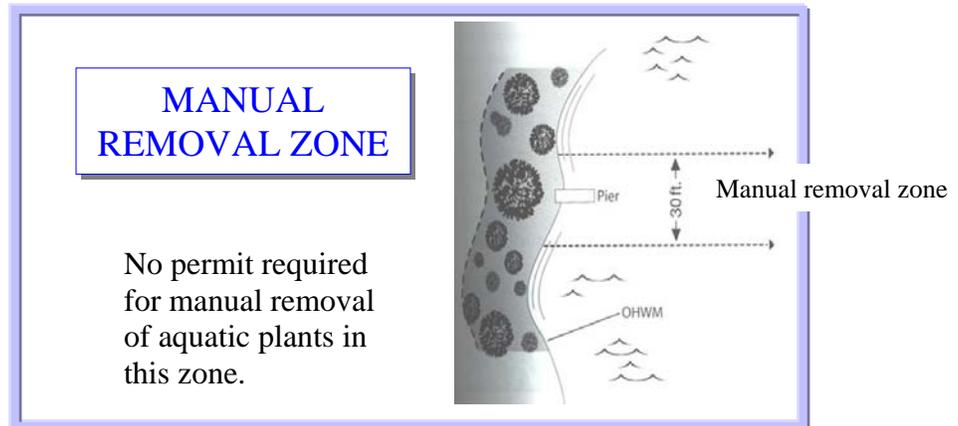


Figure 1

Chapter 109 also provides special protection for certain plants, including wild rice. Where wild rice may be present, advice on whether a permit is required should be obtained from your DNR APM Coordinator (<http://dnr.wi.gov/org/water/wm/dsfm/shore/county.htm>). This protection is particularly important under established treaty obligations designed to assure wild rice is managed for its cultural and ecological importance in northern Wisconsin.

Any manual removal outside the manual removal zone, mechanical removal and any use of chemical herbicides require a permit. The permit may specify the quantity of plants, species, locations, methods, times and disposal methods for managing aquatic plants in your lake. Permit fees will be established based on size of the proposed project. Fees will range from \$30 to \$300 for harvesting, and from \$20 to \$1,270 for chemical treatment. Other methods that require a permit include biological controls, draw down, bottom coverings, and various plant removal devices. One type is designed to attach to docks or be placed on the bottom and operate automatically. These devices are permitted under Chapter 30, but rarely approved.

The DNR may specify any of the following as conditions of a harvesting or chemical permit:

THINGS TO CONSIDER WHEN APPLYING FOR A PERMIT

- The quantity of plants that may be managed
- The method that may be used for management
- The species that may be managed
- The methods used for disposal of harvested aquatic plants
- The areas that will be managed
- The time that management will take place

Chemicals

The use of chemicals in the waters of Wisconsin always requires a permit from the DNR under NR 107.05. Whether a permit will be granted or not, hinges on many complex factors. Consider the following list if you are thinking about chemical use. Meeting these criteria does not mean you will receive a permit, but the following questions should be considered as part of any APM plan.

These are some of the criteria used by Wisconsin DNR to evaluate a chemical application permit NR 107.05*

**CAN WE USE
CHEMICALS?**

- The chemical is registered with the State of Wisconsin.
- There is a current department of aquatic chemical fact sheet.
- The chemical will provide nuisance relief, and not place unreasonable restrictions on existing water uses.
- The chemical will not cause a hazard to humans, animals or other non-target organisms.
- The chemical application is part of an APM plan.
- The chemical will not significantly injure fish, fish eggs, fish larvae, essential fish food organisms or wildlife, either directly or indirectly through habitat destruction.
- The chemical will not be applied in a location known to have endangered or threatened species.
- The chemical will not be applied in locations identified by the Department of Natural Resources (DNR) as sensitive areas*, unless the applicant can demonstrate to the satisfaction of the DNR that treatments can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.
- The chemical will not be used in waters beyond 150 feet from shore except where approval is given by the DNR to maintain navigation channels, piers or other facilities used by organizations or the public, including commercial facilities.

**(Sensitive areas are areas of aquatic vegetation identified by the DNR as offering critical or unique fish and wildlife habitat, including seasonal or life stage requirements, or offering water quality or erosion control benefits to the water body.)*

Remember: New applications will be reviewed with consideration given to the cumulative effect of applications already approved for the body of water.

**For complete details, link to the Wisconsin Administrative Code NR 107 (<http://www.legis.state.wi.us/rsb/code/nr/nr107.pdf>)

Harvesting

The use of mechanical harvesting in the waters of Wisconsin always requires a permit from the DNR under NR 109. Whether a permit will be granted or not, hinges on many factors. Consider the following list if you are thinking about harvesting as a tool to manage plants. Meeting these criteria does not mean you will receive a permit, but the following questions should be considered as part of any APM plan.

These are some of the criteria used by Wisconsin DNR to evaluate a harvesting permit under NR 109.05:**

**CAN WE
HARVEST?**

- Are the aquatic plants impairing water use activities?
- Will the harvesting remedy water use impairments?
- Will the harvesting cause a hazard to humans?
- Will the harvesting cause significant adverse impacts to threatened or endangered resources?
- The harvesting is part of an APM plan.
- The method you intend to use to report your activities
- Will the harvesting adversely affect water quality, aquatic habitat or the aquatic community, including the native aquatic plant community?
- Is the harvesting in locations identified by the DNR as sensitive areas*? (If so, the applicant must demonstrate to the satisfaction of the DNR that treatments can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.)
- Will the harvesting cause significant adverse long-term or permanent changes to a plant community or a high value species in a specific aquatic ecosystem?
- Will harvesting impact wild rice beds?

**Sensitive areas are areas of aquatic vegetation identified by the DNR as offering critical or unique fish and wildlife habitat, including seasonal or life stage requirements, or offering water quality or erosion control benefits to the water body.*

Remember: New applications will be reviewed with consideration given to the cumulative effect of management activities already approved for the body of water.

**For complete details, link to the Wisconsin Administrative Code NR 109 (<http://www.legis.state.wi.us/rsb/code/nr/nr109.pdf>)

Permits for mechanical harvesting and chemical treatments will be issued annually, unless an approved APM plan is in place for your lake. Multi-year permits for harvesting may be issued with an approved APM plan. The DNR will evaluate APM plans in terms of scientific base and feasibility. Reviewing the goals of your aquatic plant management plan will help prevent mistakes in managing lakes that may be costly, ineffective or possibly harmful to the lake ecosystem. With this review in mind it is up to the community to decide what methods are most practical and feasible.

Goals

Planning as Part of a Permit

Developing an APM plan is highly recommended, and may be required, as part of your application for a permit. An APM plan may be developed as a “stand alone” management plan or as part of a comprehensive lake management plan. It is always sound management to think of a lake as a whole when planning. Doing small pieces of plant management around the lake with no thought toward the cumulative impacts can lead to unforeseen consequences.

Objectives that may lead you to prepare an aquatic plant management plan can include:

- Protection—preventing the introduction of nuisance or invasive species into waters where these plants are not currently present;
- Maintenance—continuing the patterns of recreational use that have developed historically on and around a lake;
- Rehabilitation—controlling an imbalance in the aquatic plant community leading to the dominance of a few plant species, frequently associated with the introduction of invasive nonnative species.

Techniques

An aquatic plant management plan is desirable, and may be required when conducting aquatic plant management activities over larger areas of the lake or contemplating whole-lake treatments, especially if you are considering:

- Mechanical harvesting
- Application of chemical herbicides
- Aquatic plant introduction
- Water level manipulations
- Use of Biological controls such as Eurasian water-milfoil weevils.

NOTE: The use of grass carp or rusty crayfish as biological control agents in Wisconsin is strictly prohibited.

Wisconsin Stewardship and APM

You may be wondering why you should be required to get a permit and may be required to have a plan to remove aquatic plants from public waters. In deciding to manage aquatic plants that grow in our waters, keep in mind Wisconsin's great public trust and tradition. Our actions affect not only us, but also all people who use the waters.

Wisconsin has developed and adopted statutes regulating aquatic plant management in Wisconsin. The state has recognized that aquatic plants are an important resource, fundamental to the ecological health of our waterways. The state also recognizes the need to assist communities in managing aquatic plants, and has created grant programs to subsidize local costs.

Permit costs may seem high at the local level, but they are only a small portion of the total cost of aquatic plant management. The permit dollars assist in supporting Wisconsin's aquatic plant program and the specialists who work with communities to manage aquatic plants. Consider this, through permit fees, you're investing in your lake's future – like any investment, it requires initial finances to promote a good return. Your lake communities' support and investment of time, talents and dollars is fundamental to the work that will assure our public that fresh water lakes remain rich, diverse centers of aquatic life for generations to come.

Many lakes develop annual aquatic plant management budgets that range from thousands to tens of thousands of dollars to improve recreational conditions on lakes. With such a large investment, it makes sense to have a well thought out plan to assure the money is spent wisely, and the lake and its users benefit.

**The people of Wisconsin
thank you for your stewardship.**

CHAPTER II

Components of a Seven-Step Aquatic Plant Management Plan

Chapter II can be used to lay out your APM plan. It describes the concept of planning and goal setting in detail. Then it shows how to bring together information and techniques into a plan of action. More detail on each component of an APM plan can be found in Chapter III.

Aquatic plant management plans are working documents. They are used on lakes of all types and sizes; from 80-acre lakes with simple, short plans to protect wild rice beds; to lakes that are thousands of acres, having complex plans, full-time staff, specialized equipment, and big budgets.

Why Should We Have an Aquatic Plant Management Plan?

Aquatic plant communities, like the range of human activities, can vary greatly from one waterbody to the next. An Aquatic Plant Management (APM) plan will generally consist of describing the given lake, presenting the APM circumstances for that lake, and proposing a direction. An agreed upon APM plan is an action step that can help ensure that your time at the lake is satisfying and enjoyable. The amount of effort that you will need in developing your plan will be determined by the size of the group that needs to be engaged in the process, the size of the lake and its environmental sensitivity, and the number of issues that need to be addressed.

A sound plan can benefit your lake community and the lake in many ways. Consider these **5 Cs** of planning...increasing **communication**, building **consensus**, being **cost** effective with your project, getting a good **contractor**, and making sure you **comply** with state and federal laws. Whether or not a particular lake has a current aquatic plant issue, formulating an APM plan is a desirable and advantageous project. An aquatic plant management plan can present a coordinated strategy to prevent the introduction of invasive aquatic plants as well as manage the existing community of aquatic plants.

Positive Planning

Sitting down and planning together with the people that use the water can make life on the lake better for everyone. Like most other things in life, APM plans can be simple, complex, or somewhere in between. The approaches, techniques and participants can be as varied as the ways we use the water. We may not be able to agree that all the solutions we come up with are perfect, but we can agree that a healthy lake ecosystem, good fishing, enjoyable boating and a diverse native aquatic plant community are most likely to occur if a solid plan is in place.

The Planning Approach

Planning allows communities to control their fate. Planning can correct past problems, protect and improve current conditions, and provide a guide to the future. It seeks to minimize conflict and undesirable conditions while helping communities attain things they value.

The real appeal of planning is in its rational and systematic approach to dealing with issues. By responsibly analyzing issues and encouraging comprehensive research of the facts, sound decisions can be made. Without a plan, decisions have no basis for consistency, resulting in ineffective management and the likelihood of disagreement in the community.

Fulfilling Statute and Permit Requirements

By statute, before a permit is issued or activity is authorized, an aquatic plant management plan may be required. A good plan will make getting a permit easier. With an approved plan, permits may be issued for multiple years, as it will be clear to both the regulating agency and to the lake organization what management actions are expected over the permit period.

The Seven Step Plan

So, what are the steps in creating an aquatic plant management (APM) plan? While the specifics and details vary, the process of planning (and a plan) includes the following general steps:

<ol style="list-style-type: none">1. Goal setting – Getting the effort organized, identifying problems to be addressed, and agreeing on the goals2. Inventory – Collecting baseline information to define the past and existing conditions3. Analysis – Synthesizing the information, quantifying and comparing the current conditions to desired conditions, researching opportunities and constraints, and setting directions to achieving the goals4. Alternatives – Listing all the possible management alternatives and evaluating their strengths, weaknesses and general feasibility5. Recommendations – Prioritizing and selecting preferred management options, setting objectives, drafting the plan6. Implementation – Formally adopting the plan, lining up funding, and scheduling activities for taking action to achieve the goals7. Monitor & Modify – Developing a mechanism for tracking activities and adjusting the plan as it evolves	<p style="text-align: center;">A SEVEN STEP PLAN</p> <p><i>While each step is necessary, the level of effort and detail for each step will vary depending upon the project's goals, size of the lake, and number of stakeholders.</i></p>
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While each step is necessary, the level of effort and detail for each step will vary depending upon the project's goals, size of the lake, and number of stakeholders. For many Wisconsin lakes, the process described in this part may be more involved than is generally needed. You should carefully assess your lake's needs and then consider the detail required for each step in the process. A rule of thumb may be that the larger the plan or planned nuisance control, the more comprehensive the plan will need to be. The guidance offered here is to help assure important considerations that apply to your lake are not overlooked.

Getting Organized

While most folks accept the idea of planning, it does not necessarily mean they will participate in, or accept the results of the plan. An expansive and open approach is most likely to help folks understand the planning process. A broad cross-section of people and interests should be involved in the planning process from beginning to end allowing all ideas and opinions to be voiced. Though this can be time consuming and arduous, the process allows differences and conflicts to be reconciled, resulting in a plan (and decision-making) that is more likely to be accepted by the community.

The start-up step of your planning effort is critical. This first step is called setting goals, but it is really several steps about getting organized. It is about organizing thoughts, issues and people, and laying out a process for addressing common concerns. Goals at this point should be general, keeping in mind that as the process unfolds they will become more specific and refined.

A Plan for Decision Making

The importance of preparing a pre-plan or “blueprint for planning” is often underestimated. It is essential that everyone understand why a plan is needed and the approach that will be followed to develop it. Good preparation will lead to a good plan. It begins with thinking hard about why a plan is needed, who needs to be involved, how ideas and information will be collected and communicated and the process for making decisions. A fairly detailed work plan, timeline and budget should be assembled. Assistance may be available from your county UW-Extension Educator or local government staff.

The Process

A key element is to think through the process of how information will be submitted and how decisions will be made. Aim for a factual basis for making your decisions. Schedule convenient times and locations for meetings, and prepare a calendar of what information will be discussed and what decisions will be made. Develop a timeline of milestones for each major step in the process to help keep the effort on track. If you represent a governmental body, such as a public inland lake protection and rehabilitation district (lake district), you need to post notice of meetings and conform to other aspects of the open meetings and open records laws of the state.

(http://www.doj.state.wi.us/dls/docs/op_rec.pdf)

Who Should be Involved?

Responsibility for lake management does not lie solely with any one group. This makes the initial organizational step critical. Successful management efforts may require cooperation among local government, lake organizations, state, and sometimes federal, agencies. Businesses, sportsmen and organized lake recreationists may also hold considerable sway over the management of some lakes. In planning your strategy, you will need to identify stakeholders and consider how they will participate. The types of issues you are concerned with will play a role in determining who is responsible for dealing with them and who needs to be “at the table”. In broadest terms these will be people who:

- Are concerned about the issue
- Have interests that are affected
- Have interests they believe will be affected
- Believe their power will be enhanced or diminished

The Planning Committee

The size of your lake will help determine how you go about forming an advisory planning committee which should contain a cross-section of your lake neighborhood with folks from all sides of the issue: property owners, passive and active lake users, businesses, clubs, agencies and local government. If your lake is large, or your issues complex, the committee may be broken into subcommittees assigned to specific tasks that relate to the overall scope of the project. The size of the group will often be in direct proportion to the size of the lake community. Participants should be interested in bringing the lake community together to solve common issues. Even if people decline the offer to play a role, you've made the effort to solicit their input, and let them know they are welcome to participate in a community effort to create an APM plan.

In deciding the committee make-up, be sure to think beyond residents and users of the lake and consider groups or people that can provide support in the areas of:

- Politics
- Finance
- Laws and Permits
- Education
- Science and Technology

The size of your lake will help determine how you go about forming an advisory planning committee.

The committee members have a two-way responsibility: to report to their constituent group, and to provide feedback to the committee. This should be made clear from the outset. The planning committee will provide input and recommendations to the elected officials, regulators, lake district or lake association boards which may have the final decision-making responsibilities.

In some cases, you may want to find someone familiar with the planning process that has facilitation skills to assist you in pulling together this group and running meetings. This person should be accepted by all stakeholders and perceived as a “neutral party.”

Regional planners, private consultants, county UW-Extension Educators, or your UW-Extension Basin Educator may be able to offer these talents. These folks can be a great help in laying out a path to follow through the planning process.

Working with Governments and Agencies

On some lakes government bodies and agencies may have an interest in your plan, and have their own priorities or mandates to deal with. Become aware of these roles and what regulations or ordinances may already be in place. Each organization will have a role. It may be a lead role, an advisory role or supportive role.

Setting the boundaries or jurisdiction of local and county level agencies on a map may be helpful in understanding which agency is responsible for specific aspects of your plan. This is most useful for large lakes that may span several jurisdictions. Maps and other graphical tools may help you visualize the extent and type of plant community and lake uses present, plus provide a pictorial representation of the major elements of your plan.

Reaching and Listening to People

One significant question that we need to ask is, “What are the best ways to find and reach the people that need to provide input?” The best ways are varied and depend on the number of people you need to reach, the complexity of the issue, size of lake and the assets available to your group. Typically, you will use a number of different approaches and techniques. Here are a few techniques for gathering public input:

<ul style="list-style-type: none">• Open public informational meetings• Workshops/focus groups• Nominal group processes• Scoping papers• Presentations to groups• Ad Hoc and advisory groups• Contacts with key persons• Web sites• U.S. mail• Questionnaires and surveys• News releases and mass media• Daily contacts	<p style="text-align: center;">GATHER PUBLIC INPUT</p> <p style="text-align: center;"><i>Contact your county UW-Extension Educator to learn more about these techniques.</i></p>
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To gather information on the perceptions of the local community and lake users, many pieces of data may be helpful. Begin by collecting any existing information from government agencies like Wisconsin Department of Natural Resources (DNR) or University of Wisconsin-Extension (UWEX), including both social data and physical information about the lake.

STEP 1

Setting Goals...Why are we doing this?

Developing a Goal Statement

Plans must be based on goals. A goal is a desired state of affairs that is sufficiently broad and diverse to ensure agreement, yet sufficiently focused to infer actions needed to achieve goals. While there should be little argument about a positive goal statement, there may be debate about which goals should be included and which take priority. Unintended negative consequences are usually the result of choosing a set of goals that is too narrow or placing too much priority on one or two goals at the exclusion of the others.

Goals need to be practical. Consider what can be reasonably expected from the particular lake in question. Some lakes are naturally better suited for some management techniques than others. For example, small or shallow lakes may need a different approach to plant management than big deep lakes. All lake plans should explicitly, and by consensus, state which goals are being addressed. APM goals can be broken down into goals for specific types of use or protection.

- Maintain the plant community like it is.
- Monitor for aquatic invasive plants.
- Educate and inform lake residents about APM planning activities.
- Protect aquatic plants in sensitive areas.
- Promote the protection and expansion of diverse native plants.
- Prevent the introduction of nuisance invasive plants.
- Reduce nuisance plant growth in high recreational use areas.

TYPICAL APM GOALS

The key to this effort is setting reasonable expectations. Develop a realistic goal statement that is appropriate for the lake. The planning process is part discovery. As the process proceeds, the specific goals or objectives of the project will tend to shift as more information comes to light. Therefore, it is important that the initial goal statements be fairly broad and inclusive.

A Plan of Work

Once goals have been agreed upon, the rest of the planning process will have direction. Developing a plan will probably incur expenses in direct proportion to the size and the population of your lake. Costs can vary but will normally include items such as mailings, research, surveys, room rental and advertising. You should develop a work plan for your effort that includes written descriptions of all necessary steps and tasks together with reasonable timelines and names of key individuals who are to carry out the work elements. A plan of work should be realistic and fit your needs and your budget.

Grants

Grants are available through the DNR to help lake organizations manage aquatic plants. NR 190 Lake Management Planning Grants can be used to develop APM plans. Small-scale grants may be useful in conducting the first phase of your aquatic plant management planning program, and large-scale grants of up to \$10,000 may be applicable if considerable data collection is needed. NR 191 Lake Protection and Classification Grants are available for up to \$200,000 and can be used to implement plans for improving lakes, restoring native plant communities and other work.

The NR 198 Aquatic Nuisance Species Control Grants can provide 50% cost-sharing for a variety of projects specific to the prevention and control of aquatic invasive species. The NR 7 Recreational Boating Facilities Program provides cost-sharing for the purchase of aquatic plant harvesting equipment and limited funding for the chemical control of Eurasian water milfoil. Work with your regional DNR lake coordinator or environmental grants specialist to select the best grant options based on your specific situation.

For more detail on these Natural Resources administrative rules, go to the Wisconsin Legislature: Infobases at <http://folio.legis.state.wi.us/> and click on *Administrative Code* then find the specific rules under the *Natural Resources* heading.

Communication and Education Strategy

Successfully implementing your lake APM plan is likely to mean that some people will change their perceptions of the lake and gain an understanding and appreciation for other needs and concerns. Essential to success is a broad public recognition of the issues behind the need for the plan. One element of planning is an ongoing education and communication effort to inform people about why the plan is needed, as well as what progress is being made along the way. After all the work is done, you will want to be able to demonstrate broad public support for the plan. Involvement of news media may be part of this strategy. Include in the plan a clear statement of what methods you will use to communicate with others.

STEP 2

Inventory...Gathering Information

At this point you should have a group of people committed to working on the plan, a general statement of the goals or issues to be addressed, a work plan, and an education and communication strategy. *Now it's time to roll up your sleeves and begin the "real" work.*

We can only look objectively at the situation when we have information in which everyone is confident. If little information is available regarding the lake and its aquatic plants, investment of time and resources for additional study may be required. Once again, the amount of effort will be in proportion to the size of the lake and the task.

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This step in the planning process is essentially an attempt to document or characterize the existing conditions of the lake. A description of the natural resources of the lake and its social surroundings including uses, issues and existing management policies and strategies are examples of the types of data you will need. In this "discovery" phase you will further identify and clarify issues and may unearth information that may redirect your efforts or modify your goals. This information will certainly determine the outcome of your plan.

Find Existing Information

The first place to start is to collect as much of the existing information as you can about the lake and the issues that you are facing. This will include:

- Existing plans and studies of the lake
- Aquatic plant, fish, wildlife and water quality data
- Citizen surveys
- Maps and historical documents about the lake and traditional uses
- Aerial photos
- State and local regulations and ordinances
- Technical information/research on topics of concern
- Examples of other lake APM plans

**FIND EXISTING
INFORMATION**

For existing information contact your area DNR Lakes Coordinator, DNR APM coordinator, DNR fish and wildlife specialists, county UW-Extension Educator, regional planning offices, town clerk, county zoning and land and water conservation offices. Ask these initial contacts for other names of individuals or organizations that might be of assistance.

Conduct public meetings to get a handle on how lake users see the aquatic plant community. Meetings can be an effective way to collect information quickly. Using a large map of the lake divided into sectors, citizens can tag plant related areas of concern. Use different colored stickers to denote specific uses or areas.

If some of the information you need is missing, you will need to develop ways to collect it. You may want to split your planning committee into teams to collect specific pieces of information. It is always helpful to keep a record on the particulars about the person that collected the information for future reference.

STEP 3

Analysis...Synthesis of the Information

The analysis phase is the key to the entire process. This phase is where we compare existing conditions to desired conditions. Sometimes groups feel that once they have completed the research or inventory step they are ready to proceed directly to decision making. While there is tendency to analyze while you collect the data, it's necessary to step back and thoroughly consider the information you have collected.

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Once all of the information on the waterbody is in hand, the steering committee should evaluate the data. Historical data and overlay maps, which can be produced via GIS methods, provide the basis for delineating aquatic plant communities. These communities are generally identified as areas of difference in the grouping or assemblage of specific aquatic plant species. An initial commitment to use digital mapping methods that convert data into GIS information will greatly assist in analysis and assure previous conditions can be readily compared to current conditions.

At this point, the committee will be able to assess whether the initial issues voiced match the facts.

- Note the proximity of aquatic plant concerns to desirable habitat areas and beds of native plants.
- Have invasive or rare species been identified that will alter the priorities for control or methods?
- Are control measures proposed in areas where no control is desired or warranted?
- Is it possible to restore the lake to an earlier condition?
- Should management efforts be aimed at managing lake plants in a different way?

To answer these and other aquatic plant management questions, it is necessary to consider the data and their implications in a systematic, objective way. Identifying specific criteria that relate to your management objectives can work well. These criteria should relate to goals from the first step and address the three main categories: resource protection, habitat maintenance, and recreational experience/human use of the lake. Some basic questions to be asked during this analysis phase include the following:

- What is the nature of people's concern?
- Where do conflicts occur?
- Has the problem changed over time?

What is the Nature of People's Concern?

Do people feel that the aquatic plants limit the use of the shore for swimming or mooring of boats? Do high levels of aquatic plants limit access to central parts of the lake? Are there concerns about aquatic plants interfering with human use or public safety? Are there habitat-related concerns that affect the fishery or aesthetics of the lake? Appropriate aquatic plant management measures should address these concerns to the extent possible, within the law and without causing "collateral damage" that will lead to other in-lake problems. In this regard, it is important that the community be aware that a certain level of aquatic plant growth in a lake has value in sustaining other human uses, such as wildlife viewing and water quality.

Where do Conflicts Occur?

Understanding the basis of people's concerns, in conjunction with the aquatic plant map, should help determine areas where disagreement in proposed uses may occur. A common area of disagreement may be in areas that anglers would like left alone or nesting areas that conservationists would like to protect, that coincide with places that water skiers want to use. It will be important to consider how a proposed aquatic plant management program will affect the desired lake uses. For example, will a harvesting program schedule overlap with heavy boating days? In each of these cases, recommended APM measures may need to be specifically tailored to the conditions on your lake.

Has the Problem Changed Over Time?

It is not unusual for aquatic plant communities to change as climatic and watershed conditions change, or with the implementation of APM measures.

Questions that should be asked include:

- Has the volume of aquatic plants increased over the years?
- Have complaints of too many plants increased over the years?
- Have the types of plants growing in the lake changed over time?

In assessing the responses to these and similar questions, you should consider the time period over which you have records. There are a number of statistical measures that can be used to determine changes in the aquatic plant community over time. The statistics outlined in *Appendix F* or the Floristic Quality Index in *Appendix D* can help compare plant data from two different surveys.

Inventory and Analysis Report

The result of these inventories should be a characterization of the lake's condition, its natural features, recreational uses, community values, problems and opportunities to resolve any concerns relating to conflicts between these attributes. Organize and list your conclusions and findings according to the need for management intervention.

<ul style="list-style-type: none">• No action• Selective management• Nuisance relief• No restrictions• Restoration	IDENTIFY POSSIBLE ACTIONS
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To aid in the interpretation and analysis, capture the information in tables and on base maps. If aquatic plant removal or control is an anticipated management action, this report will be essential in serving as a foundation for justifying the need for the work, or the adoption of appropriate regulations.

STEP 4

Alternatives...Providing Choices

Bringing It All Together

The degree of work here will depend on the complexity and size of your lake and intensity of aquatic plant management needed. At this point, the planning committee needs to convene and synthesize the information, compare the results of each analysis, generate alternatives, and consider their ramifications. The interpretation and integration of information from *Step 3* into a management action plan should be based on a range of possible actions. In many cases, there are various ways to achieve an objective. With respect to aquatic plant management, common choices include; doing nothing, harvesting, using an aquatic herbicide, using biological control agents or placing physical interventions. Consequently, this is the point where the influence of various stakeholder groups will tend to surface. Now is the time to go back to the public for their input on the alternative management scenarios.

The degree of work here will depend on the complexity and size of your lake and intensity of aquatic plant management needed.

For many lake communities in Wisconsin, agreement may be reached that the current aquatic plant populations are at tolerable levels. In this case, the overall goal of the plan becomes one of “holding the line” to prevent a transition to intolerable levels. In other words, the community may wish to implement actions that will limit future increase in plant numbers. Shoreland and littoral zone management can be a key tool in aquatic plant management. This is especially true on smaller and mid-sized lakes, in more urban areas, and at tourist and resort locations. Over-development or inappropriate shoreland development can impact plant growth, degrade habitat, and increase demands for more plant removal. Replacement of native vegetation with lawns, or complete removal of

aquatic vegetation in the lake, can lead to repercussions that include shoreland loss, near shore algal blooms, or loss of aesthetic appeal as shoreland wildlife are driven away by lack of habitat.

Depending on the size and complexity of the task at hand, it may be appropriate to break your committee into subgroups to look at specific elements or areas of concern. Additional stakeholders and interested citizens can be invited to participate in the subgroups and their meetings, to broaden input, and to help build consensus. Each subgroup can focus on a specific issue, debate an alternative or set of alternatives, and propose a course of action. It is important that these subgroups be clearly informed that their advice will be consolidated with that of other subgroups prior to the formulation of the management plan. This will help limit misunderstandings later in the process, especially if the consensus is that an alternative other than that investigated by a particular subgroup is selected for implementation.

The final plan should be as complete and detailed as possible. At this point, you will want to include enough detail on the various alternatives to allow fair comparison and informed decision-making. Your goal statements and findings from the analyses that document or justify the need for action should accompany presentations. Discussions on the various management alternatives should occur as they are transformed into management recommendations.

The planning committee should have the task of listing and evaluating all the management recommendations, based on the inputs from the subgroups. As a reminder, a list of the original goals should be placed conspicuously so the committee can compare them to the recommendations of each subgroup as they start to list conclusions and reactions. Facilitation tools like opportunities and constraint analysis or SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) can help bring ideas and strategies to light.

As you generate alternative actions consider:

**COMMITTEE
RECOMMENDATIONS**

Effectiveness

- Will it protect the resource?
- Will it promote the stability of the ecosystem?
- Will it improve the recreational experience?

Cost

- Does it stay within your budget?

Legality

- Does it have regulatory approval? Are permits needed?
- Have the proper permits been obtained?

Community Acceptance

- Will it satisfy the concerns of the majority of lake users?
- Do the lake users feel “ownership” of the process?

Institutional Capacity

- Are enough human resources available to make it happen?

Some of this activity should be conducted in a public setting and have extensive public involvement. At some point, the committee will have to decide it has enough input to develop its final recommendations and preferred management plan based upon the alternatives considered. It is important that this process be conducted openly and honestly to avoid hurt feelings or perceptions that the committee has simply endorsed a preferred alternative regardless of the facts!

Determining Appropriate Levels of Management

The level of sophistication and detail in the plan will generally increase with the level of usage, number of conflicts and lake sensitivity. Typically there is a progression of alternatives available to Wisconsin lake managers that range from *simple strategies* (basic provisions that all lakes should consider) to *more complex strategies* (dependent upon greater investments and commitments of resources). These strategies should build upon one another, and be appropriately scaled to the lake and its conditions. In other words, *Level 3* activities should not be contemplated unless *Level 1* activities are in place. See *Chapter III* for more details.

<p>Level 1</p> <ul style="list-style-type: none">• Periodic monitoring of the plant community• Enforce existing AIS laws• Develop educational and informational programs• Implement watercraft boat launch inspection programs• Encourage lake residents to create natural shorelines• Encourage removal of nuisance plants near private docks with hand or manual methods <p>Level 2</p> <ul style="list-style-type: none">• Manage specific, “localized” problems areas• Place waterway markers in sensitive areas <p>Level 3</p> <ul style="list-style-type: none">• Purchase a plant harvester or contract for aquatic herbicide application• Institute a lake-wide integrated plant removal or control program• Institute biological controls of purple loosestrife at boat launches	<p>LEVELS OF MANAGEMENT</p>
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STEP 5

Recommendations...Completing the Plan for a Formal Decision

Once public input has been gathered on the various management options, it is time to select the preferred alternatives and draft a detailed plan for eventual adoption.

Review the plan

1. Goals and objectives...purpose and justification
2. Existing conditions (inventory)
 - a. Natural resources
 - b. Aquatic plants
 - c. Description of problems
3. Analysis...setting direction to reach goals
4. Management alternatives
5. Recommended or preferred alternatives - list policies and strategies in priority order and include at least one measurable performance objective for each recommendation
6. Implementation
 - a. Action elements
 - b. Who does what, when
7. Monitoring and adjusting the plan

**REVIEW THE
PLAN**

The inventory data, maps, results of analysis, and alternative scenarios should all be referenced and either included in the plan or placed in appendices. The main body of the document should summarize and incorporate the main findings within the recommended APM plan.

Action Plan

Once the main management recommendations are developed, consider how they will be implemented. Your management actions need to be translated into work items. The action plan describes “who will do what, by when.” It identifies and sets priorities within a range of actions to be taken. Actions provide both the guideposts for implementation and a barometer of success. An action should state a quantity and a timeline. For example, “launch an educational program on the benefits of native aquatic plants on cable TV and newspapers by May 1st.” This section may be part of the plan or developed after adoption of the management recommendations.

Actions provide both the guideposts for implementation and a barometer of success.

Administration

Consider what to do if the recommendations require staff, equipment or enforcement. Most small lake organizations will have to depend on local government (town/city/village) assistance with aquatic plant management tasks or enforcement issues. Conversely, community members and students from area schools may be available to serve as volunteers in boat launch monitoring for invasive plants. Programs such as Adopt-A-Lake and Clean Boats Clean Waters may provide guidance in integrating public initiatives across generations. Volunteer programs still require scheduling and administrative actions that should be identified and addressed in the action plan.

Legal

Do we have regulatory approval for our plan? Do we need and have the proper permits? Changes may be needed to carry out the recommended management techniques within the regulatory framework applicable in your community. For example, formation of a public inland lake protection and rehabilitation district or incorporating a lake association may be a desirable step in creating a legal body responsible for implementing the APM plan. Liability and liability insurance should be carefully considered.

Financial

Consider your costs and how they will be met. Prepare a budget that addresses the costs of implementation. Revenue sources should also be identified. The availability of funding may limit the timing and number of recommendations that can be implemented. For example, if your community wishes to access state cost-share funding through grants, grant application dates may limit the ability of a project to be conducted at a specific time. High priority actions may be those that are least expensive. These actions, which frequently include sharing information to empower individual landowners, should be scheduled first. For more information on grants, go to <http://www.uwsp.edu/cnr/uwexplakes/law/>.

Information and Education

A good information and education plan should be in place from the beginning of the process. It should deliver detailed information to those that need it, and it should have an awareness-building (public relations) component. The information and education plan will describe a process that gives the major details of the APM plan to the public and lake users. It will also be a quick reference to those responsible for implementing the APM plan.

Your information and education plan may use the World Wide Web, local media, agency speakers, workshops and direct mailings. Diverse public relations and training techniques should be considered. Various user groups, such as personal watercraft and water-skiing or fishing clubs, may team up to deliver an educational message. Partnering with existing awareness initiatives may provide an avenue for disseminating your message. The scope of your campaign depends on the size of your lake and the scope of your project. Youth education programs may add a youth educational element to the plan.

Lake residents and users can “turn over” rapidly. Every year there may be people “new” to the lake that will be unaware of the work you have done. An effective information and education plan will help orient these new users to the APM plan. However, bear in mind that your plans will also need to be periodically updated as your community changes.

STEP 6

Implementation...Taking Action

Who Adopts the Plan?

A plan can be adopted as a guide by a local lake association or lake district. Plans adopted by lake associations can serve as guidance and informational vehicles targeted to your specific community. Local governments (towns/villages/cities) also can develop both informational programming and enforceable ordinances governing aquatic plant management in communities under their jurisdiction. They may strengthen the enforcement of plant removal at landings or set aside sensitive areas on the lake. Work with legal professionals versed in municipal or governmental law if you determine that developing new ordinances or amending existing laws is necessary to implement your plan.

The plan, or parts of it, can be incorporated into the permits issued for conducting the plant management on your lake. A plan that meets the regulatory requirements for necessary permits can serve as the basis for receiving a multiple year permit that authorizes the actions recommended in the plan. Consistency and direction of a plan will help reduce annual permitting requirements and reduce the cost of permit fees. In effect, your plan will be adopted as part of the permits required by the state statutes.

Prioritizing and Scheduling Actions

An action plan may cover a short time span of two to five years. In contrast, a comprehensive lake management plan may include components that will be ten or twenty years away from implementation. Aquatic plant management plans, because they deal with the constantly changing conditions of the lake, should be updated more frequently than comprehensive lake management plans, and it is recommended that they be reviewed and updated on a three-year to five-year schedule.

An action plan may cover a short time span of two to five years.

Actions could be categorized as immediate, short-range, medium-range or longer range. Actions should also include periodic or annual review of the plan and a continuous or ongoing monitoring effort. Prioritization of efforts will help you to allocate resources appropriately and in a timely fashion, and provide direction to assist your community in spending resources wisely. An information and education campaign to advise riparian owners of the benefits of aquatic plants may be implemented immediately, using materials available from the DNR and UW-Extension. Permits for more intensive APM actions and grant applications can be prepared simultaneously. Many grant programs, which could be used for aquatic plant management, have annual submission dates that may result in the funds being awarded in a second or third year of your APM timeline. (<http://www.uwsp.edu/cnr/uwexlakes/law/>)

Roles and Responsibilities

The precise roles and responsibilities of the various agencies and organizations need to be specified to ensure follow through. These responsibilities need to be formally recognized by the organizations and individuals that are to carry them out. This can be accomplished through the formal adoption of the plan by the organization, or by a resolution acknowledging their role.

Once the plan has been formally adopted, and an action plan developed, it will be useful to produce a succinct summary of the most relevant information and make it readily available to residents, interests groups, civic clubs, elected officials, resource management professionals, and the media. It may be necessary to showcase the plan and its implementation annually or on a scheduled basis in order to maintain community interest in the plan and awareness of the proposed actions.

STEP 7

Monitor and Modify...So How are We Doing?

An APM plan is not static. It should grow and change with the times.

An APM plan is not static. It should grow and change with the times. To allow this, the plan should be continuously monitored and reevaluated. What you examine depends on the plan's objectives and milestones. Periodically repeating the surveys and field observations used in the inventory and analysis steps, and establishing and tracking specific management records, can be useful to provide the information needed for effective monitoring. This information will provide a way to measure progress in resolving differing viewpoints on aquatic plant-related issues, or in protecting environmentally sensitive areas of a lake. It will also allow "mid course" corrections, should the actions be ineffective in addressing a specific situation.

The monitoring program will provide information for making on-going decisions concerning changes in plant communities. Monitoring can identify changes in conditions that require adjustments of techniques or call for a whole new approach if the techniques are not working. It can also help detect problems at the earliest stage possible and allow appropriate interventions.

A monitoring program is designed to evaluate the plan under real-life conditions. The data you gather for monitoring will be based on the data you gathered for your plan. Having clear performance objectives for each management action, as described in *Step 5*, will guide effective monitoring.

Your periodic monitoring report can answer these specific questions:

- Was the educational program launched?
- How well were our plant ID workshops received?
- Was the program operational by May 1st?
- What were the reactions to the program by lake users?

**EXAMPLE
QUESTIONS**

Measuring Achievement

Achievement should focus on performance and not necessarily on the level of effort. It's not how much money was spent, or how much time was put into an action, it is what was accomplished. Therefore, monitoring and evaluation should rely on measurable things. Did invasive plants come back after their initial removal? Are the sensitive areas still in good shape?

Evaluation forms or surveys can be used when the objective is more subjective. Here is an example of a hierarchy of questions for objectives.

**ACHIEVEMENT OF
EDUCATIONAL
OBJECTIVES**

Energy Input	Did the instructor prepare for the workshop?
Event Occurrence	Was the workshop held?
Participation	How many people were involved?
Reaction participation	What were the post-event subjective feelings?
Learning	Was there a statistical difference between pre- and post-test knowledge?
Applications	Did participants use the knowledge offered?
Impact	As a result of using the knowledge provided, was an individual, business, family, or community changed?

In addition to evaluating specific objectives, review the entire plan and the whole set of objectives about every three to five years.

Do It Again

No plan is static. Conditions change. Scientific understandings change. Human values and attitudes change. Plans have to change - patiently and systematically. A plan needs to be flexible to changing conditions but not so vague that it simply becomes a record of change. The plan needs to be specific enough to influence change but not so rigid it will lose relevance. Remember APM plans should be updated about every three to five years.

Keeping it Fresh

Overtime, organizations may begin to lack cohesion and the ability to track and implement the plan. A conscious effort is needed to replenish the enthusiasm of its leadership. Lake management organizations should consciously and slowly turn over the organization to the next generation as the planning process is repeated. Planning for the long term stability of your organization - using programs for adult leadership, like the Lake Leaders Institute (<http://www.uwsp.edu/cnr/uwexplakes/lakeleaders/>) - can help instill good stewardship values and keep your organization “fresh” and effective.

CHAPTER III

Specific Elements of Your Aquatic Plant Management Plan

This chapter takes the basics of the planning process discussed in Chapter II and puts it to work. It is designed to help you match the actual techniques and level of detail with your particular situation. This guide will help assure that the plan you develop will meet your needs and gain the approval of the DNR. Be sure to contact a DNR lake coordinator or Aquatic Plant Management (APM) coordinator (from here on referred to as the DNR lake coordinator) to discuss your APM plan as it develops. Every lake is unique and will benefit from an aquatic plant management plan. After assessing your lake, you may find that there is no need for any manipulation, or you may find a moderate problem needing some treatment or a severe or wide spread problem, necessitating a significant manipulation. This guide provides the flexibility to create a plan appropriate to the level of aquatic plant management required for your lake.

GRANTS

Grants are available through the DNR to help lake organizations manage aquatic plants. NR 190 Lake Management Planning Grants can be used to develop APM plans. Small-scale grants may be useful in conducting the first phase of your aquatic plant management planning program, and large-scale grants of up to \$10,000 may be applicable if considerable data collection is needed. NR 191 Lake Protection and Classification Grants are available for up to \$200,000 and can be used to implement plans for improving lakes, restoring native plant communities and other work. The NR 198 Aquatic Invasive Species Control Grants can provide 75% cost-sharing for a variety of projects specific to the prevention and control of aquatic invasive species. The NR 7 Recreational Boating Facilities Program provides cost-sharing for the purchase of aquatic plant harvesting equipment and limited funding for the chemical control of Eurasian water milfoil. Work with your regional DNR lake coordinator or environmental grants specialist to select the best grant options based on your specific situation.

For more detail on these Natural Resources administrative rules, go to the Wisconsin Legislature: Infobases at <http://folio.legis.state.wi.us/> and click on *Administrative Code* then find the specific rules under the *Natural Resources* heading.

This chapter is divided into three parts: the first part includes information everyone must collect to complete an Aquatic Plant Management Plan for Department approval. The second part includes information needed if you plan to do any permit-requiring manipulation on your lake such as an herbicide treatment, harvesting or a drawdown. You will need to apply for a permit for these and other lake manipulations, but the goal is that your plan will include all the information needed for the permit. The third part includes information on what to do if you discover a pioneer population of an aquatic invasive plant (AIS or aquatic invasive species, though we are mainly concerned with plants in this document) in your lake. We want to have a seamless path between gathering lake information, creating recommendations for treatment and fulfilling the permit requirements.

It is critical that you maintain a close working partnership with the local DNR aquatic plant manager so that your analysis and recommendations for treatment will be acceptable to the DNR, who must approve the Aquatic Plant Management and any permit requests.

**MANAGEMENT
LEVELS**

No manipulation. A protection-oriented plant management plan where no significant plant concerns exist or no management is proposed.

Useful for a lake appraisal where the goal is to begin to understand the lake's plant ecology. A healthy aquatic plant community exists and invasive and non-native species generally are not present.

Small-scale manipulation. Primarily protection-oriented plans where slight to moderate plant concerns exist and some management is proposed. Proposed treatments involve less than 10 acres or less than 10% of the littoral area. Invasive species may be present.

Large-scale manipulation. Moderate to severe plant concerns exist. Extensive management is proposed (more than 10 acres or more than 10% of the littoral area) that may substantially impact or change the current state of the lake ecosystem. Established infestations of invasive species usually are present.

Whole-lake-scale manipulation. Large-scale manipulations involving ≥ 160 acres or $\geq 50\%$ of the lake littoral area)

Part 1. Creating Your Plan

Goals

- **A Goal Statement.** This is a general description of the plan's management goals (see *Chapter II*, page 17).

Example:

We hope to maintain a healthy plant community on Blue Lake by inventorying and monitoring the plant community and being aware of changes and being on guard for invasive species.

- Maintain the plant community like it is.
- Monitor for aquatic invasive plants.
- Educate and inform lake residents about APM planning activities.
- Protect aquatic plants in sensitive areas.
- Promote the protection and expansion of diverse native plants.
- Prevent the introduction of nuisance invasive plants.
- Reduce nuisance plant growth in high recreational use areas.

TYPICAL
APM GOALS

Inventory: Lake Information

All plans need to be based on a factual understanding of the lake ecosystem. The purpose is to characterize the historical and current conditions of the waterbody's aquatic ecosystem. Much of this information (raw data) can be presented in appendices. However, the plan should describe what data were collected and how, and include a narrative description of the planning process.

The DNR requires the grantee to turn in all data collected, including maps and shape files generated from the data, lists and other information.

Management History

- Describe the historical control actions taken or those currently being used to manage aquatic plants. Explain the results of those actions and why they are, or are not, still being used. In some cases it may be a statement that says nothing was ever done to manage plants.
- If records are available summarize them in an appendix or in the body of the management history section. These data can become useful for evaluation even if it happened decades ago.

- Describe different stakeholder viewpoints and potential conflicting philosophies over plant management.

Plant Community

An evaluation of the aquatic plant community is the foundation of the Aquatic Plant Management Plan. All plant surveys and sampling described below should be conducted between mid-June and the end of August except where noted (e.g. Secchi readings) or when early season growth species like curly-leaf pondweed is a primary concern. Contractors and organizations must consult with the DNR lake coordinator regarding survey techniques and what time of year the survey should be done.

All plant surveys and sampling should be conducted between mid-June and the end of August except when early season growth species like curly-leaf pondweed is a primary concern.

Details on the protocol for conducting plant surveys can be found in [Appendix B - Recommended Baseline Monitoring of Aquatic Plants in Wisconsin: Sampling Design, Field and Laboratory Procedures, Data Entry and Analysis, and Applications](#) (from here on *Appendix B*).

- Collect quantitative data on the lake’s aquatic plant community throughout the littoral zone using the protocol described above and the [Appendix C - Aquatic Plant Survey Data Workbook](#) (from here on *Appendix C*). This Excel workbook provides field data sheets, data entry sheets and automatically calculates summary statistics. This will create:
 - An aquatic plant species list, where each species is found in the lake and the abundance of each species found.
 - The relative frequency of each species
 - The depth at which each species is found.
 - Lake bottom sediment types.
 - A description of the near-shore vegetation observed during the Boat Survey as described in the plant survey protocol.
- Collect two samples of every species (also described in the sampling protocol). Press, dry and voucher each sample. The lake organization may keep one specimen, and the regional DNR office will send one on to the vouchering institution. DNR may require that these specimens be in hand before a permit for herbicide treatment is authorized. For a detailed description, please see [Appendix B](#) and, specifically, see sections:
 - *Collecting and Identifying Voucher Samples*
 - *Plant Identification and Troublesome Taxa* and
 - *Pressing Plants – Preparation of Voucher Specimens*
- Determine the lake’s Floristic Quality Index and Aquatic Macrophyte Community Index (see *Calculate FQI and AMCI Worksheet* in [Appendix C](#)).
- Certain weevils (aquatic insects) eat northern water-milfoil and will eat Eurasian water-milfoil if this species is present. If either of these water-milfoil species is found during the initial aquatic plant survey, you may want to look for and estimate

weevil damage (please see [Aquatic Invasive Species Monitoring: Water-milfoil Weevil](#)).

- A quantitative plant survey of the lake plant community should be performed at least every five years. Watch for changes in species diversity or changes in abundance of native species, and not just for the presence or absence of exotics. A decrease in diversity or an increase of one particular species may be an early-warning sign of changing water quality.

Lake Map

Most people comprehend faster when given information in a visual format. A map is a very quick and reliable way to assure that everyone knows the place you are talking about when you describe a certain point on your lake. A map will assist in locating plant communities, recreational and habitat use areas, and more.

- Obtain a map with an accurate scale (the US Geological Survey 1:24,000 scale topographic map series is widely available).
- Determine the location of the lake using the township, range and section designations.
- Tabulate the lake area, and maximum and mean depths.
- Find the Water Body Identification Code (WBIC) assigned by DNR.
- Obtain any available aerial photos, preferably those that are to scale (such as the US Department of Agriculture Natural Resources Conservation Service aerial orthophotographs).
- Using the aquatic plant community data, create maps of the lake vegetation. Include:
 - A map showing locations of the various plant communities of interest, including aquatic invasive species, if present, and corresponding densities (see [Appendix B](#)).
 - A map showing proposed treatment areas, if any are expected.
 - A map of areas containing threatened, endangered, and special concern species. Include any Critical Habitat Designations, if one was performed for that lake and if it described vegetative sensitive areas (see [DNR Surface Water Viewer](#)).
 - Maps created using GIS (such as ArcGIS) will be most useful, however all maps should be based on GPS coordinates. Please see [Appendix B](#) for instructions on generating ArcGIS maps from the data collected and organized in the Aquatic Plant Survey Data Workbook. (This map-generating section is still under development). For all plans, maps should include GPS coordinates as reference points
 - For plans expecting a large-scale manipulation of more than 10 acres or more than 10% of the littoral zone, maps created using GIS will allow for the most efficient permit planning, evaluation, tracking, and summary.
 - When a state grant is being used to fund an APM Plan, submittal of a copy of the GIS maps and shape files used to maps them will be required to satisfy completion of the grant.

Fisheries & Wildlife Habitat

All aquatic life is linked to the aquatic plant community, which supplies habitat and food. It is essential to identify and develop a portion of your plan to assure the protection and enhancement of fish and wildlife habitat, endangered resources, and other local natural resources of concern. Be sure to hold a discussion with the DNR fisheries biologist to identify any special issues early in your planning process.

Prepare a narrative characterization of the fish and wildlife community and their ecological relationship to the aquatic plant community from existing data.

- Append a Critical Habitat Designation (CHD) assessment, if one has been done for the lake at any of the following websites:
 - [For Critical Habitat Areas](#)
 - [For Areas of Special Natural Resources](#)
 - [For Outstanding and Exceptional Waters](#)
- If there is no CHD assessment, report conservancy areas recognized as having exceptionally good habitat for fish, waterfowl, and other wildlife on a map.
- Have a discussion with the DNR fisheries biologist about your plans.
- Please be aware that a permit for herbicide treatment in sensitive locations as identified by the DNR may (or may not) be denied.

Water Quality

There is a relationship between plants and water quality. Changes in the plant community can affect changes in water quality, while changes in water quality (such as nutrient enrichment) can affect the types and densities of aquatic plants. Your knowledge of water quality conditions must increase as the intensity of plant control measures increases. Water quality data should be included in a summarized fashion in an appendix or in the body of the water quality section. Some data can be collected and evaluated with volunteers. For other data you may wish to use a consultant. Reference any ongoing monitoring programs from the [Citizen Lake Monitoring Network](#).

- Obtain one year of current water quality data consisting of a minimum of 4 to 5 Secchi disk transparency readings (about every 2 weeks) from June 1 through August 31.
- Prepare a summary of any historical water quality data.
- Prepare a brief analysis of how plants and water quality may be affecting each other.
- **If you plan any lake manipulation** the DNR lake coordinator may ask you to provide more detailed water quality data.
 - In order to collect water quality data, you may want to become a Citizen Lake Monitor and follow the sampling protocol for volunteers doing chemistry monitoring: again contact the [Citizen Lake Monitoring Network](#).
 - Collect surface samples to measure total phosphorus concentrations in early spring, and chlorophyll *a* and phosphorus concentrations in mid-summer.

- Measure water temperature and dissolved oxygen concentrations during summer at the deepest part of the lake at 1-3 meter or 5-10 foot intervals to determine whether the lake stratifies. This information can be helpful in determining some control strategies and in explaining some observed phenomena (e.g., late summer fish kills). The level of dissolved oxygen may provide information on the possibility of internal nutrient loading, which may fuel late season algal blooms.
- If you are considering plant harvesting, take a turbidity sample in an area that might be harvested.

Water Use

Understanding the patterns of recreational use on the water will help determine where and how plants need to be managed. Label the lake map and provide a description of key areas on the lake. Describe any surface use ordinances, use restrictions such as no-wake areas, park hours or motor use hours if applicable.

- Note the established or primary human use areas and use patterns in the lake and on shore (e.g., swimming beaches, boat launches, ski lanes, fishing grounds).
- Mark any areas of the lake where there is restricted use, for any reason.
- Identify the locations of any water intakes for public water supply or irrigation use.
- Identify areas where individual riparian plant concerns exist and where you think management may be proposed.
- **If you plan to do a large scale manipulation** (more than 10 acres or more than 10% of the littoral zone):
 - Assess lake users' perceptions and opinions on how plant conditions affect recreational use. Some possible approaches might include surveys, focus groups or other techniques. (See Chapter II.)
 - Identify riparian expectations and compare them to the physical conditions of the lake (For example, a shallow, nutrient rich lake is likely to have abundant native plants and manipulation is unlikely to change that situation. Is there an interest to blend management to best coincide with natural conditions, or is there an expectation to reshape conditions into unnatural, high maintenance areas? This is where a group can better understand and form realistic goals.)

Watershed Description

A lake is a reflection of its watershed. The human activities in the watershed may be playing a role in the nutrient loading in the lakes and the nature of the aquatic plant community. (If there is a serious algae problem on the lake, watershed issues will be more important and a nutrient budget may be necessary, but this is beyond the purview of a simple aquatic plant management plan.)

Map the watershed boundaries showing the major inflows and outflows.

- Determine the watershed area.
- Quantify (i.e. find the percentage of each category) the forested, wetland, agricultural, residential, commercial/industrial and other land use areas within the watershed. This will help to identify potential problem areas and source areas

associated with point and nonpoint source pollution. These data will provide baseline information on watershed land use.

Analysis and Alternative Treatments

You have now gathered substantial information on the lake. You know the history of the lake, all about the plant community and are ready to tend your “garden”, vigilant for “weeds” and other danger signs of declining lake health. The purpose of this element of the plan is to demonstrate your understanding of the lake’s plant ecology and set management objectives. It will be the most individualized part of the plan and will be the most difficult to “cookbook.” This will be the part that the DNR lake coordinator will look at most closely when reviewing the finished plan. It should show how the need for any control action was determined. The analysis can begin by determining the impact of a “do nothing” scenario. Go back to your original goal statements and compare them to the findings of the inventory. Map and overlay the information collected in the inventory and interpret the results.

- Summarize your findings using data and maps generated from the inventory.
- Identify the management objectives needed to maintain the beneficial uses of the aquatic ecosystem and recreational needs.
- Keep your results and summary so that you may refer to it in the future. Submit all results (data survey and all electronically generated maps) electronically to the DNR. Contact the DNR lake coordinator to learn where the data should be sent.
- If you are considering a plant manipulation such as an herbicide treatment or a harvesting program, you must evaluate the pros and cons of this direction.
 - Hold a meeting to inform stakeholders of findings, discuss recommendations and implementation details.
 - Discuss why a manipulation is necessary. Sometimes no action is best, even if there is a small population of an invasive species.
 - If a manipulation is deemed necessary, consider several alternative management techniques. (see [Chapter IV](#)).
 - Do more than simply list treatments. Briefly summarize and assess each technique being considered, given your lake’s situation.
 - Discuss all options with interested lake users and appropriate agencies.
 - Remember that different techniques may be suitable in different parts of the lake.
 - For example, an herbicide treatment may be best in a bay heavily infested with EWM but a lightly infested walleye spawning area might be best handled by hand removal by SCUBA divers.
 - Discuss the potential adverse impacts that each technique (or the project as a whole) may have on non-targeted species, drinking water or other beneficial water body uses. Plans should include measures to protect the valuable elements of the aquatic plant community and plants that enhance habitat for fish and aquatic life.

- Identify the specific areas proposed for manipulation on a map (using GPS coordinates) and the kind of manipulation.
- Please see more in *Part 2: Implementing and Evaluating Your Plan* of this chapter.

Recommendations

This may be the part you have been waiting for, a chance to give your suggestions for plant management. This section considers the results from the **Analysis and Alternative Treatments** and other portions of the plan leading to the preferred management strategies for the lake. Now, write up your recommendations to ensure your lake stays healthy, including:

- Your analysis from the previous section.
- Ideas from your stakeholders. Hold a meeting to inform stakeholders of findings, discuss recommendations and implementation details.
- Aquatic Plant Issues
 - If you do find an exotic species, please see Part 3 of this chapter, *Contingency Plans for Newly-found Populations of an Aquatic Invasive Species*.
 - Evaluate the diversity, abundance and distribution of native species. Holding on to native plant species is the key to keeping the lake healthy. You may want to consider special care for parts of your lake where plants are either abundant or scarce.
 - In general, a quantitative evaluation (survey) of the lake plant community should be performed at least every five years (see Plant Community above).
 - Watch for changes in species diversity or changes in abundance of native species, and not just for the presence or absence of exotics. A decrease in diversity or an increase of one particular species may be an early-warning sign of changing water quality.
 - Track parameters such as the Floristic Quality Index (see *Calculate FQI* in [Appendix C](#)).
 - Remind shoreline owners not to remove plants in the water, except according to the plan
 - Even activities that do not require a permit, such as the 30' riparian manual removal zone, need to be considered as part of the plan to remove plants.
 - Remind lake shore property owners that it is better to leave near-shore plants undisturbed even though some plant removal is allowed without a permit.
 - Note that if 100 riparian owners each pull out 30' of plants that is 3000' with no plants!
- Consider the results from any Critical Habitat Designations that have been completed on the lake and whether any sensitive areas or any conservancy areas recognized as having exceptionally good habitat for fish or waterfowl are within the manipulation area.
 - Discuss and consider regulations designed to limit boating in sensitive areas

- Watershed, Shoreland and Water Quality Issues:
 - Include information on the value of a natural shoreline to protect the aquatic plant community and consider local ordinances to preserve or rehabilitate natural shorelines.
 - Encourage lake front property owners to leave wide, naturally vegetated buffers between their homes and the lake.
 - Involve the public in keeping the lake healthy by finding ways to decrease harmful watershed inputs:
 - Discourage the use of fertilizers on lake front property.
 - Consider measures designed to target sources of nutrients that contribute to extensive aquatic plant growth
 - Get help from the DNR and county Land and Water Conservation Departments (LWCD).
- If your recommendations will include an herbicide treatment, a harvesting program or other manipulation, a few additional issues must be considered. Your lake group's recommendations, especially if they involve some sort of manipulation, must be reviewed, and approved by the DNR. For example, the DNR might recommend different timing for an herbicide treatment or a different off-loading site for a harvester.
 - You should be in close contact with the DNR lake coordinator all parts of this component, you will be ready to apply for a permit.
 - Consider the results from any Critical Habitat Designations that have been completed on the lake and whether any sensitive areas or conservancy areas recognized as having exceptionally good habitat for fish or waterfowl are within the manipulation area.
 - Discuss and consider regulations designed to limit boating in sensitive areas or areas where there are communities of plants dominated by Eurasian water milfoil.
 - If the manipulation will involve more than 10 acres or more than 10% of the littoral zone, there must be pre- and post-treatment evaluation. See [Appendix D - Aquatic Plant Treatment Evaluation](#) (from here on *Appendix D*). This evaluation takes considerable planning and coordination with the DNR, consultants, and applicators.
 - Next Step: See *Part 2: Implementing and Evaluating Your Plan* in this document.
- Get Involved
 - If you have not done so already, become part of the [Citizen Lake Monitoring Network](#) to monitor for invasive species and develop strategies including education and monitoring activities.
 - Implement a "[Clean Boats, Clean Waters](#)" program as a component of the aquatic plant management plan. This program actively informs lake front property owners and public boat landing users of the need to prevent the spread of aquatic invasive species.

Part 2. Implementing and Evaluating Your Plan for an Aquatic Plant Manipulation

This section is designed to help you create an implementation plan once you have decided on a manipulation to deal with a plant problem. A manipulation includes an herbicide treatment of an established population of an invasive species, a harvesting regime for nuisance invasive or native plants, or a drawdown. The DNR often distinguishes a manipulation with the goal of restoration of a balanced plant community, from management of an ongoing nuisance (invasive or native) problem. Both situations will involve a permit, but manipulations with restoration as a goal best fall into this section. Please discuss with the DNR lake coordinator whether it is necessary to follow the guidance in Part 2 if you are managing your lake plant issues with routine treatment of some kind. (If this is a new pioneer population of an invasive plant, please see *Part 3. Contingency Plan for Newly-found Populations of an Aquatic Invasive Species* in this document.) Regardless of the type of treatment planned, include the DNR lake coordinator in deciding on your best management strategy. Please consult the [DNR's Wisconsin's Aquatic Plant Management and Protection Program](#) web site for information on contacts, permit requirements, permit application forms and more information. In the end it is the actions you take that will determine success of your plant management program.

When you are planning a manipulation it is important to realize that the steps necessary for acquiring a permit, performing the manipulation, and evaluating the results are interwoven and must be planned carefully. For example, in order to measure the success of some herbicide treatments, you must assess the original conditions (pre-treatment evaluation) so that they can be compared to the final conditions (post-treatment evaluation), with the treatment itself sandwiched in between. These steps are laid out in more detail in the “*Prior to the Permitting Process*” and “*Aquatic Plant Community Evaluation*” sections below.

Much of what is needed in the implementation plan is also needed for an AIS grant, so there will be an economy of effort if you are planning to submit a grant to support your implementation plan. For information on lake grants, go to the UW-Extension Lakes website [“Law and Grants” page](#) or see the [AIS Control Grant Application form](#).

Prior to the Permitting Process

Just as an aquatic plant management plan required a great deal of data-gathering, more information must be collected before applying for a permit to perform a plant manipulation. In most cases, you must have an approved plan (including an implementation plan) before a permit for treatment will be issued. However, much of the information listed below is also needed for an herbicide permit, especially for large scale herbicide projects so again, completing the implementation plan will help you prepare to apply for an herbicide permit. Your implementation plan should include:

- A description and map (using GPS) of the project area, including proposed treatment plots
- A description of the problem to be addressed by project

- A discussion of the project goals and objectives
- A description of methods and activities
- A description of project products or deliverables
- A description of data to be collected
 - The DNR may require pre- and post-treatment monitoring for herbicide treatments of more than 10 acres or more than 10% of the littoral zone in manipulation (please see the [Compute Pre & Post Data](#) worksheet for details).
- A description of existing and proposed partnerships
 - Be clear on roles and expectations of the consultant, applicator and lake association members and anyone else involved in the project- who does what and when?
 - Decide on the firm that will carry out your manipulation. Ideally, the firm that does the pre- and post-treatment monitoring is different from the firm that performs the herbicide application. There is a potential for, or the appearance of a conflict of interest if the herbicide applicator assesses the success of its own herbicide application.
 - Describe how the public will be involved.
- A discussion of role of project in planning and/or management of lake
- A timetable for implementation of key activities

Example timeline for herbicide treatment of Eurasian water-milfoil:

February 2010: Apply for grant
(there is also an August 1 deadline)

August 2010: Establish and carry out pre-treatment evaluation
(first phase of pre-and post-treatment evaluation)

May 2011: Perform herbicide treatment

August 2011: Carry out post-treatment evaluation

Fall 2011: Write up results of treatment

EXAMPLE
TIMELINE

- A budget, including operational cost estimates and identification of funding sources, including plans for any grant applications.
- A plan for sharing project results with community and DNR
 - Describe the process by which the plan will be adopted, revised and coordinated, with DNR approval.
 - For example, the original plan may have called for a large-scale 2,4-D treatment of 30 acres of Eurasian water-milfoil. The following year, you may only need to apply for a permit for spot treatment of 2,4-D in certain locations.
- A special evaluation when a whole-lake scale manipulation is planned (e.g. drawdown or herbicide treatment of more than 50% of the littoral area, or in conjunction with a fish rehabilitation project). Contact the DNR lake coordinator to see if an Environmental Assessment is needed.

Applying for a Permit: Treatment-Specific Requirements

- **Harvesting**
 - Obtain a Mechanical / Manual Aquatic Plant Control Application ([Form 3200-113](#)) from the DNR.
 - Identify plant offloading and disposal locations sites (using GPS coordinates or ¼ section of township, range and section designations).
 - Identify where and how you will obtain the needed equipment (harvesters, trucks, unloading equipment, etc.)
 - Refer to [Chapter NR109](#) for full details
 - If this is an ongoing nuisance-relief harvesting program, speak with the DNR lake coordinator about requirements for an APM plan.

- **Herbicide Application**
 - Obtain a Chemical Aquatic Plant Control Application ([Form 3200-004](#)) from the DNR.
 - If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth, complete and attach [Form 3200-004A](#), Large-Scale Treatment Worksheet
 - This form requires the applicant to identify
 - Recreational needs of the property owners and visitors
 - Value of the proposed treatment area to fish and wildlife
 - Cause(s) of the excess plant growth problem
 - Short and long-term solutions to the problem
 - Please see [NR 107](#), and especially NR 107.04 for details on herbicide permit requirements for large-scale projects, such as public notification.
 - Consider the timing of the herbicide application. With few exceptions, any large-scale herbicide treatment of EWM and CLP should be accomplished by the end of May (contact the DNR lake coordinator).
 - Specify the herbicide(s) to be used, method of application and dose level.
 - If the treated area will be greater than 0.25 acres, the product to be used is classified as a restricted use pesticide and/or a liquid herbicide will be used, a certified applicator must apply the herbicide.
 - The herbicide application may be supervised by DNR personnel.
 - Be aware that as new information develops, an annual permit may change to reflect current Best Management Practices.

- **Drawdown**
 - Produce a map showing exposed lakebed and affected plant communities.
 - Contact the Water Management Specialist for your County to determine whether a Chapter 30 permit is needed.
 - Discuss with the DNR lake coordinator how to evaluate the results of the drawdown.

On the Day of Herbicide Treatment (or other Management Action)

The herbicide applicator will be busy on the day of the application, but be sure that every permit requirement has been addressed before application takes place. Consider having a lake resident or consultant on hand to oversee the operation. In particular, be sure that the following items are done before or on the day of treatment:

- Verify that pesticide notice signs are posted and that they contain correct information.
- Assure there is a copy of the Implementation Plan at hand and all necessary permits.
- Review the permit and any special conditions. Review what areas will be treated, and what will be done in each area.
- Verify with the contractor that conditions are proper for the intended method including wind speed, water temperature, and growth stage of the target plants.
- At the end of an herbicide treatment, ask for a copy of the Treatment Record Form to have in the lake records.
- Consider having lake residents familiar with the plan take pictures and notes from a separate boat.
 - Keep a log or notes of the day's actions, and note any unusual conditions that may affect the outcome, or give reason for complaints.
 - Be inquisitive, ask the contractor when you have questions to learn and understand what is going on.

Aquatic Plant Community Evaluation

Following any treatment, you will want to answer the following questions: Did the implemented management plan meet the management objectives? If not, what is the next step? Did anything change (for example, were non-targeted plants harmed or was there significant oxygen depletion?)

- Herbicide manipulations on more than 10 acres or more than 10% of the littoral zone requires an assessment of the effectiveness of the treatment. (If you are treating less acreage than this, you do not have to perform this evaluation.)
 - The protocol for evaluating large-scale treatments is in [Appendix D - Aquatic Plant Treatment Evaluation](#).
 - This protocol necessitates several visits to the lake per year but must be done to assess the overall success of the herbicide treatment. Once there is a track record for the success rate of these large scale herbicide treatments, the evaluation process may be scaled back.
 - Ideally, plant community evaluations should be conducted by an independent party not directly affiliated with the herbicide applicator to prevent bias or appearance of bias.
- Smaller herbicide or harvesting manipulations
 - There is no formal treatment evaluation required for smaller herbicide treatments, or other types of treatments such as harvesting, but there should be a qualitative assessment of the treatment. For these non-large scale herbicide treatments, the lake group should report:
 - How well the treatment accomplished its goals

- Was there a noticeable change in the abundances of invasive species and/or native species?
- Whether and/or how soon the targeted plants grew back to nuisance levels following harvesting
- Oxygen levels, watching for low oxygen levels due to decomposing plants that might be harmful to the fish and other lake animals (see more under *Water Quality Evaluation*, next section)
- Suggestions for the following year

Water Quality Evaluation

Water quality changes may result from large scale manipulations of the plant community, and should be closely monitored. For example, there could be negative impacts on dissolved oxygen levels or an algal response to nutrients released from decaying vegetation. Another concern might be increased algal growth due to less competition for nutrients from macrophytes, especially in shallow, eutrophic systems. In addition, monitoring of herbicide residues can be useful to evaluate effectiveness of treatments and monitor safety thresholds. Some general monitoring steps are listed here, but the exact monitoring requirements will vary with the specifics of each project and will be established in consultation with the DNR lake coordinator.

- Secchi disk water clarity is a useful and cheap tool for monitoring changes in water quality.
- For large-scale treatments (greater than 10 acres or 10% of the littoral zone and where treatment depth is 10 feet or less), obtain dissolved oxygen concentration profiles weekly for four weeks following a manipulation that leaves aquatic plant biomass in the lake.
- For whole-lake scale projects (those involving ≥ 160 acres or $\geq 50\%$ of the lake littoral area), more water quality evaluations may be required. Collect water quality (total phosphorus, chlorophyll a, and pH) samples weekly, beginning the week prior to treatment, and 4-6 weeks post-treatment at various locations in lake (i.e., middle of the lake, untreated areas, and treated areas).
- Herbicide residue monitoring should be coordinated with the applicator or monitoring consultant, and should occur more frequently within several days of treatment. Residue monitoring of sediments may be warranted, particularly with large-scale repeated treatments.
- Drawdown: Record lake levels weekly and note any abnormal conditions. Other monitoring may be required as a condition to the permit.
- Harvesting: Measure turbidity before and after harvesting.

Monitoring for Long Term Changes in the Community:

The goal of monitoring is to watch for ecosystem changes and so is distinct from the initial assessment of the plant community. Change may include: new populations of a known invasive species; reemerging populations of a previously treated population of an invasive species; a different invasive species; or changes in the native plant community.

The goal of monitoring is to watch for ecosystem changes.

Aside from plants, there may also be changes in physical and environmental parameters, or in other species, such as fish and macroinvertebrates.

In general, baseline aquatic plant monitoring ([Appendix B](#)) of the lake plant community should be performed at least every five years (see Part 1. Creating Your Plan/Inventory: Lake Information/Plant Community).

- Watch for changes in species diversity or changes in abundance of native species, and not just for the presence or absence of exotics. A decrease in diversity or an increase of one particular species may be an early-warning sign of changing water quality.
- Track parameters such as the Floristic Quality Index. These can be extremely useful over time.

Volunteers can do much of the monitoring. Monitoring strategies differ somewhat by species. Please go to the Citizen Lake Monitoring Network web site and view individual chapters of the [Wisconsin Citizen Lake Training Manual – AIS Training Procedures](#) for different species.

Part 3. Contingency Plan for Newly-found Populations of an Aquatic Invasive Species

Each plan should have a strategy for dealing with aquatic invasive plants if and when they are discovered. Invasive plants can be removed (after confirmation of identification) *without a permit* under the following conditions:

- **Private ponds:** Manual removal or use of mechanical methods to control non-native or invasive aquatic plants from a body of water that is 10 acres or less and is entirely confined on the property of one person, can be done with the permission of that property owner.
- **Public waters:** Manual removal of nonnative or invasive aquatic plants can be done as indicated in [NR 109.07](#) without a permit when performed in a manner that does not harm the native aquatic plant community.

For treatments other than manual removal on public waters there is a state-wide “[Response for Early Detection of EWM Field Protocol](#)” ready to be put into action to control pioneer populations of aquatic invasive species before they become established. A “pioneer population” means a small population of aquatic invasive species in the early stages of colonization, or re-colonization, in a particular water body. For rooted aquatic plants, a pioneer population is a localized bed that has been present less than 5 years and is less than 5 acres in size or less than 5% of the lake littoral area, whichever is greater. Please see an example of an Early Detection Plan: [Eurasian Watermilfoil \(EWM\) Rapid Response Plan, Prepared by the Gilmore Lake Association, 2009](#).

The response procedure is a collaborative venture between the DNR, other agencies and the lake group (sponsor) as outlined below. Once a population has been spotted, the sponsor should follow the procedure below:

- Collect an entire intact specimen and submit it to the DNR within 3 days for species verification. Once the DNR verifies the species is an invasive and determines that it is a pioneer population, the sponsor should:
- Assemble a response team:
 - The response team should include an agency contact from the DNR and may include others as appropriate: County, Tribal, and/or US Forest Service personnel.
 - Leader – The leader will be the main contact person for your organization that will help implement and coordinate the response plan.
 - Monitors – Monitors will conduct AIS surveillance and track and report it throughout the response project. This should include someone who can run a GPS unit for accurate mapping.
 - This may also include SCUBA divers and snorkelers who can double as monitors and hand pullers.
 - Boat drivers: Identify boat drivers who can help monitors and perhaps help oversee any herbicide treatments.
 - Educators – Train and inform lake residents, users and the community about AIS, necessary prevention measures, and the status and objectives of the response project.

- Communicators - Write newsletter articles and press releases. They will also develop phone trees, maintain organization, community and agency contacts, and other tasks. They will schedule meetings and take minutes, and write, review or file reports and keep records.
- Treasurer – While some activities will be paid through grants, there will be costs when responding to a new population of invasive plants. The treasurer will raise money, manage bank accounts and the checkbook and will also apply for and manage grants and pay bills.
 - Estimate costs and establish a “contingency fund” & fund raising strategy.
- Consultants - Identify reputable consultants or contractors as needed to augment your team for surveys, monitoring, planning or applying herbicides.
 - A certified applicator is required for herbicide applications.
 - Ideally, the certified applicator represents a different firm than the consultants hired to help with planning.
- Conduct or contract for control of the aquatic invasive species through means authorized by the DNR in the response plan.
- Complete grant application requirements for the project and submit it to the DNR
 - Fulfill DNR reporting requirements.
 - Apply for permits if required.
- Post landings with appropriate signs declaring which invasive species is present in the lake.
- Pay all costs of the control as defined in the response plan, and request reimbursement for the state’s share of the project through the AIS Early Detection and Response grant. Be sure to request a 25% cash advance when you are signing the final grant agreement.
- Other duties discussed earlier in Recommendations such as initiating a Clean Boats/Clean Waters program.
- Coordinate with the DNR who will:
 - Consult with the sponsor and, tapping appropriate expertise within and outside the department, will develop a response plan including appropriate control methods, pre- and post-control monitoring, follow-up control and reporting requirements.
 - Determine sponsor eligibility for an AIS Early Detection and Response grant.
 - Provide on-site supervision/observation of control treatments when possible
 - Provide technical assistance as needed throughout the project.
 - Review the report and authorize grant reimbursement, when appropriate.
- There may not be a need for a formal evaluation of the success of the treatment for small, pioneer populations of an invasive species as there are for larger treatments as outlined in Aquatic Plant Treatment Evaluation, but this must be evaluated by the DNR lake coordinator.
- Update Aquatic Plant Management Plan to ensure adequate long term monitoring for recurrence of the new invasive species, or if not successful at initial control, to begin planning for a large-scale manipulation or ongoing management.

**Response for Early Detection of Eurasian Water milfoil
Field Protocol (April 2008)**

A. PRETREATMENT

1. Visual concurrence by trained DNR staff that it is Eurasian Water milfoil (EWM). If there is doubt, proceed quickly with Herbarium or DNA verification but authorize project to proceed regardless. Collect voucher specimens and send to the U.W. Stevens Point Herbarium and notify SWIMS data manager in Central Office or enter information into SWIMS for statewide listing of existing populations.
2. Use GPS and rake throws to precisely define the location of the colony or plants following the established population sampling protocol ([Appendix D - Aquatic Plant Treatment Evaluation](#)).
3. Consider need and ability to quarantine the area - mark beds with buoys - to help prevent spread from boating activity in consultation with area Conservation Warden and Water Management Specialist.
4. Visually survey entire lake littoral zone from a boat. Throw rakes at random points. If possible, deploy underwater survey, either SCUBA or video. This effort is best targeted after surface survey.
5. Contact Bureau of Integrated Science Services and request point/intercept grids for entire lake. Deploy DNR survey crew, or sponsor retains qualified consultant, to survey and map aquatic plants during summer peak growing season (mid June to mid Sept).
6. Sign boat landings, recruit/establish CBCW boat landing inspection program, inform and educate lake residents to recognize EWM and recruit volunteers or retain qualified consultant for ongoing monitoring.

B. TREATMENT

1. Determine if herbicide is the appropriate tool. Scattered plants may be better dealt with through hand pulling. Hand pulling in conjunction with herbicide treatments has proven the most effective way to manage and possibly eliminate pioneer infestations over time. Hand pulling can be done throughout the season and should be integrated into all post-herbicide treatment monitoring efforts. Bottom barriers may be an effective, though

unried, method for control of small isolated beds. A chapter 30 permit is required for bottom barriers.

2. If early season and plant is still actively growing, use pretreatment mapping (A2) to apply for NR 107 permit and conduct treatment using a systemic herbicide such as 2,4-D.
3. If mid to late season and plants are topped out (flowering) and reached mid-season dormancy, map bed following pretreatment protocol (A2) and prepare for spring or, fall and spring, treatment with a systemic herbicide. The decision to delay treatment needs to consider location - isolated vs. near boating traffic - the ability to quarantine and other factors that may enhance or help inhibit spreading.
 - 3.1 Hand pulling plants with SCUBA or snorkel divers collecting all plant fragments and disposing them inland on the shore is highly recommended at this stage.
 - 3.2 A contact herbicide can be used to kill apical tips /condemn fragments. This will eliminate/reduce plant biomass. Follow up treatment with systemic herbicide or hand pulling will be required to eliminate regrowth. Careful consideration of formulation and dose is needed to limit impacts to non-target native plants.
 - 3.3 The effectiveness of herbicide treatments on compact, small beds may be enhanced by deploying a barrier or curtain to help "hold" the chemical on plants. Most appropriate in flowing or large open water especially adjacent to deep water drop offs. (This is not an established procedure at this time - EXPERIMENTAL.)

C. POST TREATMENT

1. Following initial treatment, repeat all steps above as necessary until at least one season year after plant is no longer detected.
2. Maintain monitoring/surveillance, education and CBCW efforts indefinitely.
3. Obtain plant survey results and develop an aquatic plant management plan.