



MANISTEE-CADILLAC RANGER DISTRICT

Nordhouse Dunes Wilderness

Non-native, Invasive Plant(s) Management Plan



Approved by: _____

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Overview

The intent of this plan is to detail the process used to develop the proposed action for addressing invasive species in the Nordhouse Dunes Wilderness Area. This plan utilizes direction outlined in the 2006 Huron-Manistee National Forests Plan along with laws, regulations, and policies governing the management of National Forest wilderness areas and invasive species. The minimum tool alternative identified for 2006 is Alternative #2.

This document is a planning tool and not a National Environmental Policy Act (NEPA) analysis or decision. An analysis and decision will be prepared to thoroughly analyze any proposed actions prior to implementation. This plan is intended to be updated annually to update information and monitor the effectiveness of management activities.

Our Mission Statement

The mission of the USDA Forest Service “is to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.”

Abstract of Nordhouse Dunes Wilderness

The Nordhouse Dunes Wilderness is a 3,450 acre wilderness area located in northwestern lower Michigan, approximately 12 miles southwest of Manistee in Mason County. The wilderness is bordered by Lake Michigan shoreline on the west, Nordhouse East semi-primitive motorized area to the east, Ludington State Park to the south and the Lake Michigan Recreation Area to the north.

The wilderness is well known for its unique geologic and ecologic attributes. The dunal formations on the western half of the wilderness, formed 2-3,000 years ago, are Michigan’s best examples of wind-blown dunes and form part of the most extensive interdunal wetlands systems adjacent to freshwater in the world. In addition, the association of open and active dunes, wooded stabilized dunes, interdunal wetlands and bogs form a continuum not found at most of the other natural areas along Lake Michigan’s shorelines. In 1987, the Forest Service designated a 795 acre Research Natural Area along the southwestern boundary of the wilderness. This area was created to protect and monitor the unique sand dunal ecosystem, species and freshwater interdunal wetlands in the area.

The Nordhouse Dunes Wilderness provides habitat for Piping Plover (*Charadrius melodus*). This bird is listed as an endangered species under the Endangered Species Act of 1973 (as amended). This species of shorebird was formerly common in the Great Lakes states during the breeding season. The species was listed due to a high degree of threat and low recovery potential. As of the spring of 2006, no Piping Plover have been located nesting in the wilderness area. The Forest Service monitors the shoreline to identify any potential nesting pairs and ensure protection of any nests.



In addition, the Pitcher's Thistle (*Cirsium pitcheri*) inhabits the sand dunes. This plant is listed as a threatened species under the Endangered Species Act of 1973 (as amended). The Act requires federal agencies to protect these species and their habitat. Pitcher's thistle is part of a dynamic dune ecosystem interacting with other plant species. The habitat requirements of Pitcher's thistle have made it extremely vulnerable to shoreline erosion, development, and recreational use. The biggest threat to the species includes loss of habitat from development and human disturbance. The Forest Service monitors Pitcher's thistle to track long-term trends in the population and to monitor habitat changes.



Purpose of Invasive Plant(s) Management Plan

The overall purpose of this management plan is to reduce, minimize, or eliminate the potential for introduction, establishment, spread, and impact of invasive plants across the Nordhouse Dunes Wilderness.

Note: This management plan will be revised annually or as needed to be consistent with invasive plant control needs as they arise within the Nordhouse Dunes Wilderness. Exhibit A is the 2006 list of the non-native invasive plants identified by forest botanists and plant ecologists as presenting a threat to ecosystems on the Huron-Manistee National Forest. This list will be updated annually.

Goals for Invasive Plant(s) Management Plan

- Manage human influences, a key to wilderness protection.

- Manage wilderness, and sites within, under a non-degradation concept.
- Protect wilderness benefits.
- Manage in conjunction with adjacent lands.
- Guide management with written plans that state objectives for specific areas.
- Apply only minimum regulations and tools necessary to achieve objectives.
- Monitor conditions and experience opportunities for the long-term.
- Focus on threatening and damaging sites.
- Involve the public as a key to acceptance and success of wilderness management.
- Restoration of native plant species, if necessary.

Introduction to Invasive Plant(s)

Non-native invasive species have the potential to damage the biological diversity and ecosystem integrity of many wilderness areas. Although all invasives species can have a major impact on naturally functioning ecosystems, this plan will focus specifically on invasive plants (NNIP).

These species create a host of adverse environmental effects, including the displacement of native plants; reduction in habitat and forage for wildlife; loss of threatened, endangered, and sensitive species; increased soil erosion and reduced water quality; and changes in the intensity and frequency of fires. Each year the United States loses 1.7 million acres to the spread of these invasives. Invasive plants continue to increase and invade previously uninfested areas. Section 4c of The Wilderness Act of 1964 requires that wilderness be "...protected and managed so as to preserve its natural conditions...". An effective non-native invasive species management plan will help preserve wilderness character and natural conditions.

By nature, invasive plants spread rapidly and can quickly cross administrative boundaries. Successful management of non-native invasive species in wilderness can only be accomplished through cooperative efforts between local, state, and federal agencies. Although control is only one part of a successful program, it is the only option for areas that already have infestations.

Three main treatment categories exist for removing non-native invasive plant species (herbicide, bio-control, and hand-pulling). An analysis and appropriate NEPA documentation will be completed prior to proceeding with any treatment program. The Huron-Manistee National Forests has completed NEPA for hand-pulling of invasive species.

Invasive Issue Concerns

- The dilemma concerning invasive plants is that managers must choose either:
 - to preserve natural conditions by actively manipulating wilderness to reduce or eliminate invasive plants, or

- to keep wilderness free from intentional modern human manipulation, but loose natural conditions due to the changes caused by invasive plants
- Wilderness invasive plant abatement decisions need to decide:
 - if treatment of invasive plants (manipulation of wilderness) is appropriate in order to reduce or eliminate unnatural conditions, and
 - if treatment of invasive plants is appropriate in wilderness, is it appropriate everywhere or just under certain circumstances:
 - Does the appropriateness of invasive plant treatment vary with spatial scale, intensity, or periodicity of the treatment (if so which spatial scales, intensities, and periodicities are appropriate?)
 - Should invasive plant treatment be considered more appropriate in some wildernesses than in others (if so, what criteria distinguish wildernesses where treatments are or are not appropriate?)
- Wherever invasive plant treatment in wilderness is considered, the wilderness invasive plant decisions must specifically address these issues:
 - Quantity and quality of information on reference conditions
 - Quantity and quality of information on the consequences of both no treatment and treatment
 - Monitoring—for both pre and post treatment by any method
 - Vectors—what is being done to prevent the spread of invasive weeds into wilderness
 - Rehabilitation—what type of work needs to be done after treatment to mitigate treatment effects
 - Restoration—what is being done to restore natural plant communities
 - Under what conditions or treatment prescriptions is use of motorized equipment or mechanized transport appropriate

Law & Forest Service Policies

Definition of Wilderness

Is defined by the Wilderness Act of 1964 (P.L. 88-144) Sec. 2.(c) is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Use of Wilderness Areas

Sec. 4. (b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

This section of the act specifically directs managing agencies to preserve wilderness character, and states that wilderness areas shall be devoted to several public purposes that relate to managing non-native invasive species, including recreation, scenic, scientific, and conservation uses.

SPECIAL PROVISIONS

Sec. 4. (d). In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.

Although it does not specify non-native invasive plant species, this section of the Act provides direction applicable to non-native invasive species management activities. It provides the Secretary with the authority to take measures as may be necessary to control insects, and diseases as deemed desirable. Special Provisions MAY be allowed to continue subject to analysis and restrictions. The minimum requirements concept is one screen that is typically applied to projects that are considered under the special provisions section of the Act.

EO 13112 (February 3, 1999)

Executive Order 13112, issued by President Bill Clinton in 1999, directs all agencies in the Executive Branch to: prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, provide for restoration of native species and habitat, conduct research and develop technologies, promote public education, and directs agencies not to authorize, fund, carry out actions that are likely to cause or promote the introduction or spread of invasive species. It also directs the creation of a federal invasive species council, directs the development of a national Invasive Species Management Plan and Invasive Species information clearinghouse, and directs federal agencies to participate in the council and to implement the Invasive Species Management Plan.

FOREST SERVICE MANUAL (FSM) REFERENCES

FSM 2320 – Wilderness Management, does not include a section specifically addressing non-native invasive species. However, numerous sections provide applicable direction, and below are sections which are determined to be most applicable. Managers are urged

to review the FS Directives, especially any applicable Regional and/or Forest Manual Supplements. Other FSM with applicable NNIS and/or Wilderness direction include FSM 2080 – Noxious Weeds Management, and FSM 2150 – Pesticide Use Management and Coordination

According to National Policy FSM 2080 Noxious Weed Management

Required Practices

Required means this practice must be integrated and implemented where appropriate to mitigate the effects of the proposed project or program, unless an equally effective measure can be developed at the forest level.

Recommended Practice

Recommended means this practice is not a requirement but represents an effective measure to reduce the risk of spreading weeds and may be integrated where appropriate.

Recreation, Wilderness, Roadless Areas (applicable sections only)

12) Minimize transport and establishment of weeds on NFS lands.

12.1) Environmental analysis for recreation and trail projects will include weed risk assessment. *(Required; Policy 2081.03)*

12.5) Maintain trailheads, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. *(Required)*

12.6) Only seed when necessary at backcountry sites to minimize introduction of non-native species and weeds. *(Required)*

13) Increase weed awareness and prevention efforts among forest users.

13.1) Use education programs to increase weed awareness and prevent weed spread by recreationists. *(Required)*

13.2) Post weed awareness messages at strategic locations such as trailheads, roads, and forest portals. *(Required)*

14) Reduce weed establishment and spread from activities covered by Recreation Special Use Permits.

14.1) Include Clause R1-D4 in all new and reissued recreation special use permits, authorizations, or other grants involving ground-disturbing activities. Include this

provision in existing ground-disturbing authorizations which are being amended for other reasons. *(Required)*

Consider including Clause R1-D4 by amending existing ground-disturbing authorizations as necessary. *(Recommended)*

14.2) Revegetate bare soil resulting from special use activity according to #4.1, 4.2, 4.3. *(Required)*

15) Prevent weed establishment resulting from land and float trail use, construction, reconstruction and maintenance activities.

15.1) All trail crews should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. *(Recommended)*

15.2) All equipment must be cleaned, prior to leaving the project site, if operating in areas infested with new invaders. *(Required)*

15.3) All human-disturbed soil should be evaluated and appropriate revegetation measures implemented to assure prompt, preferably native, revegetation. *(Required)*

Wildlife, Fisheries and Botany

17) Incorporate weed prevention into wildlife, fisheries and botany project design.

17.1) Environmental analysis for wildlife, fish and botany projects with ground disturbing actions will include weed risk assessment. *(Required; Policy 2081.03)*

17.2) Revegetate bare soil resulting from wildlife and fish project activity according to #4.1, 4.2, 4.3. *(Required)*

17.3) Remove all mud, dirt, and plant parts from all off-road equipment before moving into project area. Cleaning must occur off National Forest lands. (This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area.) *(Required)*

17.4) All equipment must be cleaned, prior to leaving the project site, if operating in areas infested with new invaders. *(Required)*

Fire: Pre-fire, Pre-incident training

32) Increase weed awareness among all fire personnel.

32.1) Emphasize weed awareness and weed prevention in all fire training (especially resource advisors, fire management teams, guard school, and district orientation). *(Required)*

32.2) Include weed risk factors and weed prevention considerations in the Resource Advisor duties on all Incident Management Teams and Fire Rehabilitation Teams. *(Required)*

Wildfires General

33) Mitigate and reduce weed spread during fire activities.

33.3) Check and treat weeds that establish at cleaning sites after fire incidents. *(Recommended)*

33.5) Emphasize M.I.S.T. tactics to reduce soil and vegetation disturbance. *(Recommended)*

Rehabilitation

39) Encourage desirable vegetation during rehabilitation activities.

39.1) Revegetate only erosion susceptible and high risk areas (as defined in Regional Risk Assessment Factors and Rating protocol) as described in #4.1, 4.2, 4.3. *(Required)*

39.2) Check and treat weeds at cleaning sites and all disturbed staging areas. *(Recommended)*

39.3) If straw is used for rehabilitation and erosion control, it must be certified weed-free or weed-seed-free. *(Required; Policy 2081.03)*

39.4) Treat weeds within the burned area as part of rehabilitation plan to reduce weed spread into burned areas. *(Recommended)*

39.5) Check for weed spread resulting from fire and fire suppression activities. *(Recommended)*

39.6) Apply for restoration funding for treatment of weed infestations within the fire area. *(Recommended)*

Administration/General

41) Ensure all Forest Service employees are aware of and knowledgeable about noxious weeds.

41.1) Encourage weed awareness and education in employee development and training plans and orientation for both field and administrative work. *(Recommended)*

41.2) Consider a reward program for weed awareness, reporting and locating new invaders. *(Recommended)*

41.3) Each Line Officer will be trained in noxious weed management principles and practices. *(Required)*

42) Ensure all forest workers are reducing the chance of spreading noxious weeds.

42.1) All forest workers should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment including FS vehicles. *(Required)*

43) Ensure continuity in weed management programs.

43.2) Ensure at least one permanent staff member, per District, is trained and proficient in weed management. *(Recommended)*

FSM 2320 – WILDERNESS MANAGEMENT

2320.5 – Definitions

Indigenous Species: Any species of flora or fauna that naturally occurs in a wilderness area and that was not introduced by man.

Native Species: Any species of flora or fauna that naturally occurs in the United States and that was not introduced by man.

Naturalized Species: Any non-indigenous species of flora or fauna that is close genetically or resembles an indigenous species and that has become established in the ecosystem as if it were an indigenous species.

Exotic Species: Any species that is not indigenous, native, or naturalized.

MINIMUM REQUIREMENTS DECISIONS **&** **MINIMUM TOOL ANALYSIS**

“(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character.”

Wilderness Act, 1964, Section 4 (b)

Any wilderness Non-native Invasive Plant Program should begin by addressing whether or not management action is necessary in wilderness in order to preserve wilderness character. If the answer to this question is yes, then the second question must address the minimum tool needed to implement treatment with the least adverse effects to

the wilderness resource. The Minimum Requirements or Minimum Tool analysis should be completed for any site specific action that proposes to include roads, structures or installations, motorized equipment, and mechanical transport as part of treatment for invasive plants. This analysis is not a substitute or alternative for a NEPA analysis but is intended to compliment a NEPA analysis and show how analysis in the EA or EIS applies to designated wilderness. It is also intended to show how existing law, regulation, and policy apply regarding invasive plants in designated wilderness, and does not create new policy or direction. Any project level Minimum Requirements or Minimum Tool Analysis should cite information from the relevant NEPA analysis as necessary.

**DETERMINING THE MINIMUM REQUIREMENT:
Is Action Needed?**

The issue addressed in this analysis is the presence or potential establishment of invasive plants in wilderness.

Is this an emergency? Yes No

Although the situation is not an emergency in the sense of fire or rescue, rapid identification and action regarding invasive plants is the surest way to eradicate an infestation and is likely to offer the least impacting control options. There are currently many invasive plant infestations in wilderness across the region; a decision is needed as quickly as possible on what, if any, action is appropriate for as many infestations as possible.

Is this problem/issue subject to valid existing rights, such as access to valid mining claim, state lands, etc? Yes No

Can the problem/issue be addressed by administrative actions outside a wilderness area? (For example, the administrative actions could be an information program at the visitor center or trailhead instead of a physical action in the wilderness, etc)

Yes No

Outside wilderness, the most important action is to treat infestations in order to prevent introduction of invasive plants into wilderness. All alternatives of the PNW Invasive Plant EIS include treatment and public use requirements outside wilderness which are intended to prevent or manage invasive plant infestations. This analysis only addresses treatment, or not, inside wilderness.

Is there a special provision in legislation (the 1964 Wilderness Act or subsequent laws), that allows this project or activity?

Yes No

The provisions of Section 4(d) of the 1964 Wilderness Act allow control of fire, insects, and diseases. Treatment of invasive plants, although potentially somewhat similar to fire, insects, and diseases is not mentioned. Clearly there is no explicit allowance for treatment of invasive plants in this language, and this analysis assumes treatment of invasive plants is not implicitly intended.

If the issue/problem is not resolved, or action is not taken, will the natural processes of the wilderness be adversely affected?

Yes No

The dilemma created by invasive plants is that it is usually not possible to both preserve natural conditions and to also maintain freedom from human manipulation. A choice must usually be made to either preserve natural conditions by actively manipulating wilderness to reduce or eliminate invasive plants; or to keep wilderness free from intentional modern human manipulation, but loose natural conditions due to the changes caused by invasive plants.

Invasive plants, left untreated, can alter natural plant communities, interact with native wildlife species, and alter ecological processes such as plant community dynamics and disturbance processes such as dunal formation.

Action to prevent invasive plants from becoming established, to contain infestations, or to eradicate invasive plants are recognized as active human manipulations of wilderness.

If the issue/problem goes unresolved, or action is not taken, will the values of solitude or primitive and unconfined type of recreation be threatened?

Yes No

There are potential positive *and* negative effects to the wilderness experience.

Negative effects from no action and the continued presence and expansion of invasive plants include: direct physical effects to recreationists from chemicals and spines, barbs, etc., of invasive plants; changes to the natural conditions and processes expected as part of the experience of wilderness; loss or reduction in the sense that this is a place free from unnatural vegetation.

Negative effects of treating invasive plants include trammeling or modern human interference with ecological dynamics between the natural plant communities and the introduced invasives that can affect the sense that the wilderness is free from human

control or manipulation. Manual control methods, mechanical treatments, use of herbicides, use of motorized equipment, mechanical transport, or other treatments and related activities have adverse effects to the experience of wilderness.

If the issue/problem goes unresolved or action is not taken will evidence of human manipulation, permanent improvements, or human habitation be substantially noticeable?

Yes No

There are noticeable effects of human manipulation from *both* treatment and absence of treatment.

Where invasive plants have been introduced by people, there are noticeable effects to wilderness. Without treatment, in extreme cases, the invasive plants will alter natural plant communities, interact in unknown ways with native wildlife species, and alter ecological processes such as plant community dynamics and disturbance processes such as dunal formation. In the most extreme situations, invasive plants can irrevocably alter evolutionary processes.

Treatment also can, in the most extreme cases, require essentially perpetual human action to prevent spread or establishment of invasive plants, and may even require establishment of non-native species for extended periods of time, if not essentially permanently. In some cases treatment will also require use of motorized equipment and mechanical transport and also mechanical manipulation of vegetation or use of herbicides or biocides. Any of these treatments pose the risk of unwanted effects to other than the targeted invasive plants. Even limited and localized manual control methods require crews and activity that would be evident to many wilderness users and are an obvious manipulation at least at a small scale.

Does addressing the issue/problem or taking action protect the wilderness as a whole as opposed to a single resource?

Yes No

The intent of the Invasive Plant(s) Management Plan proposed action is to protect wilderness from establishment of non-native invasive plants and, where invasive plants are already present in wilderness, to limit the spread of the infestation, and ultimately to reestablish natural plant communities. The proposed action favors species that are native to wilderness and adversely affects invasive, non-native plants.

Does addressing this issue/problem or taking action contribute to protection of an enduring resource of wilderness for future generations?

Yes No

Taking action will protect natural conditions, but introduces human manipulation. Taking no action avoids manipulation of wilderness, but natural conditions are not protected. There are long term effects to wilderness no matter which approach is taken.

This analysis is structured to provide a range of alternatives so that effects to both naturalness and to freedom from manipulation can be minimized. The alternatives presented here are determined by the characteristics of the invasive plant being addressed and by the situation being addressed. The analysis also addresses minimum requirement considerations regarding roads, structures or installations, motorized equipment, and mechanical transport.

Is this an issue for reasons other than convenience or cost of administration?

Yes No

As noted above, this is an issue that is being addressed so that, where necessary, an explicit choice is made to either protect natural conditions or to avoid manipulation in wilderness. The issue is not driven by convenience or cost of administration.

DETERMINING THE MINIMUM REQUIREMENT: Minimum Requirement Alternatives

MINIMUM REQUIREMENT ALTERNATIVE #1:

No Treatment

Does this alternative involve:

Use of temporary road?	Yes	<u>No</u>
Use of motor vehicles?	Yes	<u>No</u>
Use of motorized equipment?	Yes	<u>No</u>
Use of motorboats?	Yes	<u>No</u>
Landing of airplanes?	Yes	<u>No</u>
Landing of helicopters?	Yes	<u>No</u>
Use of mechanical transport?	Yes	<u>No</u>
Creating a structure or installation?	Yes	<u>No</u>

Biophysical effects/benefits of this alternative:

Wilderness ecosystems would be free from herbicides, biocides, and from the manipulation that would result from these control methods. There would be no risk of herbicide effects to non-target species. Ecosystem adaptations to invasive plants would be free from human interference. Effects of invasive plants would be determined by competitive and other interactions. In extreme cases, invasive plants are likely to alter

natural plant communities, interact in unknown ways with native wildlife species, reduce TES plant species populations, and alter ecological processes such as plant community dynamics and disturbance processes such as dunal formation. In the most extreme situations invasive plants could irrevocably alter evolutionary processes.

Social/recreation effects/benefits:

People would not be exposed to herbicides or biocides in wilderness.

Invasive plants can create noticeable effects to wilderness. Direct physical effects to recreationists include effects of chemicals and spines, barbs, etc., of invasive plants. Noticeable changes could occur to natural conditions and processes that are expected as part of wilderness setting, resulting in a loss or reduction in the sense that wilderness is a predominately natural place.

Societal/political effects/benefits:

Wilderness will continue to be free to evolve and respond without interference from invasive plant treatments and will serve as a reference for comparison to areas that are treated. Competition and change introduced by invasive plants will continue. Those who believe that it is most important that wilderness remain free from management will favor this alternative. Those who believe that protecting natural conditions is most important will remain concerned about loss of native species and natural ecosystem processes, if these threats are present. Wilderness may be viewed as a source of invasive plants that threatens values on surrounding lands, both National Forest System and private.

Health and safety concerns/benefits:

No risk from herbicide or biocide application, either from the herbicide, biocide, or from treatment activities.

Economic and timing considerations/benefits:

There would be no cost for invasive plant treatment. If invasive plants in wilderness have potential to move to adjacent lands, ongoing costs of treatment on these lands and threats to values on these lands, both public and private, will be a concern.

MINIMUM REQUIREMENT ALTERNATIVE #2:

No treatment except by manual control methods (hand pulling or hand cutting); no herbicide or biocide use.

Does this alternative involve:

Use of temporary road?	Yes	<u>No</u>
Use of motor vehicles?	Yes	<u>No</u>

Use of motorized equipment?	Yes	<u>No</u>
Use of motorboats?	Yes	<u>No</u>
Landing of airplanes?	Yes	<u>No</u>
Landing of helicopters?	Yes	<u>No</u>
Use of mechanical transport?	Yes	<u>No</u>
Creating a structure or installation?	Yes	<u>No</u>

Biophysical effects/benefits of this alternative:

Wilderness ecosystems would be free from herbicides, biocides, and from the manipulation that would result from their use. There would be no risk of herbicide or biocide effects to non-target species. There would be a high probability for control of invasive plants responsive to manual control methods, and good probability for control of small initial infestations even of plants somewhat resistant to manual control methods if treatments can be applied soon enough and repeated often enough to eliminate or reduce the infestation. Some of the biophysical effects from invasive plants would be eliminated; typically in limited, localized areas.

Most invasive plants, however, are not responsive to manual control methods alone. For most invasive plant species, effects would be much the same as Alternative #1.

Social/recreation effects/benefits:

People would not be exposed to herbicides or biocides in wilderness and concerns about unknown effects of their use would be eliminated. Natural conditions would be preserved and protected in limited, localized areas where treatments can be applied soon enough and repeated often enough to eliminate or reduce infestations. For most invasive plant infestations, effects would be much the same as Alternative #1.

Societal/political effects/benefits:

Except for the limited number of cases where invasive plants are responsive to manual control methods alone, or where treatments can be applied soon enough and repeated often enough to eliminate or reduce an infestation, effects would be much the same as Alternative #1. There is likely to continue to be an issue that more than manual control methods should be used because many invasive plants are not responsive to manual control methods and because it is not always possible to detect infestations soon enough or to treat them often enough to make manual control methods successful or practical.

Health and safety concerns/benefits:

No risk from herbicide or biocide application, or from treatment activities. Manual control methods may increase exposure of workers to risk and hazard from working in remote and rugged terrain and in difficult conditions.

Economic and timing considerations/benefits:

Manual control methods commonly require repeated treatments and therefore repeated costs. This alternative is likely to be the most costly in the long term due to the number of repeat treatments necessary to achieve effective control of invasives. Rapid response and effective monitoring are more essential with a manual control strategy than with other treatment strategies. Except for the limited number of cases where invasive plants are responsive to manual control methods alone, effects would be much the same as Alternative #1.

MINIMUM REQUIREMENT ALTERNATIVE #3:

Treatment with herbicides or biocides only when:

- **Invasive plant establishment will likely expand to landscape scale**
- **Invasive plant has capability to displace native species and to alter ecosystem processes**

No herbicide treatment for invasive plants that do not have potential for landscape scale expansion and that do not have capability to displace native species or alter ecosystem processes.

Application of herbicide in the Nordhouse Dunes Wilderness Area requires Regional Forester approval.

Does this alternative involve:

Use of temporary road?	Yes	<u>No</u>
Use of motor vehicles?	Yes	<u>No</u>
Use of motorized equipment?	Yes	<u>No</u>
Use of motorboats?	Yes	<u>No</u>
Landing of airplanes?	Yes	<u>No</u>
Landing of helicopters?	Yes	<u>No</u>
Use of mechanical transport?	Yes	<u>No</u>
Creating a structure or installation?	Yes	<u>No</u>

Biophysical effects/benefits of this alternative:

Wilderness ecosystems would be exposed to herbicides, biocides, and to the manipulation that would result from their use. There would be a risk of herbicide or biocide effects to non-target species. Ecosystem adaptations to invasive plants would be altered by human actions. The potential would be greatly reduced for invasive plants to alter natural plant communities, interact in unknown ways with native wildlife species, and alter ecological processes such as plant community dynamics and disturbance processes such as dunal

formation. The risk that invasive plants could irrevocably alter evolutionary processes would be greatly reduced.

By law and policy, biophysical manipulation of wilderness is generally not intended to occur (1964 Wilderness Act, 36 CFR 293.2, FSM 2320.2). Because biophysical manipulation of wilderness is uncommon, this treatment strategy would have to include provisions that specify exactly what the intended effects are (including treatment intensity and periodicity, and information on reference conditions for the intended effects), that insure the intended effects do occur and that unwanted effects do not, and that specify triggers for discontinuing treatment.

Social/recreation effects/benefits:

People would have the potential for limited exposure to herbicides or biocides in wilderness. Some people may have concerns about unknown effects of herbicides or biocides use. Direct physical effects to recreationists from invasive plants (spines, barbs, etc., of invasive plants) and changes to the wilderness setting from invasive plants would be greatly reduced. In so far as native species and natural ecosystems are preserved, the sense that wilderness is a predominately natural place would be retained. People would likely see treatment activities or see the effects of them. This evidence of treatment activities and effects may reduce the sense of solitude and that wilderness is a place free from human manipulation.

Societal/political effects/benefits:

It would be unlikely that wilderness would provide an opportunity to learn how ecosystems adapt to invasive plants without human interference. Those who think it is most important that wilderness be free from biophysical manipulation would strongly object to utilization of herbicides or biocides and be greatly concerned about any effects they have to wilderness. Those who most value natural conditions would likely tolerate use of herbicides or biocides if treatments show rapid and significant success in protecting and restoring natural conditions. Wilderness would be less likely to be viewed as a source of invasive plants that threaten surrounding lands, both National Forest System and private.

Health and safety concerns/benefits:

Some employees would be exposed to risk from herbicide or biocide application and from treatment activities. Public exposed to risk from herbicides or biocides would likely be very limited. Wherever manual and chemical control methods are used, workers may have increased exposure to risk and hazards from working in remote and in difficult environmental conditions.

Economic and timing considerations/benefits:

Treatment costs would likely be more than Alternative #4 but less than Alternative #2, since fewer repeat treatments would likely be necessary. Concerns would be greatly reduced regarding the potential for invasive plants to move to adjacent lands, for ongoing costs of treatment on these lands, and of threats to values on these lands, both public and private. Manual control methods commonly require repeated treatments and therefore repeated costs. Rapid response and effective monitoring are more essential with a manual control strategy than with other treatment strategies.

MINIMUM REQUIREMENT ALTERNATIVE #4:

Treatment with herbicides or biocides when:

- **Invasive plant establishment will likely expand to landscape scale**
- **Invasive plant has capability to displace native species and to alter ecosystem processes**
- **Invasive plants do not have potential for landscape scale expansion and that do not have capability to displace native species or alter ecosystem processes**

Application of herbicide in the Nordhouse Dunes Wilderness Area requires Regional Forester approval.

Does this alternative involve:

Use of temporary road?	Yes	<u>No</u>
Use of motor vehicles?	Yes	<u>No</u>
Use of motorized equipment?	Yes	<u>No</u>
Use of motorboats?	Yes	<u>No</u>
Landing of airplanes?	Yes	<u>No</u>
Landing of helicopters?	Yes	<u>No</u>
Use of mechanical transport?	Yes	<u>No</u>
Creating a structure or installation?	Yes	<u>No</u>

Biophysical effects/benefits of this alternative:

This alternative would have similar effects o Alternative #3, except that wilderness ecosystems would be exposed to more use of herbicides or biocides and would experience more manipulation due to this increased use. This alternative could result in greater risk of effects to non-target species. Invasive plant control could have a higher probability of success with this alternative because use of herbicides or biocides would be less restricted and use of manual control methods would be optional. Because more invasive species are likely to be treated with herbicides or biocides, this alternative also reduces risk that the invasive potential of an introduced non-native plant has been underestimated.

By law and policy, biophysical manipulation of wilderness is generally not intended to occur (1964 Wilderness Act, 36 CFR 293.2, FSM 2320.2). Because biophysical manipulation of wilderness is uncommon, this treatment strategy would have to include provisions that specify exactly what the intended effects are (including treatment intensity and periodicity, and information on reference conditions for the intended effects), that insure the intended effects do occur and that unwanted effects do not, and that specify triggers for discontinuing treatment.

Social/recreation effects/benefits:

The effects of this alternative would be similar to Alternative #3. People would have the potential for limited exposure to herbicides or biocides in wilderness. Some people may have concerns about unknown effects of herbicides or biocides use. Since herbicides or biocides use would be greater in this alternative than Alternative 3, this alternative would likely be more controversial than Alternative #3. Direct physical effects to recreationists from invasive plants (spines, barbs, etc., of invasive plants) and changes to the wilderness setting from invasive plants would be most reduced by this alternative. Native species and natural ecosystems are most likely to be preserved by this alternative and therefore the sense that wilderness is a predominately natural place would have the highest probability of being preserved.

People would be more likely see treatment activities or see the effects of them under this alternative than under any other alternative. This alternative would have the most evidence of treatment activities and effects that reduce the sense of solitude and that wilderness is a place free from human manipulation.

Societal/political effects/benefits:

This alternative would be similar to Alternative #3, except that manipulation of wilderness would be a greater issue. Wilderness would not provide an opportunity to learn how ecosystems adapt to invasive plants without human interference. This alternative would be very controversial to those who think it is most important that wilderness be free from biophysical manipulation. This alternative may be unacceptable to those who most value natural conditions in wilderness, even if they agree that use of herbicides or biocides will be successful in protecting and restoring natural conditions. Wilderness would be treated much as other National Forest System lands and would not be viewed as a source of invasive plants that threaten surrounding lands, both National Forest System and private.

Health and safety concerns/benefits:

Workers and the public would be exposed to the most risk from herbicide or biocide application under this alternative, however public exposure to herbicides and biocides is expected to be very limited. Manual control methods would be optional and not likely to

significantly increase exposure of workers to risk and hazard from working in remote and in difficult environmental conditions.

Economic and timing considerations/benefits:

This alternative would likely have the least cost for invasive plant treatment because abatement efforts would likely be most effective and result in fewer return treatments. Concerns would be most reduced under this alternative regarding the potential for invasive plants to move to adjacent lands, for ongoing costs of treatment on these lands, and of threats to values on these lands, both public and private.

DETERMINING THE MINIMUM REQUIREMENT

Guidelines for Selection of the Minimum Requirement Alternative

Identify the strategy that will have minimum impacts to wilderness. Select an alternative from the “*Minimum Requirement Alternatives*” in the previous section using the following guidelines.

MINIMUM REQUIREMENT ALTERNATIVE #1

No Treatment

Guidelines for selection of this alternative: This alternative is preferable only where an explicit decision has been made to accept loss of naturalness in exchange for allowing maximum freedom from manipulation, or where an invasive plant is unlikely to displace native species or to alter ecological processes.

MINIMUM REQUIREMENT ALTERNATIVE #2

No Treatment except by manual control methods; no herbicide or biocide use.

Guidelines for selection of this alternative: This alternative is preferable where an invasive plant species is responsive to manual control methods and where manual control treatments can be implemented in a timely manner and can be repeated as needed. Also consider this alternative where an invasive plant is unlikely to displace native species or to alter ecological processes, where the probability of success with herbicide or biocide is uncertain, where effects to non-target species from herbicide or biocide are a concern, or where an invasive plant is not completely responsive to manual control methods (or where responsiveness is uncertain), but where there is evidence that manual control methods might be successful. Also consider this alternative where manual control methods have been established as part of operation of a commercial grazing allotment in wilderness (FSM 2323.22).

MINIMUM REQUIREMENT ALTERNATIVE #3

Treatment with herbicides or biocides only when:

- **Invasive plant establishment will likely expand to landscape scale**

- **Invasive plant has capability to displace native species and to alter ecosystem processes**

No herbicide treatment for invasive plants that do not have potential for landscape scale expansion and that do not have capability to displace native species or alter ecosystem processes.

Utilize manual control methods wherever they have a high probability for success.

Application of herbicide in the Nordhouse Dunes Wilderness Area requires Regional Forester approval.

Guidelines for selection of this alternative: This alternative is preferable where an invasive plant species is not responsive to manual control methods or where manual control methods are unlikely to be successful (due to inaccessible terrain, for example). It is also preferable for limited, localized infestations where control is likely to be successful to at least contain an infestation. Also consider this alternative where there is doubt regarding an invasive plant's ability to expand to landscape scale, displace native species, or to alter ecosystem processes. Also consider this alternative where these treatment methods have been established as part of operation of a commercial grazing allotment in wilderness prior to wilderness designation (FSM 2323.22).

MINIMUM REQUIREMENT ALTERNATIVE #4

Treatment with herbicides or biocides when:

- **Invasive plant establishment will likely expand to landscape scale**
- **Invasive plant has capability to displace native species and to alter ecosystem processes**
- **Invasive plants do not have potential for landscape scale expansion and that do not have capability to displace native species or alter ecosystem processes**

Manual control methods could be considered as an option to herbicide or biocide wherever they have a high probability for success

Application of herbicide in the Nordhouse Dunes Wilderness Area requires Regional Forester approval.

Guidelines for selection of this alternative: This alternative is preferable where an invasive plant is known to have the capacity to expand to a landscape scale, to displace native species, to alter ecosystem processes, and where an explicit decision has been made to accept manipulation in exchange for preservation of naturalness. Also consider this alternative as a conservative approach to protect naturalness where responsiveness to manual control is not known or where invasive characteristics of a plant are unknown, but evidence exists that the plant could expand to a landscape scale, could displace native species, or could alter ecosystem processes. Also consider this alternative where these control methods have been established as part of operation of a commercial grazing allotment in wilderness prior to wilderness designation (FSM 2323.22).

Note—this minimum requirement analysis does not address using a non-native species with less adverse effects than an invasive plant to control or prevent an infestation or to prevent expansion of an infestation. If the NEPA analysis is proposing to allow this treatment, that will have to be added. Also, that decision is the Chief of the Forest Service’s authority in wilderness (FSM 2323.04b), so if the Forest proposes it in wilderness, the Washington Offices would need to be part of the decision. Also, if we are proposing to manipulate vegetation in some other way (i.e. by a combination of mechanical treatment, prescribed fire, and planting or seeding) that would also be a Chief’s authority decision.

These approaches represent a very intrusive form of manipulation or ‘trammeling.’ Consideration should be given to restricting these two approaches to areas outside wilderness.

**DETERMINING THE MINIMUM TOOL:
Are Roads, Structures or Installations, Motorized Equipment, or
Mechanical Transport Needed?**

“ . . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act.”

– Wilderness Act, 1964

Section 4(c) of the Wilderness Act of 1964 prohibits certain activities in wilderness by the public, and, at the same time allows the agencies to engage in those prohibited activities in some situations. Section 4(c) states:

“ . . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.”

Therefore, unless a generally prohibited use is allowed by specific legislation, most of these activities are prohibited. However, in the above language, Congress acknowledged that there are times when exceptions are allowed to meet the minimum required administration of the area as wilderness. The following worksheet is intended for use in determining whether or not an otherwise prohibited action is essential for implementation of the minimum requirement alternative for treatment of invasive plants.

Worksheet for Selection of the Minimum Tool

What is the method or tool that will allow the selected minimum requirement alternative to be implemented with a minimum of impacts to wilderness?

The selected minimum requirement alternative is # 2.

Does implementing this alternative involve any of these normally prohibited actions?

Use of temporary roads	Yes	<u>No</u>
Use of motor vehicles	Yes	<u>No</u>
Use of motorized equipment	Yes	<u>No</u>
Use of motorboat	Yes	<u>No</u>
Landing of airplanes	Yes	<u>No</u>
Landing of helicopters	Yes	<u>No</u>
Use of mechanical transport	Yes	<u>No</u>
Creating a structure or installation	Yes	<u>No</u>
Other impacts to wilderness character	Yes	<u>No</u>

If the answer is yes to any of the above normally prohibited actions, specify why the action is essential for successful implementation of the selected minimum requirement alternative and is consistent with policy (see FSM 2320, 2323.22, 2324.04(b) 6, and 2326) and regulations (36CFR 293.6). Cost and convenience are not acceptable rationale for implementing prohibited actions in wilderness (FSM 2320.6).

The following describes the actions proposed in 2006 to address the various invasive species identified in the Nordhouse Dunes Wilderness Area.

1. Lombardy Poplar

- Inventory the locations and estimated amount of Lombardy Poplar in the Nordhouse Dunes Wilderness area. Utilize USFS Invasive Plant Inventory, Monitoring & Mapping Protocol (www.wilderness.net)
- Prepare a proposal to address Lombardy Poplar infestation.

2. Japanese Barberry/Honeysuckle/other Bush-like Invasives

- Manually cut by mid to late summer before flowering/ seeding occurs. Bag and remove all parts of plant including flowers and seed pods.
- Document the location and species of invasives treated.

3. All other Invasives

- Hand-pull plants by mid to late summer before flowering/seeding occurs.
- Bag and remove all parts of plant including flowers and seed pods.
- Document the location and species of invasives removed.

What are the maintenance requirements?

- Follow up monitoring and additional removal may be required in 2007.

What standards and designs will apply?

- Treatments will begin along the Northwestern corner of the wilderness along Lake Michigan and focus on the Lake Michigan shoreline.

Develop and describe any mitigation measures that apply.

- Employees will be trained in proper removal techniques along with identification of TES species to minimize impacts to individual plants.
- Caution not to spread seed/ flowering sources (Clean Equipment, including boots).

What will be provided for monitoring and feedback to strengthen future effects and preventative actions to be taken to help in future efforts?

- An Annual Invasive Weed Removal Report will be prepared which details actions which occurred, documents any recommendations for future actions, and summarizes effectiveness of treatments.

