Wild Rivers Invasive Species Coalition (WRISC)

Strategic Management Plan

2015-2017

Wild Rivers

Invasive Species Coalition

Approved June 3, 2015

MISSION

THE WILD RIVERS INVASIVE SPECIES COALITION (WRISC) IS A MULTI-PARTNER ORGANIZATION REPRESENTING FIVE COUNTIES IN TWO STATES. WRISC IS DEDICATED TO THE MANAGEMENT OF INVASIVE SPECIES ON OUR LANDS AND WATERS THROUGH COOPERATION, EDUCATION, PREVENTION, AND CONTROL.

INTRODUCTION/BACKGROUND

In 2009, the Wild Rivers Invasive Species Coalition (WRISC) was formed. The WRISC collaboration operates across a five county area in northeastern Wisconsin and the Upper Peninsula of Michigan. The group consists of formal Partners and informal members from local/state/federal/tribal agencies, businesses, individuals, and civic organizations, all committed to battling invasive species in the region. Formal Partners (Appendix A) express their support of WRISC by signing Memorandum of Understanding (MOU), but participation is strictly voluntary and WRISC welcomes the participation of informal cooperators as well.

Invasive species are recognized as a widespread and increasing problem with serious economic and ecological impacts on public and private lands and waters, as well as hazards to human health. Cooperation provides mutual benefits in managing invasive species across jurisdictional boundaries and improves working relationships between coalition members and the public.

To combat the threat of invasive species, WRISC outlined several goals in their 2011 Management Plan. In the world of invasive management, various policies, priorities, threats, research, and funding are constantly in flux. As such, the best way for WRISC to continue to combat the threat of invasive species is to take a strategic approach to its goals. As such the WRISC Strategic Management Plan was formed. This plan is intended to dynamic and adjusted as needed to address changing needs and priorities. The plan will be reviewed annually, with adjustments made as needed, and formally revised/updated every three years.

WRISC MANAGEMENT AREA

The WRISC management area is geographically defined as the lands and waters within the geopolitical boundaries of Florence, Forest, and Marinette counties in Wisconsin, and Dickinson and Menominee counties in Michigan. This area encompasses 5,208 sq. miles and a population of 105,673 (2010 census). Much of the management area is forested, with a large proportion under public ownership as national, state, or county forests. Various Native Americans also call the WRISC area home, which includes a portion of the ceded territory, and reservations for the Forest County Potawatomi Community, the Sokaogon Chippewa Community, and the Hannahville Indian Community.

LOCATION

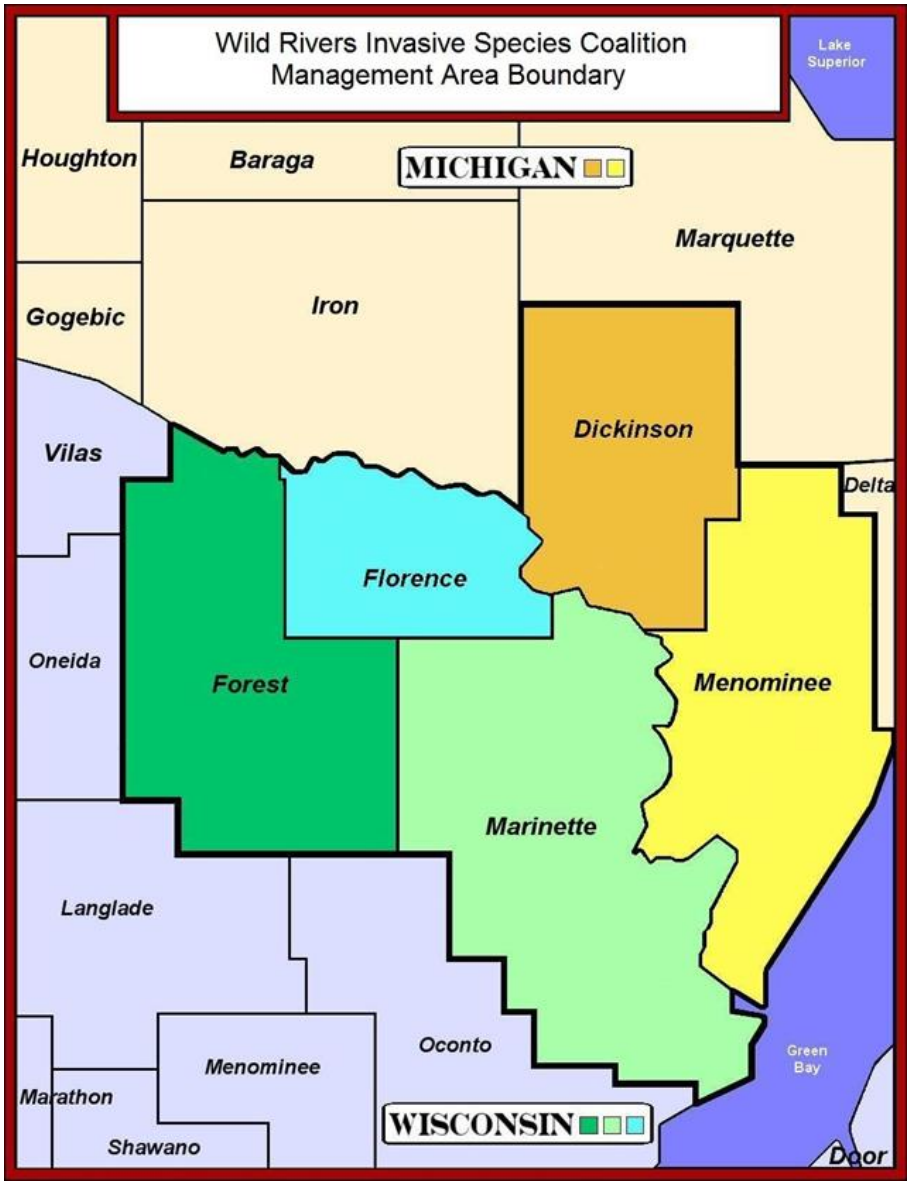

Figure 1. The WRISC Management area.

GOALS and OBJECTIVES

The primary goals of WRISC are: to raise public awareness about invasive species in Florence, Forest, and Marinette counties in Wisconsin, and Dickinson and Menominee counties in Michigan; prevent their introduction and spread through early detection and rapid response; address known populations of invasive species utilizing Integrated Invasive Species Management methods where appropriate; consider invasive species during restoration projects; and continually work to enhance collaboration among all stakeholders involved with WRISC.

Goal 1: Prevention through education.

Education is essential to meeting the goals of WRISC and its Partners. WRISC's educational outreach is focused on increasing awareness of the problem of invasive species and the role that humans play in spreading invasive plants and animals, and helping people take action in their own communities. Through education, the public can help to reduce the impact of invasive species in the WRISC management area. Community-based prevention measures can dramatically curtail the expansion of established populations.

Objective 1.1: Conduct education and training programs for Partners and members of the public to increase awareness of prevention and early detection measures.

Strategic Actions:

1. Conduct invasive species educational presentations across the entire WRISC area in public meeting areas such as libraries.
2. Assess and conduct targeted education and training for WRISC Partners.
3. Conduct outreach and targeted training programs for citizen groups: recreationists, clubs/associations, volunteer groups, youth groups, and others.
4. Connect with public officials and industry workers to conduct targeted training, including best management practices, for: road crews, foresters, private loggers, municipal workers, etc.
5. Incorporate the use of regional prevention campaigns/programs into WRISC education and outreach (Clean Boats Clean Waters, Stop Aquatic Hitchhikers, Play Clean Go, etc.).
6. Work with area schools to include invasive species education in the curriculum of elementary and high school students. Guide hands on learning through projects and field trips.
7. Develop cooperative workdays and projects for citizens and Partners across the WRISC area.
8. Provide WRISC representation and invasive species education at area meetings, conferences, and other functions.

Objective 1.2: Provide information via easily accessible means to the public at large.

WRISC will develop and distribute educational information in many forms for the general public and provide specific information to target audiences about the impacts of invasive species and the public's roles and responsibilities.

Strategic Actions

1. Obtain existing educational publications/resources from other agencies and Partners (ex. DNR, MIPN, USFS and Extension Services) to distribute at public functions (community events, school functions, county fairs, etc.)
2. Develop and maintain a WRISC educational brochure for the public; distribute at public functions and places (community events, local libraries, the Wild Rivers Natural Resource Center, etc).
3. Develop additional educational materials as able; distribute at public functions and places. Examples: pens, magnets, posters, signs, buttons, pamphlets, calendars, booklets, placemats, and other printed materials.
4. Provide targeted educational materials for various citizen and professional groups (recreational clubs, gardeners, plant industry workers, landowners, road crews, etc.).
5. Reach a vast audience of WRISC Partners and citizens through the internet:
    a. Maintain a WRISC email list and encourage citizens to join at public events. Use email list to inform the public of WRISC events and invasive species news.
    b. Provide accurate, detailed, and updated information on the WRISC Facebook page and website (www.wrisc.org).
    c. Maintain the WRISC email address (wildriverscwma@gmail.com) as a consistent and convenient contact for the public.
6. Utilize "traditional" media to further reach local residents (press releases, newspapers, radio, and television).
7. Increase the use of signage (billboards, metal signs, temporary signs, etc.) to reach outdoor recreationists and tourists at high traffic areas such as boatlandings, trailheads, and along roadways.
8. Maintain a quarterly WRISC newsletter; distribute online and via the WRSIC email list, make limited paper copies available at public functions and places.

Objective 1.3: Maintain up-to-date information on invasive species threats, management, and research.

Strategic Actions

1. Use a variety of resources (paper/digital publications, webinars, articles, professional contacts, etc.) to keep WRISC staff, Partners, and members of the public knowledgeable and up-to-date.
2. Encourage WRISC staff and Partners to attend local and regional invasive species conferences, conventions, and meetings as able.

3. Promote the sharing of information among Partners, members, natural resources professionals, and other interested parties.

Goal 2: Early Detection and Rapid Response

Once an invasive species is established in a new area, it can spread quickly and overwhelm local resources, making eradication costly, if not impossible. As such, WRISC places a high emphasis on detecting new species and populations of invasives early, and rapidly responding with control and eradication efforts. These control efforts are the most cost effective and provide a high return on investment.

Objective 2.1: Identify early detection targets.

Strategic Actions

1. Maintain the WRISC Priority Invasive Species (Appendix B) list to categorize species as Early Detection/Rapid Response, Manageable, or Widespread.
2. Update priority list annually, or as needed, to reflect the current state of invasive species in the WRISC area as well as new invasives identified by state agencies as early detection threats.
3. Identify locations within the WRISC management area in need of early detection mapping/monitoring. Examples include areas that have never been surveyed and areas deemed "high risk" as likely invasive entry/spread points (parks, roads, etc.).

Objective 2.2: Develop and enhance the capacity to detect priority invasive species populations.

Strategic Actions

1. Maintain standardized invasive species mapping protocols for use by WRISC staff and volunteers, compatible with the Midwest Invasive Species Information Network (MISIN) requirements.
2. Conduct invasive species survey work by WRISC staff using protocols and targeting areas and species identified in Objective 2.1. Use results to inform management planning.
3. Support invasive species surveys and reporting by WRISC cooperators, volunteers, and members of the public. Assist in identification of unknown species and facilitate reporting to MISIN.

Objective 2.3: Quickly respond to newly discovered/localized invasive species throughout the WRISC management area.

Strategic Actions

1. Maintain and develop cooperative relationships with regional natural resource managers and landowners; these relationships will help facilitate a quick response to reports of early detection species/populations.
2. Maintain WRISC owned tools and supplies for use by Partners and volunteers to control invasive species populations.
3. Use the WRISC prioritization tool to rank infestations for follow-up action: monitoring, further research needed, control/eradication. Conduct appropriate follow-up activities and improve/update the prioritization tool as needed.

Goal 3: Control and Management

WRISC recognizes the negative ecological and economic impacts caused by invasive species. As such, we support the control and management of invasives, even those for which eradication may not be possible. WRISC will support and encourage control/management of invasive species, participating directly as funding allows. The following objectives will allow management to be addressed strategically using information, prioritization, and integrated techniques, resulting in more effective and efficient results.

Objective 3.1: Collect, manage, and share invasive species location data to make informed control and management decisions.

Strategic Actions

1. Maintain an internal database/spreadsheet on invasive locations within the WRISC area.
2. Regularly update records with WRISC survey results, volunteer observations, data-sharing source information (ex. MISIN), and shared partner data.
3. Record details for each observation record: observer, date, species, population size, population density, control history, and landowner contact information.
4. Explore cost-efficient options for managing the location data, including: Microsoft Excel, Microsoft Access, and mapping software such as quantum GIS.
5. Regularly share invasive species location data with WRISC partners and local/regional/state natural resource managers. Report location data annually, or as needed, to the Midwest Invasive Species Information Network.

Objective 3.2: Prioritize species based on species' potential ecological and economic impacts, management objectives of infested areas, available resources, and landowner/land manager support.

Strategic Actions

1. As in Objective 2.1, maintain and update the WRISC Priority Invasive Species list (Appendix B).

2. Consider multiple factors and population characteristics when prioritizing control efforts, including: past control efforts, landowner/manager support, available resources, population size/density, risk of spread, ease of treatment and ecological/economic impacts.

Objective 3.3: Use an integrated approach to manage current invasive species populations.

Strategic Actions

1. Advocate Integrated Pest Management (IPM) practices, utilizing a combination of control techniques to effectively manage invasive populations on a case-by-case basis while limiting the economic and environmental impacts of treatment. A general overview of methods that may be employed is given below and in greater detail in Appendix C.
    a. Manual and Mechanical: Manual and mechanical techniques such as pulling, cutting, or otherwise stressing or physically removing plants can be used to control some invasive plants, particularly if the population is relatively small.
    b. Chemical: In some instances, herbicide application is the only practical way to control an invasive species due to the physiology of the plant or the extent of population.
    c. Biocontrol: Biological control ("biocontrol" for short) is the use of animals, fungi, or other microbes to feed upon, parasitize or otherwise stress a targeted pest species. Successful biocontrol programs significantly reduce the abundance of the pest or prevent the damage caused by the pest (e.g. by preventing it from feeding on valued crops).
    d. Cultural: Cultural control involves the use of methods such as flooding, smothering (covering with light barrier), controlled by wild land fires, or the use of cover vegetation to reduce the impact of invasive species.
2. When conducting control work with staff and volunteers, WRISC will adhere to all legal requirements regarding property ownership, herbicide application, and equipment use. Workers will follow all equipment and herbicide label instructions, and document landowner permission, required certifications, and records of control activities.
3. Provide landowners and land managers information on control and management options available for their own invasive species management projects.
4. Monitor and document results of control work and conduct follow-up treatments as needed and able.

Goal 4: Restoration

Objective 4.1: Include invasive species considerations in guidance for restoration and rehabilitation projects.

Strategic Actions

1. Advise land management agencies, townships, highway departments, landowners, and other interested parties on best management practices and appropriate restoration methods using native species.
2. Include restoration as a component in WRISC control efforts when and where appropriate.

Goal 5: Organizational Collaboration

The long-term success of WRISC is dependent on the structure and strength of the organization and Partnership. As such, one of WRISC's goals will be to maintain and strengthen our collaboration, which will expand our capacity to accomplish our other goals.

Objective 5.1: Maintain the WRISC organizational structure and Partnership.

Strategic Actions

1. Maintain an annually elected Board of Directors.
2. Maintain, and update as needed, WRISC's Memorandum of Understanding and By-Laws. Develop policies and procedures, as well as additional documents as needed.
3. Continue and encourage participation in WRISC Action Team committees.
4. Maintain at least one WRISC staff position to serve as the group coordinator and project manager.
5. Determine if organizational independence is desired and/or feasible, and create long-term goal(s) for WRISC's organizational status.

Objective 5.2: Work across jurisdictional and geographical boundaries to strengthen the coordination among current and potential Partners.

Strategic Actions

1. Actively recruit new formal Partners and informal members/cooperators for inclusion in the WRISC organization and WRISC activities.
2. Continually work to strengthen existing partnerships.
3. Maintain and expand communication among Partners and members through regular meetings, email/phone communication, website resources, and teleconferencing.

Objective 5.3: Seek funding opportunities to support WRISC activities.

Strategic Actions

1. Continue to seek funding through competitive grants and gifts, exploring federal, state, and local sources. The type and availability of funding opportunities is constantly changing and will be monitored.
2. Explore additional ways to raise undesignated funds: donations, sales, auctions/raffles, meeting fees, etc.
3. Funding opportunities will be reviewed on a regular basis with proposals being drafted and reviewed as able by WRISC staff, board/action team members, and financial administrator.
4. Funds will be administered through the Dickinson Conservation District (DCD), the fiscal agent for WRISC.
    a. For each grant WRISC is awarded, a copy of the approved grant application along with other necessary documentation will be sent to:

        Dickinson Conservation District
        420 N. Hooper Street
        Kingsford, MI 49802

    b. WRISC funds shall not be intermingled with DCD funds, instead being kept in a separate line item account. They shall be independently audited annually.
    c. The DCD shall be required to provide a treasurer's report to the Board of Directors bimonthly.

Appendix A: Wild Rivers Invasive Species Coalition Partners

Alliance of the Northern States Working to Ensure Regional Stability
Bay Lake Regional Planning Commission
Bureau of Land Management Northeastern States District
Central Upper Peninsula Planning and Development Regional Commission
Clean Kill Pest Control Inc.
Dickinson Conservation District
Florence County
Florence County Lakes and Rivers Association
Forest County Association of Lakes Inc.
Forest County Land and Water Resources Department
Lake Township (Menominee County)
Lumberjack Resource Conservation and Development Council
Many Waters LLC
Marinette County
Menominee Conservation District
Menominee County
Michigan Department of Natural Resources
Nicolet Sportsman's Club
School District of Florence County
Shakey Lakes Association
University of Wisconsin – Marinette
Upper Peninsula Resource Conservation and Development Council
USDA Forest Service, Chequamegon-Nicolet National Forest
USDA-NRCS Stephenson Field Office
USDA-NRCS Wisconsin
White Water Associates Inc.
Wisconsin Department of Natural Resources

Appendix B: Wild Rivers Invasive Species Coalition selected priority list of non-native invasive species.

Last updated: *3/12/2015 based on comments from Terrestrial Action Team, 3/18/2015 based on comments from AIS Action Team, final document presented to Board of Directors on June 3, 2015.*

Category Definition

This list is intended to serve as a guideline for WRISC staff/partners, as well as others managing invasive species in the WRISC five county area. Species are separated into three categories based on overall distribution across the five counties as well as other ranking considerations such as ecological and health threats. A species may be considered early detection in one area but more widespread in another. As such, when prioritizing control efforts managers should examine the local abundance of a species as well as the population size, density, and negative impacts to gauge its control priority. Please see the WRISC control prioritization tool for one way to assess and rank invasive infestations.

This list will be reviewed annually and adjusted as needed based on species distribution, updated research, and state regulation classifications.

Tier 1 – High Priority: For the most part, species in this category exist only in isolated, scattered populations. Several species on this list have yet to be found in the WRISC area, but may be classified as Restricted or Prohibited by the states, making them a detection priority. As such, species on this list are targets for early detection and rapid response efforts to prevent their introduction/spread, and to eradicate existing populations.

Tier 2 – Mid Priority: This category consists mostly of species that are more widespread than tier 1 species, but at levels still considered manageable. Species in this category can negatively impact natural areas, requiring control and management efforts, but due to their wider distribution eradication of the species may be unlikely.

Tier 3 – Low Priority: These species are considered low priority in the WRISC area. This category includes species considered very widespread in the area, making control efforts extremely difficult and reinfestation likely. Species that are not considered high ecological threats may also be added to this category.

State Legal Classification: P = Prohibited, R = Restricted

Species are chosen for regulation by state agencies based on the harm they pose to the state's environment, economy, and/or public health. In general, species that are more widespread or naturalized are restricted while less widespread species are prohibited. The transport, introduction, and sale of all regulated species is illegal. Possession is also illegal in some instances. (Exemptions are made for purposes of identification and control, permits are required for education/research.) In Michigan, it is illegal to possess any regulated species (this does not include species present on a person's property, which they did not knowingly introduce). In Wisconsin, it is only illegal to possess a prohibited species, and property owners are legally required to control prohibited species present on their property.

Note: For full details on invasive species state regulations, visit
http://dnr.wi.gov/topic/Invasives/classification.html for Wisconsin and
http://www.michigan.gov/dnr/0,4570,7-153-10370_59996-270798--,00.html for Michigan.

Common Name	Scientific Name	WI NR40 Classification	MI Classification
Tier 1 High Priority (Early Detection/Rapid Response)			
Asian clam	*Corbicula fluminea*	P	
Asian Longhorn Beetle	*Anoplophora glabripennis*	P	P
Black swallow-wort	*Cynanchum louiseae*	P/R (P in WRISC area)	
Brazilian waterweed (elodea)	*Egeria densa*	P	P
Winged Euonymous	*Euonymus alatus*	R	
Celandine	*Chelidonium maju*	P/R	
Chinese yam	*Dioscorea polystachya*	P	
Common Teasel	*Dipsacus fullonum subsp. sylvestris*	R	
Crazy Worm	*Amynthas agrestis*	R	
Curly-leaf Pondweed	*Potamogeton crispus*	R	R
Cut Leaved Teasel	*Dipsacus laciniatus*	R	
Dame's rocket	*Hesperis matronalis*	R	
Emerald Ash Borer	*Agrilus planipennis*	R	P
European Frogbit	*Hydrocharis morsus-ranae*	P	P
Faucet Snail	*Bithynia tentaculata*	P	
Flowering Rush	*Butomus umbellatus*	R	R
Garlic mustard	*Alliaria petiolata*	R	
Giant Hogweed	*Heracleum mantegazzianum*	P	P
Giant Knotweed	*Polygonum sachalinensis*	P	
Hemlock woolly adelgid	*Adelges tsugae*	P	
Hill Mustard	*Bunias orientalis*	P/R (P in WRISC area)	
HoundsTongue	*Cynoglossum officinale*	R	
Hydrilla	*Hydrilla verticillata*	P	P
Japanese barberry	*Berberis thunbergii*	R	
Japanese Hedgeparsley	*Torilis arvensis*	P/R (P in WRISC area)	
Japanese Hops	*Humulus japonicus*	P/R (P in WRISC area)	
Japanese Knotweed	*Polygonum cuspidatum*	R	P
Japanese stiltgrass	*Microstegium vimineum*	P	
Kudzu	*Pueraria lobata*	P	
Leafy Spurge, Cypress Spurge	*Euphorbia esula, E. cyparissias*	R	
Multiflora rose	*Rosa multiflora*	R	
Musk thistle	*Carduus nutans*	R	
New Zealand Mudsnail	*Potamopyrgus antipodarum*	P	P
Oriental bittersweet	*Celastrus orbiculatus*	R	
Pale Swallow-wort	*Cynanchum rossicum*	P	
Parrot Feather	*Myriophyllum aquaticum*	P	P
Phragmites (Non-native)	*Phragmites australis*	P/R (R in WRISC area)	R
Plumeless thistle	*Carduus acanthoides*	R	

Common Name	Scientific Name	WI NR40 Classification	MI Classification
Poison Hemlock	*Conium maculatum*	P/R (P in WRISC area)	
Porcelain berry	*Ampelopsis brevipedunculata*	P	
Quagga Mussel	*Dreissena bugensis*	P	R
Rainbow smelt	*Osmerus mordax*	R	
Red Swamp Crayfish	*Procambarus clarkii*	P	P
Round goby	*Neogobius melanostomus*	R	P
Ruffe	*Gymnocephalus cernuus*	R	P
Sea lamprey	*Petromyzon marinus*	R	
Servicea lespedeza	*Lespedeza cuneata*	P	
Spiny Waterflea	*Bythotrephes cederstroemi*	P	
Starry Stonewort	*Nitellopsis obtusa*	P	P
Tall manna grass	*Glyceria maxima*	P/R	
Three-spine stickleback	*Gasterosteus aculeatus*	R	
Tree of Heaven	*Ailanthus altissima*	R	
Watercress	*Nasturtium officinale*	C	
Wild chervil	*Anthriscus sylvestris*	P/R (P in WRISC area)	
Yellow flag iris	*Iris pseudoacorus*	R	P
Yellow Floating Heart	*Nymphoides peltata*	P	P
Yellow Star Thistle	*Centaurea solstitialis*	P	
Zebra Mussel	*Dreissena polymorpha*	R	R
Tier 2: Mid Priority Manageable			
Autumn olive	*Elaeagnus umbellata*	R	R
Black locust	*Robinia pseudoacacia*	R	
Bristly locust	*Robinia hispida*	R	
Bull Thistle	*Cirsium vulgare*		
Canada Thistle	*Cirsium arvense*	R	
Common Buckthorn	*Rhamnus cathartica*	R	
Common Burdock	*Arctium minus*		
Common mullein	*Verbascum thapsus*		
Common Tansy	*Tanacetum vulgare*	R	
Creeping bellflower	*Campanula rapunculoides*	R	
Crown vetch	*Coronilla varia*	R	
Eurasian honeysuckles	*Lonicera tatarica, L. morrowii and L. x bella*	R (all)	
Eurasian watermilfoil	*Myriophyllum spicatum*	R	R
European Marsh thistle	*Cirsium palustre*	P/R (R in WRISC area)	
Forget-me-not	*Myosotis arvensis, M. scorpioides, M. sylvatica*		
Glossy Buckthorn	*Frangula alnus*	R	
Purple Loosestrife	*Lythrum salicaria*	R	R
Russian olive	*Elaeagnus angustifolia*	R	
Siberian elm	*Ulmus pumila*	R	

Common Name	Scientific Name	WI NR40 Classification	MI Classification
Siberian pea	*Caragana arborescens*	proposed R	
Spotted knapweed (and other invasive knapweeds)	*Centaurea biebersteinii (and Centaurea spp.)*	R for Spotted, other species R or P	
White sweet clover	*Melilotus alba*		
Wild parsnip	*Pastinaca sativa*	R	
Winged Euonymous	*Euonymus alatus*	R	
Tier 3: Low Priority Widespread			
Banded mystery snail	*Viviparus georgianus*		
Bishop's Gout-weed	*Aegopodium podagraria*	R	
Brittle-stem hemp-nettle	*Galeopsis tetrahit*	R	
Butter-and-eggs	*Linaria vulgaris*		
Cattail hybrid	*Typha x glauca*	R	
Chinese mystery snail	*Cipangopaludina chinensis*	R	
Garden valerian	*Valeriana officinalis*		
Gypsy moth	*Lymantria dispar*	R	
Hairy vetch	*Vicia villosa*		
Narrow-leaved cattail	*Typha angustifolia*	R	
Phragmites (Non-native): Lake MI shoreline	*Phragmites australis*	R	R
Reed canary grass	*Phalaris arundinacea*		
Rusty Crayfish	*Orconectes rusticus*	R	R
St. John's-wort	*Hypericum perforatum*		
Sweet William	*Dianthus barbatus*		
White Poplar	*Populus alba*	R	

Appendix C. Integrated pest management techniques that may be utilized by WRISC.

Manual and Mechanical: Manual and mechanical techniques such as pulling, cutting, or otherwise stressing plants can be used to control some invasive plants, particularly if the population is relatively small. In some cases, this may be the only effective control technique. These techniques can be extremely specific, minimizing damage to desirable plants and animals, but they are generally very laborious and time intensive. Manual treatments must typically be administered several times to prevent a weed from re-establishing. During the course of treatment, laborers and equipment may severely trample vegetation and disturb the soil, providing suitable conditions for re-invasion of the same or other invasive species. Manual and mechanical techniques are generally favored if the population is small or if a large pool of volunteer labor is available. Manual control is also frequently used in combination with other techniques. For example, shrubs may be pulled and cut (manual treatment) and re-sprouts and seedlings may be treated with herbicides (chemical treatment) or fire (cultural alternative) several weeks or months later.

Chemical: In some instances, herbicide application is the only practical way to control an invasive species due to the physiology of the plant or the extent of population. Although chemical controls (i.e., herbicides) are an effective means of controlling unwanted vegetation, they may also have the most adverse consequences. The risk of using an herbicide must be weighed against the negative impact of the invasive species on the area of concern, and the effectiveness of chemical control should be compared to other control methods. Many herbicides contain the same active ingredients but are designed for either terrestrial or aquatic applications. Prior to using an herbicide, it is critical to research product effectiveness against the target plant, product guidelines and legal constrains for its use. An herbicide must be registered for use in the state where plant control will take place. It is also important to read the entire label prior to mixing and application. Information on the proper use of an herbicide, including procedures related to the rate and timing of application, transportation, storage, cleanup, and emergency situations, must be followed at all times. Only a state-certified pesticide applicator with the appropriate licensing for the given habitat will apply chemical treatments on site.

Biocontrol: Biological control (“biocontrol” for short) is the use of animals, fungi, or other microbes to feed upon, parasitize or otherwise stress a targeted pest species. Successful biocontrol programs significantly reduce the abundance of the pest or prevent the damage caused by the pest (e.g. by preventing it from feeding on valued crops). Biocontrol is often seen as a progressive and environmentally friendly way to control pest organisms. Biocontrol leaves no chemical residues that might harm humans or other organisms and, when successful, can provide essentially permanent, widespread control with a very favorable cost-benefit ratio. Any pest control method has the potential to harm non-target native species, therefore, before releasing a biocontrol agent (or using other methods) it is important to balance its potential benefit to conservation targets and management goals against its potential to cause harm. Only state approved and accepted bio-control methods will be utilized.

Cultural: Cultural control involves the use of methods such as flooding, smothering (covering with light barrier), controlled by wild land fires, or the use of cover vegetation to reduce the impact of invasive species. The feasibility of such methods is related to the size of the population, the location and the regulatory and permitting processes for flooding and burning. The use of cultural methods is best suited to small scale applications, such as local homeowners or small businesses through the use of noninvasive plantings and mulch.