

## Chapter 2

# Standards and Guidelines



## Chapter 2



# Chequamegon-Nicolet National Forests



## Chapter 2

# Forestwide Standards and Guidelines

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## Introduction

This chapter presents Forestwide Standards and Guidelines for the Chequamegon-Nicolet National Forests. These Standards and Guidelines apply to all Forest areas for protecting or managing forest resources. They are used with additional Standards and Guidelines included with each Management Area prescription (See Chapter 3 for these prescriptions).

A **Standard** is defined as a course of action that must be followed, or a level of attainment that must be reached, to achieve forest goals. Adherence to Standards is mandatory. In general, they limit project-related activities, not compel, or require them. Deviations from Standards must be analyzed and documented in a forest plan amendment. Standards are developed when:

- Applicable laws or policies do not exist, or clarification of existing laws or policies is needed.
- They are critical to achievement of objectives.
- Unacceptable impacts may occur if a Standard is not in place.

A **Guideline** is also a course of action that must be followed. However, Guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a Guideline must be analyzed and documented in a Project Level Environmental Assessment or Environmental Impact Statement.

When Forestwide Standards and Guidelines conflict with Management Area Standards and Guidelines, those that are more stringent or restrictive are applied.

This set of Standards and Guidelines is designed to be specific to the Chequamegon-Nicolet National Forests. Laws, regulations, and Forest Service directives generally are not repeated in this package, although references to particular laws or directives may be included to provide needed emphasis for the protection and management of specific resources.

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## Water Resources

### Watershed Protection and Management

#### Standard:

- Maintain minimum in-stream flows at 25% of base flows or that flow determined from a site specific analysis using commonly accepted in-stream flow methods.

**Guidelines:**

- Maintain water quality by following guidelines contained in “Wisconsin’s Forestry Best Management Practices for Water Quality,” (BMPs), March 1995 edition (or subsequent revisions)
- Utilize the “Wisconsin Construction Site Best Management Practices Handbook” as well as the “Best Management Practices for Erosion and Sedimentation Control,” (Federal Highway Administration) for guidance on limiting sedimentation.
- Ensure revegetation of log landings after project activities are completed, either through artificial means or natural revegetation.
- Utilize Wisconsin’s Forestry BMPs to maintain soil productivity, infiltration rates and minimize road maintenance costs.
- Design and implement stream restoration measures that apply natural channel design principles and/or are consistent with ecological conditions and floodplain characteristics.

**Riparian Areas**

**Standard:**

- Design and maintain roads and trails in riparian areas or other locations that could affect water quality, in accordance with Wisconsin’s Forestry Best Management Practices. Road and trail surfaces within these areas will be stabilized with aggregate or other suitable material when being used during non-frozen conditions.

**Guidelines:**

- Do not pile slash within or move slash into riparian areas. Keep slash out of lakes, stream channels, floodplains, and areas where it may be swept into streams, rivers, and lakes.
- Utilize Wisconsin’s Forestry Best Management Practices (BMPs) for riparian management zone categories. Expand riparian management zones wider than those defined in Wisconsin’s Forestry BMPs and modify management practices where necessary (e.g., projects on steep slopes and/or highly erodible soils).
- Protect warm and cold-water streams from sedimentation by maintaining the physical integrity of intermittent and non-navigable streams, i.e., streams that do not appear on 1:24,000 topographic maps to ensure their continued function when they do contain water.
- Lessen channel scour by gradually lowering water surfaces 25-50% prior to removing beaver dams. When there is a high risk of downstream widening or scouring, draw the entire pond down gradually
- Provide and maintain conifer thermal cover within riparian areas.
- Avoid stream and wetland crossings and riparian areas when constructing new roads and trails.
- Relocate existing roads and trails out of riparian areas and eliminate stream crossings where practicable. Otherwise, construct or reconstruct roads, trails and associated stream crossings to minimize erosion, sedimentation and riparian impacts. Design culverts and bridges to pass the estimated 100-year flood.

## Wetlands

### Standard:

- Protect hydrologic function and maintain natural hydrologic regimes.

### Guidelines:

- Utilize guidelines found in Wisconsin's Forestry BMPs to maintain water quality and hydrologic wetland functions during activities such as timber harvesting or road and trail construction.
- Minimize fill and maintain cross road drainage when wetland road and trail crossings cannot be avoided.

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## Soils

### Guidelines:

- Use R9 directive for Chapter 2 of Forest Service Handbook 2509.18 to define detrimental disturbance threshold values for soil displacement, erosion, rutting, nutrient loss, compaction, burning, and maintaining ground cover.
- Retain logging slash in place (limbing at the stump) where topsoil is less than one inch thick, or where organic matter is less than 2%.
- Minimize topsoil displacement into piles or windrows when machine piling slash and debris.
- Designate the location of roads, trails, landings, main skid trails, and similar soil disturbing activities. Stabilize disturbed sites during use and revegetate after use to control erosion.
- Operate heavy equipment only when soils are not saturated or when the ground is frozen.

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## Minerals

### Exploration and Development of Leasable Minerals

#### Guideline:

- Minerals activities within 100-500 feet of RFSS plant sites will be limited to practices that maintain habitat (including micro-climatic conditions).

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## Biological Resources

### Biological Diversity

#### Guidelines:

- Promote and maintain long-lived conifer super canopy trees, especially white pine.
- Maintain stand level ecosystem components, patterns, and pit and mound microtopography.
- Allow botanical collections of voucher and herbaria specimens.
- Regenerate white pine on appropriate sites within red and white pine ecosystems in locations of large-scale blow downs, through prescribed fire, seeding, or planting.

- Avoid modifying microclimate and microhabitat conditions within steep ravines, cliffs, talus slopes, and areas of exposed bedrock.
- Design management activities adjacent to research natural areas, special management areas, and old growth areas to complement their ecological values.
- Manage vegetation within utility right of way corridors, where permitted, to support landscape level ecological goals including wildlife populations and habitat.

## Vegetation Management

### Temporary Openings

#### Guidelines:

- Temporary openings will not exceed 40 acres in size except:
  1. Within Management Areas 4C and 8C.
  2. As a result of natural catastrophic occurrences such as fire, insect and disease attack, or wind storm.
  3. To benefit Connecticut Warbler within jack pine habitats.
- A stand is considered a temporary opening if the average crown closure is less than 20% or the regeneration averages less than 12 feet tall.
- Within areas other than those listed above, separate two or more openings with a total area exceeding 40 acres by manageable stands at least 10 acres in size with an average width of at least 500 feet.

### Rotation Lengths

#### Guidelines:

- Table 2-1 lists the minimum, standard, and extended rotation lengths for various forest types. Rotation age will be determined by the capability of a site. As a general rule the standard rotation ages will be used except in Management Areas 2B, 3B, 4B and 6B where the extended rotation ages will be used.

**Table 2-1. Rotation Lengths**

Forest Type	Site Index	Minimum Rotation Age	Standard Rotation Age	Extended Rotation Age
Aspen	All	30	45	70
Paper Birch	All	30	60	80
Even-aged Northern Hardwoods	All	30	100	140
Red Oak	<55	30	60	80
Red Oak	56-65	30	80	100
Red Oak	>65	30	100	120
Red Pine	All	50	100	175
Jack Pine	<60	30	50	60
Jack Pine	>60	30	60	70
Upland Balsam Fir	All	30	45	70
White Pine	All	70	120	200
White Spruce	All	50	80	120
Upland Black Spruce	All	-	70	80



- The above minimum rotation age guidelines may be waived for stands that have been significantly affected by fire, windthrow, insect, or disease attack or other similar natural disturbance forces. Some stands may also be harvested before minimum or after extended rotation ages when site capability, and/or site-specific analysis indicates it would be best for meeting overall multiple use objectives.

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## Regeneration and Intermediate Treatments

### Guidelines:

- Use tree seedlings or seed where seed source is known and produced from seed collected within the climatic zone in which they will be planted.
- Plant conifers at a minimum seedling density of 680 seedlings per acre in open areas, except plant white pine at 900 seedlings per acre within open areas.
- Use natural regeneration whenever feasible.

### Timber Salvage

#### Guideline:

- Leave 5-15% of potential timber salvage unharvested following large disturbance events (greater than 100 acres), except in salvage situations that are high risk to human safety and/or forest health.

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## Silvicultural Maintenance and Conversion of Forest Cover Types

### Aspen

#### Guidelines:

- Manage aspen under the even-aged silvicultural system.
- Aspen desired age class distribution:

**Table 2-2. Aspen Age Class Distribution**

Age	Percent	Target Percent
0-10	15-25	20
11-20	15-25	20
21-45	45-55	50
46 or more	5-15	10

- Harvest aspen during the dormant season where the aspen species is desired and aspen totals less than 40 square feet of basal area in the stand.
- Site preparation for natural aspen regeneration should reduce the site's average residual crown cover (2" in diameter or larger) to less than 5% (excluding reserve islands) within all Management Areas except 1B, 2A, and 2B. The average residual crown cover for site preparation for aspen regeneration with Management Areas 1B, 2A, and 2B (in instances where aspen is to be maintained) is allowed to approach 10% (excluding reserve islands).
- Consider thinning aspen stands only if the site index is greater than 70 or if conversion to other species is desired. Thin aspen stands only once at about age 30, leaving a residual basal area of 60-80 square feet.

- Do not apply treatments that support an increase in beaver populations adjacent to northern white-cedar stands.
- Avoid clearcutting aspen adjacent to areas where white pine or hemlock regeneration is present or desired.

## Paper Birch

### Guidelines:

- Manage paper birch under an even-aged silvicultural system. Use the two-cut shelterwood harvest method to regenerate paper birch. Harvesting and site preparation should provide: (1) 25% to 40% residual crown cover (initial harvest); (2) Full tree skidding opportunities if site preparation will be done after the initial harvest; (3) Scarification or prescribed fire to expose mineral soil and mix with organic and humus material on 50-75% of the area (the more paper birch regeneration desired, the greater the intensity of disturbance); (4) Site preparation after leaf fall so that seeds are mixed with, or fall on mineral soil; (5) Control of competing vegetation; and (6) Overstory removal during the winter and within two years of the establishment of regeneration (seedlings should be at least one foot tall).
- Paper birch desired age class distribution:

**Table 2-3. Paper Birch Age Class Distribution**

Age	Percent	Target Percent
0-20	20-30	25
21-40	20-30	25
41-60	20-30	25
61 or more	20-30	25

- Notify the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) about potential bark gathering opportunities when identifying paper birch for harvest.
- Consider thinning paper birch stands only when the site index exceeds 60, the objective is to grow sawtimber, and the stand has reached 40 years of age. Thin from below to a residual basal area of 80-100 square feet per acre. Improve spacing and favor the highest quality trees. Consider the potential for an increase in susceptibility to insects, disease, and mechanical damage when paper birch thinning is planned.
- Prioritize the harvest of declining paper birch stands, consistent with management area direction and other resource needs.

## Northern Hardwoods

### Guidelines:

- Do not harvest yellow birch within the northern hardwood ecosystem unless its density must be lowered to facilitate recommended residual basal area, its regeneration is facilitated with canopy gaps, nurse logs, and/or planting, and sufficient seed source remains to take advantage of regeneration opportunities.
- Retain butternut trees with more than 70% live crown, and when cankers affect less than 20% of the combined circumference of the bole and root flares. Retain butternut trees that have no cankers and at least 50% live crown. Dead or poor vigor butternut trees may be harvested.



- Maintain shade on and around large boulders, 10 feet in diameter and larger, by not establishing canopy gaps near them.

## Uneven-aged Management of Northern Hardwoods

### Guidelines:

- Utilize uneven-aged management prescriptions to develop stands that have at least three distinct age classes.
- Initial cuts in pole-sized hardwood stands should combine a crop tree release of 50-60 crop trees per acre with the creation of regeneration canopy gaps. Trees removed are generally high risk, have poor stem quality, and/or provide growing space for better quality residual trees.
- Between canopy gaps, thin to the minimum stocking levels shown in Figures FF-1, FF-2 or FF-3 in Appendix FF, when converting from even-age northern hardwoods to uneven-aged northern hardwood management. These figures are based on maintaining at least an 80% crown closure. Exception to this guideline: Initial thinnings in northern hardwood stands result in a crown closure of 75-80%. Tree crowns in these stands close in within a few years.
- Create four to eight 25 to 40-foot wide canopy gaps per acre by harvesting groups of pole-sized trees or 1-2 large-crowned trees. The percentage of area in canopy gaps is a function of the harvest interval (longer harvest intervals should have a higher percentage of canopy gaps as a general rule). Create a maximum of one, 60-foot canopy gap for every two acres, where maintenance of mid-tolerant species composition is desired (the 60-foot gap replaces some of the 25 to 40-foot gaps). The addition of the larger gap will reduce the number of smaller gaps to 3-6 per acre.
- Cut poor-quality stems larger than one inch in diameter in canopy gaps so vigorous regeneration can develop.
- After the initial improvement or selection harvest, periodically apply selection harvests that work toward the size class distribution shown in Tables 2-4 or 2-5. Create canopy gaps by harvesting large enough groups of trees to obtain successful regeneration in younger stands where crown sizes are small to moderate in size.
- Specify post-harvest stocking levels for various size classes in prescriptions. The following tables show the ideal size distribution for fully regulated uneven-aged northern hardwood stands (these tables will be used to guide the development of harvest prescriptions):

**Table 2-4. Desired Size Class Structure for Uneven-aged Hardwoods – 22 Inch  
22 Inch Diameter Using A 1.3 Q Factor**

<b>Diameter (inches)</b>	<b>Trees per Acre</b>	<b>Basal Area</b>
21-22.9	3.0	8
19-20.9	4.6	10
17-18.9	5.7	10
15-16.9	7.4	10
13-14.9	9.6	10
11-12.9	12.4	10
9-10.9	18.3	10
7-8.9	23.6	8
5-6.9	30.7	7
0-4.9	169.4	7
<b>Total</b>	<b>284.7</b>	<b>90</b>

**Table 2-5. Desired Size Class Structure for Uneven-aged Hardwoods – 25 Inch  
25 Inch Diameter Using A 1.3 Q Factor**

<b>Diameter (inches)</b>	<b>Trees per Acre</b>	<b>Basal Area</b>
25 or more	1.0	4
23-24.9	2.2	7
21-22.9	2.9	8
19-20.0	3.9	8
17-18.9	5.0	9
15-16.9	6.6	9
13-14.9	8.6	9
11-12.9	11.2	9
9-10.9	14.6	8
7-8.9	19.0	7
5-6.9	24.7	5
0-4.9	192.0	7
<b>Total</b>	<b>284.7</b>	<b>90</b>

The target distribution displayed in Table 2-5 will normally be applied for uneven-aged hardwood sites within Management Areas 2B, 3B, 4B, and 6B; while distribution displayed in Table 2-4 will generally be used for uneven-aged hardwoods in other MAs. Reserve tree numbers, as described in MA direction, Chapter 3, are included in the desired size class structure displayed in tables 2-4 and 2-5. These tables may be modified for project level decisions, as long as the intent of the management area prescription is met.

- Reserve hemlock in northern hardwood prescriptions. The following are exceptions to this guideline: (1) Hemlock trees may be cut if they impede road or skid trail development, and (or) safety problems are improved; and (2) On the Medford land base, (LTAs 212Xd05 and 212Xe05) thinning of hemlock clumps within northern hardwood stands (greater than 10% hemlock) is allowed when there is established hemlock regeneration, or hemlock regeneration efforts are planned within or adjacent to these clumps. Where hemlock regeneration is established, it will be protected and encouraged through site-specific protection measures.
- Maintain an 80% crown closure in order to avoid light level changes that result in soil temperature increases, and humidity and soil moisture decreases. See initial thinning crop tree release guidance for exceptions to this guideline.
- Avoid converting rich northern hardwood sites to other forest types.

## Even-aged Management of Northern Hardwoods

### Guidelines:

- Consider even-aged management only when species composition will exceed 30% for intolerant species such as paper birch and mid-tolerant species such as basswood, ash, hickory, yellow birch, red oak, butternut, and black cherry.
- Even-aged hardwoods desired age class distribution:

**Table 2.6. Even-Aged Hardwood Age Class Distribution**

Age	Percent	Target Percent
0-20	10-20	16
21-60	30-40	32
61-100	30-40	32
101 or more	10-30	20

- Do not intentionally create canopy gaps in even-aged northern hardwood managed stands.
- Use stocking level charts FF-1, FF-2, or FF-3 in Appendix FF to establish minimum stocking levels during vegetative treatments.
- Initial thinnings in pole-sized stands should emphasize crown release, removal of high-risk trees, and removal of sub-canopy trees until the minimum stocking level is reached.
- First thinning in pole-sized stands should include a crown release of 60-75 crop trees per acre.
- Maintain an 80% crown closure when thinning stands that have not had a previous pole-sized thinning.
- Regenerate stands using a shelterwood harvest that establishes a uniform crown closure of approximately 60%.
- Apply a shelterwood overstory removal harvest when northern hardwood regeneration is 2-4 feet tall (usually within 5 years).
- Encourage crown release and thinning of stump sprouts in seedling and sapling stands.

## Red Oak Group (northern red oak and northern pin oak)

### Guidelines:

- Manage red oak stands under an even-aged silvicultural system using thinning and shelterwood harvesting methods.
- Red oak desired age class distribution:

**Table 2-7. Red Oak Age Class Distribution**

Age	Percent	Target Percent
0-19	15-25	19
20-59	30-50	38
60-79	15-25	19
80+	20-30	24

- Manage red oak for sawtimber when the site index is greater than 55. Manage oak (normally northern pin oak) for pulpwood when the site index is less than 55.

- Reduce gypsy moth impacts by avoiding the development of pure red oak stands. Grow red oak with a mix of other mid to intolerant tree species such as white ash, paper birch, and red pine.
- Limit harvesting or pruning in the red oak group to the period between October 1 and April 15 to reduce risk of oak wilt infections.
- Obtain a residual basal area between 70 and 90 square feet in intermediate harvests. Harvesting should improve spacing, favor the development of quality crop trees, and maintain within stand diversity.
- Use mechanical scarification or prescribed fire to control understory competition and prepare a seedbed for natural regeneration when advanced regeneration is not present.
- Regenerate red oak using a shelterwood system that leaves 40 to 60% crown cover (large crowns, good form, and uniform spacing). Remove the overstory when red oak regeneration is two to four feet tall.

## Red Pine

### Guidelines:

- Utilize an even-aged silvicultural prescription for managing red pine.
- Red pine desired age class distribution:

**Table 2-8. Red Pine Age Class Distribution**

Age	Percent	Target Percent
0-20	10-20	15
21-60	25-35	30
61-100	25-35	30
101 or more	20-30	25

- Evaluate the potential for *Sirococcus* and *Sphaeropsis* shoot blights when considering red pine regeneration techniques. Do not retain residual red pine where shoot blights are likely to be a problem and red pine regeneration is being planned.
- Conduct the first commercial thinning when operable red pine stand volumes are available. Thereafter, red pine thinnings should occur every 7-15 years. Do not remove more than 40% of the basal area (except the first thinning). Thin to the following residual basal areas:

**Table 2-9. Red Pine Basal Area**

Site Index	Desired Residual Basal Area
Less than 60	10-20 sq. ft. above the "B" level (see Figure FF-4, Appendix FF )
60 or greater	20-40 sq. ft. above the "B" level

- Consider silvicultural treatments such as shelterwood harvest patches, release, scarification, and underplanting to encourage future mast, den, or nest trees where within stand diversity is lacking. Limit these activities to no more than 5% of the total stand.
- Manage natural origin red pine to its maximum rotation age (see Table 2-1).

## Jack Pine

### Guidelines:

- Utilize an even-aged silvicultural prescription for managing jack pine.
- Jack pine desired age class distribution:

**Table 2-10. Jack Pine Age Class Distribution**

Age	Percent	Target Percent
0-10	10-20	16
11-30	30-40	32
31-50	30-40	32
51 or more	15-25	20

- Harvest of declining jack pine stands is a high priority.
- Regenerate jack pine by clearcut harvesting followed by natural or artificial reforestation. Consider the genetic quality of existing jack pine stands when deciding whether to use natural or artificial reforestation methods.
- Do precommercial thinning only if stocking levels exceed 2,000 seedlings or saplings per acre.
- Commercial thinning is not recommended but may be considered when the site index exceeds 60 and a residual basal area of about 80 square feet is retained.

## Balsam Fir

### Guidelines:

- Utilize an even-aged silvicultural prescription for managing balsam fir.
- Balsam fir desired age class distribution:

**Table 2-11. Balsam Fir Age Class Distribution**

Age	Percent	Target Percent
0-10	15-25	20
11-30	35-45	40
31-45	25-35	30
46 or more	5-15	10

- When balsam fir is the objective, and where it has developed advanced understory regeneration, remove the overstory when the understory is in the seedling/sapling stage.
- Where opportunities exist, alternate balsam fir and aspen forest types on the same site over time.

## White Pine\*

### Guidelines:

- Utilize an even-aged silvicultural prescription for managing white pine.
- White pine desired age class distribution:

**Table 2-12. White Pine Age Class Distribution**

Age	Percent	Target Percent
0-20	10-20*	12
21-60	20-30	24
61-120	30-50	36
121 or more	25-35	28

*\*White pine is sometimes grown in an understory situation. The forest type is whatever the overstory is at the time. Release usually occurs at 15-20 years of age.*

- Begin intermediate thinnings as soon as operable volumes are available. Thin at 10-15 year intervals to a residual basal area between 100 and 150 square feet per acre (70%-90% crown closure).
- Use a two-cut shelterwood system (seed cut and removal cut) to regenerate white pine stands at rotation age. The seed cut should retain a residual crown cover of 40-70%. Use the lower level when competition from low shade is not expected. Conduct site preparation immediately prior to or after the seed cut to: (1) scarify 35-50% of the area (mixing humus and mineral soil); and (2) remove undesirable and unmerchantable trees. Removal harvest should occur when regeneration is about 20-25 feet tall.
- When establishing white pine:
  1. Plant white pine with blister rust resistance;
  2. Retain a crown closure of about 40% in underplanted white pine stands until the overstory is removed;
  3. Remove overstory when saplings are 20-25 feet tall;
  4. Underplant white pine at a minimum of 100 seedlings per acre (20-foot spacing) for species diversity and at a minimum of 435 per acre (10-foot spacing) for stand replacement.
- Accomplish blister rust pathological pruning when trees are in the seedling/sapling stage (3-10 feet tall).
- Manage natural origin white pine to its maximum rotation age (see Table 2-1).
- Utilize deer protection such as fencing, shelters, or repellants when planting in areas where deer populations have the potential to cause significant browsing damage.

## White Spruce\*

### Guidelines:

- Manage white spruce under an even-aged silvicultural system using intermediate thinnings, and either final harvest or shelterwood harvest followed by artificial or natural regeneration.
- White spruce desired age class distribution:



**Table 2-13. White Spruce Age Class Distribution**

Age	Percent	Target Percent
0-20	15-25*	19
21-60	30-50	38
61-80	15-25	19
81 or more	20-30	24

*\*White spruce is sometimes grown in an understory situation. The forest type is whatever the overstory is at the time. Release usually occurs at 5-20 years of age.*

- Maintain a crown cover between 50% and 70% when frost damage protection for artificial or natural regeneration is needed, such as upland/lowland transition areas or landscape depressions. Remove the overstory when frost damage is no longer a concern.
- Begin thinnings as soon as operable volumes are available. Thin at 10-20 year intervals to a residual basal area of between 100 and 120 square feet per acre. Do not remove more than 40% of the basal area in any single harvest.

### Mixed Lowland Conifers, Lowland Hardwoods, and Hemlock\*

#### Guidelines:

- Harvest lowland conifers, lowland hardwoods, and hemlock only to benefit or maintain habitat for species of viability concern.
- Plant no more than 500 seedlings per acre when attempting to develop or improve hemlock composition in other forest types.
- Do not attempt natural or artificial hemlock regeneration within deer yards unless protection measures such as fencing are utilized.

*\* See Aspen Vegetative Management Guidelines for management direction adjacent to northern white cedar stands. See Uneven-aged Management of Northern Hardwoods Guidelines for hemlock protection requirements in mixed hardwood stands.*

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## Special Forest Products

#### Guidelines:

- Utilize a permit system, except as defined by agreement with Native American tribes, to specify what special forest product species and quantities may be gathered and what harvest/gathering locations are authorized.
- Gathering special forest products for personal use and (or) commercial sale is permitted throughout much of the Forest, except for the following: (1) Collecting species on the list of Regional Forester Sensitive Species for the Chequamegon-Nicolet National Forests, except by permit for Tribal gathering or scientific purposes; (2) Peat mining or collecting sphagnum moss. Permits may be issued for gathering sphagnum moss for scientific purposes; (3) Gathering special forest products within wetlands, Forest Service recreation areas, administrative sites or within 100 feet of perennial water bodies (exception: the collection of fruits, nuts, berries, and fungi for personal use, or unless permitted for tribal gathering); (4) Gathering boughs, Christmas trees, birch bark, and firewood within 100 feet of trails that have high scenic integrity objectives; and (5) Additional restrictions on gathering special forest products listed within the Standards and Guidelines of some Management Areas.

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## Wildlife and Fish

### Timber Harvest Reserve Areas and Reserve Trees\*

#### Guidelines:

- Leave and protect existing downed logs greater than 10 inches in diameter (small end diameter) consistent with providing for management access (e.g. skid trails).
- Exclude heavy logging equipment from wet areas, excessively steep slopes, or reserved areas within timber harvest units.

*\*See Management Area descriptions in Chapter 3, as well, for reserve tree guidelines in uneven-aged managed stands.*

#### Reserve tree guidelines for even-aged managed stands:

- Emphasize diversity, cover and (or) mast by reserving tree species such as hemlock, northern white cedar, white pine, red oak, American beech, hickory, ironwood, blue beech, yellow birch, paper birch and other species that may not have strong local or forest wide representation.
- Reserve the above-listed tree species in small clumps or islands of trees within clearcuts, overstory removal cuts, and other regeneration harvest areas.
- Reserve 2 to 5 live trees per acre greater than 11 inches in diameter, or select the largest trees available; and reserve variable size reserve islands/clumps that total up to ½ acre for every 10 acres managed with an even aged harvest.

#### Reserve snag guidelines for even-aged and uneven-aged managed stands:

- Reserve all dead snags and live den trees up to 10 trees/snags per acre, unless they present a safety concern. Emphasize the largest snags and den trees available. Those snags felled for safety reasons should be left on site as coarse woody debris wherever possible. Additional snags will be recruited from live reserve trees.

## Wetlands Management

#### Guidelines:

- Coordinate wild rice seeding site selection with Native American tribes.
- Avoid fragmenting shallow water marshes, or large wetlands containing open water, with corridors used for power lines, roads, and trails.
- Limit water level fluctuations to less than one foot during the growing season on bodies of water where wild rice occurs and where the Forest Service is able to manipulate water levels.
- Perpetuate emergent vegetation such as cattails, sedges, and bulrushes by minimizing the frequency of reservoir and low head impoundment drawdowns.
- Protect hydrologic functions and maintain hydrologic regimes.

## Woodland Ponds

### Guidelines:

#### Ephemeral ponds smaller than one acre:

- Do not operate heavy equipment in woodland ponds.
- Locate landings and roads to avoid erosion and the contribution of sediment into woodland ponds.
- Do not allow logging slash in woodland ponds. However, selected trees may be dropped and left in ponds where large woody debris would enhance aquatic habitat.
- Prohibit the operation of heavy equipment during non-frozen conditions within 15 feet of the normal high water mark.

#### Ephemeral ponds larger than one acre:

- Do not operate heavy equipment in woodland ponds.
- Locate landings and roads to avoid erosion and the contribution of sediment into woodland ponds.
- Do not allow logging slash in woodland ponds. However, selected trees may be dropped and left in ponds where large woody debris would enhance aquatic habitat.
- Prohibit the operation of heavy equipment during non-frozen conditions within 15 feet of the normal high water mark.
- Do not clearcut within 50 feet of the normal high water mark of these ponds. Individual tree timber harvesting may be done within this zone if there is an emphasis on retaining shade trees and large diameter cavity and nest trees adjacent to the pond.

#### Permanent woodland ponds smaller than one acre:

- Do not operate heavy equipment in woodland ponds.
- Locate landings and roads to avoid erosion and the contribution of sediment into woodland ponds.
- Do not allow logging slash in woodland ponds. However, selected trees may be dropped and left in ponds where large woody debris would enhance aquatic habitat.
- Prohibit the operation of heavy equipment during non-frozen conditions within 15 feet of the normal high water mark.
- Do not clearcut within 50 feet of the normal high water mark of these where they are uncommon (less than one per 10 acres). Where they are common, do not clearcut within 50 feet of at least one-third of the ponds. Individual tree timber harvesting can be done within this zone if there is an emphasis on retaining shade trees and large diameter cavity and nest trees adjacent to the pond.

#### Permanent woodland ponds larger than one acre:

- Use “Wisconsin’s Forestry Best Management Practices for Water Quality” (1995 or subsequent revisions) including Riparian Management Zone direction, for guidance on protection.

## Upland Wildlife Habitat Management

### Guidelines:

- Temporary openings within ruffed grouse management areas will be 10-acre patches or less.

- Provide for an average of one ruffed grouse drumming log for every 10 acres of aspen clearcut. The log should be 10 inches or more in diameter and at least 12 feet long.
- Construct artificial nest and den structures from materials that blend with the site and do not detract from the natural landscape. Concentrate these structures in the most productive habitat (based on field inventories). Monitor and maintain these structures to minimize threats from insects, disease, competitors, and predators.
- Small permanent forest openings will be located in upland areas and will generally range in size from one to 10 acres. Maintain brush or shrub openings so that no more than 50% of the area is covered by woody vegetation such as hazel, chokecherry, willow, unless the area is being managed for a specific purpose requiring such cover. These areas include remnant or restored barrens communities, frost pockets, and other natural openings.
- Constructed openings should be at least 200 feet in diameter, have irregular shapes, and blend with the surrounding landscape.
- Use mechanical methods (mowing, disking, hand brushing, chaining, girdling), prescribed fire, or biological means to restore and maintain selected openings to prevent natural succession to woody plants.
- Use native species when planting supplemental mast or fruit-bearing trees or other shrubs for wildlife habitat improvement.
- Allow natural conversions of upland open areas to forested conditions where open habitat exceeds management area acreage goals. Do not convert natural openings to tree plantations.

## **Fisheries Habitat Management**

### **Standard:**

Maintain a minimum of 80% shrub or tree shade (where present) around ground water seeps within cool and cold water systems.

### **Guidelines:**

- Manage riparian areas so that they contribute large woody debris (LWD) to lakes, ponds, rivers, and streams. LWD characteristics include: (1) At least 10 to 30 pieces per 1,000 feet of shoreline adjacent to uplands, and at least 5 to 20 pieces per 1,000 feet of shoreline adjacent to forested lowlands; (2) Most pieces greater than 12 inches in diameter and some resistant to decay; (3) Many pieces in lakes with strong branches on the boles which hold part of the wood off the bottom; (4) LWD length should be at least 50 to 120 feet long in lakes and wide streams, or a length that is 1 to 2 times bankfull width in narrow-medium width streams (i.e. less than 50 ft wide).
- Restore or enhance habitat complexity in lake habitat manipulation projects by using a variety of wooden cover structures (e.g., fish cribs, tree-drops and half-logs) and rock reef placements.
- Simulate a natural appearance in aquatic habitat improvement tree drops by having variable distances between them. Stumps should either be flush cut or angled away from the lake, river, or stream. Bury tree drop holding attachments where possible.
- Reshape the bank and smooth contours when revegetating exposed streambanks. Partially cover stabilization structures with transplanted native vegetation and revegetate with native species suited for site stabilization. Vary the rock size and

utilize native rock for riprap and within water rock structures. Maintain natural lake edges and stream meanders when making shoreline and within stream improvements.

- Design, construct, and maintain stream crossings and dams to minimize disrupting the migration or movement of fish and other aquatic life. Passage may be blocked for a prescribed fish management procedure or if passage is deemed unnecessary.
- Do not remove in-stream large woody debris for more than one-half the stream channel width when removal is necessary for recreational boating or canoeing.

## Aspen and Beaver Management

### Standard:

Aspen patches will not be regenerated within 450 feet of selected Class I, II, and segments of Class III trout streams including their tributaries and spring ponds (see Appendix DD for a list of streams). Aspen patches will also not be regenerated within 300 feet of all other Class I and II trout streams including their tributaries and spring ponds. Manage vegetation within these zones for species other than aspen, preferably long-lived conifers and northern hardwoods.

### Guidelines:

- Convert from aspen to long-lived conifers and northern hardwoods within 300 feet of all Class I and II trout streams (and their tributaries including spring ponds) and 450 feet of “selected” Class I, Class II, and segments of Class III trout streams and their tributaries including spring ponds (See Appendix DD for a list of selected streams).
- Protect and restore coldwater stream communities by maintaining some Class I and II trout streams and their tributaries in a free flowing condition through beaver and beaver dam removal. Streams listed in Appendix DD will be considered first.
- Control beaver and remove beaver dams as needed to protect ecologically sensitive areas (e.g., old growth, wild rice, and northern white cedar) and capital improvements (e.g., roads, recreation areas, and buildings) from flooding.
- Maintain at least one representative of each narrow stream valley segment type (bankfull width less than 20 feet) without artificial dams or beaver impoundments to maintain free-flowing riparian and aquatic communities associated with each type.
- Maintain beaver populations and their works (dams, lodges, food caches, etc.) except when there are adverse effects on important resource values such as cold water fisheries, rare plants, road and trail systems, and ecosystems susceptible to flooding and vegetation changes.

## Management for Great Blue Heron

### Guidelines:

- Close roads and trails under Forest Service jurisdiction within 1,320 feet of a heron nest site to vehicular traffic between March 15 and August 1 unless no feasible alternatives exist and use can be justified.
- When a heron colony becomes inactive for three consecutive years, restrictions on land use activities can be removed.
- Maintain beaver ponds as potential heron and other wildlife habitat where the ponds are not adversely impacting critical resources and facilities.

- All land use activities will be excluded within 330 feet of active heron colonies, unless existing activities appear to have been in place before herons began to use the site.
- Land use activities that make no significant change in the landscape are permitted within the 330 to 660 foot zone around a great blue heron colony. Activities such as thinning, permanent opening maintenance, and pruning, may occur from August 1 to March 15. Clearcutting, land clearing, and construction activities will not be permitted within this zone.

## **Management for Osprey**

### **Guidelines:**

- All land use activities will be excluded from 0 to 330 feet from active osprey nests.
- Land use activities, which make no significant change in the landscape, will be permitted within the 330 to 660 foot zone around an osprey nest. Activities such as thinning, permanent opening maintenance, and pruning, may occur from August 1 to March 15. Clearcutting, land clearing, and construction activities will not be permitted within this zone.
- Site disturbing land use activities will not be permitted within a zone 660 to 1320 feet from an osprey nest from March 15 to August 1.
- All land use activities will be excluded within 0 to 330 feet of active osprey nests, unless existing activities appear to have been in place before ospreys began to use the site.
- Land use activities can be permitted after an osprey nest becomes inactive for three consecutive years.
- Place and maintain artificial platforms to provide secure osprey nest sites where natural sites are lacking or nests have fallen down.

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## **Federal Threatened and Endangered Species**

### **Bald Eagle**

#### **Standards:**

- Retain restrictions as described in the “Northern States Bald Eagle Recovery Plan” (1983) within 330 feet of the former nest tree site (when a nest disappears, but the tree remains, or other suitable nesting structures are nearby), as long as the bald eagle breeding area is occupied. If the nest tree blows down, and no suitable replacement trees are nearby, all restrictions can be removed.
- Remove restrictions in the area beyond 330 feet when a nest is classified as a remnant (i.e., a nest unmaintained and unoccupied for five consecutive years).

#### **Guidelines:**

- Close or relocate roads and trails (under Forest Service jurisdiction) within 1,320 feet of a nest site to vehicular traffic between February 15 and August 1. Waive this requirement only if no feasible alternatives exist and use can be justified.
- Reserve known roosting, perching, and potential nest trees within active bald eagle breeding areas.



## Eastern Timber Wolf

### Standard

- Protect wolf den and rendezvous sites by utilizing the following direction contained in the “Wisconsin Timber Wolf Recovery Plan” (1999): (1) Protect wolf den sites (verified by wildlife biologists) and key rendezvous sites as determined by surveys, that have been used within the last two years; (2) Utilize a year-round restriction on land use activities (including tree harvest and road construction) within 330 feet of a wolf den or rendezvous site (human uses of the area will be passively discouraged, and existing trails and logging roads will be closed or rerouted); and (3) within one-half mile of a wolf den or rendezvous site, land use activities such as tree harvest, road construction and maintenance, and mineral core drilling exploration will be prohibited between March 1 and July 31. New road and trail construction will not be permitted within this zone. Roads and trails under Forest Service jurisdiction will be closed on a case-by-case basis.

### Guidelines:

- Do not exceed existing densities of roads open to public vehicles within active wolf territories. This requirement also applies within areas that have a Wisconsin Department of Natural Resources Probability Index of 50 or above, and applies to permanent roads that require routine maintenance and are accessible year-round by two-wheeled drive vehicles (Forest Service Maintenance Level 5, 4, 3, and possibly some Level 2 roads). See “Recovery Plan for the Eastern Timber Wolf,” 1992; and the “Wisconsin Wolf Management Plan,” 1999.
- Do not upgrade roads beyond existing Maintenance Levels within active wolf territories (or areas with a probability index greater than 50).

## Fassett’s Locoweed

### Standard:

Protect and manage all known plant sites utilizing Fassett’s Locoweed Recovery Plan (1991) direction. All land use activities (except population monitoring and those activities necessary to protect the site) will be excluded from water’s edge to the high-water mark and within a buffer zone 200 feet inland from the high-water mark for locoweed populations.

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## Regional Forester’s Sensitive Species (RFSS)

*Note: Some of these species may be found in more than one habitat. In addition, the RFSS list is subject to change and can be found on the web page for the Eastern Region.*

### Standard:

- Do not allow the collection of RFSS plants, except for scientific or educational purposes, or for the conservation or propagation of the species. Collection must be authorized by a Forest Service permit.

**Guidelines:**

- Vegetation management within 100 to 500 feet of RFSS plant and animal sites will be limited to practices that maintain or enhance habitat and micro-habitat conditions. Animal sites are defined as active nest, active den, or evidence of breeding activity.
- Prohibit domestic livestock grazing, and restrict recreation activities as needed within the 100 to 500 foot distance from an RFSS site.

## Northern Blue Butterfly

**Guideline:**

In the area(s) where the northern blue butterfly tends to congregate in roads, accomplish road maintenance that maintains good road crowns so butterfly puddling on the road itself is rare. Roads or motorized trails developed or reconstructed in this area will be designed for good drainage to decrease water collection on road surfaces.

## West Virginia White Butterfly

**Guideline:**

- Protect known locations for toothwort (*Cardamine diphylla*), and maintain at least 80% canopy crown cover over and extending at least 100 feet from the perimeter of known toothwort sites. Avoid isolating toothwort populations from larger blocks of interior forest.

## Henry's Elfin Butterfly

**Guideline:**

- Burn no more than 50% of the host plant area annually within Moquah Barrens, Riley Lake, or other large areas of potential habitat.

## Chryxus Arctic Butterfly

**Guidelines:**

- Protect known locations of chryxus arctic butterfly from disturbance such as prescribed burning. Reevaluate the need for protecting individual colonies if at least ten colonies are located.

## Tawny Crescent Butterfly

**Guideline:**

- Minimize disturbance at sites known to support tawny crescent butterfly populations. Limit prescribed burning in areas that support this species to no more than 50% of habitat annually.

## Northern Goshawk and Red-shouldered Hawk

**Guidelines:**

- Protect active and historic nest sites. Within an area of at least 30 acres surrounding nest site(s), land use activities will be limited to those that do not reduce canopy

closure or are necessary to protect the nest site for as long as the territory or stand is suitable habitat. No timber harvest will occur within the buffer area. Human disturbance will be minimized within the buffer from February 15 to August 1.

- Within a minimum of 330 feet of the designated 30-acre buffer area:
  1. Do not use even-aged management.
  2. Emphasize at least 80% crown closure with not more than 4 canopy gaps per acre up to 40 feet in diameter.
- Close roads and trails under Forest Service jurisdiction to vehicular traffic within 330 feet of a nest site from February 15 to August 1 unless no feasible alternatives exist and use can be justified.
- Conduct surveys for these species prior to projects being implemented within potential habitat areas.
- Goshawk take will be by permit only.

### LeConte's Sparrow and Upland Sandpiper

#### Guideline:

- Maintain and restore needed sedge and shrub components in sedge meadows larger than 40 acres.

### Swainson's Thrush

#### Guidelines:

- Protect Swainson's thrush nesting activities from May 15 - August 1 by prohibiting disturbance within stands with known nest locations.
- Encourage a conifer understory where Swainson's thrush is present within stands of high quality potential habitat.

### Connecticut Warbler

#### Guideline:

- Harvest jack pine in blocks of 100 or more acres where possible.

### Black Tern

#### Guidelines:

- Maintain impoundment and flowage water levels and avoid disturbance within one-quarter mile of active black tern nests between May 1 and July 15.
- Emphasize purple loosestrife eradication on water bodies with active black tern colonies.

### Trumpeter Swan

#### Guidelines:

- Maintain adequate impoundment water levels from April 15 to July 15 (no drawdowns), if breeding pairs are present.

- Do not permit land use activities, such as timber harvest, recreational development, and construction within 1,320 feet of an active trumpeter swan nest site from April 15 to July 15.

## **Spruce Grouse**

### **Guideline:**

- Emphasize a mosaic of jack pine / spruce habitat in an array of age classes from regenerating to mature, including lowland spruce patches in areas of historic and known spruce grouse populations. Management activities will help provide an extensive and continual supply of dense stands of short-needed conifers with live branches 0 to 13 feet above the ground.

## **Sharp-tailed Grouse**

### **Guideline:**

Expand available habitat by providing temporary openings adjacent or close to large open areas with known sharp-tailed grouse populations.

## **Black-backed Woodpecker**

### **Guideline:**

- Maintain a dead conifer habitat component across the landscape to provide feeding and nesting sites for black-backed woodpeckers.

## **American Marten**

### **Guideline:**

- Within areas determined to be occupied by marten (see Glossary for definition of American Marten occupied areas) do the following:
  1. Leave 15-25% of potential timber salvage unharvested following large disturbance events (greater than 100 acres) except in salvage situations determined high risk to human safety and/or forest health.
  2. Incorporate Management Area 2B Reserve Tree Guidelines (Chapter 3) relative to tree numbers and diameters to even and uneven-age managed stands, where existing tree diameters allow.

## **Wood Turtle**

### **Guidelines:**

- Protect known communal wood turtle nesting sites from predator impacts, where feasible, and protect from site disturbance due to construction, or recreation use impacts.
- Streambank stabilization projects must protect wood turtle nesting sites. Utilize the following mitigation measures: (1) Reshape the bank and smooth contours when revegetating exposed streambanks; (2) Partially cover stabilization structures with sod and revegetate with species similar to those growing on the adjacent bank; (3) Vary the rock size and utilize native rock for rip rap and within-water rock structures; and (4)

Maintain natural lake edges and stream meanders when making shoreline and within stream improvements.

### **Extra-striped Snaketail Dragonfly, Pygmy Snaketail Dragonfly, and Green-faced Clubtail Dragonfly**

#### **Guideline:**

Perform instream work (where sediment disturbance could occur) after June 30<sup>th</sup> at documented sites of the Extra-striped Snaketail Dragonfly, Pygmy Snaketail Dragonfly, or Green-faced Clubtail dragonfly.

### **RFSS Mussels**

#### **Guideline:**

Relocate live mussel specimens, at documented species concentration sites (mussel beds), to similar habitat upstream from instream excavation project areas.

### **Dwarf Bilberry (*Vaccinium cespitosum*)**

#### **Guidelines:**

- Remove overshadowing trees and shrubs in and around northern blue butterfly breeding habitat (emphasize hand cutting).
- Create connecting corridors between dwarf bilberry populations where feasible.
- Use habitat manipulation and revegetation (planting or seeding if necessary) to create new dwarf bilberry populations.
- Cut and/or burn areas adjoining northern blue butterfly breeding habitat when expanding dwarf bilberry populations.
- Do not spray *Bacillus thuringiensis* (BT) in the vicinity of dwarf bilberry populations.
- Do not burn more than 25% of the total number of openings containing dwarf bilberry colonies per year and avoid burning bilberry colonies within them.

### **Ginseng (*Panax quinquefolia*)**

#### **Guideline:**

- Prohibit wild ginseng harvesting on national forest land except as provided by tribal agreements.

### **RFSS Plant Species Found in Aquatic Habitats**

#### **Guidelines:**

- Do not create new motorized access to lakes with documented RFSS plant species sites.
- Avoid removing beaver dams in streams that are occupied by Hill's pondweed.

## RFSS Plant Species Found in Riparian Habitats

### Guideline:

Use Wisconsin's Forestry Best Management Practices (1995 or subsequent revisions) for riparian management zones.

## RFSS Plant Species Found in Open Wetland Habitats

### Guidelines:

- Maintain natural hydrologic regimes and limit runoff and sedimentation caused by adjacent area management activities within known plant habitat.
- Limit travel by vehicles and/or equipment to frozen ground conditions in known RFSS plant habitat.

## RFSS Plant Species Found in Dry, Early Successional Habitats

*Note: In addition to protection, these species may require some form of active management, or disturbance such as timber harvest or prescribed fire, to maintain viability.*

### Guideline:

Avoid direct mechanical disturbance to plant sites except under frozen conditions.

## RFSS Plant Species Found in Cliff and Exposed Rock Habitats

### Guideline:

- Avoid direct mechanical disturbance of known sites and do not encourage recreational activity that disturbs these habitats.

## RFSS Plant Species Found in Forested Wetland Habitats

### Guidelines:

- Do not manipulate habitat in a manner that encourages an increase in beaver habitat adjacent to RFSS plant sites.
- Protect hydrologic functions and maintain natural hydrologic regimes.
- Prohibit permanent or temporary openings within 100-500 feet of identified plant sites.

## RFSS Plant Species Found in Upland Hardwood Habitats

### Guidelines:

- Protect dense bryophyte mats (moss, liverworts, and hornworts) in areas considered highly suitable for *Asplenium trichomanes* (areas of calcareous soil and rocks).



## Forest Health and Disturbance Processes

### Forest Health

#### Guidelines:

- Manage short-lived pioneer species at rotations that minimize susceptibility to catastrophic events such as large fires and insect outbreaks. Exceptions are made for areas specifically managed or influenced by natural disturbances.
- Give preference to mixtures of species and age classes over monocultures and large areas of a single age class. This is especially important in northern hardwoods where sugar maple can dominate a landscape.

### Fire Management

#### Guidelines:

- Allow selected wildfire areas to regenerate naturally within fire-dependent ecosystems.
- Consider a range of fuel treatment options that include but are not limited to: commercial timber sales, other utilization methods, mechanical treatment, fuel break construction, and prescribed fire.
- Introduce diversity into the prescribed burning regime by lengthening burn intervals, allowing fuels and topography to determine intensity, and varying the seasons when prescribed burning is applied.
- Use both natural and prescribed fire to maintain non-forested upland ecosystems or to set back succession for species of concern.
- Allow natural disturbance mechanisms and prescribed fire to create early seral stage areas or open canopy conditions in lowland conifer habitat.
- Focus fuels reduction activities within the urban interface and the areas surrounding the communities at risk.

### Non-Native Invasive Species

#### Standard:

Use permissible mechanical, biological, and chemical controls to reduce the spread of non-native invasive species.

#### Guidelines:

- Reduce the importation and movement of non-native invasive plant species across the Forests by taking the following actions:
  1. Avoid the placement of log landings in areas infested with non-native invasive plant species.
  2. Consider non-native invasive plant species treatment when planning prescribed burn projects in areas of heavy weed infestation.
  3. Minimize the need for prescribed burn area fire lines and soil disturbance by using existing barriers where possible.
  4. Utilize staging areas and helispot facilities (for prescribed burning) that are free of non-native invasive plant species.

## Pest Management

### Guidelines:

- Emphasize species diversity, age class distribution, stand density (stocking) levels, and suitable site / species matches when managing vegetation for resistance to pest outbreaks.
- Pest management will tier to the 1986 (or latest revision) “Gypsy Moth Management in the United States: a cooperative approach” Final Environmental Impact Statement and Record of Decision.

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## Social—Recreation Programs

### Recreation Facilities and Access Management

#### Standards:

- Prohibit horse and mountain bike use of trails during spring breakup (timing determined locally by spring conditions each year).
- Prohibit any net increase in motorized vehicle access to lakes, with the exception of access associated with lakes in new land acquisitions. If roaded access is provided to a lake that is not a new acquisition and previously did not have such access, another lake on the forest will have roaded access removed.

#### Guidelines:

- Some new campsites may be added to existing campgrounds.
- Recreation facility rehabilitation should be undertaken in the following priority: (1) Correct health and safety problems; (2) Protect the environment; (3) Improve accessibility; (4) Changing camp unit design for efficient administration; and (5) Refurbish worn facilities.
- Utilize the following criteria when evaluating developed sites for closure: (1) High unit operating costs; (2) High deferred maintenance costs; (3) Less than 25% of practical maximum capacity use within two preceding years; (4) Public concerns; (5) Able to satisfy demand at alternative locations; (6) Resource damage; and (7) strategic change to meet regional tourism goals and meet customer demand.
- Improve degraded remote campsites by adding items such as gravel, fire rings, wilderness toilets, and picnic tables. Close remote campsites when use is causing significant resource damage and funds are not available to repair the site.
- Limit the number of remote campsites on lakes, rivers, streams, and other concentration points when site use exceeds the design capacity as determined in a project analysis (NEPA) and decision.
- Improve some boat landings to minimize resource impacts or improve customer convenience where fully surfaced access roads (graveled, paved, or concrete) already exist.
- Construct new boat landings only on lakes where: (1) Fully surfaced roads (graveled, paved, concrete) already exist within 300 feet of the lake; (2) No other public access points exist; and (3) Private or national forest developments already exist on at least 25% of the lake shore.

- Trail management and accessibility should be compatible with the area recreation opportunity spectrum class.
- Maximize the placement of horse and mountain bike trails in upland (dry) areas, and minimize the number of water crossings by these trails (streams, wetlands, and riparian areas).
- Rehabilitate forest trails and (or) adjacent areas impacted by resource management activities.
- Manage and maintain the North Country and Ice Age Trails primarily for hiking and backpacking.
- Follow guidelines in the publication “North Country National Scenic Trail - A Handbook for Trail Design, Construction, and Maintenance” when maintaining or constructing additional hiking trails and support structures.

## Off-Road Vehicle Use

*Note: ATV Route – Forest road that has been posted open for ATV use.*

*ATV Trail – Forest trail that has been posted open for ATV use.*

### Standards:

- Automobiles, trucks, and other street legal vehicles must remain on roads open to the public for motorized use, or on trails designated for use by specific motorized vehicles.
- Permit all-terrain vehicles (*see definitions in Appendix EE*) only on roads and trails that are posted open and designated for their specific use.
- Permit all-terrain vehicle use on designated ATV trails and designated ATV road routes year-round except as follows:
  1. Routes located on classified roads that are closed to general vehicle use will be closed to ATV use during spring break up with timing determined locally by spring conditions each year.
  2. Routes located on classified roads that are open to general vehicle use will be closed to ATVs when local townships/counties have road weight limits in effect.
  3. Trails will be closed during spring break up with timing determined locally by spring conditions each year.

### Guidelines:

- Restrict snowmobiles to routes and trails posted open and designated for their use. In addition, snowmobiles may travel on normally unplowed, open roads when snow accumulations exceed four inches.
- Allow off-road vehicle use, such as ATV or snowmobile, for individuals to access their private property by special use permit, when such use would cause less damage than full-size vehicles. Use of all-terrain vehicles to access private land within designated Wilderness and recommended Wilderness Study Areas is not permitted.

## **Construction, Reconstruction, and Use of Motorized Trails**

### **Standards:**

- Do not locate new motorized trails or routes over State of Wisconsin navigable waters when alternative locations are feasible. This requirement does not apply to snowmobile trails that are routed over frozen surface waters.
- Do not locate new motorized trails or routes through wetlands when alternative locations are feasible. This requirement does not apply to snowmobile trails that cross wetlands under frozen conditions (without the use of fill). If a new trail or route must be located within a wetland, alternatives to earthen fill must be considered.
- Install adequately sized culverts (or other appropriate drainage structures) and appropriate erosion control measures where motorized trails or routes cross navigable and non-navigable streams. This requirement does not apply to snowmobile trails that cross streams under frozen conditions.
- New, replacement, and reconstructed trail bridges must have closed-slat or similar running surfaces that prevent the deposit of trail sediment and debris in waterways.
- All-terrain vehicles that operate on Forest trails and routes must be registered with the State of Wisconsin (or meet requirements for registration if the owner is a non-resident), and have a Forest Service approved spark arrestor.
- Snowmobiles and all-terrain vehicles operating on Chequamegon-Nicolet National Forest trails and routes shall meet all sound attenuation requirements defined in Wisconsin statutes. Snowmobiles and all-terrain vehicles operating on Forest trails or routes shall not be modified in any manner that amplifies or otherwise increases total noise emissions above the noise emission levels of originally manufactured machines. Such modifications may be allowed as part of a special event under special use permit.

### **Guidelines:**

- Do not locate new motorized trails or routes through a Special Management Area, or designated Old Growth and Natural Feature Complexes.
- Do not locate new motorized trails or routes adjacent to Wilderness, Proposed Wilderness, or Semi-Primitive Non-Motorized areas unless such a location is the best feasible relocation of a trail from inside the area.
- Use existing corridors for new all-terrain vehicle, snowmobile, and other off-road vehicle routes wherever possible.
- Provide multiple motorized recreation uses on motorized trails when ground conditions permit and the uses are compatible. Caution signs should provide sufficient warning to visitors that several motorized activities may be taking place on the trail simultaneously. Single use trails may connect to multiple use trails.
- Locate new all-terrain vehicle trails outside of areas identified as least suitable for such use (ATV Resource Suitability Map, See Map Packet)..
- Avoid (when possible) wetlands, riparian areas, stream crossings, sustained grades of 5% or more, and highly erodible soils (silt cap, sand, etc.) when designing new all-terrain vehicle trail systems, relocating existing motorized trail segments, or considering the designation of roads as all-terrain vehicle routes. Where such locations cannot be avoided, consider stabilizing the trail tread and ensuring adequate drainage. Give priority to relocating trail segments that cause erosion, and a degradation of water quality and other resources.

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## Heritage Resources

### Guidelines:

- Utilize the “Programmatic Guide regarding the Operation Maintenance and Development of the Heritage Program” of 1999 or as revised (Programmatic Guide) for guidelines on survey, protection, evaluation, interpretation, personnel certification and mitigation for the heritage resources program.
  - Human remains and any associated objects must remain in place when they are discovered through project work, natural forces, or vandalism. Subsequent actions should be conducted in accordance with direction found in the “Programmatic Guide.”
  - Complete heritage resource surveys and document any required protective mitigation measures prior to project implementation. Decision documents must display required mitigation measures and evidence of compliance with applicable laws and regulations.
  - When heritage resources are discovered during Forest Service project implementation, all activities within the vicinity of the discovery area will cease until a professional archaeologist has made an on-site assessment of the discovery, and has consulted with SHPO, ACHP, and other interested parties regarding possible treatment alternatives.
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## Scenery Management

### Facilities

### Roads, Trails, Recreation Use Areas, and Water Bodies

#### Guidelines for High Scenic Integrity Objective (SIO) Areas:

- The following are high SIO roads, trails, recreation use areas, and water bodies (see SIO map in map packet and Appendix HH. The list in Appendix HH is current as of August 2003 and is subject to change):
  1. State and county highways, Forest Service scenic byways, designated travel routes to campgrounds and other major recreation use areas, and roads that border established Wilderness areas and designated Wilderness study areas.
  2. The North Country National Scenic Trail (WI State Trail), the Ice Age National Scenic Trail (WI State Scenic Trail), hiking trails within Semi-Primitive Non-Motorized areas (except hunter walking trails), and hiking trails within ½ mile of campgrounds.
  3. Campgrounds and designated trailheads and parking areas (the high SIO zone is 600 feet wide around the perimeter of these areas).
  4. All natural lakes and selected impoundments 10 acres and larger in size, all wild and scenic rivers, and rivers that are normally canoeable and have a history of high recreation use.
- Maintain minimal evidence of forest management activities.
- Locate temporary openings at least 200 feet from roads (except high speed highways), trails, recreation use areas, and water bodies.
- In temporary openings made in jack pine, consider the following:
  1. Retain red and white pine trees.

2. Create a savannah appearance as seen from sensitive travelways in lieu of limiting size of temporary openings.
  3. If not counter to reforestation needs, time mechanical treatments to achieve reduction of slash height and to encourage bracken fern and other vegetation to cover slash material.
- Temporary openings adjacent to high-speed highways (55 miles per hour speed limits) should be no more than 130 feet long (along the road), should be separated by a minimum distance of 500 feet, and should occupy no more than 400 feet of each mile of road.
  - Use Table 2-5 guidance when harvesting northern hardwoods within high SIO areas (see Uneven-aged Management of Northern Hardwoods).

### **Guidelines for Moderate SIO Areas:**

- The following are moderate SIO roads, trails, recreation use areas, and water bodies (See Forest SIO map in map packet and FEIS Appendix R. The list in Appendix R is current as of August 2003 and is subject to change):
  1. Maintenance level 5 and 4 arterial and collector roads that are listed and mapped as Moderate in the Forest SIO Map.
  2. All non-motorized trails not included in the high SIO category (except hunter walking trails and trails designed specifically for mountain bike use).
  3. All developed recreation sites not included in the high SIO category (e.g., boat landings and trailheads), and remote campsites on lakes and canoeable rivers.
  4. All canoeable rivers not included in high SIO category.
- Forest management activities are moderately evident.
- Locate temporary openings:
  1. At least 100 feet from the perimeter or edge of recreation use areas, such as campgrounds and trail heads, and canoeable rivers.
  2. No more than a 300-foot distance of temporary opening will be allowed along roads and trails. Such openings will be separated by a minimum distance of 500 feet and will occupy no more than 1,056 feet of each mile of road or trail.
- In temporary openings made in jack pine, consider the following:
  1. Retain red and white pine trees.
  2. Create a savannah appearance as seen from sensitive travelways in lieu of limiting size of temporary openings.
  3. If not counter to reforestation needs, time mechanical treatments to achieve reduction of slash height and to encourage bracken fern and other vegetation to cover slash material.

### **Guidelines for Low SIO Areas:**

- Areas not classified as High or Moderate SIO Areas fall under the low SIO category.
- Forest management activities are readily evident.
- Reserve some live trees within temporary openings adjacent to remote campsites (see wildlife reserve tree guidelines).
- Locate temporary openings at least 100 feet from the edge of lakes and ponds.



- Restrictions, if any, on temporary openings along roads and trails will be determined on a site-specific basis during project analysis.

#### Guidelines Applicable to High, Moderate, and Low SIO Areas:

- Minimize the use of road signs as much as possible.
- Road signposts should have natural appearing colors.

### Permanent Openings

#### Guidelines:

- Shape and blend permanent openings created through vegetative management with the adjacent characteristic landscape. Avoid straight lines in the design and layout of these openings.
- Take advantage of natural openings when creating vistas or enhancing views.

### Utilities

#### Guidelines:

- Bury new utility lines within existing rights-of-way (where technology permits). Newly created rights-of-way should have spatial variety (i.e., varied clearing widths and tree heights).
- New utilities that cannot be buried (such as radio towers) should be placed on national forest land only after all other ownership locations are determined to be infeasible.
- High SIO areas: New overhead utility structures and rights-of-way clearings should be located out of view from the traveling or recreating public, except for distances of less than ¼ mile where no other options exist.
- Moderate SIO areas: New overhead utility structures and rights-of-way clearings should be only occasionally visible to the traveling or recreating public.
- Low SIO areas: New overhead utility structures may be located adjacent to roads and other travel corridors.

### Reforestation

#### Guidelines for High and Moderate SIO Areas:

- Natural reforestation is preferred within high SIO areas. Planting may be done to meet an objective of increasing long-lived species.
- Planting within high and moderate SIO areas should be done in a non-linear pattern, within 100 feet of a travel corridor, use area, or water feature.

### Tree Marking

#### Guideline:

Apply tree-marking paint on the sides of trees that face away from travelways, use areas, and water bodies.

## Treatment of Residue from Timber Harvest or other vegetation removal activities

### Guidelines:

- Establish a 10-foot slash removal zone adjacent to travelways, use areas, and water bodies within high SIO areas, and where vegetation management activities have occurred adjacent to private land.
- Visible portions of timber harvesting or other vegetation removal areas should receive the primary emphasis for slash treatment.
- The following are non-motorized use area SIO slash height guidelines for visible area up to 150 feet from the edge of trails, recreation use areas, or water bodies:

**Table 2-15. Non-Motorized Use SIO Slash Height – 150 feet**

SIO	Slash Height Less Than or equal to (inches)
High	24
Moderate	24
Low	36

- The following are motorized use area slash height guidelines for the visible area up to 100 feet from the edge of trails, use areas, water bodies, and Maintenance Level 5, 4, and 3 roads:

**Table 2-16. Motorized Use SIO Slash Height – 100 feet**

SIO	Slash Height Less Than or equal to (inches)
High	24
Moderate	24
Low	36

## Temporary Openings

### Guidelines:

- Borrow from natural or man-made openings in the surrounding landscape, and follow natural boundaries to minimize straight-line opening edges.
- Visible temporary opening sizes adjacent to travelways, use areas, or water bodies in motorized and non-motorized settings are described below (the primary emphasis is the visible area in the first 200 feet from the travelway, use area, or water body):

**Table 2-17. Visible Temporary Openings**

SIO	Visible Opening Size (acres)	Percent Travelway or Shoreline Impacted
High (travel speed low, less than 55 mph)	0	0%
Moderate (travel speed high, 55 mph)	5 or less	7.5%
Moderate	10 or less	20%
Low	40 or less	50%

- Establish reserve areas when there is a visual need to reduce the apparent size of a temporary opening.

## Visual Management for Riparian Areas: Shorelines and within Streams

### Guidelines:

- Vary the distance between tree drops to create or re-create a natural appearance. Stumps should either be flush cut or angled away from the water. Where possible, tree drop attachments should be buried.
- Reshape and re-vegetate exposed banks to smooth contours.
- Partially cover bank stabilization structures with sod and re-vegetate with species that are similar to those growing on the adjacent shoreline.
- Use native rock for water structure riprap. Where possible, vary rock size to create a natural appearance.
- Shoreline and within stream improvements should maintain natural lake edges and stream meanders.

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## Administration

### Treaty Rights

#### Standard:

- Specific land management allocations and designations are not intended to affect Tribes' treaty-guaranteed hunting, fishing, and gathering rights.

### Surface Ownership and Land Adjustments

#### Standards:

- Land adjustments (land purchase or exchange) must satisfy one or more of the following purposes: (1) Accomplish objectives of public laws or regulations; (2) Meet demand for national forest resources; (3) Result in more efficient land ownership patterns; and / or (4) Result in lower resource management costs.

#### Guidelines:

- Use the following order of priority for land acquisition: (1) Habitat for federally listed species and Forest Service Regional Forester Sensitive species; in-holdings within Wilderness areas; and land with frontage on lakes and rivers; (2) Tracts with unique ecological, scientific, heritage, or recreation qualities; and (3) Tracts that consolidate land holdings and provide management access needs.
- Use the following order of priority for land exchange (disposal): (1) Lands outside the Forest boundary; (2) Isolated parcels within the Forest boundary; (3) Parcels involved in cases of trespass where exchange would resolve the trespass; (4) Parcels which, through exchange, would reduce the need for landline maintenance and corner monumentation; (5) Tracts that are difficult to manage due to rights-of-way problems, special use permits, or section and quarter-section subdivisions; (6) Lands needed for municipal expansion; and (7) Tracts that do not require public ownership to maintain important ecological or resource values.

- Use the following procedure in assigning management area prescriptions for newly acquired national forest system lands: (1) the tract should have the same management area classification as the surrounding national forest land (if it has similar attributes); or (2) if the land has attributes that are unique or different than the surrounding land, the acquired tract will be evaluated by an integrated team to decide its management area designation.
- Acquire lands through purchase as a first priority and through land exchange as a second priority.
- Acquire lands on a willing seller basis.
- The sale or other transfer of National Forest System land on which any hazardous substance was known to have been released or disposed of (such as a landfill with an engineered cover containment system) would be subject to CERCLA 42 USC 9620(h). The sale or other transfer would need to be made in the public interest, and prospective purchasers would need to be notified of the site's history. Any cover containment systems or caps must remain undisturbed.
- Ensure that land exchanges (over time) do not result in a net loss of water frontage quantity or quality. The acquisition of high quality developable frontage and high quality clear water lake frontage are preferred over wetland and stained water frontage.
- Do not encumber land available for exchange with Forest Service capital improvements that compromise land exchange opportunities (i.e., buildings, developed recreation facilities, dams, and new roads).
- Make land disposal decisions on a case-by-case basis where significant improvement investments have been made.

## **Special Uses, Rights-of-Way, and Utility Corridors**

### **Guidelines:**

- Place roads and utilities for private land access in the same right-of-way corridor and within existing corridors whenever possible.
- Do not route new utility corridors through wetlands, riparian areas, and large blocks of mature forest (1,000 + acres) when alternative routes are feasible.
- Avoid placing or reconstructing towers in areas where moderate to high bird mortality could occur.
- The current 11 recreation residences (Lovers Bay, Washburn District) may remain in place as an appropriate use of National Forest lands.

## **Public Health, Hazardous Materials, and Pollution Control**

### **Standard:**

- Prohibit disturbing the surface of existing sites with engineered cover containment systems, such as capped landfills, and thereby avoid exposing the public to potential contamination. Mineral exploration and extraction, the construction of buildings and utility transmission corridors, the installation of water supply wells, and other potentially intrusive work are prohibited. Gate or otherwise close access to the public for these sites to prevent disturbing the integrity of the cap.

**Guideline:**

- Do not construct new landfills or reactivate old ones on National Forest system lands.

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## Transportation Systems

### Road Design, Construction, and Reconstruction

#### **Guidelines for State and County Highways, Forest Service scenic byways, and travel routes to campgrounds and other major recreation use areas that are listed and mapped as High SIO roads in the Forest SIO maps included in map packet:**

- Provide consistent construction lines, a smooth finish, and a neat appearance for the final shaping and grading of roadbeds, shoulders, and ditch slopes.
- Allow back slopes to be rough, partially covered with scattered woody debris, and, if possible, to re-vegetate naturally.
- Plant native or desirable non-native species immediately after construction or reconstruction, where natural re-vegetation is unlikely, or sedimentation and erosion are concerns.
- Use accepted guidelines (AASHTO) to establish travelway width.
- Allow an average of no more than two side road entrances per mile on each side of a High SIO road.
- Reduce clearing limits and maintain tree crown closure over roads (as much as possible).
- Consider adjusting the clearing limits or road alignment to reserve trees with outstanding scenic qualities.
- Highlight outstanding roadside visual features with turnouts and vistas.
- Bury slash and grade to contour, remove it from view, or lop it down to 24 inches in the visible area up to 100 feet from the roadside. Bury or place uprooted stumps out of view from the road.
- Incorporate aesthetic modifications into the design of bridges, guardrails, major culverts, outlet ditches, and other drainage control devices.
- Brush roadsides on a 5-year cycle.
- Use wood or manmade materials with natural appearing colors on signs and posts.
- Use High SIO road guidelines for Forest Service road construction and reconstruction and when the Forest has the opportunity to provide road design or maintenance advice to other jurisdictions that have the authority and responsibility to maintain or improve High SIO roads that cross national forest land (e.g., state and county highways).

#### **Guidelines for Maintenance Level 4 and 5 roads that are listed and mapped as moderate SIO Roads in the Forest SIO inventory.**

##### **Apply High SIO road guidelines with the following change:**

- Moderate SIO roads, compared to High SIO roads, may have a rougher appearance and less consistent construction lines. Also, the final shaping and grading of Moderate SIO roadbeds, shoulders, and ditch slopes need not have as neat an appearance as High SIO roads.

**Guidelines for All Maintenance Level 5 roads not included in the High or Moderate SIO category and roads that border designated Wilderness and Wilderness study areas.**

- Minimize clearing widths by utilizing cut, fill, and back slope grades that are the steepest permissible for safety, soil conditions, and the height of the cut.
- Final shaping and grading of shoulders and ditch slopes may be rough in appearance. Back slopes may also be rough in appearance and covered with loose woody debris.

## Road Closure

**Guideline:**

- Restrict weight limits on National Forest System arterial and collector roads when county road weight limits are in effect.

## Road Decommissioning and Landscape Restoration

**Standards:**

- Decommission classified and unclassified roads that are closed to motorized traffic and identified as not needed for long-term access.
- Decommission all temporary roads upon completion of authorized use.

**Guidelines:**

- Road decommissioning must render a road inaccessible to all motorized traffic, including all-terrain vehicles. Effectively preventing motorized vehicles from gaining access to any portion of a decommissioned road may involve obstructing access at several points along the road.
- Render a road inaccessible by reclaiming the first 300 feet (or the distance necessary to prevent viewing the road from an intersecting or adjacent travelway). This action may involve restoration of the natural topography, scarification of the roadbed (deep disking), utilizing erosion control measures, planting trees, and (or) placing natural obstructions (boulders, downed trees, etc.) in the road in such a way that they appear visually haphazard but effectively restrict access. Use a combination of closure devices, including but not limited to berms, boulders, and downed trees, when rendering a road inaccessible.
- Roads identified for decommissioning and made inaccessible may receive one of the following levels of landscape restoration:
  1. Minimum Level Restoration: Render roads inaccessible, remove stream crossings, and rehabilitate streambeds and banks. This level of restoration is typically applied to Maintenance Level 3, 2, and 1 dead end roads that have only minimally altered the landscape. The roadbed and clearing have few improvements and natural re-vegetation is likely to occur (little or no additional planting or seeding).
  2. Moderate Level Restoration: Render roads inaccessible, remove stream crossings, and rehabilitate streambeds and banks. Remove road improvements that contribute to resource degradation and mitigate road improvements that alter the landscape. Moderate level road restoration measures include (but are not limited to) removing road surfacing (if salvageable), establishing erosion control measures on steep grades and cut and fill slopes, removing fill from wetland

crossings, removing cross-drainage structures, and assisting re-vegetation where necessary.

Moderate Level Restoration may be applied to remnant portions of Maintenance Level 5, 4, or 3 roads that have been relocated; where significant landscape alterations need to be mitigated (large cuts and fills, wetland fill, stream crossings, etc.); or where restoration of the natural landscape is a primary goal (Wilderness study areas, SPNM areas, etc.).

3. Maximum Level Restoration: Render roads inaccessible, and, as much as possible; completely remove all road improvements from the landscape (signs, gates, culverts, etc.). Restore natural topography, wetlands, and watercourses along the length of the road. Scarify (deep disc) the compacted area and reforest or re-vegetate the entire travelway.

Maximum Level Restoration is typically applied to remnant portions of Maintenance Level 5, 4, or 3 roads that have been relocated to repair resource damage, where complete removal and restoration of the roadbed is necessary, or where restoration of the natural landscape is a primary goal (Wilderness study areas, SPNM areas, etc.).

- Relocate roads to enhance resource management or improve user safety, utility, and resource protection. Decommission and restore old roadbeds as soon as possible after road relocation has been completed.
- Road decommissioning and restoration priorities:
  1. Resource protection and (or) restoration.
  2. Abandoned roadbeds and unneeded access roads associated with road relocation.
  3. Meeting desired road densities within Wilderness study areas, Management Areas 6A and 6B (semi-primitive non-motorized areas), wild and scenic riverways, Moquah Barrens, and Riley Lake Wildlife Management Area.
  4. Meeting desired road densities within Research Natural Areas, Special Management Areas, and Old Growth and Natural Feature Complexes.
  5. Local roads that connect to arterial or collector roads scheduled for reconstruction.
  6. Working towards desired total road density within areas not listed above and shown as 2.0 mile/square mile open road density on Road Density Map (See Map packet).
- Render inaccessible and restore skid trails that access local or collector roads and remain open to public traffic (skid trails drivable by high clearance four-wheel drive vehicles). This process may be delayed if roads and skid trails need to be utilized for post sale rehabilitation treatments.

## Road and Landing Locations, and Access and Skidding Requirements

### Guidelines:

- Access logging operations from local or collector roads wherever possible.
- When the only logging operations access alternative is from a gravel or paved road, the access road should have a gravel surface for the first 100 feet, unless it is used during frozen ground conditions.
- Locate landings a minimum of 100 feet from a collector road. Landings should not be located within the road template of an arterial or town road (including the ditch line

and back slope). Landing location exceptions can be obtained with written permission from the township.

- Skidding should not occur on arterial or town roads.
- Roads should provide access to within a specified skidding distance for timber harvesting operations (road access that provides skidding distances of no more than one-quarter mile in most situations). Some terrain and soil types may allow skidding distances of as much as one-half mile. Consult current research information on economic harvesting and skidding techniques before determining a maximum skid distance in a given terrain and soil type.

## **Roads Management and Related Soils and Vegetation Impacts**

### **Guidelines:**

- Minimize road impacts by utilizing soil protection measures described in “Wisconsin’s Forestry Best Management Practices,” March, 1995 edition (or subsequent revisions), and “Wisconsin’s Construction Site Best Management Practices Handbook,” November, 1997.
- Stabilize road cut and fill slopes using the most effective, natural-appearing, and cost-efficient methods available.
- Consider seasonal road use restrictions (with effective closures) for roads that traverse silt-cap soils. Utilize road design modifications that are environmentally sound and minimize erosive rutting on poorly drained soils.
- Control erosion and effectively manage water flow on and adjacent to roads by providing adequate roadside and outlet ditches, ditch checks, and cross-drainage.
- Plant native or desirable non-native plant species where vegetative cover is needed to stabilize slopes or decommission a travelway.
- Insure, to the extent practicable, that road fill and gravel sources do not contain non-native invasive plant species.
- Avoid stream and wetland crossings, riparian areas, and frost pockets (whenever possible) when constructing or relocating roads.