



Wisconsin's Forestry

**Best
Management
Practices**

For Invasive Species

APPENDICES

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Appendix A: Brief Overview of Control Methods

Manual control techniques include activities such as hand-pulling, digging, flooding, mulching, burning, removal of alternate hosts, and manual destruction or removal of nests, egg masses or other life stages. These techniques work best on small populations or in areas where chemicals or motorized equipment cannot be used. Manual control efforts must be persistent and several treatments may be needed to reduce or eliminate the target population. If infestations are too pervasive, manual control may become labor intensive and thus not economically feasible.

Mechanical control techniques include hoeing, cutting, girdling, tilling, mowing, chopping and constructing barriers using tools or machines. These techniques are most useful in areas with large infestations where terrain does not create safety or equipment issues. Repeated mowing or cutting of invasive plants can weaken the population by depleting root reserves and preventing flowering; however, mechanical control is typically most effective when used in conjunction with herbicide treatments. If infestations are small, the cost of mechanical control is usually relatively low, and when combined with other treatments it can be very effective. However, cutting large populations of woody invasive plants can become labor and resource intensive.

Chemical control refers to the use of pesticides, and for all practical purposes, some invasive organisms cannot be controlled without the use of pesticides. There are many kinds of herbicides, insecticides, and fungicides, and not all of them will be appropriate for every situation. The choice of pesticide depends on the target population, stage of growth, the presence of desirable species that may be affected, the proximity of water resources and environmental conditions. Additionally, there may be some areas where chemical control is inappropriate, for example if rare species are present. Pesticides must always be applied in accordance with the label. Landowners should possess the proper equipment and the knowledge to safely apply chemicals or hire a licensed applicator. Proper personal protection gear should be used, and materials to contain spills should be kept close by. Major invasive plant infestations may require complete stand removal, using herbicides to remove the invasives after harvest, and establishing a plantation of native tree species.

Biological control refers to the use of animals, fungi, or diseases to control invasive populations. Control organisms usually come from the native range of the target species, and require a period of study to ensure that they will remain specific to the target population, and will not harm native species, crops, or other ornamental species. Biological control typically does not eliminate the invasive species, and usually takes several years to show results. However, biological control has been effective for some species. Examples include the *Galerucella* beetle which has been used with some success to control the European perennial purple loosestrife (*Lythrum salicaria*), and two species of parasitic wasp (*Agathis pumila* and *Chrysocharis laricinellae*) which were introduced to control larch casebearer (*Coleophora laricella*) infestations in tamarack.

Cultural Control is the manipulation of forest structure and composition to control invasive species or the alteration of the stand so that effects will be limited if invasion occurs. Trees that

are potentially susceptible host species can be reduced as a component of the stand, thus limiting population outbreaks of insects and disease-causing organisms. Alternately, species that are resistant to invasive insects and diseases may be planted instead of nonresistant species. Other examples of cultural control activities include maintaining a level of canopy closure that impedes shade intolerant invasive species, or developing advanced regeneration that can compete with invasive plants before removing the overstory. For drastically disturbed sites, cultural control may include the replacement or restoration of the plant community through cultivation—cutting, tilling, re-seeding, fertilizing, and irrigating—to reduce the weed seed bank prior to planting desirable species and prevent or reduce future weed infestations.

Appendix B: Regulations

Invasive Plant Statutes and Codes

Wisconsin Statutes <http://www.legis.state.wi.us/rsb/stats.html>

See left navigation area to search for a specific Statute in the website's *Infobase* or go to a Statute Chapter.

15.34 Department of natural resources; creation.

15.347 Same; councils.

(18) INVASIVE SPECIES COUNCIL

History: 1973 c.74; 1991 a.316; 2001 a.16.

23.22 Invasive species.

Cross Reference: See also ch. NR 198, Wis. adm. code.

History: 2001 a. 109 ss. 72t, 72xd; 2003 a. 33.

23.235 Nuisance weeds.

History: 1987 a. 41; 1999 a. 150 s. 616; Stats. 1999 s. 23.235; 2001 a. 16; 2001 109 ss. 72td to 72wj.

26.02 Council on forestry.

History: 2001 a. 109.

28.04 Management of state forests.

History: 1995 a. 257.

Cross Reference: See also ch. NR 44 and s. NR 1.24, Wis. adm. code.

66.0407 Noxious weeds.

History: 1975 c. 394 s. 12; 1975 c. 421; Stats. 1975 s. 66.96; 1983 a. 112, 189; 1989 a. 56 s. 258; 1991 a. 39, 316; 1997 a. 287; 1999 a. 150 ss. 617 to 619; Stats. 1999 s. 66.0407.

94.38 Agricultural and vegetable seeds; definitions.

History: 1975 c. 39, 308; 1983 a. 189; 1985 a. 138; 1993 a. 112.

94.39 Seed labeling requirements.

History: 1975 c. 39, 308; 1985 a. 138.

94.41 Prohibitions.

History: 1973 c. 194, 195; 1985 a. 138; 1993 a. 492.

94.45 Powers and authority of the department [Department of Agriculture].

History: 1975 c. 39, 308; 1983 a. 189 s. 329 (20).

Cross Reference: See also ch. ATCP 20, Wis. adm. code.

Administrative Code <http://www.legis.state.wi.us/rsb/code.htm>

See left navigation area to search for a specific Statute in the website's *Infobase* or go to a Code Chapter (look under "NR Natural Resources".)

<http://www.legis.state.wi.us/rsb/code/codtoc.html>

NR 150.025 Policy.

History: Register, February, 1981, No. 302, eff. 3-1-81; renum. (2) (g) and (h) to be (2) (h) and (i), cr. (2) (g), Register, February, 1984, No. 338, eff. 3-1-84; am. (2) (e), Register, January, 1987, No. 373, eff. 2-1-87.

NR 1.211 Cooperative forestry policy.

History: Cr. Register, July, 1989, No. 403, eff. 8-1-89.

NR 44.04 Master plan development, adoption and public involvement.

History: Cr. Register, August, 1996, No. 488, eff. 9-1-96.

Insects and Diseases Statutes

Wisconsin Statutes <http://www.legis.state.wi.us/rsb/stats.html>

See left navigation area to search for a specific Statute in the website's *Infobase* or go to a Statute Chapter: <http://www.legis.state.wi.us/rsb/Statutes.html>

Wisconsin Statutes that apply to the Department of Natural Resources (WDNR):

26.30 Forest insects and diseases; department jurisdiction; procedure.

History: 1977 c. 29 s. 1650m (1); 1979 c. 32 s. 92 (9); 1979 c. 110 s. 60 (11); 1983 a. 189; 1985 a. 13; 1991 a. 316; 2003 a. 33, 57.

Cross Reference: See also s. NR 47.910, Wis. adm. code.

Wisconsin Statutes that apply to the Department of Agriculture, Trade and Consumer Protection (WDATCP):

94.01 Plant inspection and pest control authority.

History: 1975 c. 394 s. 18; Stats. 1975 s. 94.01.

Cross Reference: See also ch. ATCP 21, Wis. adm. code.

94.02 Abatement of pests.

History: 1975 c. 394ss. 5, 19; 1975 c. 421; Stats. 1975 s. 94.02; 1977 c. 418; 1981 c.20.

94.03 Shipment of pests and biological control agents; permits.

History: 1975 c. 394 ss. 6, 17; 1983 a. 189 s. 329 (20).

94.10 Nursery stock; inspection and licensing.

History: 1975 c. 394 ss. 20, 22; 1975 c. 421; Stats. 1975 s. 94.10; 1983 a. 189; 1989 a. 31; 1993 a. 16; 1995 a. 27; 1999 a.9.

94.685 Pesticides; licensing of dealers and distributors of restricted-use pesticides.

History: 1987 a. 27; 1991 a. 269; 1993 a. 16, 490; 1997 a. 27.

Cross Reference: See also chs. ATCP29, 30, and 31 and ss. ATCP 160.19 and 160.21, Wis. adm. code.

94.69 Pesticides; rules.

History: 1975 c. 94s. 91 (10); 1977 c. 106; 1983 a. 410; 1997 a. 27, 237.

Cross-reference: See s. 94.709 for prohibition of use of DDT and exceptions to the prohibition.

Cross Reference: See also chs. ATCP 29, 30, and 31 and ss. ATCP 160.19 and 160.21, Wis. adm. code.

Wisconsin Statutes that apply to both the Department of Agriculture, Trade and Consumer Protection (WDATCP) and the Department of Natural Resources (WDNR):

146.60 Notice of release of genetically engineered organisms into the environment.

History: 1989 a. 15; 1993 a. 213; 1995 a. 27 s. 9126 (19); 1997 a. 283; 2001 a. 109.

Appendix C: Resources

Invasive Plants (See also *All Invasives*):

Center for Invasive Plant Management (CIPM). <http://www.weedcenter.org>

This web site provides information on invasive plant identification, biology, and impacts of invasive species. It also includes links to a resource guide, weed control methods, and invasive plant management online textbook.

Great Lakes Indian Fish and Wildlife Commission (GLIFWC)—Exotic Plant Information Center.

<http://www.glifwc.org/invasives/> This site features a searchable database of invasive species accounts. It also provides distribution maps, educational materials, and a slide library.

Invasive Plants Association of Wisconsin (IPAW). <http://www.ipaw.org>

The mission of IPAW is to promote better stewardship of the natural resources of Wisconsin by advancing the understanding of invasive plants and encouraging the control of their spread. Their web site offers a photo gallery, invasive species list, educational resources, news and events, and more.

Midwest Invasive Plant Network (MIPN). <http://www.mipn.org/>

This organization's mission is to reduce the impact of invasive plant species in the Midwest. The web site provides information on prevention, early detection and rapid response, control and management, education, research, and more.

Plant Conservation Alliance (PCA), Weeds Gone Wild, Alien Plant Invaders of Natural Areas.

<http://www.nps.gov/plants/alien/> This web site provides a list of invasive plants in the US, background information on the threats and impacts of invasive species, fact sheets, and relevant links.

University of Wisconsin Herbarium. <http://www.botany.wisc.edu/wisflora>

The Herbarium's web site is fully searchable for Wisconsin's vascular plant species. It includes photos, habitat information, distribution maps, and herbarium specimen data.

Invasive Insects and Diseases (See also *All Invasives*):

Department of Agriculture Trade and Consumer Protection (DATCP).

<http://www.datcp.state.wi.us/core/insectspesticides/insectspesticides.jsp>

DATCP is responsible for the prevention, introduction and spread of plant pests. This webpage provides information on specific pests, rules, firewood restrictions, and firewood dealer certification.

Department of Agriculture Trade and Consumer Protection (DACTP)—Wisconsin Pest Bulletin.
<http://pestbulletin.wi.gov/index.jsp> The most relevant links are: *Nursery and Forest, Exotic Pest of the Week*, and *DATCP Contacts*.

Emerald Ash Borer: What you need to know. <http://www.emeraldashborer.info/> This web site is part of a multi-state effort to provide the latest information about EAB to the public.

National Agricultural Pest Information System (NAPIS)—Pest Tracker.

<http://ceris.purdue.edu/napis/> This web site has links to state information, pest information, survey maps and publications. Information presented here is derived, in part, from the National Agricultural Pest Information System (NAPIS), an agricultural pest tracking and database sponsored by the US Department of Agriculture Animal and Plant Health Inspection Service (APHIS) and Plant Protection and Quarantine (PPQ) Cooperative Agricultural Pest Survey, (CAPS).

The Exotic Forest Pest Information System for North America.

<http://spfnic.fs.fed.us/exfor/index.cfm> This web site contains a database of invasive insects, mites, and diseases with background information for each pest.

U S Department of Agriculture (USDA) Animal Plant Health Inspection Service (APHIS).

http://www.aphis.usda.gov/plant_health/ APHIS safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests. The site has links to information on specific plant pests, pest detection and identification information, and plant protection and quarantine manuals.

US Department of Agriculture (USDA) Forest Service—North Central Research Station: Emerging Forest Insect Pests.

http://www.ncrs.fs.fed.us/4501/focus/emerging_pests/ The North Central Research Station web site provides information on exotic forest insects, describes current research, and features publications and maps for a 20-state region spanning the Midwest and Northeast.

Wisconsin Gypsy Moth. <http://www.gypsymoth.wi.gov/> The Wisconsin Gypsy Moth site has information on predicting defoliation, management options, identification, and life cycle and includes the phone number for the Gypsy Moth Information Line.

Wisconsin's Emerald Ash Borer Resource. <http://emeraldashborer.wi.gov/> This site includes information on surveys, detection, and management, and includes an email address and phone number to report suspected infestations.

All Invasives:

National Invasive Species Council's Definition of Invasive Species.

<http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf>

National Invasive Species Management Plan.

<http://www.invasivespeciesinfo.gov/council/nmp.shtml>

The Nature Conservancy (TNC)—Global Invasive Species Initiative.

<http://tncweeds.ucdavis.edu> This web site provides many resources designed to help conservationists deal most effectively with invasive species. It provides links to an introduction on invasive species management, planning and strategy, control methods, and photo archive and more.

USDA Forest Service Invasive Species Program. <http://www.fs.fed.us/invasivespecies> This web site serves as a portal to Forest Service invasive species information and related management and research activities across the agency and with partners. The program's goal is to reduce, minimize, or eliminate the potential for introduction, establishment, spread, and impact of invasive species across all landscapes and ownerships.

Wisconsin Council on Invasive Species. <http://dnr.wi.gov/invasives/iscouncil.htm>

This site includes a link to the comprehensive state management plan.

Wisconsin Department of Natural Resources (WDNR). <http://dnr.wi.gov/invasives>

The Invasive Species webpage provides links to invasive species information including a photo gallery, complete plant and animal invasive species lists, and information on managing invasive species populations.

General Sites of Interest:

University of Wisconsin Extension. <http://www.uwex.edu/locations/> The Extension has offices in every county in Wisconsin.

University of Wisconsin Forestry Extension. <http://www.forest.wisc.edu/extension/index.html>

This site has publications, internet resources, and other materials related to forests, their management, and the wood products industry in Wisconsin. It includes a link to the popular *Forestry Facts* series.

Wisconsin Department of Natural Resources (WDNR). List of Native Plant Nurseries and Restoration Consultants in Wisconsin.

<http://dnr.wi.gov/org/land/er/plants/nurseries.htm> The list includes nurseries within 100 miles of Wisconsin that may be able to provide native seed and/or plants for your projects. Consultants provide services such as design, landscape installation, and maintenance services including prescribed burning.

Wisconsin Department of Natural Resources (WDNR). State Nursery Program.

<http://dnr.wi.gov/forestry/nursery/> The DNR operates three forest tree nurseries: the Wilson State Nursery in Boscobel, the Griffith State Nursery in Wisconsin Rapids, and the Hayward State Nursery in Hayward. Trees are sold for reforestation, wildlife habitat, and erosion control purposes.

Wisconsin Family Forests (WFF). <http://www.wisconsinfamilyforests.org/>

This organization is a non-profit that works with professional wildlife managers, foresters and experienced woodland owners who act as advisors to other forest owners.

Wisconsin Forest Management Guidelines (PUB-FR-226 2003).

<http://www.dnr.state.wi.us/forestry/publications/Guidelines/toc.htm>

The Guidelines serve as a practical reference guide to responsible resource management.

Wisconsin Prescribed Fire Council. <http://www.prescribedfire.org/index.html> The Wisconsin Prescribed Fire Council strives to make the use of prescribed fire in Wisconsin safer and more accepted for all practitioners. The site provides information and links on government relations, liability, training, weather, and fire implementation.

Wisconsin Woodland Owners Association (WWOA). <http://wisconsinwoodlands.org>

This organization is a nonprofit educational organization established to advance the interests of woodland owners and the cause of forestry, develop public appreciation for the value of Wisconsin's woodlands and their importance in the economy and overall welfare of the state, foster and encourage wise use and management of Wisconsin's woodlands for timber production, wildlife habitat and recreation, and educate those interested in managing Wisconsin's woodlands.

General Invasive Plant Management:

Center for Invasive Plant Management (CIPM)—Weed Control Methods.

<http://www.weedcenter.org/management/control.htm>

The Weed Control Methods web page offers information and links on the following control techniques: biocontrol, grazing, herbicides, mechanical and prescribed burning.

Department of Conservation and Natural Resources Invasive Exotic Plant Tutorial for Natural Land Managers. Invasive Exotic Plants in Pennsylvania List.

<http://www.dcnr.state.pa.us/forestry/invasivetutorial/List.htm>

Although this site is for Pennsylvania most of the species featured are also invasive in Wisconsin. The site provides links to fact sheets and management and control recommendations.

Garlic mustard (Alliaria petiolata)—Guide for identifying and controlling.

<http://www.for-wild.org/download/garlicmustard.pdf>

Illinois Nature Preserve Management Guidelines.

http://dnr.state.il.us/INPC/Management_guidelines.htm The information presented gives guidance to landowners, managers, custodians and stewards of sites in the Illinois Nature Preserve Programs on control methods for common invasives.

Invasive Plants of the Upper Midwest by Elizabeth J. Czarapata. This book is a comprehensive, fully-illustrated guide to the identification and control of invasive plant species. Available for purchase at www.ipaw.org.

Plant Conservation Alliance—Alien Plant Invaders of Natural Areas.

<http://www.nps.gov/plants/alien/factmain.htm> This web site features illustrated, easy-to-read fact sheets on select invasive plants with native ranges; plant descriptions; ecological threats; US distributions and habitats; background of introductions; plant reproduction and dispersal; management approaches; alternative native plants; and other useful information.

The Nature Conservancy (TNC)—Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas. <http://tncweeds.usdavis.edu/handbook.html>

The handbook provides detailed information on the use of manual and mechanical techniques, grazing, prescribed fire, biocontrol, and herbicides for use in controlling invasive species in natural areas.

USDA Forest Service Invasive Species Program—Control and Management.

<http://www.fs.fed.us/invasivespecies/controlmgmt/index.shtml> This page provides links for more information on research, management planning, forest service activities, and pest-specific control and management.

US Forest Service—Dangerous Travelers: Controlling Invasive Plants along America's Roadsides (Video). <http://www.fs.fed.us/invasivespecies/> The video outlines the best management practices that road crews should be following in their day-to-day operations. This is the first in a series on “Best Management Practices for Invasive Species Prevention.” The video can also be ordered on DVD by contacting: USDA Forest Service; San Dimas Technology and Development Center; 444 East Bonita Avenue; San Dimas, CA 91773; (909) 599-1267

Wisconsin Department of Natural Resources (WDNR). Wisconsin Manual of Control Recommendations: Ecologically Invasive Plants.

http://dnr.wi.gov/invasives/publications/manual/manual_toc.htm

Biocontrol:

Invasive Plants of the Eastern U S—Biological Control of Invasive Plants in the Eastern United States. (USDA Forest Service Publication FHTET-2002-04, 413 p.)

<http://www.invasive.org/eastern/biocontrol> This web site serves as a reference guide for field workers and land managers concerning the historical and current status of the biological control of select invasive plants in the eastern United States.

Cornell University. Biological Control: A Guide to Natural Enemies in North America.

<http://www.nysaes.cornell.edu/ent/biocontrol/> This web site provides photographs and descriptions of biocontrol agents of insect, disease and weed pests in North America.

Grazing:

University of Idaho Rangeland Ecology and Management. Targeted Grazing: A Natural Approach to Vegetation Management and Landscape Enhancement.

<http://www.cnr.uidaho.edu/rx-grazing/Handbook.htm> The handbook outlines the basics of applying targeted grazing for vegetation management. This handbook includes 18 chapters and represents a compilation of the latest research on harnessing livestock to graze targeted vegetation in ways that improve the function and appearance of a wide variety of landscapes.

Prescribed fire:

California Invasive Plant Council—The Use of Fire as a Tool for Controlling Invasive Plants.

<http://www.cal-ipc.org/ip/management/UseofFire.pdf>

This document contains information on the following: planning and implementing prescribed burns, control of invasive plants with prescribed fire, using prescribed burning in integrated strategies, effects of fire on plant communities, effects of fire on chemical, physical, and biotic properties of soil.

Center for Invasive Plant Management (CIPM)—Fire As a Tool For Controlling Nonnative Invasive Plants. http://www.weedcenter.org/management/burning_weeds.pdf

This review focuses on the intentional use of fire, alone or integrated with other methods, to control exotic plants in North America.

The Nature Conservancy (TNC)—Fire Management Manual. <http://www.tncfiremanual.org/index.htm>

The manual serves as the Conservancy's guiding document on all aspects of wildland fire management.

USDA Forest Service—Fire Effects Information System (FEIS).

<http://www.fs.fed.us/databas/feis/>. FEIS features a searchable database that summarizes and synthesizes research about living organisms in the United States —their biology, ecology, and relationship to fire.

Wisconsin Prescribed Fire Council. <http://www.prescribedfire.org/index.html> The Wisconsin Prescribed Fire Council strives to make the use of prescribed fire in Wisconsin safer and more accepted for all practitioners. The site provides information and links on government relations, liability, training, weather, and fire implementation.

Herbicide:

Department of Agriculture Trade and Consumer Protection (DATCP)—Pesticide Database Searches. <http://www.kellysolutions.com/wi/> Use this site to search for registered pesticide products, the companies that sell and use pesticides, and the people that apply them.

Herbicide safety information—Material Data Safety (MDS) sheets and product labels.

<http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=>

The Nature Conservancy (TNC)—Safe Herbicide Handling in Natural Areas: A Guide for Land Stewards and Volunteer Stewards. <http://tncweeds.ucdavis.edu/products/library/herbsafe.pdf>

The Nature Conservancy (TNC)—Upkeep and Maintenance of Herbicide Equipment: A guide for natural area stewards. <http://tncweeds.ucdavis.edu/products/library/herbupkeep.pdf>

Early Detection and Rapid Response:

iMapInvasives: Geotracking invasive exotic species. <http://imapinvasives.org/index.html>

A consortium developed an on-line GIS-based invasive species mapping tool designed to aid in Early Detection and Rapid Response efforts. The site allows one to display maps and query by invasive species or contributing organization. Currently the site has only sample plant data for the state of New York. Long-term goals for the site include seeking participation of additional states and/or provinces.

National Biological Information Infrastructure (NBII). National Framework for Early Detection, Rapid Assessment, and Rapid Response to Invasive Species.

[http://159.189.176.5/portal/community/Communities/Ecological_Topics/Invasive_Species/Early_Detection,_Rapid_Response_\(EDRR\)/](http://159.189.176.5/portal/community/Communities/Ecological_Topics/Invasive_Species/Early_Detection,_Rapid_Response_(EDRR)/) This framework includes seven main components: 1) identification and validation, 2) reporting, 3) expert verification, 4) occurrence databases, 5) rapid assessment, 6) planning, 7) rapid response.

The Nature Conservancy (TNC)—Weed Information Management System (WIMS).

<http://tncweeds.ucdavis.edu/wims.html> WIMS is a Microsoft Access-based relational database application that is designed to assist natural resource managers in managing their weed data.

The North American Weed Management Association. <http://www.nawma.org/> The North American Weed Association has developed a data collection standard for invasive plant monitoring in the western United States and it has been adopted by several federal agencies, including US Forest Service and the National Park Service. At the home page, scroll down to “Mapping Standards” link.

USDA Forest Service. The Early Warning System for Forest Health Threats in the United States.

http://www.fs.fed.us/foresthealth/publications/EWS_final_draft.pdf

This is a monitoring framework for early detection and response to environmental threats (e.g., insects, diseases, invasive species, and fire) to forest lands. The framework is based on the following steps: 1) identify potential threats, 2) detect actual threats, 3) assess impacts, and 4) respond.

Wisconsin Department of Natural Resources/ University of Wisconsin-Madison Herbarium—Invasive Plants of the Future. <http://dnr.wi.gov/invasives/futureplants/>

This monitoring and early reporting project has three main goals: 1) identify and report populations of high-risk early-stage target weed species in Wisconsin; 2) eliminate or contain those populations before they spread; and 3) coordinate long-term monitoring of occurrence sites. All land managers are encouraged to participate in this program.

Prioritizing Management:

NatureServe—An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impacts on Biodiversity.

<http://www.natureserve.org/library/invasiveSpeciesAssessmentProtocol.pdf>

The Invasive Species Assessment Protocol was developed as a tool for assessing, categorizing, and listing non-native invasive vascular plants according to their impact on biodiversity in a large area such as a nation, state or province, or ecological region. This protocol is designed to make the process of assessing and listing invasive plants objective and systematic.

Animal and Plant Health Inspection Service (APHIS)—Weed-Initiated Pest Risk Guidelines for Qualitative Assessments.

http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra.pdf

This document provides a template for conducting pest risk analysis: initiating the process by identifying a pest that may qualify as a quarantined pest, and/or pathways that may allow introduction or spread of a quarantine pest; and assessing pest risk (determining which pests are quarantine pests, characterized in terms of likelihood of entry, establishment, spread, and economic importance.)

Invasive Species Plant Lists:

Chequamegon-Nicolet National Forest, Invasive Plants of Immediate Concern.

http://www.fs.fed.us/r9/cnnf/natres/nnis/species_list.html

Invasive Plant Association of Wisconsin, Working List of Invasive Plants in Natural Plant Communities and Wild Areas of the State.

<http://www.ipaw.org/list/list1.htm?n0>

USDA Forest Service, Invasive Plants Field and Reference Guide: An Ecological Perspective of Plant Invaders of Forests and Woodlands.

http://www.na.fs.fed.us/pubs/misc/ip/ip_field_guide.pdf

USDA PLANTS Database. Invasive and Noxious Weeds.

<http://plants.usda.gov/java/noxiousDriver> This database provides information about the vascular plants, mosses, liverworts, hornworts, and lichens of the US, including invasive plants. It includes species distribution, characteristics, species abstracts, images, references and links to more information.

*Wisconsin DNR, Program Feasibility Study: Invasive Plants in Forests
Plants Currently a Problem in Wisconsin's Forests (p.6-12).*

<http://dnr.wi.gov/org/land/forestry/Publications/pdf/InvasivePlantStudy.pdf>

WDNR Target Invasive Plants of the Future.

<http://dnr.wi.gov/invasives/futureplants/target.htm>

Insects and Diseases Lists:

*Wisconsin DNR Forest Health Protection Unit's Annual Report:
Forest Health Conditions in Wisconsin, 2005.*

<http://dnr.wi.gov/org/land/forestry/fh/pdf/AnnualReport2005.pdf>

USDA Forest Service Invasive Species Program Web pages.

<http://www.fs.fed.us/invasivespecies/speciesprofiles/index.shtml>

USDA Forest Service North Central Research Station.

http://www.ncrs.fs.fed.us/4501/focus/emerging_pests/

*The Nature Conservancy's Invasive Species Initiative Regional List of Pests, 2004 (scroll down
to Midwest region, but note that this covers from MI to ND, south to TX).*

<http://tncweeds.ucdavis.edu/products/gallery/regionlist.html>

Appendix D: Financial Assistance for Controlling Invasives

Invasive Plants:

Conservation Reserve Program (CRP)

CRP is a federal program administered by the Farm Service Agency (FSA) with NRCS and DNR providing technical advice. It is an annual payment program based on bids submitted by the landowner, offering a 50% cost-share for establishing ground cover and agreeing not to farm the land. Cost sharing is available for plan preparation, tree planting, wildlife planting, grass establishment, erosion control structures, and stream buffers. For more information, go to: <http://www.wi.nrcs.usda.gov/programs/crp.html>.

Conservation Technical Assistance (CTA)

The CTA Program provides the technical capability, including direct conservation planning, design, and implementation assistance, that helps people plan and apply conservation on the land. This assistance is provided to individuals, groups, and communities who make natural resource management decisions on private, tribal, and other non-federal lands. NRCS, through the CTA Program, provides conservation technical assistance that addresses natural resource conservation issues at the local level that are of state and national concern. <http://www.nrcs.usda.gov/programs/cta/>

Cooperative Forest Health Management Program

This is a US Department of Agriculture grant and partnership program to fund weed management activities on state and private forest lands. Eligible entities include Cooperative Weed Management Areas, states, and non-profit organizations. This program requires a 50% match. For more information contact Rob Mangold at (703) 605-5340 or rmangold@fs.fed.us.

Environmental Quality Incentives Program (EQIP)

EQIP is a federal program administered by the NRCS, with DNR Forestry providing technical advice for forested lands. This program provides up to a 75% cost share, with 65% of funds allocated to priority areas and the remainder available statewide. Contracts are for five or ten years. Maximum cost shares set by the program are currently \$10,000 annually and \$50,000 per contract. Cost sharing is available for tree planting, ecosystem management including prescribed burning and brush management, erosion control, agricultural waste management, and stream buffers. For more information, go to: <http://www.wi.nrcs.usda.gov/programs/eqip.html>.

Forest Land Enhancement Program (FLEP)

FLEP was authorized by the 2002 Farm Bill, but was not re-funded in 2004, so funding under this program is not currently available. It replaced the Stewardship Incentives Program (SIP) and the Forestry Incentives Program (FIP). FLEP provided technical, educational, and cost share assistance to non-industrial private forest landowners. There is a possibility that it may be reauthorized in future Farm Bills.

Landowner Incentive Program (LIP)

LIP is funded by the U.S. Fish and Wildlife Service and administered by the DNR Bureau of Endangered Resources. The program helps private landowners by providing financial and technical assistance to manage and restore habitat for at-risk species on their land. At-risk species include rare and declining plants and animals in Wisconsin such as those that are listed as endangered or threatened, special concern or species of greatest conservation need. LIP provides up to 75% of the project cost for eligible projects. The maximum cost share is \$25,000. Potential projects include conducting prescribed burns, planting native vegetation, and controlling invasive and woody species. For more information, go to: <http://dnr.wi.gov/org/land/er/wlip/>.

National Fish & Wildlife Foundation Pulling Together Initiative (PTI)

PTI applications are accepted from private non-profit (501) (c) organizations, local, county, and state government agencies, and from field staff of federal government agencies. Individuals, for-profit businesses, and USDA staff are not directly eligible to receive PTI grants, but are encouraged to work with eligible applicants to develop and submit applications to PTI. Proposals may be submitted that describe initiatives to prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships; and that increase public awareness of the adverse impacts of invasive and noxious plants. For more information, see: <http://www.nfwf.org>.

National Fish & Wildlife Foundation Upper Mississippi River Watershed Fund (UMRWF)

UMRWF is a partnership between the USDA Forest Service and the National Fish and Wildlife Foundation that provides grants for forest stewardship and watershed restoration in the Upper Mississippi River drainage. Eligible applicants include non-profit 501 (c) organizations, local, and state units of government. In particular the UMRWF will support projects that address: conservation of priority forest areas, loss of migratory bird habitat, regeneration of bottom land hardwoods, enhancement of water quality and aquatic habitat, and outreach and education. For more information, see: <http://www.nfwf.org>.

Partners for Fish and Wildlife (U.S. Fish & Wildlife Service)

The Partners for Fish and Wildlife (PFW) program provides technical and financial assistance to private landowners who voluntarily restore wetlands and other fish and wildlife habitats on their lands. A dollar-for-dollar cost-share, although not a program requirement, is sought on a project-by-project basis. Up to 100-percent funding for habitat restoration projects is available through the Service and its partners. Landowners agree to maintain the restored habitats for no less than 10 years, but otherwise retain full control of their lands. For more information, go to: <http://www.fws.gov/partners>.

State Wildlife Grant

The State Wildlife Grants program is designed to assist states by providing federal funds for developing and implementing programs that benefit wildlife (including fish and invertebrates) and their habitats. This funding is intended to supplement, not duplicate existing fish and wildlife programs. Funding in the program is provided for species with the greatest conservation need, species indicative of the diversity and health of the state's wildlife, and low and declining populations as deemed appropriate by the state's fish and wildlife agencies. For more information, go to: <http://dnr.wi.gov/org/land/er/swg/>.

Wildlife Habitat Incentives Program (WHIP)

WHIP is a federal program administered by the NRCS, with NRCS and DNR Fisheries and Wildlife providing technical advice. WHIP provides 75% cost share for items proposed in a five or ten year contract. The maximum cost share per year is \$10,000. Cost sharing is available for wildlife planting, grass establishment, fencing, prescribed burning, farmstead shelterbelts, and wildlife practices that include nesting habitat, vegetation management, tree and shrub planting, creation of openings, and wildlife corridors. For more information, go to: <http://www.wi.nrcs.usda.gov/programs/whip.html>.

Wisconsin Forest Landowner Grant Program (WFLGP)

WFLGP is a state program administered by the WDNR Division of Forestry. It provides \$1,250,000 annually for stewardship practices on private lands. A wide array of practices are eligible for cost sharing including management plan development, wetland restoration, tree planting, forest improvement, and prairie restoration. Up to 50% of the eligible costs can be refunded to the landowner upon completion of the work. The maximum cost share amount is currently set at \$10,000 per year. Landowner Grant applications are accepted continuously but processed only four times a year—February 1, May 1, August 1 and November 1. Applications are funded on the basis of priority. Plan development, afforestation, reforestation and timber stand improvement are top priorities while the remaining practices are secondary. For more information, go to: <http://dnr.wi.gov/forestry/private/financial/#costshare>.

More information

Grants are sometimes available for special purposes or community projects. See the following websites for current announcements or opportunities.

- Midwest Invasive Plants Association - <http://www.mipn.org/grants.html>
- Invasive Plants Association of Wisconsin - <http://www.ipaw.org/funding/index.htm>
- All federal grants - <http://www.grants.gov/>

Insects and Diseases:

Gypsy Moth Suppression Program

The DNR facilitates an aerial spray program to suppress gypsy moth outbreaks which is offered to landowners in WI through counties. Because this is a state organized program, the DNR can apply for federal cost sharing available for management of outbreaks of this invasive pest. Depending on availability of federal funds, the reimbursement may be up to 50% of the cost of the spray and its associated administrative work. The DNR passes through the federal cost share to the counties to offset their costs and for distribution to the communities and/or individuals who paid for the treatment. <http://dnr.wi.gov/org/caer/cfa/lr/gypsy/moth.html>

United States Department of Administration Forest Service Wood Education and Resource Center (WERC)

The Wood Education and Resource Center (WERC) funds projects that create opportunities for sustained forest products production for primary and secondary hardwood industries located in the eastern hardwood forest region. Examples of proposals that would be given priority include: Develop technology and markets to address emergency issues including: 1) Phytosanitation of wood packaging materials, firewood and similar products to eliminate these pathways for the transport of insect and disease pests, and 2) development of markets for and utilization of unpredicted increases in volume of urban and rural wood due to incidents like new pest introductions (e.g. EAB).

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Appendix F: Glossary

Biological Control: The management of pests using other organisms, often natural predators.

Chemical Control: The application of a pesticide as the primary means of managing a pest.

Containment: Slowing the spread of an invasive species from a defined geographical area.

Control: To reduce the impact of a pest to a level necessary to meet site management goals.

Cultural Control: A planned series of treatments designed to change stand structure and composition to one that meets pest management goals.

Early Detection: An integrated system of active or passive surveillance to find new populations of invasive species, as early as possible while their population is low, when eradication and control are still feasible and less costly. It may be targeted at: a) areas where introductions are likely, such as access points and travel corridors, b) areas with high ecological value where impacts are likely to be significant, and c) vulnerable habitats or recently disturbed areas.

Impact: The cumulative net effect of a pest population on any or all forest resources.

Invasive Species: A species that is not native to the ecosystem under consideration whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Integrated Pest Management: To reduce the impact of destructive agents by the planned use of a variety of preventive, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable.

Inventory: A set of objective sampling methods designed to quantify the spatial distribution, composition, and rates of change to forest parameters within specified levels of precision for the purpose of management.

Manual Control: The deliberate management of pests using means such as hand-pulling, digging, flooding, mulching, burning, removal of alternate hosts, and manual destruction or removal of nests, egg masses or other life stages.

Mechanical Control: The deliberate management of pests by means such as hoeing, cutting, girdling, tilling, mowing, chopping, and constructing barriers using tools or machines.

Monitoring: The periodic inspection of post-activity sites to detect new invasions and evaluate the success of pest management plans and control measures.

Pest: An organism that is undesirable or detrimental to achieving management objectives.

Prevention: The prescriptions or strategies used to discourage the presence or spread of pests.

Propagule: Any reproductive structure or part of an organism that can grow independently of its parent source. In plants, this may be a fruit, seed, bud, tuber, root, stem with rooting structures, or shoot. In insects, this may be an egg, larva, pupa or adult. In diseases, this may be a spore, mycelial fragment (similar to roots), or a fruiting body.

Rapid Response: A systematic effort to contain, control, or eradicate invasive species while the infestation is still localized. It may be implemented in response to new introductions or to isolated infestations of a previously established species. Preliminary assessment and subsequent monitoring may be part of the response. It is most effective when based on a plan organized in advance so that the response is rapid and efficient.

Reforestation: The reestablishment of forest cover either naturally (*e.g.*, natural seeding, coppice, root suckers) or artificially (*e.g.*, direct seeding or planting).

Restoration: The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.

Revegetation: The reestablishment and development of vegetation.

Appendix G: Species Lists/Factsheets for Highly Damaging Invasive Species

Go to <http://council.wisconsinforestry.org/>

Appendix H: Species Recommended for Revegetation

Go to <http://council.wisconsinforestry.org/>.

Appendix I: Working List of Terrestrial Invasive Plant Species

Go to <http://council.wisconsinforestry.org/>.