

Invasive Free Zone

Guidebook



*A practical guide to developing
an Invasive Free Zone*



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with the exception of the photo on page 9, provided by the Northwoods Cooperative Weed Management Area.

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Introduction

This guidebook is written by the project staff of the Chequamegon Bay Invasive Free Zone in response to several requests for this type of document. It is designed to provide practical recommendations, information, and insights for those interested in creating an Invasive Free Zone. The guidebook is written with the assumption that the reader is generally familiar with the issues associated with invasive species. Whenever possible, we have tried to reference existing publications and websites in order to avoid duplication of efforts. We hope that the guidebook will be a useful reference for anyone working to control invasive species, particularly those who are managing invasive species on a large scale.



Darienne McNamara, USFWS

The Invasive Free Zone Guidebook is based on the format and concept of the *CWMA Cookbook: A Recipe for Success* by the Midwest Invasive Plant Network (2006). The concept of a Cooperative Weed Management Area is quite similar to the IFZ. However, the CWMA focuses on facilitating local partnerships and increasing awareness within the community, whereas the IFZ is focused on invasive species treatment and habitat restoration.

As you read through this guidebook, please keep in mind that this is not a one-size-fits-all solution to invasive species. The steps outlined in this guidebook may not be applicable or feasible in all situations. The Invasive Free Zone Guidebook is intended to be just that—a *general* guide to be applied and interpreted in a way that is most useful for the reader.

What is an Invasive Free Zone?

The concept of the Invasive Free Zone (IFZ) was introduced in 2004. The name would seem to speak for itself—an Invasive Free Zone is an area that is free of invasive species. Yet, if you have worked with invasive species, you know it is not that simple. Invasive species are very mobile, pervasive, and persistent. Therefore, we liken the goal of the Invasive Free Zone to the Zero Discharge targets set forth by the Great Lakes Water Quality Agreement. Although it may not be possible, the ultimate goal is virtual elimination.

An Invasive Free Zone is an area of any size where partners are working together to eradicate invasive species using an ecological approach. This typically requires working beyond land ownership boundaries. Although it makes sense ecologically, this approach is not always put into practice. Admittedly, this type of work comes with its own challenges—which are addressed in this guidebook—but the result should be an effective long-term strategy to managing invasive species.

Creating an IFZ often involves managing multiple invasive species and restoring native species. We have provided several recommendations to overcome the challenges involved with this approach, but there is no substitute for careful planning and experience.

Strategically locating an Invasive Free Zone can help target limited resources to protect our most valuable natural habitat.

Why create an Invasive Free Zone?

You've probably heard it before: "*Invasive species are everywhere, why bother?*" It is true, we face a daunting challenge, and resources such as staff, volunteers, and funding are finite. By creating an Invasive Free Zone, limited resources can be focused on a manageable area. Strategically locating an IFZ helps target these same limited resources to protect valuable habitat. This point cannot be overstated given the growing number of invasive species, increasing pressure from development, and habitat degradation. Finally, if we preserve certain high-quality areas and keep them free of invasive species, we will essentially be maintaining a living record of "natural" conditions (prior to the influx of invasive species). These areas can serve as a reference for future restoration in highly infested or disturbed areas.

Ultimately, when invasive species have been eradicated from one area, that IFZ can be expanded. Ideally, one IFZ will eventually be connected to another, resulting in a large contiguous area that is maintained as invasive-free. The IFZ strategy provides a systematic approach to achieving that goal.



Creating an Invasive Free Zone

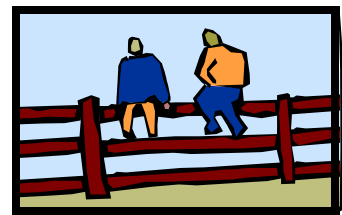
The following section describes the steps involved in creating an Invasive Free Zone. The author has arranged them in order based on experience, however you may wish to change the order of some steps, or even omit certain steps altogether. Each situation will be different.

Determine geographic boundaries

Consider the following as you determine the geographic boundaries of your IFZ:

- 1) Do not be restrained by ownership boundaries. An Invasive Free Zone can include all types of land—private, public, commercial, etc.—assuming you can ultimately obtain permission from each landowner. You may not be able to obtain permission from all the landowners *initially*, but some may decide to participate later when they have a better understanding of the project.

You may be pleasantly surprised to discover how many landowners are willing to take part in the project, particularly if you ask them for nothing more than access to their property for the purpose of mapping. Once you can show them that there are invasive plants on their land, they may be more open to the idea of conducting treatment and restoration as well.



- 2) Try to include areas with diverse natural habitat in the IFZ. Remember, creating an IFZ targets limited resources toward a particular area—if that area is a high-quality site to begin with, the restoration and control efforts will have a more significant impact.
- 3) Be realistic about what you can accomplish with the resources you have. Consider your available resources such as staff, volunteers, tools, expertise, funding, etc. Remember that good projects *attract* resources. You may be able to obtain grants or recruit volunteers as the project progresses.
- 4) The boundaries may be changed later if need be.

Identify potential partners and begin building support

Recruiting partners will help you obtain technical expertise, funding, labor, and other resources. As you seek partners, consider the roles that each person or organization will play. For example, one group may provide technical expertise, while another conducts treatment, and yet another pursues funding. Remember, *not every partner needs to be involved in the day-to-day activities of the project.*



Ideally, each landowner within the IFZ will be a cooperating partner, even if that means they allow you to map their property and nothing more. Be sure to maintain good communication with landowners involved in the project, and assure them that you will respect their privacy. Let them know when you will be on their property. Annual mailings or meetings are a good way to keep landowners informed and ensure that they are still willing to take part in the project. Appendix A is a sample letter for landowners. Appendix B is a sample contract between a landowner and the agency/organization conducting treatment (typically required for federal agencies, but may not be necessary for all cases).

For landowners who are not interested in the project, be politely persistent. Inform them, very respectfully, about noxious weed laws, potential impacts to their property values, and the many ways invasive species affect wildlife. Also, it helps to offer some type of benefit for landowners who participate. For example, when you conduct treatment, offer to treat invasive plants on their land at no cost. When you order trees or plants for restoration, order a few extra and give some to each landowner. It will cost very little, but it speaks volumes about your appreciation for their cooperation.

Try to find ways to recognize each partner's contribution to the project—after all, the IFZ concept could not exist without their cooperation. Host a picnic, give certificates, but most importantly, thank them personally for their cooperation.

In addition to landowners within the IFZ boundary, the following are a list of possible partners:

- ◆ Local government agencies (municipal, county, state, federal, or tribal)
- ◆ Local weed groups, gardening clubs, wildlife or hunting clubs, and conservation groups
- ◆ Nonprofit organizations
- ◆ Chemical companies (particularly if you plan to use their herbicides)
- ◆ Students (grade school through college)

Create a Plan

This is the most important step in the process. It will take longer than you expect, but a well-written plan is invaluable. It can help ensure efficient use of limited resources, recruit new partners and landowners, and even attract funding. Once completed, it will also help relieve some of the stress involved in managing a long-term large-scale project.

To view a sample Invasive Free Zone management plan, visit the Whittlesey Creek National Wildlife Refuge website at www.fws.gov/midwest/WhittleseyCreek/ and click on the link to the “Invasive Free Zone Management Plan.”

As you draft a plan, consider both short-term and long-term goals for the Invasive Free Zone.

Also, consider the following strategic decisions:

- ◆ *Which species are highest priority? Why?*
- ◆ *Are there any areas in the IFZ that are already invasive-free or intact, and therefore should be a focus area?*
- ◆ *Who will do the work? Contractors? Seasonal staff? You?*
- ◆ *What are others doing in your area to address invasive species? Can this be incorporated into the project? Can the project contribute to their efforts? How so?*

If you can not answer these questions, find a partner who can. It is important to have someone to address these technical questions for the project plan. This does not have to be someone with a long list of credentials, but they should have sufficient knowledge and experience to make strategic decisions such as those listed.

At a minimum, the outline for an IFZ plan should include the following:

I. Introduction

- A) Location, size, general description (ex. urban, forested, agricultural, etc.)
- B) Landowners within the IFZ (ex. federal, municipal, private, etc.)
- C) Partners involved and their role in the project
- D) Map of the IFZ location

II. Invasive Species Management

- A) Species present within the IFZ
- B) Which species or sites are highest priority and why
- C) Treatment protocol for each species
- D) Monitoring plans to ensure treatment efficacy

III. Restoration

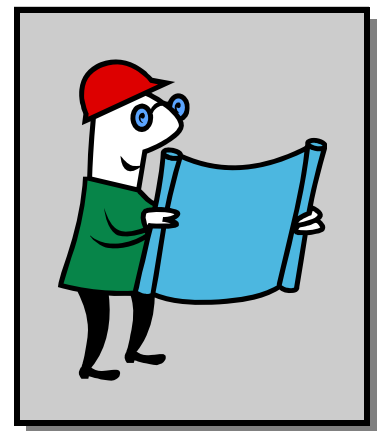
- A) Restoration goals
- B) Restoration strategies

IV. Outreach and Educational Programs

V. Estimated and Projected Project Costs

VI. Summary

- A) Criteria for project success



Other helpful components of the IFZ plan include:

A **project timeline** which outlines when major project tasks should be completed. This helps you to set long-term goals and short-term objectives. Also, many funding sources will ask to see a project timeline, so it helps to have it prepared ahead of time.

A **treatment calendar**—a calendar which shows all the treatment activities taking place throughout the year. This is different from a project timeline. It will help you plan ahead to have the necessary supplies, equipment, and staff/volunteers *when* you need them. If you are doing any treatment, you will find this is one of the most useful elements of your plan. See Appendix C for a sample treatment calendar.

Maps and photos are always helpful for communicating concepts. If possible, include maps of the IFZ location and boundary, quality habitat sites, known infestations, land ownership, or any other relevant information. Photos are useful to depict specific sites, treatment methods, monitoring plots, etc.

A **history** of the land use at the site is a good thing to include, with a description of previous efforts to control invasive species or restore habitat. This will prevent you from repeating mistakes or “re-inventing the wheel” (hopefully), and also put the project into a larger context.

Obtain funding

Some people may have ready access to labor, tools, herbicide, or other resources. Others may need to purchase equipment or hire contractors. Regardless of the situation, you should plan to pursue additional funding for the project. When you do, be sure to convey these unique aspects (i.e. selling points) of the Invasive Free Zone concept:

- ◆ Partnership—potential funders generally like to see collaboration to demonstrate broad-based support for the project, and ensure that resources are being leveraged among partners
- ◆ Ecological approach—working on a landscape-scale, controlling multiple species across ownership boundaries, restoring plant communities (not just plants)...all of these strategies should result in a more effective strategy for invasive species management
- ◆ Innovative strategy—a new creative approach to a familiar issue
- ◆ Priority concern—invasive species have been identified as a priority issue across the nation and beyond our borders, with far-reaching implications for the economy and environment
- ◆ Leadership—those who utilize the IFZ concept are demonstrating a new approach by engaging multiple landowners and working on a landscape-scale

Fortunately, the list of funding sources for invasive species work is extensive—far too long to list in this guidebook. The following websites may help you in your quest for funding:



USDA National Invasive Species Information Center, Manager’s Tool Kit—Grants & Funding

www.invasivespeciesinfo.gov/toolkit/grants.shtml

USDA Rural Information Center, Guide to Funding Resources

www.nal.usda.gov/ric/ricpubs/fundguide.html#fdatabase

Center for Invasive Plant Management—Funding Sources

www.weedcenter.org/grants/rfp.html

Note about federal agencies: Obtaining grants can be difficult as they often require *non-federal* match. Consequently, any federal resources you bring to the project (your time, supplies, equipment) cannot be offered as match. This is where project partners are key. Be sure to document *all* volunteer time and in-kind contributions. Try applying for funding from foundations, corporations, or other private sources, then use these awards as match for federal grants. Finally, work with partners who can submit grants on behalf of the project if federal agencies are not eligible (for example, a nonprofit, weed group, or municipal government).

Survey, Inventory, and Mapping

The book, *Inventory and Survey Methods for Nonindigenous Plant Species*, defines the following terms:

Survey a sampling of a representative portion of a management area

Inventory a cataloging of the entire management area

Mapping a general description of the entire range of inventory/survey, data-recording, and data-depiction activities

Although the terms are often used interchangeably, this section refers to mapping as defined above. Mapping invasive species will help you discover the number and abundance of species in the IFZ, and subsequently identify priorities for the project.



Asya Kowalski, USFWS

Mapping standards (which determine what kind of information to collect) have been developed so that different agencies collect similar information. Two common mapping standards are the North American Weed Management Association (NAWMA) standards, and The Nature Conservancy’s Weed Information Management System (WIMS). The table below compares the two methods. For more information about the WIMS standards, go to tncweeds.ucdavis.edu/wims.html. For information about the NAWMA mapping standards, go to www.nawma.org/ and select Mapping Standards. Both systems have merit, and both are used by projects throughout the United States.

As you determine which mapping standards to use, find out what others are doing in your area. It is much easier to compare data with others if you are using the same mapping standards—in other words, if you are “speaking the same language” (even if you deviate from NAWMA or WIMS standards). For example, cover class can be recorded as a number, a range, or a representative value. Similarly, certain aspects of treatment are not always recorded, such as the phenological stage (growth stage) of the plant during application, or the percent of active ingredient in the chemical applied. These are examples of the ways that data can be “incompatible” and therefore difficult to share or compare.

	Pros	Cons
The Nature Conservancy Weed Management Information System (WIMS)	<ul style="list-style-type: none"> Fields for tracking treatment methods and effectiveness Field for recording phenology Becoming more widely used (according to TNC website) Can be exported to NAWMA format 	<ul style="list-style-type: none"> Some fields are ambiguous Does not require scientific name for invasive species Fields for size of infested area and gross area are confusing, could result in decreased accuracy
North American Weed Management Association (NAWMA)	<ul style="list-style-type: none"> Used by multiple federal agencies Fields have standardized codes/values, which makes information-sharing easier and more accurate 	<ul style="list-style-type: none"> No fields to document treatment activities No field for recording phenology

Photo Phenology

Imagine for a moment that it is early March and you are trying to put together a work plan for the upcoming field season. You know that invasive shrubs should be mapped in the spring or fall when native plants are dormant. You also know that biennial species must be treated before they produce seeds. Unfortunately, you're not sure exactly when native plants become dormant, or when biennials begin to flower in your area.

Documenting plant phenology in your specific area can help you determine the best time to map and treat invasive plants. Photograph plants every 7-14 days during the growing season. Once you've done this 2-3 times, you will develop a routine that should take no more than an hour each time. At the end of the season, you will have a series of photos that give you a detailed and accurate record of plant phenology in your area.

The following example shows Canada thistle (*Cirsium arvense*) in northern Wisconsin in 2006:



June 6



June 19



June 26



July 10



August 14

Darlene McNamara, USFWS

Before you begin mapping, be sure you are familiar with the species in your area. Much of that information is available online. Quite often, the best way to learn is to consult with others in your area who are working on invasive species. They will know where to find certain species, which are locally prevalent, and which are most problematic.

While you are mapping invasive plants, you may begin to feel like you are wasting precious time that could be used for treatment or restoration. Remember that once you have an inventory of the infested areas within the IFZ, you can be confident that limited resources are being directed to the most critical areas. Also, while you are mapping, you are creating a record of baseline conditions. This will help you track changes in infestations over the long term.

Be strategic about *when* you conduct mapping. If possible, inventory plants when they are easiest to find, such as when they are flowering, or late in the season when native species are dormant (see Photo Phenology above). This can save considerable time spent looking for plants, and helps ensure that small infestations are not overlooked. This is particularly important in forested areas, which take *substantially longer* to map than open areas. If possible, wait until early spring or late fall. It is easier to get around without dense leaf cover, there are fewer bugs, and invasive forest species are often the only plants with green leaves. Not only is this more convenient, it is a more efficient use of time and money.

If possible, mapping should precede treatment and restoration. However, in some cases, this is simply not feasible. For example, many national forests and wildlife refuges are far too large to thoroughly map for invasive plants, and an attempt to do so would monopolize resources for many years (during which infestations may increase exponentially). In situations like this, conduct map-

ping and treatment at the same time. When you arrive at an infested area, record the appropriate information (based on mapping standards), treat the site, and move on. This process is more cumbersome and less efficient than doing mapping and treatment separately, but in some cases it is the best or only option. This method works well with a large crew where tasks can be divided among members. Once again, begin mapping in areas with intact high-quality habitat that is nearly invasive free already. This is where your work will have the most immediate and significant impact.

Treatment

Managing invasive species within an Invasive Free Zone presents unique challenges. You will be treating multiple species at the same time with limited resources and diverse site conditions. There will be many infested areas to restore, and several high-quality sites to protect.

As you are probably aware, there are a variety of options in the manager's "toolkit" when it comes to treating invasive species. We are not going to describe various control methods in this document. There are other publications which do a good job of this, one of which is *The Invasive Plants of the Upper Midwest* by Elizabeth Czarapata (2005). Also, many publications describe detailed control techniques for individual species. If you would like to find more information about species-specific control methods, the following websites may be useful:

The Nature Conservancy's Global Invasive Species Initiative
tncweeds.ucdavis.edu/esadocs.html

The Global Invasive Species Database
www.issg.org/database/welcome/

The Center for Invasive Plant Management
www.weedcenter.org/



Working on a Landscape-Scale

Chances are you will feel a little overwhelmed when you begin treatment. If you have mapped the IFZ, you probably found more invasive species than you anticipated. If you have not mapped, you aren't sure just how much work is ahead of you.

As you prioritize areas or species for treatment, consider which species are most invasive in your area. This will change based on your location, habitat type, and land use.

Prioritize areas which serve as conduits for invasive species. These areas are the first to be infested, and often provide the seed sources for satellite infestations throughout the IFZ. Riparian corridors are an example of a conduit for invasive plants. Plant fragments or seeds which are washed downstream are deposited on floodplain soils, which are frequently disturbed by flooding. The result is an area highly susceptible to invasion. Similar examples include roadsides, utility rights-of-way, trails, and newly-developed or recently-disturbed sites. Invasive plants can spread rapidly along these conduits, and should be prime targets for treatment.

The Bradley Method (described on page 9) suggests another strategy for long-term management of natural areas. Also, the familiar phrase *Early Detection, Rapid Response* describes a strategy for managing invasive species that applies very well to the IFZ concept. The idea is that after invasive species have been significantly reduced, ongoing monitoring will be sufficient to detect new infestations *early* so they can be treated *rapidly*.

Finally, in addition to the species at your site, be aware of invasive plants that are approaching your region. That way, you can recognize them immediately if they appear in your area. Schedule an hour each month to familiarize yourself with these plants, examine photos of each species, and take note of the type of habitat they prefer. Work closely with others doing invasive species control so that you know the species they have encountered and the control methods they are using.

The Bradley Method

Joan and Eileen Bradley, two sisters in Australia, developed this method in the 1960's. The Bradley method is a strategy for long-term invasive plant management. Thomas Brock from the University of Wisconsin breaks it down into the following three concepts (excerpt from the October 2002 newsletter of the Invasive Plant Association of Wisconsin):

- 1) *Always begin control work in undisturbed natural areas, and then work out toward areas more heavily infested with invasive species.*

Start in areas where the native plants are thriving and gradually clear into the more heavily invaded areas. Non-native species do not invade readily into areas where native plants are already well established. Weeding a little at a time within and adjacent to good stands of native plants, then moving out toward the most invaded areas, gives the native plants a chance to move in and thrive.

- 2) *While removing invasive plants, try to keep from disturbing the environment any more than necessary.*

Large numbers of invasive plant seeds rain down on natural areas. If the ground is opened, these seeds can thrive. Undisturbed native soil, with its natural mulch, is resistant to invasion by non-native plants.

- 3) *Do not over-clear.*

Leave the natural area as undisturbed as possible. If a large team of workers is available, people should spread out and weed small amounts in many places, rather than having the entire crew work in one place. The total area cleared of invasive plants will be as large, but regeneration by native plants will be greater. The Bradley method emphasizes that removing invasive plants from a natural area involves two different kinds of time, *working time* and *waiting time*. Patience is not only a virtue; it is essential.



Darienne McNamara, USFWS

Using Herbicide

When you are working on a landscape-scale, you will most likely need to include herbicides in your “toolkit” of control methods. Manual removal is extremely resource-intensive, and would exhaust funding, volunteers, and other resources very quickly. Also, many invasive species will resprout from rhizomes or cut stems if they are not treated with herbicide.

Using herbicides on a large scale is expensive, requires safety precautions, and careful planning. Take steps to minimize cost, risk, and environmental impacts. Use herbicides that are appropriate for the site conditions (e.g. near open water). Choose application methods that minimize overspray and use small quantities of herbicide. For example, cut-stump applications

(continued on page 11)

Tools of the Trade

The following observations are based on conversations with contractors, land managers, and the experiences of the IFZ staff. Your experience with various tools and methods may differ.

Tool	Comments
Brush saw (gas-powered)	<ul style="list-style-type: none"> ◆ back-saver when compared to using a bow saw or loppers all day ◆ helps you avoid the thorns when used for buckthorn (up to 4" in diameter) ◆ convenient for reaching under honeysuckle shrubs, which have low, wide-spreading limbs ◆ noisy, may require hauling fuel and oil to remote sites
Bow saws	<ul style="list-style-type: none"> ◆ work great for shrubs 1-4" diameter
Loppers	<ul style="list-style-type: none"> ◆ work great for plants up to 1.5" diameter ◆ use loppers that are made for cutting shrubs (some are best for pruning only)
Machetes	<ul style="list-style-type: none"> ◆ work great for small patches of forbs or grasses, particularly in remote areas ◆ safety concern when multiple people are using them in a small area
Walk-behind weed whip (gas-powered)	<ul style="list-style-type: none"> ◆ burdock wreaks havoc with this machine; the fibrous threads in the stalks get wrapped around the rotating mechanism and bind it up; the fibrous threads are difficult to remove ◆ designed for use on grasses and forbs without fibrous stems
Squirt bottles	<ul style="list-style-type: none"> ◆ work great for cut-stump treatment, which requires only minute amounts of herbicide ◆ small bottles are light and easier to carry around than larger spray bottles or backpack sprayers ◆ pressurized spray bottles or backpack sprayers are better for long days of spot treatment (spot treatment requires more herbicide than cut-stump)
Pressurized spray bottle	<ul style="list-style-type: none"> ◆ spray mechanism is easy on your hands even after hours of use ◆ easy to control spray volume with combination of pressure pump and nozzles ◆ be careful not to bump the "hold/lock" button (maintains constant flow), it is easy to accidentally lock it in without noticing
Pressurized backpack sprayer	<ul style="list-style-type: none"> ◆ spray for hours without refilling ◆ comfortable with padded waist and shoulder harnesses ◆ easy to control spray volume and pattern with pressure pump and appropriate nozzles
Hand-held weed wiper	<ul style="list-style-type: none"> ◆ difficult to manage flow of herbicide on some models ◆ have to refill often for large areas or long days ◆ some models are more efficient and user-friendly than others
Speidel® ATV weed wiper	<ul style="list-style-type: none"> ◆ the first and second time you use a new Speidel weed wiper, the wicking action is not consistent; it takes a few uses to get the canvas broken in ◆ make sure to dilute by at least 1:1 or herbicide is too thick to soak through canvas wrap ◆ cover air intake with cloth or paper towels to keep grit from getting in the tube ◆ it will seem as though you are not getting enough herbicide onto the plants – you probably <i>are</i>, wait several days to see if they respond and apply again if needed ◆ uses very little herbicide – be sure to filter chemicals with a very fine screen when pouring into/out of tube ◆ can be used as a hand-held weed-wiper (using 2 people) for wet/soft/sensitive areas ◆ using the ATV to apply herbicide is <i>not</i> like riding an ATV for recreation, you are making tight turns almost constantly and riding off-trail where the terrain is bumpy and throws you around – you will get tired more quickly than you expect, especially in warm weather wearing personal protective equipment (PPE) ◆ for more information, see App. C of the Chequamegon Bay IFZ—Invasive Species Management Plan online at http://www.fws.gov/midwest/WhittleseyCreek/

use much less herbicide than basal bark application. Weed wipers can selectively treat target species, avoiding unwanted over-spray that is typical of sprayers. Remember, it is almost always more effective to combine herbicide with other techniques such as mowing, burning, cutting, or biocontrol. This approach is referred to as Integrated Pest Management.

Although they can be expensive, bulk containers of concentrated herbicide cover a very large area and can be a very economical way to purchase chemicals. Sharing chemicals is a way to help make expensive herbicides more affordable. Trading smaller quantities is also a good way to access a variety of herbicides without purchasing more product than you need (one more good reason to have partners!). If you are trying a product that is new to the market, ask the manufacturer if they will send you a free sample. Just be sure to obtain a copy of the herbicide label for every chemical that is used. These are often free online.

Finally, always follow the herbicide label. Not only does it provide useful information related to treatment and safety, but *the label is the law*. Herbicides are approved based on the information contained in the label, therefore it is very important to adhere to the guidelines included therein.



Photo: Northwoods CWMA

Biological Control

Some people are still apprehensive about the use of biological control (e.g. insects). Current regulations require that all new species released for biological control undergo exhaustive lab analysis and field testing to ensure they will not damage native ecosystems. This testing process is administered by the USDA Animal and Plant Health Inspection Service (APHIS). Biocontrol has been in use in the United States since the 1940's, and it has many benefits over conventional control methods. Although it takes an initial investment to get a population established, biocontrol agents eventually do most of the work themselves with comparatively little need for time or money. Perhaps the most important benefit to using biological control is that it has the potential for long-term control of invasive species, even when there are no staff or projects to support them. In an article by the U.S. Forest Service, R. VanDriesche writes that "weed biological control projects will increasingly be seen as an essential approach to protecting natural areas, water bodies, forests, and pastures in the region."

To learn more about biological control in the United States, go to www.invasiveplants.net— the website of the Ecology and Management of Invasive Species Program at Cornell University. To find out more about the species that have been released in your area, contact your state Department of Natural Resources or similar agency (they may refer you to a researcher or other local expert). Again, there may already be others in your area doing biocontrol on select species, so be sure to inquire with those doing invasive plant control in the region.

Monitoring

Monitoring is generally understood to be a valuable component to any invasive species program. It can help you evaluate treatment efficacy, identify new infestations, and track restoration progress, among other things. Unfortunately, with limited labor and other resources, monitoring is not always conducted. For a large-scale project like an IFZ, monitoring is absolutely critical.



In order to ensure that monitoring occurs, use protocol that are as fast and simple as possible. For example, if you do not plan to publish your work, do not spend hours developing statistically valid protocol. If photo-points will suffice, use them. You can also save time by using a data sheet from another agency or organization, and tailor it to suit your needs (many federal and state agencies have developed data sheets specifically for monitoring invasive species). Keep in mind that utilizing comparable methods will help you share data with partners much more easily. If you need more assistance, talk to wildlife biologists, statistics professors, or foresters to see what they recom-

mend. In any case, spend some time thinking about what you hope to learn from the data—in a year, two years, five years, and ten years from now. This will determine what kind of information you collect.

To monitor treatment activities, it is important to record the phenology of the plant, ideally with a photograph. Treatment efficacy can vary depending on the phenological stage of a plant, which can be different on the same date from year to year. Also, be sure to record the treatment method and the percent of active ingredient in the formulation applied. This information is omitted in some studies, making it difficult for others to repeat the same method.

The following is a sample of commonly-used methods for monitoring invasive species:

- ◆ Transects (sampling at quadrats or intersections along the transect)
- ◆ Macro-plots (large area in which smaller quadrats are sampled)
- ◆ Fixed photo-points
- ◆ Qualitative observations (subjective)

These methods are discussed in more detail in *Inventory and Survey Methods for Nonindigenous Plant Species* published by Montana State University Extension and the Center for Invasive Plant Management. You will notice that these methods can also be used for mapping. In some cases, simply re-evaluating the cover class (i.e. re-mapping) will serve as a form of monitoring because it will reveal whether invasive species have increased, decreased, or remained the same in a given time period. This is not a precise way to evaluate treatment methods, and it is highly subjective. However, it is a quick and easy way to assess treatment efficacy over the long-term.

Theoretically, after you have been conducting treatment and restoration for several years, you will be able to scale back monitoring efforts considerably. Once a reliable treatment method has been identified for each species, you no longer have to do intensive monitoring of control efforts. Eventually, when invasive plants have been mostly eradicated, monitoring could entail nothing more than a walk through the IFZ to detect new infestations. Visiting each site every two years (biennially) may be sufficient to apply the Early Detection, Rapid Response approach. With biennial visits, new plants will be identified and eradicated while the infestation is still small. Keep in mind that when you are visiting supposed “invasive-free” areas, it is best to conduct monitoring when the plants are easiest to spot (e.g. when they are flowering).

Restoration

As Thomas Brock stated in his article on the Bradley Method, “*non-native species do not invade readily into areas where native plants are already well established.*” If you restore a robust native plant community, you have created a good long-term defense against invasive species.

Restoration can occur either actively or passively. When we say *active* restoration, we’re referring to activities such as planting trees, spreading seeds, and restoring original topography or hydrology. In some cases, however, native plants are capable of restoring themselves. For example, if there are a few small infestations surrounded by native plants, the surrounding species will often close in and fill the gap left behind when the invasive plants have been removed. This is what is meant by *pas-sive* restoration. In such cases, there is no need to conduct active restoration. In fact, doing so may cause more disturbance and result in unexpected changes to the ecosystem.

If you determine that active restoration is necessary, take a moment to think about what you are trying to restore. Is it a hedge row? A garden? Natural landscaping? Wildlife habitat? Your ultimate goal will determine how you approach treatment and restoration.

Restoring fish and wildlife habitat, with its ecological functions, is complex so we will address this further. First, you must determine what the site conditions were before the area was disturbed. You may have to go back 10 years or even 110 years to find out. Try talking to residents who have lived in the area for a long time, reference old plant or habitat surveys if they exist, read the notes from the Public Land Survey records in your area (the original surveying of land in many parts of the country), and look at old maps of plant cover, soil types, etc.

When you have identified the habitat type that will be restored, travel around the area and visit local sites where the same type of habitat exists in a relatively pristine state (e.g. a national park, state natural area, or preserve). Make a note of the species present (not just the dominant species), the relative abundance of different species, their relative location in the landscape, and any other unique features. This will serve as an important reference when you conduct restoration. Also, consult with local experts. These may include college professors, botanists, resource professionals, or naturalists.

When the time comes to obtain plant materials, you may find that native plant materials can be a rare commodity. If you plan to purchase plant materials, save time and talk to someone with experience buying native plants and seeds. They can probably direct you to a supplier with an affordable, diverse selection of species. Also, be prepared to pay more than you anticipate. Native plants—particularly native seeds—can be far more expensive than traditional plant materials, and prices vary *dramatically* depending on the species and the supplier. Ideally, native seeds would be collected locally to ensure that adapted genotypes are used. This can be labor-intensive and requires some expertise, but helps ensure that native diversity is restored.



Azsa Kowalski, USFWS

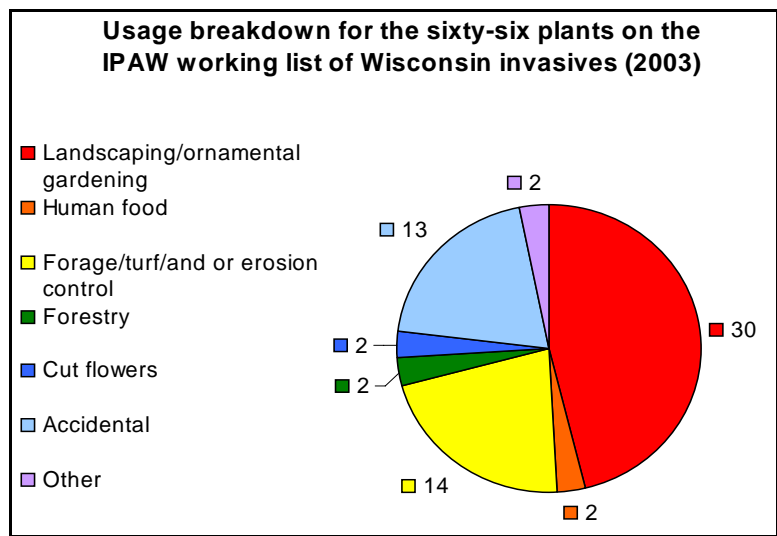
If you have purchased native plant materials, do not hesitate to ask the sales representative for advice on site preparation, planting methods, seeding rates, and long-term maintenance at the site. Maintenance may include watering, weeding, and protection from herbivores (e.g. white-tailed deer, rabbits, etc.). If you are unsure about preventing wildlife damage, talk to local natural resource professionals, landscape professionals, or foresters about which animals or insects are most problematic. Seek advice about minimizing their effects. If you do not adequately protect your plants from herbivores and other damage, they will be a lost investment of money and time.

Finally, have patience. You may be discouraged in the first year when trees or seeds do not take off. Continue to monitor and maintain restored sites, and do not be surprised if the second and third year bring more success.

Education & Outreach

Think of education and outreach as another item in your “toolkit” for managing invasive species. It is one more way to help stop their spread.

The Invasive Plants Association of Wisconsin (IPAW) put together a pie chart (at right) listing sources of invasive plants within the state. Take a close look at each of the sources identified. Nearly all of them could have been prevented if the right people had an understanding of the potential impacts. The importance of education and outreach can not be overstated.



Courtesy IPAW

Fortunately, there are an *abundance* of materials designed to increase awareness about invasive species. There are brochures, reports, pocket-sized identification cards, posters, and presentations all available through government agencies, nonprofits, weed groups and the internet. IPAW has a collection of PowerPoint presentations available on its website, www.ipaw.org. These can be ordered online and edited to accommodate your specific area. The Midwest Invasive Plant Network (MIPN) also has a list of resources on its website at www.mipn.org.



Mike Mlynarek, USFWS

Be creative in your methods for outreach. Use a game or craft activity to teach children. Invite children to help with seeding, tree planting, or pulling weeds. If you conduct biological control, consider rearing the insects in a visible area where the public can observe the process. Post educational signs in areas where treatment or restoration are taking place. Design a traveling poster or exhibit. Host a work day where people can see invasive species first-hand and get hands-on experience doing treatment. If necessary, present to distant audiences using conferencing via phone, video, or internet. Do not be confined by the tri-fold brochure or PowerPoint format.

Try to tailor program content to the audience. For example, if you are speaking to landowners about invasive species, do not overwhelm them with too many details about individual species. Instead, talk about the general impacts of invasive species and ways people can help stop their spread. Give them a user-friendly handout with information about each species that they can take home and pour over at their own pace. Conversely, if you are hosting a workshop for land managers and natural resource professionals, allow time for the audience members to share their experience. It would be presumptuous to assume that the speakers are the only ones with relevant expertise. Many times the most interesting discussions at a workshop take place during unstructured “down time,” so be sure to build this into your programs as well.

In addition to using creative outreach methods, keep an open mind about your audience members. The following is a list of possible audiences (remember to adjust program content for each audience):

- ◆ Natural resource professionals/land managers
- ◆ Hikers, Bikers, and Skiers
- ◆ Local landowners
- ◆ Foresters
- ◆ Loggers
- ◆ Farmers
- ◆ Nursery owners
- ◆ Wildlife or weed groups
- ◆ Conservation groups
- ◆ Local government officials and staff
- ◆ School groups of all ages



Mike Mlynarek, USFWS

Expand the Invasive Free Zone

If you have made an area invasive-free, celebrate your accomplishment! Next, spread the word to all of your project partners and others who would be interested. After that, the next logical step is to expand the IFZ and protect more habitat from invasive species.

Once again, consider the four items listed on page 2 regarding the boundaries of the IFZ. Update the plan to include a strategy for the newly included area.

Repeat the process you went through during the first stages of the IFZ, being careful not to spread your resources too thin. Keep in mind that you will need to provide resources to continue monitoring and doing occasional treatments at the existing invasive-free area.

By now, hopefully you have taken the opportunity to communicate with the landowners outside the original boundary of the IFZ. This is the time to tell them about the success you have had thus far, and ask them to join the effort.

In an ideal world, one IFZ will eventually be combined with another, then another, and so on, creating large contiguous tracts that are being monitored and maintained as invasive-free. The IFZ concept provides the framework for achieving that goal.



Summary

Invasive species have been around for a long time, and they are not going away any time soon. The Invasive Free Zone concept is an innovative way to address this issue and protect valuable wildlife habitat. It requires that we think outside the box—beyond land ownership boundaries and the species-by-species approach, toward a more ecological approach that takes advantage of our collective resources. An Invasive Free Zone can be any size, located in any place, organized by anyone. The key is to establish an area and get started, working toward the goal of becoming *invasive free*. The project will never be “finished” given the continuous influx of new invasive species and their persistence in the environment. However, when an IFZ has been established, with a plan and committed partners, it sets up a long-term commitment to managing invasive species even as individual staff people come and go.

Whether it is possible to remain truly invasive-free remains to be seen. Much like the “zero tolerance” or “zero discharge” policies put in place around the Great Lakes, the target is clearly defined and based on necessity more than feasibility.

Please read the Invasive Free Zone Challenge in Appendix E. This challenge is being issued to federal agencies, and we would like to extend the challenge to you as well. Hopefully this guidebook and case study will provide you with the information you need to get started.

Case Study: *Chequamegon Bay Invasive Free Zone*

The Chequamegon Bay Invasive Free Zone (IFZ) began in 2005. It is located along Lake Superior near Ashland, Wisconsin. The IFZ boundaries include the Northern Great Lakes Visitor Center (NGLVC), the Whittlesey Creek National Wildlife Refuge, and the private lands within the Refuge acquisition boundary. The project goal is to eradicate invasive terrestrial and emergent aquatic plants from the entire area, and restore native plant communities.

The IFZ covers 720 acres in total—30% is owned by the Refuge, 25% by the Chequamegon-Nicolet National Forest (NGLVC), and 45% by private landowners (16 total). In 2005, letters were sent to each of the private landowners within the IFZ boundary to explain the project and solicit their involvement. Initially, 12 out of 17 landowners agreed to allow access to their property for invasive species mapping. Landowners were assured that their privacy would be respected and that they would not incur any project-related costs.

At the start of the project, there was one full-time summer intern and a Refuge biologist working on the project. Both were supported through grant funds. Mapping the IFZ was the first objective. This helped staff understand which species were present and to what extent. Staff used a Thales® MobileMapper® setup with a data dictionary to record information required by the NAWMA mapping standards. The NAWMA standards were chosen because they were endorsed by the U.S. Fish and Wildlife Service (the agency responsible for conducting the mapping). During the first field season, the intern mapped mostly open areas within the IFZ and covered approximately 340 acres.

About 10 acres of buckthorn and honeysuckle were treated in the first year by the Great Lakes Exotic Plant Management Team (EPMT) of the National Park Service. They used the site to train seasonal crew members, and the work was conducted free of charge.

Additionally, purple loosestrife beetles were released as part of a long-term biological control program initiated by the Wisconsin Department of Natural Resources and the Great Lakes Indian Fish and Wildlife Commission. Beetles were reared at the NGLVC where visitors could observe the process and learn about invasive plants. The display has now become an annual exhibit, along with other educational programs hosted at the Visitor Center.

In January of 2006, a full-time staff person was hired for the project. During the winter, she researched the biology of invasive species. Seven “high priority” species (out of 20 species

Project staff at the Whittlesey Creek National Wildlife Refuge host an annual invasive species workshop at the Chequamegon Bay IFZ. The workshop is designed to foster discussion and collaboration among local natural resource professionals.



Linnea Thomas, USFWS

total) were identified based on their extent within the IFZ, and their ability to invade natural habitat. Treatment methods were selected based on discussions with others working on invasive species, a literature search, and the experiences of the staff themselves. This research ultimately became an integral part of the management plan, which was completed in 2007.

Another major objective during the winter of 2006 was to develop outreach materials and provide updates for project partners, including private landowners, regional leadership teams from the U.S. Fish and Wildlife Service and U.S. Forest Service, U.S. Environmental Protection Agency, Lake Superior Binational Program, Lake Superior Task Force, and regional biologists from the U.S. Fish and Wildlife Service. Presentations were given in Wisconsin, Minnesota, and Canada, as well as conference calls and video conferences. Answering questions and exchanging ideas certainly is much more effective in person than over the phone.

High Priority Species	Acres Infested
reed canarygrass (<i>Phalaris arundinacea</i>)	182
buckthorn (<i>Rhamnus cathartica</i> and <i>R. frangula</i>)	31
Canada thistle (<i>Cirsium arvense</i>)	6
exotic honeysuckle (<i>Lonicera species</i>)	5
purple loosestrife (<i>Lythrum salicaria</i>)	5
knapweed (<i>Centaurea jacea</i> and <i>C. stoebe</i>)	1
common reed grass (<i>Phragmites australis</i>)	<1

Private landowners received a mailing that included a one-page update about the project, a map of the invasive species on their property, and a letter for them to sign and return if they were still willing to participate in the project. A similar mailing has been sent out annually to each landowner, and each year, more landowners have agreed to participate.

Another summer intern was hired in 2006 to help conduct mapping and treatment. Invasive shrubs were mapped in the spring and fall when native shrubs were dormant. Grasses and forbs were mapped later during the summer, with occasional help from a volunteer. In total, 115 acres were mapped in 2006.

When treatment began in 2006, the decision was made to target small infestations first in order to eradicate them early. This approach of starting small worked well for IFZ staff. It gave them an opportunity to become more familiar with different control methods and evaluate their effectiveness on each species. Plots were established to evaluate the efficacy of control methods for reed canarygrass, Canada thistle, and spotted knapweed. Setting up the plots and collecting stem counts was time consuming, but staff felt it was important to test various methods before applying them on a much larger scale.



Great Lakes Exotic Plant Management Team, NPS

The Great Lakes EPMT returned to conduct their training and treat invasive shrubs at the IFZ in 2006. Purple loosestrife beetles were released once again. Throughout the 2006 field season, treatment was initiated on approximately 40 acres and included 13 species.

With more treatment experience, and mapping nearly completed, the IFZ staff began writing a management plan in

the winter of 2006-07. During the development of the plan, they created a treatment calendar, compiled the data from two years of mapping and treatment, and outlined their approach to future management and restoration. While they drafted the plan, staff frequently referred to the treatment records, field notes, and photo phenology images taken weekly during the growing season in 2006. Having this detailed information about phenology and field work made it much easier to create a detailed plan. The plan was reviewed by a variety of project partners and peers, and finalized in February of 2007 (available online at www.fws.gov/midwest/WhittleseyCreek/).

Treatment efforts were increased in 2007, despite the fact that staffing was down to one full-time person with support from the Refuge biologist. Fortunately, through various partnerships and grants, the IFZ received assistance from the Youth Conservation Corps, the Minnesota Conservation Corps, the Great Lakes EPMT, and several volunteers. In 2007, over 100 acres and 11 species were treated.



Darrienne McNamara, USFWS

Restoration began on a small scale in the spring of 2007 with a goal of establishing a patchwork of forested wetlands, shrublands, and open wetlands (described in more detail in the Habitat Management Plan for the Whittlesey Creek NWR). This is similar to the type of habitat described by surveyors during the Public Land Survey in the 1850's. Within the IFZ, a few relicts of these native habitats survived decades of logging, farming, and development. These remaining areas serve as reference sites for restoration.

The goals for restoration within the Chequamegon Bay IFZ have interesting implications for the invasive species at the site. Out of more than 20 species identified within the IFZ, only 2 are commonly found in closed-canopy (forested) habitat. Consequently, if forests and shrublands are restored, many of the invasive species will lose their desired habitat—open, disturbed sites. With this in mind, IFZ staff view restoration as a form of invasive species control because the objectives are overlapping.

In the spring of 2007, approximately 5,000 tree and shrub seedlings were planted within the IFZ, and over 11 lbs of seeds (native wetland species) were broadcast. The IFZ staff had help from the Youth Conservation Corps, two school groups (third and sixth grade), and a private contractor hired through grant funds. When they had questions about seeding methods, they found the nursery owners and seed suppliers to be very knowledgeable and willing to help.

Some trees were planted on private lands at no charge to the landowners. They were planted as part of the overall IFZ restoration, but also served as a gesture of appreciation to the landowners for their cooperation. Although less than 1% of the trees were used on private lands, they helped pave the way for new partnerships with landowners.



Darrienne McNamara, USFWS

A Minnesota Conservation Corps crew member releases purple loosestrife beetles at the Chequamegon Bay IFZ in 2007.

Due to record-setting drought in the spring and summer of 2007, many of the tree and shrub seedlings died early in the year, and seeds had not sprouted by mid-summer. However, based on their experience and that of other restoration practitioners, Refuge staff expect many of the trees and seeds to recover next year (assuming the weather conditions are more typical). Additional seeding and planting will take place in 2007 and subsequent years until native plant communities are established.

It is worth noting that in other reforestation projects at the Refuge (prior to the IFZ project) have done very well with relatively little maintenance. Refuge staff have even planted 12-16" seedlings into old hay fields with reed canarygrass (*Phalaris arundinacea*)—an invasive grass that forms dense monotypic stands—and found that the trees fare quite well. To minimize damage from deer browse, staff apply deer repellent once each fall, and use tree shelters or large exclosures for browse-sensitive species (tree species that deer prefer most, such as northern white cedar).



Invasive species are no match for the 2007 Youth Conservation Corps crew at the Chequamegon Bay IFZ..

Funding for the Chequamegon Bay IFZ has come from a variety of sources. In-kind contributions of labor, supplies, and technical assistance are essential to the project. In 2007 alone, partners contributed over \$17,000 of in-kind contributions. This pooling of resources is one of the main benefits of creating an IFZ.

Because the project was supported by grants, funding was not always consistent. The amount of staff working on the project ranged from less than one full-time person up to three full-time people. In the future, it would be more productive to utilize the funds strategically so there are enough staff during busy times of the year (April through November). However, it is not always possible or practical to hire staff when it is most convenient.

In retrospect, there are a few things the staff would have done differently. For the purpose of planning and budgeting, it would have been wise to detailed records on the amount of time spent on each activity (treatment, mapping, restoration), the amount of money spent on various supplies (herbicide, tools, seedlings), and other costs. This would help staff identify the true cost of treatment per acre, restoration per acre, etc., which in turn would help project *realistic* budget needs for future years. In addition to better record-keeping, it would be ideal to have at least three full-time staff people to conduct treatment during the field season, given the area and abundance of invasive species within the IFZ.

In the management plan, it states that the ultimate goal for the Chequamegon Bay IFZ is to reduce invasive species cover by 95% within the IFZ, and reach a “monitoring and maintenance” mode. At that point, treatment would no longer occupy several full-time staff. Minimal monitoring would reveal new infestations which would be eradicated as quickly as possible—applying the Early Detection, Rapid Response approach. Another way that progress is meas-

ured is the percent of the IFZ that is “invasive-free.” By the end of the 2007 field season, that figure was approximately 10%, or 70 acres.

As stated earlier, one of the benefits of the Invasive Free Zone concept is the pooling of resources from various partners to protect a specified area. Below is a list of the partners involved in the Chequamegon Bay IFZ, and their respective contributions (in alphabetical order).

- ◆ **EPA Great Lakes National Program Office**—*project funding*
- ◆ **Friends of the Northern Great Lakes Visitor Center**—*help manage grants and assist with grant applications*
- ◆ **Lake Superior Binational Program**—*major funding and input for the project*
- ◆ **Minnesota Conservation Corps**—*treatment (young adult crew can use power tools and apply herbicide)*
- ◆ **National Park Service**—*maps and controls invasive shrubs as part of their training for seasonal crews; technical assistance*
- ◆ **Northwoods Cooperative Weed Management Area**—*co-hosts workshops annually; provides technical assistance; use of supplies and equipment*
- ◆ **Northland College**—*provided additional salary for seasonal interns; managed grant funds from 2005-2006*
- ◆ **Private landowners (16 total)**—*comprise 45% of the IFZ; allow access to their property to map and control invasive species, and implement habitat restoration*
- ◆ **U.S. Forest Service (Chequamegon Nicolet National Forest and Northern Great Lakes Visitor Center)**—*comprise 25% of the IFZ; provide facility for conducting outreach (Northern Great Lakes Visitor Center); technical assistance; funding for control on USFS land; ongoing guidance for the project*
- ◆ **Whittlesey Creek National Wildlife Refuge (U.S. Fish & Wildlife Service)**—*comprise 30% of the IFZ; full-time project staff, funding, technical assistance, supplies and equipment*
- ◆ **Volunteers**—*mapping and treatment, presentations at workshops, technical assistance*
- ◆ **Youth Conservation Corps**—*treatment, restoration, and monitoring*



Pam Dryer, USFWS

Members of the 2007 Youth Conservation Corps and IFZ staff at the Chequamegon Bay Invasive Free Zone.



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Notes

 **Appendices****Appendix A**

Sample Landowner Letter

Appendix B

Sample Contract for Invasive Species Control on Private Land

Appendix C

Sample Invasive Species Treatment Calendar

Appendix D

Sample Treatment Form

Appendix E

Invasive Free Zone Challenge



Appendix A

The following is a sample letter distributed each year to landowners who are part of the IFZ. A similar letter is distributed before the IFZ project is initiated in order to recruit landowner cooperation. Also, landowners who are within the IFZ but are *not* taking part in the project receive a similar letter each year to keep them informed of progress and hopefully obtain their cooperation in time.

SAMPLE LETTER

Dear _____,

(Date)

Thanks for your past participation in the effort to map invasive plant species on land near Whittlesey Creek. Numerous landowners have been contacted and response has been excellent. Property owners like yourself are very willing to cooperate. This is greatly appreciated!

As a reminder, Refuge staff are leading an effort to map, control and monitor invasive plants on the Refuge and at the Northern Great Lakes Visitor Center. This area encompasses 720 acres. We anticipate conducting a multi-year effort, with an ultimate goal of eliminating invasive plants and reestablishing native vegetation. Your participation in any and all portions of this project is entirely voluntary.

To date, visits have involved vegetation mapping and initial control of selected invasive species. Our staff would like continued access to your land to complete mapping and conduct ongoing control work. I've enclosed a map that shows examples of invasive plant infestations on your land and adjacent parcels. When the whole project area is considered, several patterns are apparent. For instance, wetter open sites tend to have lots of reed canarygrass, many coastal wetlands have purple loosestrife, Canada thistle occurs in patches where soil was brought in for the proposed golf course, and fence rows and forest edges have exotic honeysuckle and buckthorn.

An Invasive-Free Zone Management Plan has been developed and is available online at www.fws.gov/midwest/WhittleseyCreek/. Treatment options for individual species are detailed in the plan. Cutting, mowing and similar techniques will be used in situations where they are effective and efficient. Herbicides will be selectively applied in other cases. For example, exotic shrubs will be cut and herbicide will be applied to the short stump only. Adjacent vegetation will not be affected. A Roundup (glyphosate) formulation that is registered for such use will be applied with a small squirt bottle.

Again, we will not access your property without your permission. We will respect your privacy. Regular updates about our progress and future plans will be forwarded. You can indicate at any point that you no longer want to participate. **All aspects of this project will be provided to you without cost, including controlling invasive plants and reestablishing native vegetation.**

Please feel free to contact me with any questions or concerns that you have. Thanks for your time and consideration.
Regards,

(Contact Information)

 **Appendix B**

The following is a sample contract between an agency/organization (Agency) and a private land-owner (Cooperator(s)) to conduct treatment or restoration on private land. The contract ensures the long-term viability of the project, and defines the responsibilities of each party.

SAMPLE CONTRACT

The Cooperator(s) agrees to join as a participant in an Invasive Free Zone program and grants to the (Agency) the authority to carry out invasive species control and/or restoration, or agrees to personally carry out invasive species control and/or restoration with financial or material support, as described in the plan. Any supplies, equipment or direct payment from the (Agency) to the Cooperator(s) for carrying out invasive species control and/or restoration are also listed in the plan.

The Cooperator(s) further agrees:

1. To allow the invasive species control and/or restoration described in the plan to remain in place for a period of _____ years from the date of last signature on this Agreement.
2. To allow the (Agency) or its representatives reasonable access to the described property for the period of this Agreement in order to complete the agreed upon invasive species control and/or restoration and to make periodic inspections of the habitat development for program monitoring purposes.
3. To notify the (Agency) in writing at least 30 days before closing of any planned sale or other change in the ownership of the described property.

The (Agency) assumes no authority over the described property for purposes of controlling trespass, for controlling noxious weeds, for identifying or removing pre-existing hazards including waste materials, for granting rights of way, or for any other incidents of ownership. The (Agency) also assumes no liability for property damage or injuries to people not caused by its own negligence, and any claims shall be processed in accordance with the Federal Tort Claims Act. The Cooperator(s) shall own all of the completed or installed developments and shall be solely responsible for paying all taxes and assessments on the described property.

This Agreement may be modified at any time by mutual written consent of the parties. It may be terminated by either party upon 30 days advance written notice to the other party. However, if the Cooperator(s) terminates the Agreement before its expiration, then the Cooperator(s) agrees to reimburse the (Agency) prior to final termination for the pro-rated costs of all restoration conducted on the described land through this Agreement. For these purposes the total cost of the project to the (Agency) are agreed to be \$ _____.

COOPERATOR(S)

AGENCY

Signature

Signature

Printed name(s)

Printed name

Date

Date

Agreement No. _____



Appendix C — Sample Treatment Calendar

Species	April		May		June		July		August		September		October	
	early	late	early	late	early	late	early	late	early	late	early	late	early	late
Scientific Name														
Common Name														
<i>Aegopodium podagraria</i>					cut			cut		cut				
<i>Arcium minus</i>					cut			cut		cut				
<i>Centaurea sp.</i>							herbicide		late herbicide*					
<i>Cirsium arvense</i>							herbicide		late herbicide*					
<i>Cirsium vulgare</i>					Alternative 1: Alternative 2:		herbicide		late herbicide*					
<i>Coronilla varia</i>							herbicide							
<i>Hieracium sp.</i>														
<i>Lonicera sp.</i>														cut & spray
<i>Lotus corniculatus</i>														
<i>Lupinus polyphyllus</i>					Alternative 1: Alternative 2:		mow herbicide							
<i>Lythrum salicaria</i>							collect beetles							release beetles
<i>Melilotus sp.</i>							cut							cut
<i>Phalaris arundinacea</i>														cut (if flowering)
<i>Phragmites australis</i>														herbicide
<i>Rhamnus sp.</i>														late herbicide*
<i>Salix fragilis</i>														cut & spray
<i>Tanacetum vulgare</i>														herbicide
<i>Trifolium sp.</i>														cut & spray
<i>Verbascum thapsus</i>														cut

* A "Late herbicide" treatment is likely to kill the plant, but *not likely* to prevent seed set for that year.
 *** Note: Honeysuckle and buckthorn can be treated in winter as well. Cut-stump and basal bark treatments are both reported to be effective.

 **Appendix D**

The following is a sample treatment form to record information about methods, time spent, quantity applied, and other useful information for future applications and planning. This form is a hybrid between two forms, one used at the Chequamegon Bay IFZ and one from the nearby Chequamegon-Nicolet National Forest.

SAMPLE TREATMENT FORM

DATE: _____ **LOCATION OF APPLICATION:** (include parcel
TIME: _____ and landowner info, attach map) _____
TOTAL # OF HOURS: _____
NAME(S): _____

SPECIES INFORMATION:

Target Species: _____
Growth stage: ___ leaves rosette boot early headed headed
 anthesis shoot bud flower senescence

TREATMENT METHOD(S) (*circle all that apply*):

herbicide** hand-pulled mowed weed-whip brush saw biocontrol
Other(s): _____

****HERBICIDE INFORMATION** (*if applicable*):

Herbicide Trade Name: _____ Active Ingredient: _____
Dilution ratio: _____ Dilutant used: _____
Concentration (% active ingredient) **before** mixing: _____
Concentration **after** mixing (actual concentration applied): _____
Volume of herbicide applied (specify units): _____
Application method: _____

ACRES TREATED: _____

NARRATIVE OF TREATMENT: _____

OTHER COMMENTS (*weather conditions, observations from past treatment, etc.*): _____



Appendix E

The following challenge is being issued to several federal agencies. Consider taking the challenge within your own agency, organization, or neighborhood. The form on the following page is signed by those who are willing to take the challenge.

***Creating additional Invasive Free Zones in the Great Lakes basin:
Following the inter-agency model at the Northern Great Lakes Visitor Center***

The Challenge

Voluntarily identify at least one area such as an administrative site, protected area or other specific location of any size to become an invasive free zone (focus is on terrestrial and emergent invasive plants). The zones will be patterned after the Chequamegon Bay IFZ model and case study.

The Goal

Create a network of invasive free sites that demonstrate this integrated, landscape approach to addressing invasive species and provide core areas from which expanded zones can be created in partnership with local landowners, communities, counties, states and federal agencies. Also, to provide a focus area for active weed groups to address invasive plants.

The Model

The first project combined two federal agencies' lands, private lands, and numerous partners to inventory, plan, control, demonstrate, and educate within a designated 720-acre invasive free zone. The project site includes the Whittlesey Creek National Wildlife Refuge, the Northern Great Lakes Visitor Center, and private lands within the Refuge boundary. The goal is to eliminate invasive plants on the entire area. An inventory is nearly complete, treatment and restoration have been initiated, and a management plan has been developed. The project has been multi-agency funded and is being led by the U.S. Fish and Wildlife Service. Project personnel would be available to assist in the establishment of new zones.

Significant attributes:

- Targets multiple non-native invasive plants (20+ species) on a contiguous landscape scale
- Incorporates restoration of native plants and wildlife habitat
- Encompasses several habitat types on a diverse, contiguous land base
- Integrates leadership, coordination, information management, education, detection, control
- One of a kind project with wide applicability
- Incorporates GIS-based location mapping and analysis
- Partners: Northern Great Lakes Visitor Center, U.S. Fish & Wildlife Service, U.S. Forest Service, Environmental Protection Agency, Lake Superior Binational Program, National Park Service, Northland College, Private Landowners (16)

Support of Ongoing Efforts

This idea compliments and helps fulfill invasive species actions identified in the Great Lakes Regional Collaboration strategic plan, the Midwest Natural Resource Managers Group (MNRG) "Action Plan for Addressing Terrestrial Invasive Species in the Great Lakes Basin", cooperative weed management area plans, the Lake Superior Lakewide Management Plan, agency invasive species plans, etc.

Funding

Agency funding plus grant dollars.

For more information, contact:

Darienne McNamara
Whittlesey Creek National Wildlife Refuge
29270 County Hwy G
Ashland, WI 54806
715-685-2648

We understand that collaboration is necessary for effective management of invasive species, and provides more access to resources and expertise.

We agree to take the Invasive Free Zone Challenge and commit to the following:

- apply an ecological approach to manage invasive species, working on a landscape-scale and across land ownership boundaries wherever possible
- coordinate with partners to achieve project goals
- ensure continuity in management activities by maintaining records such as:
 - species presence and abundance
 - mapping standards
 - treatment methods and efficacy
 - restoration activities
- utilize adaptive management, understanding that each site is unique and that lessons will be learned along the way
- become a supporter for the Invasive Free Zone concept
- advocate for more support of invasive species programs both within our agency/ organization and beyond
- collaborate with project staff at other Invasive Free Zone sites

We will establish an Invasive Free Zone at _____
to include _____ acres.

Signature

Date

Contact Person

Name: _____

Affiliation: _____

Address: _____

Phone: () _____ E-mail: _____



Notes



Notes

Invasive Free Zone

Guidebook

Printed September 2007

For more information,
or additional copies of this publication,
please contact:

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