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Hiawatha National Forest

Executive Summary of the Draft Environmental Impact Statement

To accompany the proposed Land and
Resource Management Plan



Executive Summary of the Draft Environmental Impact Statement to Revise Hiawatha National Forest's Land and Resource Management Plan

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Abstract: This is the summary of the Hiawatha National Forest's draft environmental impact statement (DEIS). It documents the analysis of four alternatives developed for programmatic management of the Hiawatha National Forest. At this draft stage, the Forest Service's preferred alternative is Alternative 2, which may or may not become the selected alternative that will be implemented as the land and resource management plan for the Forest. The Forest Service developed the following alternatives with input from the public and other agencies.

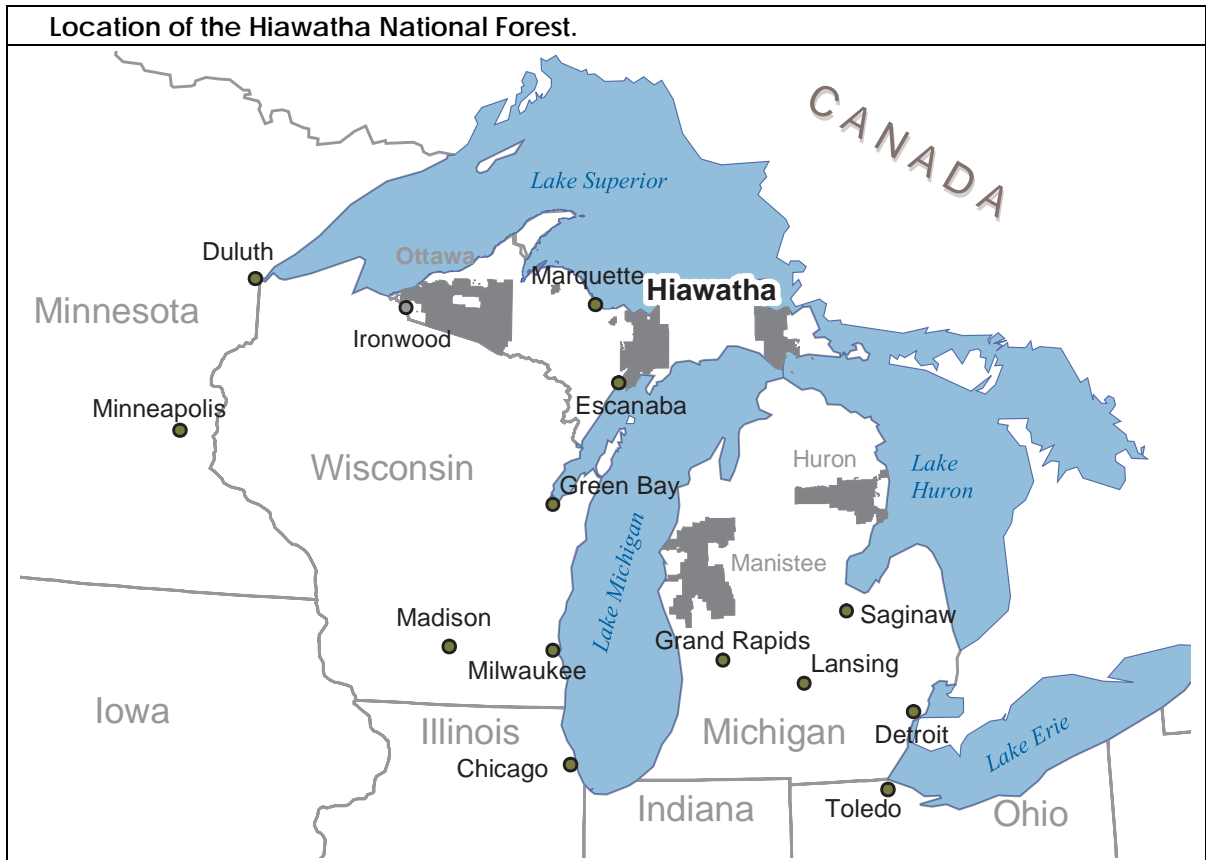
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CHAPTER ONE

Introduction to the Executive Summary

The Hiawatha National Forest's East Unit was established by President Teddy Roosevelt in 1909 as the Marquette National Forest. The West Unit was established in 1931, when President Herbert Hoover signed a proclamation to create the Hiawatha National Forest in the central region of Michigan's Upper Peninsula. In an executive order on February 9, 1962, all lands within the Marquette National Forest (East Unit) were transferred and made part of the Hiawatha (West Unit). There are approximately 1.3 million acres within the Hiawatha's proclaimed boundary, with approximately 895,300 acres in federal ownership. The planning area encompasses the entire Hiawatha National Forest.



Revising the 1986 Forest Plan

Hiawatha's current Forest Plan was issued in 1986. The National Forest Management Act (NFMA) requires that national forests revise their forest plans every 10 to 15 years (36 CFR 219.10). The National Forest Management Act also provides direction for the six decisions that are made in a forest plan:

1. Forest-wide multiple use goals and objectives
2. Forest-wide management requirements
3. Management area direction
4. Determining lands suited for timber management and the allowable sale quantity
5. Monitoring and evaluation requirements
6. Recommendations for wilderness areas and wild and scenic rivers

This revised Forest Plan has been developed under the provisions of the 1982 planning rule, as permitted by section 219.13(e) of the 2004 rule.

The Hiawatha National Forest began its formal revision process when it published the Notice of Intent on September 18, 2003. Since then, the Hiawatha's interdisciplinary planning team completed extensive analysis to develop the four alternatives that were considered in the draft Environmental Impact Statement. The proposed Forest Plan is based on the preferred alternative (Alternative 2) proposed in the draft Environmental Impact Statement (dEIS).

After release of the dEIS and the proposed Forest Plan, the interdisciplinary planning team will review public comments and make appropriate modifications. The final revised Forest Plan and final EIS will then be issued. At the same time, the Record of Decision will be published explaining the rationale for choosing the selected alternative.

The final revised Forest Plan will replace the 1986 Forest Plan. Once the Plan is in place, the Hiawatha National Forest will complete annual monitoring and evaluation reports to determine if the Forest Plan continues to provide effective management direction for forest resources.

Purpose and Need for Action

The purpose of the draft Environmental Impact Statement is to revise the Hiawatha National Forest's Land and Resource Management Plan.

Since 1986, the Hiawatha has successfully implemented site-specific projects with the management direction in the Forest Plan. However, the National Forest Management Act (NFMA) of 1976 requires that forest plans be revised at least every 15 years. In addition, the following indicators also direct the need to revise the forest plan:

- ▶ When conditions of the land or demands from the public have changed significantly
- ▶ When changes in Agency policies, goals or objectives have a significant affect on Forest programs
- ▶ When an interdisciplinary team recommends a revision as the result of a monitoring and evaluation process
- ▶ When new information suggests that a revision is necessary

Public Involvement and Cooperative Planning

Throughout the revision process, the Hiawatha has been committed to revising the 1986 Forest Plan by collaborating with interested individuals, groups, other government agencies and local Native American tribes. The Hiawatha used many methods to share information and to involve citizens in the revision process, including newsletters, news releases, open houses, public meetings and Internet postings.

Significant and Secondary Issues

Public comments were also used to determine the resource management issues to help define the range of alternatives. A resource management issue is a potential conflict from an effect on physical, biological, social or economic resources. The Forest identified two significant issues and several secondary issues.

Significant Issues. The topics that were selected as significant issues received a wide range of comments and viewpoints regarding managing these resources.

- ▶ **Vegetation Management.** There are differing opinions about how the Forest's vegetation should be best managed. Comments range from a desire for vegetation goals that emphasize older aged late seral forest to those emphasizing more early seral conditions. The revised Forest Plan will determine the long-term desired conditions for young, mature, old and old-growth forests, the species composition of forest communities, types and distribution of forest vegetation communities, and the size and distribution of managed non-forested openings. Components of this issue include the vegetation composition and structure, amount, ecological representation, and landscape design of old growth, late seral species, and habitat for species of concern and species of interest.
- ▶ **Recreation Access.** There are differing opinions about the amount and development level of boat accesses to provide for inland and Great Lakes. In addition, there are differing opinions about the amount and connectivity of off-highway vehicle (OHV), snowmobile, and non-motorized routes/trails to provide on the Forest. Trail connectivity is focused on developing trail loops and connecting trails off of existing trails and roads and providing access to facilities and services.

There has been an increase in snowmobile, off highway vehicles (OHVs), mountain biking, hiking and horseback riding since the Forest Plan was written. The increased demand has resulted in some conflicts between uses. Several Upper Peninsula counties have opened up county roads to OHV use, which has increased access to Hiawatha National Forest lands. Both motorized and non-motorized users have requested more loop trails and better connectivity to facilities and services. Components of this issue include the amount, distribution and type of inland and Great Lakes access, OHV and snowmobile trails and routes & non-motorized trails.

Secondary Issues. Secondary issues are important features of the alternatives that have received further analysis. There is generally limited difference in these issues between the alternatives.

- ▶ Management Indicator Species
- ▶ Management Areas
- ▶ Candidate Research Natural Areas
- ▶ Recreation Opportunity Spectrum
- ▶ Land Suitability
- ▶ Soils
- ▶ Timber Output
- ▶ Watershed, Riparian and Aquatic Health
- ▶ Wild and Scenic River Management Plans
- ▶ Wilderness/Roadless Area Evaluation

CHAPTER TWO

Summary of the Alternatives

This chapter describes and compares the alternatives considered for the proposed Forest Plan. The National Forest Management Act (NFMA) requires that a broad range of reasonable alternatives be developed and analyzed during the planning process.

There are four proposed alternatives in the Draft Environmental Impact Statement (DEIS). Each alternative has a different approach to managing the Hiawatha National Forest's resources for the next 10 to 15 years. Each of these alternatives is a potential forest plan that can be implemented if selected.

Developing Alternatives

The Hiawatha used an interdisciplinary team approach when developing the alternatives. Each alternative was designed to respond to the comments and significant issues by providing different scenarios for management area allocation, management prescriptions, goals and objectives, and standards and guidelines.

All four alternatives comply with applicable laws, regulations and Agency policies and guidelines, and are fully implementable. All alternatives adhere to the concepts of multiple use and ecosystem management. In addition to the four proposed alternatives, the Hiawatha also considered three alternatives that were eliminated from detailed study.

Summary of Proposed Alternatives

Alternative 1 is the "no action" alternative as required by the National Environmental Policy Act. No action means that the management allocations, activities and directions found in the Hiawatha's 1986 Forest Plan would continue for the next 10-15 years. It continues to move the Hiawatha toward the desired conditions, goals and objectives in the current Forest Plan. Planning language and resource descriptions have been updated, obsolete direction has been removed and other minor aspects of the plan have been revised.

Alternative 2 is the preferred alternative and the proposed Forest Plan. It responds to the proposed changes published in the Notice of Intent, but also addresses new issues identified during the public comment period. It emphasizes a mix of early and late seral species within the ecological capability of the land. This alternative emphasizes uneven-aged hardwood sawlog management rather than even-aged hardwood management. It responds to comments about motorized and non-motorized lake access and settings, and for more OHV and snowmobile loop and connected trails/routes.

Alternative 3 reflects comments for managing vegetation for higher timber product outputs and less old growth forests. It places more emphasis on early seral species such as jack pine and aspen than the other alternatives and provides for even-aged management of northern hardwoods. It responds to comments for increased motorized access to inland lakes and for more OHV and snowmobile loop and connected trails/routes.

Alternative 4 responds to comments to manage the Forest for less commodity production and more old growth characteristics. It emphasizes late seral species and uneven-aged hardwood sawlog management rather than even-aged hardwood management. It responds to comments for decreased motorized access to inland lakes and less OHV and snowmobile access.

Alternatives Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Notice of Intent provided suggestions for alternative methods for achieving the purpose and need.

Some of these alternatives may have been outside the scope of the proposed changes, duplicative of the alternatives considered in detail, or that would not comply with applicable laws and regulation. Alternatives considered but dismissed from further consideration include:

- ▶ **Additional Wilderness.** Hiawatha interdisciplinary teams completed a forest-wide Roadless Area Inventory for potential roadless area characteristics as outlined in FSH 1909.12, Chapter 7. They found that Fibre was the only area that contained roadless characteristics and would be evaluated for wilderness potential. There is nothing culturally, biologically or physically unique or of significant value that would warrant a re-evaluation by Congress for designation as a wilderness.
- ▶ **Additional Wild & Scenic Rivers.** The Hiawatha's interdisciplinary team completed a Forest-wide wild and scenic river eligibility assessment and found no additional rivers that were eligible for wild and scenic river study.
- ▶ **No Harvest.** This alternative was eliminated from detailed consideration in part because the National Forest Management Act, Multiple Use Sustained Yield Act, Endangered Species Act, and other laws require that national forests be managed for a variety of uses and provide resource protections.

Comparison of Management Areas by Alternative					
MA	Management Area Emphasis	Acres			
		Alt. #1	Alt. #2	Alt. #3	Alt. #4
1.1	Aspen management for fiber production, deer & grouse outputs	21,943	0	0	0
1.2	Deer & grouse outputs, dispersed recreation, and Aspen management for fiber production	65,950	45,891	167,831	0
2.1	Uneven aged management of hardwoods for high-quality saw logs, dispersed recreation, and Non-game wildlife outputs	58,750	0	0	0
2.2	Dispersed recreation, developed recreation, vegetative composition and older forest for wildlife, un-even aged management of hardwoods for quality saw logs	74,306	0	0	0
2.3	Uneven aged management of hardwoods for high quality saw logs; and dispersed recreation; and non-game wildlife outputs	0	208,874	73,255	248,250
3.1	Even-aged management of hardwood for quality saw logs, dispersed recreation, and non-game wildlife outputs	32,249	0	0	0
3.2	Game and non-game wildlife outputs, dispersed & developed recreation, even-aged management of hardwoods for quality saw logs	10,864	0	120,778	0
4.1	Conifer management for fiber production, non-game wildlife outputs	14,298	0	22,165	0
4.2	Conifer management for saw logs production, non-game wildlife outputs	114,804	126,128	88,566	183,736
4.3	Dispersed recreation, fish outputs, developed recreation, conifer management for saw logs production, non-game wildlife outputs	27,883	0	0	22,829
4.4	Habitat production for upland wildlife species, conifer management for fiber production, and dispersed recreation	75,935	113,166	115,540	0
4.5	Deer yards and habitat for upland and lowland wildlife species, wetland plant communities, older forest habitat, conifer management for saw logs, and dispersed recreation.	104,826	116,065	118,623	62,873
5.1	Congressionally designated Wilderness Areas	37,207	37,020	37,020	37,020
6.1	Semi-primitive non-motorized (SPNM) recreation, non-game wildlife, even & uneven aged management with limited motorized entry	11,519	11,486	11,486	11,486
6.2	Semi-primitive motorized (SPM) recreation, access to fish & canoeing areas, habitat for game and non-game wildlife, even & un-even aged management.	17,572	17,511	17,511	17,511
6.3	Non-game wildlife, SPNM recreation, no timber harvest (includes RARE II Government Island, 214 acres)	2,287	2,606	2,606	8,867
6.4	Habitat for game & non-game wildlife, water fowl and wetland habitat, SPM recreation, access to hunting and fishing areas, even & uneven aged management (includes RARE II Fibre, 7,900 ac.)	60,451	46,603	19,319	75,703
7.1	Intensively developed recreation facilities	13,108	1,086	1,086	1,086
8.1	Protection of significant biological, geological, cultural features.	28,686	16,078	16,078	16,078
8.2	Forest Research Activities	5,615	5,573	5,573	5,573
8.3	Secluded wildlife habitat, wetland plant communities, dispersed recreation, even & uneven aged management	60,023	103,964	34,616	163,040
8.4	Wild & Scenic Rivers	30,075	29,841	29,841	29,841
8.5	Grand Island National Recreation Area	13,421	13,421	13,421	13,421
9.1	Minimal level management	13,480	0	0	0

Alternative Comparisons				
Criteria & Indicators	Alternative 1: Existing Forest Plan	Alternative 2: Preferred alternative	Alternative 3	Alternative 4
FOREST COMPOSITION (ISSUE – VEGETATION MANAGEMENT)				
<i>Species composition, size, structure and openings: Acres for Goals and condition trends on suited lands</i>	<p>Early seral conditions Openings (acres) Min. goal..... 32,950 Max. goal NA</p> <p>Aspen (acres) Min. goal 32,570 Max. goal NA</p> <p>Jack pine (acres) Min. goal 16,981 Max. goal NA</p> <p>Late seral & large size conditions (acres) Min. goal 5,000 Max. goal NA</p>	<p>Early seral conditions Openings (acres) Min. goal 11,224 Max. goal 17,390</p> <p>Aspen (acres) Min. goal 29,139 Max. goal 100,430</p> <p>Jack pine (acres) Min. goal 39,992 Max. goal 75,636</p> <p>Late seral & large size conditions (acres) Min. goal 79,700 Max. goal NA</p>	<p>Early seral conditions Openings (acres) Min. goal 10,984 Max. goal 17,546</p> <p>Aspen (acres) Min. goal 59,393 Max. goal 154,450</p> <p>Jack pine (acres) Min. goal 49,884 Max. goal 92,237</p> <p>Late seral & large size conditions (acres) Min. goal 50,500 Max. goal NA</p>	<p>Early seral conditions Openings Min. goal 10,756 Max. goal 10,756</p> <p>Aspen (acres) Min. goal 21,364 Max. goal 81,165</p> <p>Jack pine (acres) Min. goal 9,784 Max. goal 33,961</p> <p>Late seral & large size conditions (acres) Min. goal 89,800 Max. goal NA</p>
OLD GROWTH SYSTEM (ISSUE – VEGETATION MANAGEMENT)				
<i>Old growth acres and design</i>	<ul style="list-style-type: none"> ▶ Minimum - 51,988 acres ▶ classified as suited ▶ Minimum percent of forest cover type per management area 	<ul style="list-style-type: none"> ▶ 52,000 acres ▶ classified as unsuited ▶ Larger blocks and connective corridors ▶ No minimum percent per management area 	<ul style="list-style-type: none"> ▶ 5,400 acres ▶ classified as unsuited ▶ Larger blocks and connective corridors ▶ No minimum percent per management area 	<ul style="list-style-type: none"> ▶ 231,300 acres ▶ Larger blocks and connective corridors ▶ No minimum percent per management area

Alternative Comparisons				
Criteria & Indicators	Alternative 1: Existing Forest Plan	Alternative 2: Preferred alternative	Alternative 3	Alternative 4
SPECIES VIABILITY (ISSUE – VEGETATION MANAGEMENT)				
<i>Outcome ratings for species with viability concerns - Threatened, endangered, and sensitive species (TES)</i>	► Provide ecological conditions for species viability	► Provide ecological conditions for species viability	► Provide ecological conditions for species viability, emphasizing species needing early seral conditions	► Provide ecological conditions for species viability, emphasizing species needing late seral conditions
	<ul style="list-style-type: none"> ► Outdated TES species list ► Limited TES direction ► No specific lynx or KW direction ► No RFSS list 	<ul style="list-style-type: none"> ► TES species list incorporated by reference ► Direction incorporated by referencing recovery plans ► Address Lynx and KW management direction ► TES S &Gs updated based on new information 		
<i>MIS and species of interest habitat availability</i>	► 22 Management Indicator Species (MIS)	<ul style="list-style-type: none"> ► 4 MIS (American marten, brook trout, ruffed grouse, sharp-tailed grouse) ► 6 community groups of interest 		
INLAND LAKE ACCESS (ISSUE – RECREATION ACCESS)				
<i>Maximum percent of lakes managed for:</i>				
► <i>Non-motorized</i>	► 7%	► 47%	► 17%	► 71%
► <i>Motorized, no PWC</i>	► Not identified or quantified	► 38%	► 58%	► 23%
► <i>Motorized with PWC</i>		► 15%	► 25%	► 6%
<i>Maximum percent of access types:</i>				
► No access	► 41%	► 50%	► 47%	► 61%
► Carry-in	► 47%	► 35%	► 25%	► 29%
► Back-in	► 12%	► 15%	► 28%	► 10%

Alternative Comparisons				
Criteria & Indicators	Alternative 1: Existing Forest Plan	Alternative 2: Preferred alternative	Alternative 3	Alternative 4
GREAT LAKES ACCESS (ISSUE – RECREATION ACCESS)				
<i>Maximum number of Great Lakes boat access sites</i>	► 5 motorized (public) ► 4 motorized (permit)	► 5 motorized (public) ► 4 motorized (permit)	► 5 motorized (public) ► 4 motorized (permit)	► 4 motorized (public) ► 5 motorized (permit)
	► Additional accesses permissive	► Allow up to 1 additional Great Lakes Access		► No additional accesses
OFF-HIGHWAY VEHICLES (ISSUE – RECREATION ACCESS)				
<i>Maximum miles of designated OHV trails and routes</i>	Maximum determined by road/trail density by MA; ► 12 miles (projected)	► 75 miles	► 85 miles	► 50 miles
<i>Maximum acres of designated OHV areas</i>	No maximum established; ► 15 acres (one area)	► 15 acres (one area)	► 15 acres (one area)	► 0 acres
<i>Road Open/closure direction (maintenance level (ML))</i>	► ML 3-5: Closed unless posted open ► ML 2: Open unless posted closed ► All trails closed unless posted open	► All roads closed unless designated/posted open.		
<i>Maximum open road miles by maintenance levels (ML)</i>	► Maximums established by road density & other factors	► ML 3-5 150 miles ► ML 2 2,100 miles	► ML 3-5 220 miles ► ML 2 2,100 miles	► ML 3-5 130 miles ► ML 2* 2,100 miles (*open during hunting season only)
<i>Cross country travel</i>	► No cross country travel allowed.			
SNOWMOBILES (ISSUE – RECREATION ACCESS)				
<i>Maximum allowed miles of groomed designated trails and routes</i>	Maximum determined by road/trail densities by management area. ► 244 miles identified	► 340 miles	► 415 miles	► 305 miles
<i>Maximum acres & number of designated snowmobile areas</i>	No maximum established; ► 15 acres (one area)	► 15 acres (one area)	► 15 acres (one area)	► 0 acres

Alternative Comparisons				
Criteria & Indicators	Alternative 1: Existing Forest Plan	Alternative 2: Preferred alternative	Alternative 3	Alternative 4
<i>Maximum miles of forest roads open to snowmobiles that are not part of designated trail system</i>	► FS roads with motorized ROS open unless posted closed	► ML 3-5: 373 miles ► ML 2: 2,100 miles	► ML 3-5: 373 miles ► ML 2: 2,100 miles	► ML 3-5: 0 miles ► ML 2: 0 miles
<i>Cross country travel</i>	► Allowed	► Not Allowed	► Allowed	► Not Allowed
NON-MOTORIZED TRAILS (ISSUE – RECREATION ACCESS)				
<i>Maximum miles of non-motorized trails by trail types</i>	Focus on hiking & walking trails. Maximum established by MA identified in appendix			
► Hiking only	► 124 miles	► 135 miles	► 135 miles	► 135 miles
► Hiking, biking & skiing	► 205 miles	► 175 miles	► 175 miles	► 175 miles
► Hiking, biking, skiing & horseback riding	► 99 miles	► 115 miles	► 115 miles	► 115 miles

Alternative Comparisons of Not Significant Issues Range of Response

NOI topic	Alternative 1: Existing Forest Plan	Alternative 2: Preferred alternative	Alternative 3	Alternative 4
1. <i>cRNA Evaluation</i>	<ul style="list-style-type: none"> ▶ 3 RNAs ▶ 21 cRNAs Total acres: 18,496 	<ul style="list-style-type: none"> ▶ 3 RNAs ▶ 20 cRNAs (minor adjustments to boundaries and 2 cRNAs merged into 1.) Total acres: 20,373 		
2. <i>Wild and Scenic Rivers Comprehensive Management Plans (CRMP)</i>	<ul style="list-style-type: none"> ▶ 2 CRMP (Indian & Carp) ▶ 2 Final River Boundaries ▶ 3 rivers without CRMP ▶ 3 rivers with no Final Boundaries 	<ul style="list-style-type: none"> ▶ 3 CRMP (Whitefish, Sturgeon and E. Branch Tahquamenon) ▶ 3 Final River Boundaries 		
3. <i>Watershed, Riparian and Aquatic Health</i>	<ul style="list-style-type: none"> ▶ Minimal plan direction ▶ No DFC s, goals and objectives 	<ul style="list-style-type: none"> ▶ Desired conditions, goals, objectives, and S&Gs similar across alternatives ▶ Michigan BMPs incorporated by reference into plan 		
4. <i>Soils</i>	<ul style="list-style-type: none"> ▶ Current Forest Plan Direction based on out dated information 	<ul style="list-style-type: none"> ▶ Desired conditions, goals, objectives and S&Gs for soil productivity and function is similar across all alternatives ▶ Soil standards reflect new information 		
5. <i>Management Areas</i>	<ul style="list-style-type: none"> ▶ No change to MAs ▶ Vegetation goals as minimum percentages by forest cover type 	<ul style="list-style-type: none"> ▶ MA boundaries based on updated LTAs ▶ Maintains most of the existing Forest Plan MA direction (DFC, S&Gs) ▶ Vegetation goals as percentage range for each vegetative condition within an MA ▶ Fewer and larger MAs 		
6. <i>Suitability:</i> <i>NFS acres:</i> <i>Bio/physical unsuited:</i> <i>Admin. Unsuited:</i> <i>Suited:</i>	<ul style="list-style-type: none"> ▶ 895,313 ▶ 216,227 (24%) ▶ 168,451 (19%) ▶ 510,635 (57%) 	<ul style="list-style-type: none"> ▶ 895,313 ▶ 216,227 (24%) ▶ 100,625 (11%) ▶ 578,461 (65%) 	<ul style="list-style-type: none"> ▶ 895,313 ▶ 216,227 (24%) ▶ 55,315 (6%) ▶ 623,771 (70%) 	<ul style="list-style-type: none"> ▶ 895,313 ▶ 216,227 (24%) ▶ 153,077 (17%) ▶ 529,400 (59%)
7. <i>Max. ASQ (1st decade)</i>	1,100 MMBF	1,140 MMBF	1,160 MMBF	970 MMBF
8. <i>Roadless Areas (Fibre & Government Island)</i>	Fibre: MA 6.4 (SPM)	Fibre: MA 8.3 (mixed ROS)	Fibre: MA 1.2 (RN ROS)	Fibre: MA 8.3 (mixed ROS)
	Government Island: MA 6.3 (SPNM ROS)			
	No additional roadless areas inventoried			
9. <i>Wilderness</i>	No recommendations for additional wilderness			
10. <i>ROS (Boot Lake, Buck Bay Creek and Delias Run)</i>	Classified as semi-primitive non-motorized (SPNM)	Classify as semi-primitive motorized (SPM)		Classify as SPNM
11. <i>Wild & Scenic River eligibility</i>	Study rivers were designated in the Michigan Scenic Rivers Act of 1991	No Additional river eligibility recommendations		

CHAPTER THREE

Affected Environment & Environmental Consequences

Chapter 3 in the Draft Environmental Impact Statement describes the current condition for each resource area, the criteria used in the analysis, and the environmental effects that would be expected to occur as a result of implementing each alternative. The following discussion is a summary of the environmental effects for each resource.

Vegetation

Many vegetation outcomes are the result of vegetation management activities and the resulting conditions of the forest, over time. This section evaluates Forest Plan alternatives with respect to seral stage (mix of species), size classes of trees, old growth and the allowable sale quantity.

Vegetation Management. The Hiawatha is largely a second growth forest as a result of exploitive logging and burning around the end of 19th century. Fire control and planting took place in the 1930s and 1940s by the Forest Service and the Civilian Conservation Corps. The result is a forested landscape of mostly uniform age classes, with little within-stand diversity or structure. Species that are short-lived, like jack pine, aspen and balsam fir, are currently mature and over-mature. Longer-lived species like red and white pine, northern hardwoods and cedar are maturing and growing into larger size classes.

The desired conditions for each alternative are expressed as vegetation composition (seral stage and size class) goals, which guide the mix and age class of forest vegetation on suited lands within management areas (MA). Vegetation goals for all alternatives are prescribed by ecological landtype (ELT) and by management area. These vegetation guides are given as minimum and maximum percentages (or acres) of the suited land within the management area. See Alternative Comparison – Forest Composition for the minimum and maximum vegetation goals on suited lands by alternative for all of the vegetation types. Forest vegetation on suited lands would be treated through a variety of harvest treatments to achieve the desired vegetative goals summarized below.

- ▶ **Openings** are a result of vegetation management by regeneration harvest and/or maintained by use of fire or mechanical treatments. All alternatives would manage and maintain openings. For Alternative 1, the minimum goal would maintain the most acres, (nearly three times as much as the other alternatives) while Alternatives 2-4 are nearly the same at about 11,000 acres. Alternative 1 does not have a maximum goal, while Alternative 4 has the lowest amount at 10,750 acres. Alternatives 2 and 3 are nearly the same at about 17,500 acres. Alternative 1 has no set maximum level, so could be the highest of all alternatives as long as the other forest species minimum goals are met.
- ▶ **Aspen stands** were far less abundant before European settlement than today. Today's aspen acreage on the Hiawatha is largely due to the extensive disturbance by turn-of-the 19th century logging. Although aspen acreage has declined since the 1960s, it remains the second most prevalent forest type in the Lake States region. Aspen is shade intolerant and requires disturbances such as clearcutting, ground scarification, wind or fire to become established and maintained.

All alternatives would manage and maintain aspen. Alternative 3 would maintain the highest minimum aspen at 59,400 acres, with Alternative 4 the least with 21,400 acres while Alternatives 1 and 2 are fairly similar at 32,600 and 29,100 acres. Alternative 3 could maintain the highest maximum amount of aspen with over 154,000 acres followed by Alternative 2 with 100,000 acres and Alternative 4 the least with 81,000 acres. Alternative 1 has no set maximum level, so could be the highest of all alternatives as long as the other forest species minimum goals are met.

- Jack pine is a short-lived conifer forest species and is usually managed using even-aged management treatments. Jack pine is shade intolerant and requires disturbances such as clearcutting, ground scarification or fire to become established and maintained. Existing forest-wide composition is greater than pre-European settlement due to turn-of-the-19th century logging disturbance. Without disturbance, jack pine will convert to other species. Many jack pine stands on the Hiawatha are succeeding to mixed pine stands. Because a high proportion of the jack pine on the Hiawatha is old and deteriorating, some acres are expected to be lost within the next few decades.

All alternatives would manage and maintain acreage of jack pine. Alternative 3 has the highest jack pine minimum goals at 50,000 acres, with Alternative 4 the least amount with 9,800 acres. Alternative 2's minimum goals are second highest with 40,000 acres and Alternative 1 are the least at 19,000 acres. Alternative 3 could maintain the highest maximum amount of jack pine with over 92,000 acres followed by Alternative 2 with 75,600 acres and Alternative 4 the least with 34,000 acres. Alternative 1 has no set maximum level so could be the highest of all alternatives as long as the other forest species minimum goals are met.

- Late Seral and Large Size Forest Conditions on the Hiawatha has changed dramatically compared to pre-European settlement due to the large scale logging at the turn-of-the-19th century to the 1920s. Much of the large white pine and hemlock and northern hardwoods were logged off with the lands subsequently burned over. Presently there is still less white pine and hemlock forest composition. In addition, there is less larger size late seral forest species because of the time required for the forest to reach larger size diameters.

All alternatives were designed to create and maintain some late seral and large size forest conditions, with each management area having a different desired vegetation composition percentage. Alternative 4 has the highest minimum goals of late seral and large size forest conditions at 89,800 acres with Alternative 1 the least amount with 5,000 acres. Alternative 2's minimum goals are second highest with 79,700 acres and Alternative 3 is lower at 50,500 acres. There are no maximum late seral large size goals for any of the alternatives. Maximum acreage could be higher for all alternative minimums, as long as the other forest species minimum goals are met.

Old Growth. The majority of the Hiawatha is considered a young forest, recovering from the turn-of-the-19th century disturbances. It is estimated that there are only about 500 acres of true old growth on the Forest. In all alternatives, the designated old growth system would be complemented by areas classified as unsuited for timber production (wildernesses, RNAs, etc.). Under Alternative 1, designated old growth would continue to be classified as suited for timber production with rotation ages extended. Alternatives 2-4 would classify designated old growth as part of the unsuited landbase.

Alternative 1 would designate a minimum of 51,988 acres. As mapped, the system would be comprised primarily of small, scattered blocks, and provide representation of a variety of forest types, but would lack some representation of the pine and wetter lowland types.

Alternative 2 would designate 52,000 acres and would focus on larger block sizes. Representation includes white pine and hemlock, red maple, northern hardwoods and cedar. Both red pine and black spruce old growth would have somewhat lower representation than the forest potential.

Alternative 3 would designate approximately 5,370 acres comprised of stands that presently contain the best representation of old growth characteristics. This results in fewer and smaller blocks than the current system. This alternative does not have the representation of forest types that Alternatives 1, 2 and 4 have.

Alternative 4 would designate approximately 231,335 acres as old growth. Some stands currently exhibit some old growth characteristics, but these large areas also include wetlands and other openings that will not become forested old growth and areas of early seral conditions that will move toward old growth characteristics over time. This alternative would have large blocks of old growth, with a variety of forest types including non-forested wetlands. There is less representation of the red pine/white pine/hemlock and northern hardwood types than the Forest potential.

Lands Suited for Timber Production. As part of the Forest Plan revision process, a suitability analysis was conducted to determine how much land is suitable for timber production. The analysis determined the acres on the Forest where timber harvest would be biologically and physically possible, areas that are legally or administratively withdrawn (e.g. Wilderness, Grand Island). Suited timberland is the landbase where planned timber harvests may occur. Table TR-1 displays the suited landbase for each alternative.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Total Hiawatha National Forest acres	895,313	895,313	895,313	895,313
Total suited acres	510,635	578,461	623,771	526,007

Allowable Sale Quantity. The allowable sale quantity (ASQ) is the *maximum* amount of timber that may be sold from the Forest's suitable land base per decade. Table TR-2 displays the predicted ASQ by alternative for the first two decades of plan implementation.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
ASQ Decade 1	1,100	1,140	1,160	970
ASQ Decade 2	1,110	1,140	1,160	1,070

Forest Health

Insects and Disease Risk. The Forest is getting older. When mature or over-mature, they are very susceptible to many different native and naturalized insect and disease pests which kill or severely degrade a tree's health. Predicted amounts of over-mature aspen, jack pine and spruce- fir were used as indicators of insect and disease susceptibility. All alternatives would emphasize maintaining a healthy forest using silvicultural treatments and integrated pest management techniques. Alternative 4 has the greatest number of acres in the susceptible age classes, for the longest period of time. This is due to the high amount of unsuited acres in the short term, which would not receive active silvicultural treatments. As these acres succeed into later seral types, the risk of infestation declines.

Non-Native Invasive Species. Non-native invasive species (NNIS) include aquatic and terrestrial animals and plants which have the potential to cause a variety of negative impacts to the Forest's terrestrial and aquatic ecosystems. Vectors analyzed for invasion and spread of NNIS are road work, amount of trails and uses, and amount of timber harvested. Unlike Alternatives 2-4, Alternative 1 does not include new management direction reduce the introduction and spread of NNIS.

Given the mix of risks posed by roads, harvest and recreation, Alternative 1 poses the highest risk of NNIS spread. Alternative 1 has a moderate level of road construction, the lowest compensating decommissioning and closures, the highest level of high-risk harvest systems, and potentially high levels of motorized/non-motorized recreational use if off-highway vehicles use is allowed to expand. Alternative 2 has the lowest proportion of high-risk harvest systems, but the highest overall harvest levels, coupled with moderate, compensating levels of road construction and closure/obliterations. Alternative 3 has a higher proportion of high-risk harvest systems than Alternative 2, a moderate level of road construction/reconstruction moderated by an overriding level of road closures and decommissioning. Alternative 4 probably poses the least risk of NNIS invasion and spread, based on the lowest road construction and reconstruction, a moderate level of closures and obliterations and the lowest OHV use.

Fire Ecology. Fire and Fuels is recognized by the Chief of the Forest Service as one of the four threats to the Nation's forests. To help national forests move towards reducing the threat of wildfire, the Healthy Forest Restoration Act (HFRA) of 2003 (H.R. 1904) and the Healthy Forest Initiative (HFI) were enacted.

Fire Regime Condition Class is a unit of measure for determining ecosystem health, with focus on wildfire risk. The combination of changes to vegetation/fuels and fire dynamics results in a measure of how far away from the reference conditions an alternative lies. The further the departure, the higher the risk. This in turn relates to wildfire risk level, forest and watershed health, and sustainability of landscape conditions. Fire Regime Condition Class (FRCC) will be used to express the current condition of the Hiawatha National Forest, as well as projected conditions under each alternative.

Fire Regime Condition Class includes three ratings to describe the degree of departure from reference conditions:

- **FRCC 1:** Ecological conditions are close to reference conditions and the risk of losing key ecosystem components is low.
- **FRCC 2:** Ecological conditions are moderately different from reference conditions. Risk of losing key ecosystem components is moderate.

- **FRCC 3:** Ecological conditions are substantially different from reference conditions. The risk of losing key ecosystem components is high.

The effects of the alternatives on FRCC ratings indicate there are more similarities than differences between alternatives. All alternatives had a landscape score of FRCC 1 for vegetation and an FRCC 2 score for fire dynamics well into the future.

For Alternative 1, the forest-wide fire dynamics FRCC rating does not change during the planning period. However, the vegetation/fuels departure shows steady improvement during the planning period. Alternative 1 shows the second highest average vegetation/fuels departure and therefore, is ranked next to last in reducing fire risk during the planning period.

Alternative 2 has the second lowest forest-wide vegetation/fuels departure and the second-lowest fire dynamics departure. Alternative 3 has the second highest total vegetation departure for the first 20 years, then moves to the highest departure for the remainder of the planning period. Alternative 4 appears to have the greatest overall improvement in FRCC rating during the first 60 years of the planning period. However, it has the most land classified as old growth and management options for high hazard fuel accumulations from spruce budworm infestations are non-existent. Therefore, the fire risk of Alternative 4 is higher than the other three alternatives.

Throughout the Hiawatha National Forest, there are communities and isolated residences located within wildland fuel situations that can be threatened by an advancing fire. All alternatives have the capability of reducing fuels in the vicinity of private property and communities. Alternatives 1 and 2 would protect both private properties at risk and the wildland-urban interface (WUI). Alternative 3 develops the highest fire risks, and Alternative 4 allows the least opportunity to manage fire-dependent wetland conifers because of the large amount of this type designated as old growth.

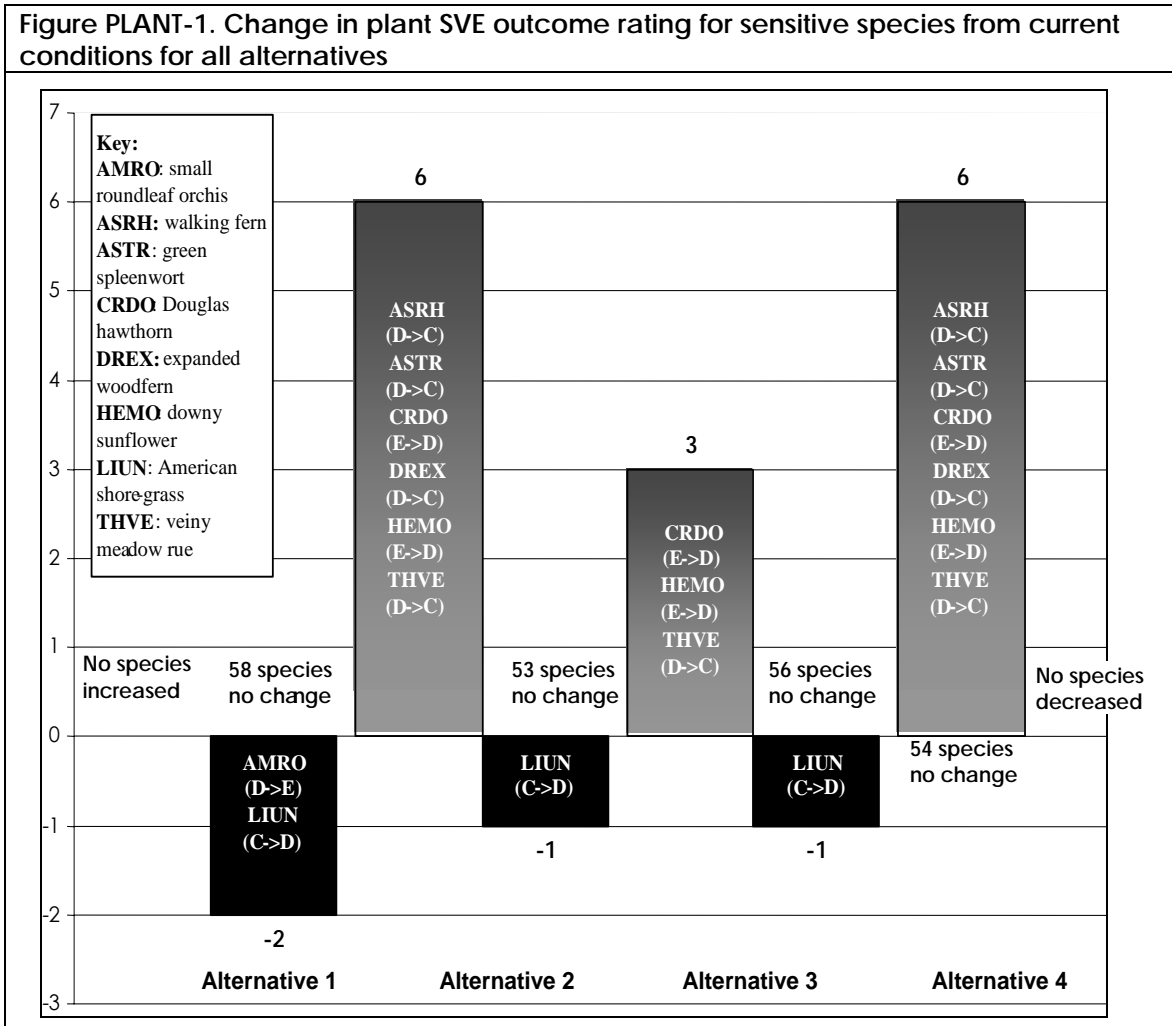
Air Quality. Geographic regions of the country are given air quality classifications that designate the level of protection areas receive, and the Hiawatha National Forest lies within an area characterized by some of the best air quality in the nation. The state of Michigan considers the Hiawatha National to be within a Class II attainment area under the Clean Air Act of 1990 (PL 88206), and that all areas of the Upper Peninsula are in compliance with the criteria pollutant health standards (MDEQ 2004). In all alternatives, Class II air quality attainment standards would be met.

Plant Habitat

Plant Species of Concern. The Hiawatha harbors more sensitive, threatened and endangered plants than any other Eastern Region (Region 9) forest. Approximately 40 percent of the Hiawatha's plant species of concern are not found on any other forest in the Region. Five of the element occurrences are the only documented occurrences of these plants in Michigan. Along with climatic factors, several other factors affect the Hiawatha's rare plants. These include competition from non-native invasive species (NNIS); encroachment of woody vegetation as a result of fire suppression; trampling primarily due to recreation use; habitat alteration due to timber harvest or natural disturbance; deer herbivory and illegal harvest.

Forest biologists completed a species viability evaluation for threatened, endangered and sensitive species. The Species Viability Evaluation process was applied to five threatened and endangered species (TES) and 65 Regional Forester Sensitive Species (RFSS). Species were evaluated and given an outcome rating for historical condition, current condition and predicted condition for each alternative. The rationale for an outcome rating was based on existing information, relevant literature, current and predicted vegetative conditions and management direction for each alternative. Outcome ratings range from A (broadly distributed ecological conditions) to E (highly isolated ecological conditions). The evaluation focused on ecological conditions and primary risk factors pertinent to the species.

Figure PLANT-1 summarizes the SVE outcome ratings by alternative for sensitive species.



All element occurrences of plant species of concern are protected by mitigation measures applied during project implementation. These commonly-applied measures are mandated by law and regulation to protect these known occurrences and any subsequently discovered rare plants. Effects from fire suppression, illegal collection of rare plants, ongoing disease and insect infestations, variations in Great Lakes water levels, the maintenance of US Highway 2, previous hydrological alterations, and physical trampling during recreational pursuits are not predicted to vary measurably between alternatives.

Between 53 and 58 of the species of rare plant analyzed remain unaffected by any of the alternatives. However, many of the species that are relics of an earlier environment, or are affected by introduced diseases, may continue to decline despite any protection measures provided. For the RFSS, Alternative 4 had six increases from current and no decreases in outcome ratings. This was primarily the result of less intense human activities, less predicted spread of NNIS, and more emphasis on later seral forests. Alternative 2 had six increases and one decrease; Alternative 3 had three increases and one decrease, and Alternative 1 had no increases and two decreases. No species were predicted to decline to a point where they would trend toward federal listing.

Federally Listed Plant Species. There are 5 federally listed plant species on the Forest. As with the RFSS, all occurrences of these species are protected from the direct effects of management activities for all alternatives in accordance with the Endangered Species Act. The potential exists for all species that individual plants could be affected through non-management activities such as trampling, from illegal OHV use, collection, NNIS establishment, and fluctuations in water levels in the Great Lakes.

- **Lakeside Daisy.** The Forest harbors the only occurrence of Lakeside daisy in Michigan. Alternatives 2-4 would provide beneficial effects to this species through specific management direction to manage NNIS and OHV use. Alternatives 2-4 also include an objective to establish a new population for this species. As a result, Alternatives 2-4 would provide the greatest benefit to the species.
- **Dwarf Lake Iris.** This species inhabits the shorelines of northern Lakes Michigan and Huron. It is predicted that this species would benefit from all alternatives through control on NNIS and a prohibition on cross-country OHV travel.
- **Houghton's Goldenrod.** This species also inhabits dunes and interdunal wetlands adjacent to northern Lakes Michigan and Huron. All alternatives would maintain the ecological conditions for this species. Control of NNIS and a prohibition of cross-country OHV travel would have a beneficial impact on the species. Encroachment of woody vegetation and road maintenance along US-2 could have an adverse affect on individual plants.
- **Pitcher's Thistle.** This species occupies open dunes or beaches, primarily on Lake Michigan's shores. The anticipated effects are similar to Houghton's goldenrod.
- **Hart's-tongue Fern.** This species is specific to limestone boulders in cool moist and shaded northern hardwood forests. Known occurrences are on the East Unit of the Forest. While all alternatives would provide protection of known occurrences, Alternatives 1 and 2 would provide the most benefit. These alternatives have the largest areas adjacent to the known locations designated as old growth or unsuited for timber production. This would provide more protection to unoccupied suited habitat than Alternatives 3 or 4 which have less old growth or unsuited lands.

Wildlife Habitat

The Hiawatha is home to a wide variety of animals occupying a range of habitats, from jack pine stands on xeric outwash plains to northern hardwoods on mesic uplands. More than 292 terrestrial vertebrates are believed to utilize the Forest at some time during their life cycles. Animals are inextricably linked to their habitats. The number of wildlife species and their population levels are determined to a large degree by the amount, quality and variety of habitat available. Other factors affecting species population are: prey availability, human and natural predation, weather, diseases and natural population cycles.

Habitats for Species of Interest. Out of the approximately 895,000 acres of federal land within the Hiawatha National Forest, six wildlife habitat indicators were selected to evaluate impacts resulting from vegetation management and vegetation succession. These habitats include:

- **Pine barrens/savanna.** Pine barren, savanna and open-land are interchangeable terms used to describe opening complexes that are characterized by herbaceous and shrub cover, with scattered live and dead trees, within a matrix of forest land that is typically dominated by jack pine. Some of the species utilizing this habitat include: sharp-tailed grouse, black-backed woodpecker, Kirtland's warbler, prairie warbler, loggerhead shrike and short-eared owl. Over the next 20 years, Alternative 2 would provide more barren/savanna habitat than Alternatives 1 or 4 and less than Alternative 3. Alternative 3 would provide the most habitat, even though the long-term average for Alternative 3 is modeled about 2,000 acres less than current. Assuming a direct correlation between habitat quantity and wildlife abundance, the indicated trend towards less barren/savanna habitat in all alternatives would result in population declines of wildlife associated with this habitat.
- **Mature lowland mixed hardwoods/conifers.** All lowland forest types including hardwood species, such as red maple, American beech and yellow birch and coniferous species, such as balsam fir, eastern hemlock and white pine, are included as components of these mixed stands. Some of the species utilizing this habitat include: black-backed woodpecker, Canada lynx, gray wolf and red-shouldered hawk.

Over the next 100 years, there would be an increase in mixed lowland hardwoods/conifers habitat for all alternatives. Alternatives 3 and 4 would provide essentially equal quantities of habitat. However, it is likely that Alternative 4 would provide the greatest amounts of structurally diverse mixed lowland hardwoods/conifers, since downed logs and woody debris would be distributed across a wide area. Alternative 1 would provide the least amount of habitat, while Alternative 2 will provide more habitat than Alternative 1, but less than Alternatives 3 and 4.

- **Jack pine habitat** is characterized by all age classes of jack pine growing on a variety of soil types across the Forest. Some species of concern associated with this habitat include: sharp-tailed grouse, black-backed woodpecker, Kirtland's warbler, bald eagle, Canada lynx, northern goshawk and prairie warbler. Alternative 3 would provide more jack pine habitat than the other alternatives and is the only alternative modeled with a long-term trend towards increasing jack pine habitat on the Forest. This is followed by Alternatives 1 and 2, which are similar over the long term. Alternative 4 would provide the least amount of habitat for these species.

- ▶ **Young aspen/birch.** This indicator includes aspen and birch on various ELTs in the 0-25 year age class. Currently there are approximately 32,000 acres in this age class. Species associated with this habitat include: snowshoe hare (an important prey species for federally-listed Canada lynx) and gray wolf, as well as game species such as deer, woodcock and ruffed grouse. Alternatives 1 and 3 would provide more habitat and the most benefit to species requiring these habitats. Alternative 1 would provide the most consistent quantity of this indicator habitat over the short- and long-term periods. Under Alternative 3, the quantity of young aspen/birch would initially nearly double, but trend approximately 7,000 acres less than Alternative 1 over the long-term. Alternatives 2 and 4 would provide nearly identical quantities of young aspen/birch, trending towards less habitat over the long-term.
- ▶ **Mature northern hardwoods** are defined as sawtimber-sized stands greater than about 70 years old. Currently, there are approximately 117,000 acres in this class. Some species of concern associated with this habitat include: American marten, gray wolf, northern goshawk, black-backed woodpecker, red-shouldered hawk and bald eagle. Alternatives 2 and 4 would provide the greatest quantity of mature northern hardwoods habitat over both short- and long-term. Habitat would increase rapidly in the first 20 years and then stabilize at approximately 60 percent above the existing condition. Alternative 3 would increase mature northern hardwood forests by about 15 percent over existing condition, but by a lesser amount than Alternatives 2 and 4. Under Alternative 1, acres would not change much from the existing condition over both short- and long-term periods. Under all alternatives, it is expected that stands would mature, improving structure, increasing size and adding canopy gaps all of which will increase habitat quality.
- ▶ **Northern white cedar** is a late seral species occurring primarily in mesic to wet sites. Currently, there are approximately 78,000 acres on the Hiawatha. Northern white cedar provides important winter habitat for white-tailed deer and snowshoe hare. It also provides year-round habitat for species such as Canada lynx, red-shouldered hawk and bobcat. Over the next 100 years, there will be an increase of approximately 39,000 acres of northern white cedar habitat for Alternatives 2-4, while Alternative 1 increases by approximately 15,000 acres. Wildlife associated with this habitat would benefit under all alternatives. However, Alternatives 2-4 would provide more structurally diverse habitat than Alternative 1.

Management indicator species (MIS) are used to monitor the effects that management activities have on species viability. Species are chosen based on their ability to represent the needs of other species in similar habitat. The following are the MIS list for the proposed Forest Plan alternatives:

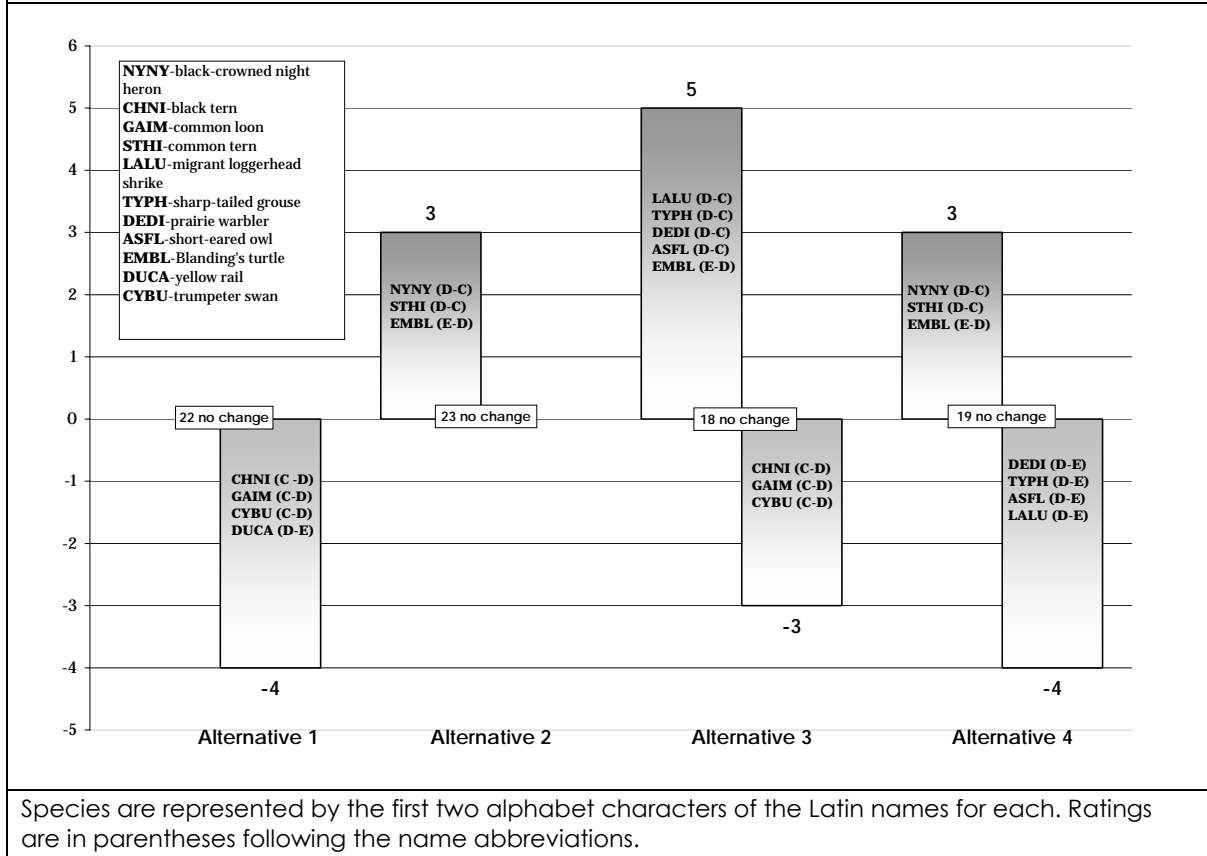
- ▶ **Ruffed Grouse** is a highly-valued game bird, which represents the early-successional stage of the aspen community and associated species such as golden-winged warbler, white-tailed deer, snowshoe hare and indigo bunting. Alternative 3 would provide the greatest amount of brood cover and winter food habitat. Mature aspen would decrease, however, it is not expected that ruffed grouse populations would be affected. Alternative 1 would provide the second highest amount of total acres of aspen/birch habitat. Brood cover would be approximately 50 percent greater than winter foraging cover. Both Alternatives 2 and 4 would decrease winter food habitat and brood habitat. However, effects to ruffed grouse would be less pronounced in Alternative 4 than with Alt. 2.

- ▶ **American Marten** represents late-successional northern hardwoods and conifer-dominated forests and includes species such as pileated woodpecker, northern goshawk, eastern chipmunk, woodland jumping mouse and gray wolf. Alternatives 2 and 4 provide the most breeding and denning habitat over the 100-year period modeled. The emphasis on uneven-aged management should result in a more structurally diverse habitat than Alternatives 1 or 3. Alternative 1 would provide the least amount of marten habitat.
- ▶ **Sharp-tailed Grouse** has been identified as an MIS for species of open-land and early successional stages of jack pine ecosystems. Associated species include short-eared owl, black-backed woodpecker, eastern bluebird, Kirtland's warbler and meadow jumping mouse. Alternative 2 would provide about the same sharp-tail nesting and foraging habitat as Alternative 1. Alternative 3 would provide the most habitat and Alternative 4 would provide the least habitat.
- ▶ **Brook trout** represents species that reside in coldwater streams. It is the only native salmonid and is a popular sport fishing species. Other resident fish species commonly associated with brook trout are the mottled sculpin, blacknose dace, longnose dace and brook stickleback. Alternatives 2 and 4 offer the best overall long-term conditions for brook trout. Both will substantially reduce potential for beaver impoundments and will increase potential recruitment of large woody debris.

Wildlife Species of Concern. A panel of Hiawatha wildlife biologists used the species viability evaluation (SVE) process to assess the effects of alternatives. Species were evaluated and given an outcome rating for historical condition, current condition and predicted condition for each alternative. The rationale for an outcome rating was based on existing information, relevant literature, current and predicted vegetative conditions and management direction for each alternative. Outcome ratings range from A (broadly distributed ecological conditions) to E (highly isolated ecological conditions). They are not a prediction of population occurrence, size density or other demographic characteristics. The evaluation focused on ecological conditions and primary risk factors pertinent to the species.

Regional Forester Sensitive Species (RFSS). There are 26 known terrestrial animal species currently listed as RFSS on the forest. All alternatives promote the protection, enhancement or maintenance of various RFSS and the habitats upon which they depend. However, the role each alternative would play in contributing to the conservation of these species and habitats varies for many species. Table WL-1 shows the changes in SVE outcome ratings for all alternatives.

Table WL-1. Changes in wildlife SVE outcome ratings from current conditions for all alternatives.



Under Alternative 1, four species showed negative changes in outcome ratings from current conditions. The changes were generally related to potential increases in motorized lake access and OHV use. Black tern, common loon and trumpeter swan nesting areas on ponds and lakes were determined to be adversely impacted from potentially increased inland lake motorized access and other forms of lake recreation. Yellow rail, an inland marsh dweller, was determined to be adversely affected from habitat loss, due to fire suppression activities and policy permitting cross-county snowmobile travel.

For Alternative 2, there were no negative changes in outcome ratings from current conditions for RFSS. Under Alternative 3, three species showed negative changes in outcome ratings. The changes were generally related to potential increases in motorized recreational activities associated with inland lakes. Black tern, common loon and trumpeter swan nesting areas on ponds and lakes could be adversely impacted from increased inland lake motorized access, however implementing the guideline that allows closure of nesting areas to motorized use would greatly reduce disturbance of nest sites.

Under Alternative 4, four species showed negative changes in outcome ratings. The changes were generally related to decreases in specific habitats. Jack pine and pine barren/savanna habitat, and sharp-tailed grouse, prairie warbler, short-eared owl, and migrant loggerhead shrike habitats declined in quantity during the first 20 years, and trended still lower at desired condition.

Federal Threatened or Endangered Species. There are 6 federally listed wildlife species on the Forest. As with the RFSS, all occurrences of these species are protected from the effects of management activities for all alternatives in accordance with the Endangered Species Act. Under all alternatives, federal recovery plans would be implemented and all nest and denning sites would be protected.

- ▶ **Bald Eagle** is present on the Forest as a breeding species and occasionally as a winter resident. Alternatives 1, 2 and 4 have the most nesting habitat for eagles because there is an increase in red and white pine types in older age classes, which are preferred nesting trees for bald eagles. These alternatives also have the most designated old growth. Alternative 3 has a more early seral emphasis as well as less old growth. Bald eagles would also benefit under Alternatives 2-4 by direction to manage riparian areas toward a later seral condition. Under all alternatives, nest site protections would be implemented.
- ▶ **Canada lynx** was listed as threatened in 2002. Lynx have been observed sporadically in the Upper Peninsula and are believed to be dispersing populations from Canada rather than resident populations. The most recent record of lynx in the U.P. was captured in a trap in Mackinac County in 2003. Critical risk factors for lynx are habitat (denning, foraging and connectivity), disturbance, and competition from other carnivores. Under Alternative 1, lynx management would be guided by direction in the Lynx Conservation Strategy and Assessment. This was a document developed shortly after the listing to guide lynx management nationally. Under Alternatives 2-4, forest-specific management direction for habitat connectivity, denning habitat and snow compacting activities would guide lynx management. All alternatives would provide sufficient denning and foraging habitat and habitat connectivity.
- ▶ **Gray Wolf** is a resident of the Forest, and numbers have steadily increased since 1996. Risk factors for wolf are prey habitat and human disturbance. All alternatives are likely to provide sufficient amount of young forest and conifer cover for prey species. Populations of available prey are expected to remain at levels to maintain viable wolf populations. Alternatives 1 and 3 have the highest likelihood of increased human disturbance due to higher allowable levels of snowmobile and OHV use than Alternatives 2 and 4. Alternative 4 would have the least amount of human disturbance potential.
- ▶ **Kirtland's Warbler** is present on the Forest, breeding and foraging in stands of young jack pine. Nesting is inextricably linked to stands of dense jack pine from approximately 6-25 years old. Primary risk factors include the availability of nesting habitat, human activity and nest parasitism. Disturbance to individual birds through human activity and nest parasitism would be similar between all alternatives. All alternatives would provide nesting habitat, however Alternatives 2-4 provide specific nesting habitat goals. Alternative 3 has the highest acreage goal, followed by Alternatives 2 and 4. Alternative 1 does not specify a minimum goal. Alternatives 2-4 would allow management in larger block sizes, which is critical to the species.
- ▶ **Hines Emerald Dragonfly** is present on Mackinac County on the Hiawatha's East Unit. This is the only known occurrence in the Upper Peninsula. Primary risk factors include available habitat and habitat destruction from off highway vehicles (OHV). All alternatives would not allow cross-country OHV use. Alternatives 2-4 generally classify occupied and potential habitat as unsuited for timber production and provide additional protection for occupied and potential habitat by increasing the size of the Summerby Swamp cRNA.

- **Piping Plover** is an endangered shorebird present on the Forest. The Forest contains both designated critical habitat and other shoreline habitat with characteristics favoring piping plover. Critical risk factors include nest protection and habitat management. All alternatives are expected to have direct and indirect effects as a result of protecting, managing, and monitoring known occurrences and essential habitat. Adverse effects to individual birds from recreation along shoreline areas and from development of recreation sites on the Forest are expected to occur under all alternatives. Alternative 1 does not contain specific management direction for piping plover. Alternatives 2-4 have a standard requiring protection of plover nests with closure or fencing, as well as a guideline to discourage recreation activities near active or historic nesting sites. All alternatives would allow habitat enhancement activities to occur, however Alternatives 2-4 have a goal to improve nesting habitat by providing nesting structures and controlling non-native invasive species.

Watershed

Riparian and Aquatic Habitat. Riparian vegetation plays an important role in maintaining the health of aquatic ecosystems. Along streams, it provides shade to keep water temperatures cool during summer, provides nutrients for aquatic organisms and provides large woody debris (LWD) which is important to channel stability and aquatic habitat complexity. The Hiawatha has 1,780 mapped stream miles. The streams are classified as either high or low priority based on the stream's potential to provide a quality fishery and state of Michigan designated uses.

The Hiawatha's riparian corridors are still exhibiting the effects from 19th century logging activities that removed long-lived tree species such as white pine and hemlock. This affected the riparian corridor's ability to provide quality large woody debris to the aquatic system. Also beavers expanded because of increased aspen forage. When beavers build dams, the water table behind the dam rises and spreads onto the floodplain, killing large trees and leads to establishing grasses, forbs and shrubs.

There has been an gradual increase of mid- and late-seral tree species in riparian corridors as the aspen is replaced through forest succession. This is moving the Forest towards the desired condition of late seral species. In Alternatives 2-4, high priority streams will have decreases in aspen within 500 feet of the streams because management direction prohibits aspen regeneration. This could eventually result in fewer beaver dams, maintaining water quality, increases in large woody debris and improvement in aquatic organisms passage.

All alternatives address watershed and riparian goals, objectives, standards and guidelines to some degree, with Alternative 1 the weakest. Management direction is designed to maintain watershed functions and resiliency during management activities designed to meet other resource objectives. Alternatives 2-4 incorporate Michigan's BMPs, which ensures many of the key aquatic habitat components will be maintained. In addition, Alternative 1 continues to implement the best available science for watershed and riparian resources while in Alternatives 2-4, latest sciences have been incorporated into the goals, objectives, standards and guidelines.

Sedimentation. Road stream crossings are the greatest source of stream sedimentation, followed by recreational activities in or near streams. The Hiawatha manages about 3,945 miles of system roads, which includes an estimated 900 stream crossings.

During the next 10 to 15 years, the Hiawatha will build new roads and decommission others to accomplish management activities. Many of the new roads will be built as temporary roads for timber harvests. In Alternatives 1-3, there is very little difference in construction, reconstruction and decommissioning miles of roads for timber harvests. Alternative 4 has the lowest allowable sale quantity, which results in less road construction, reconstruction and decommissioning and therefore the lowest risk of increased sedimentation due to stream crossings. Although the actual locations of the new roads are unknown, the Hiawatha will implement the BMPs and the timber sale temporary road strategies to reduce sediments entering streams from roads. In addition, Alternatives 2-4 incorporate standards and guidelines that are designed to protect streams.

Wetlands comprise approximately 39 percent of the Hiawatha National Forest. Changes in vegetation composition from timber harvests, succession, fires and road construction, reconstruction and maintenance could all cause wetland loss or change in function.

Wetland conditions within the Hiawatha will continue to improve because watershed restoration has been a standard practice on the Forest. All alternatives will have timber harvests in forested wetlands, but it is not expected to result in a loss of wetlands. A minor amount of rutting, puddling and compaction is expected to occur but is likely to be well within established management direction guidance. In all alternatives, incidental wetland areas may be filled by roads to access timber. Management direction will minimize these fillings and will restore the areas to original functioning conditions following harvesting.

Effects of off-highway vehicles on wetland vegetation and soils immediately adjacent to the trail are expected to increase due to increased OHV use. All alternatives prohibit cross country travel and allow restoration when damage occurs and is identified. All alternatives allow use of prescribed fire to restore wetland vegetation conditions. Wildfires may burn some wetlands, but in all alternatives, the extent and frequency of fires is expected to occur at the same frequency and intensity since 1986.

Alternatives 2-4 have management direction to improve road and trail crossings in streams and wetlands and obliterate, relocate or improve 20 segments of roads and trails in the riparian corridor to restore soil-hydrologic functions. Alternatives 2-4 also have management direction to maintain the ecological functions of woodland ponds. In Alternative 1, woodland ponds are protected when identified, but negative impacts are likely to continue, due to inconsistent recognition and lack of protection.

Non-Native Invasive Riparian and Aquatic Species. One of the primary threats to lake ecosystems is the inadvertent introduction and spread of non-native species. This often occurs through boats that are moved from lake to lake. Non-native invasive species (NNIS) are introduced or spread when they get caught on boat motors, trailers, are dumped into live wells and bait buckets or attach themselves to hulls.

Most of the lakes on the Hiawatha National Forest contain few, if any, NNIS. Inland lake accesses that encourage launching of large boats suitable for use on the Great Lakes pose the greatest risk of introducing NNIS, but any improvement in access increases the risk.

Alternative 1 does not establish a maximum percentage of lakes with motorized access. Therefore this alternative has the highest potential for NNIS introduction and spread. Alternative 2 motorized access is the same as the existing conditions therefore the risk of introducing or spreading NNIS species would not change from current risk levels. Alternative 3 motorized lake access increases to 83 percent increasing the risk of introducing or spread of NNIS. Alternative 4 has the lowest risk of NNIS introduction and spread because motorized lake access decreases to 29 percent.

Once exotics become established, efforts to eliminate them are nearly impossible. The proposed Forest Plan has management direction aimed at controlling and/or reducing the spread of NNIS on the Forest. It includes a goal to develop educational materials about controlling and/or reducing the spread of non-native invasive species and distributing them at appropriate locations including boat launches. Prevention will continue to be the best management strategy for NNIS.

Soil Resources. Some soils on the outwash plains are still recovering from 19th century timber harvests and subsequent slash fires. The slash fires oxidized much of the organic matter that had accumulated on the soil surface. Timber harvest and prescribed fire can reduce soil productivity by removing and oxidizing the organic materials that would provide nutrients in the soil.

For Alternative 1, the Forest has implemented a no whole-tree harvest policy on sites with inherent low soil productivity. Because the policy is not in the Forest Plan, there is no guarantee that it will be implemented over the course of the planning horizon. Prescribed burning occurs under Alternative 1, and could reduce soil productivity if excessive organic matter is consumed. Prescribed fires on these sites are designed to be of low intensity and are not expected to reduce soil productivity. For Alternatives 2-4, standards and guidelines for savannah and open lands conditions require slash retention on sites with inherently low productivity and retaining slash when conducting prescribed burns. No reduction of soil productivity is expected for all alternatives as a result of management activities.

Land management activities can erode, compact, puddle, or rut soils affecting soil productivity. Alternatives 2-4 establish management direction by incorporating Region 9 soil quality standards that protect soil productivity. On the Hiawatha, soil erosion hazard varies from slight on the outwash plains to severe on the steep, finer textured soils of the moraines. Under Alternative 1, soil erosion is prevented by management direction that prohibits equipment on slopes over 35 percent gradient. In Alternatives 2-4, soil erosion is further reduced with direction that restores temporary roads to natural conditions.

All alternatives have objectives to identify and restore areas where soil-hydrologic function is impaired. In Alternative 2, soil erosion as a result of management activities within stands is expected to remain slight. Alternative 3 has a slightly higher risk of soil erosion as a result of increased timber harvest activities and Alternative 4 is lower because it emphasizes longer-lived species management, resulting in less clear-cutting and more uneven-aged management. Because of management direction, all alternatives will have no measurable effect on soil erosion and productivity.

Aquatic Fauna Habitat. The effects of the alternatives on aquatic fauna habitat are addressed by expected changes to the ecological conditions for steelhead (*Onchorynchus gairdneri*) and largemouth bass (*Micropterus salmoides*).

- Steelhead is a non-native, migratory rainbow trout introduced to the Great Lakes basin in late 1800s. It is of interest because it is the most wide-spread anadromous salmonid on the Forest and supports a popular sport fishery in the Great Lakes and in spawning streams. Steelhead require relatively cold water, low sediment loads, clean spawning gravel, large woody debris and barrier-free migration routes. Steelhead dominate the larger, somewhat warmer streams that can be affected by beaver dams, the lack of large woody debris and sedimentation from road crossings.

Alternatives 2 and 4 offer the best overall conditions for steelhead in the long-term. Both will substantially reduce potential for beaver impoundments and will increase potential recruitment of LWD. Implementation of a 500-foot buffer between aspen regeneration units and high priority streams and clearer riparian management direction in Alternatives 2-4 clearly distinguishes them from Alternative 1, which would retain the existing, ineffective 200-foot buffer.

- **Largemouth bass** is the most widely-distributed predator species found in warmwater lakes on the Forest and is a popular sport fishing species. The Forest has 90 lakes that currently support, or are capable of supporting, a healthy warmwater largemouth bass fish community. The effect of the alternatives on largemouth bass habitat are addressed through changes to large woody debris, from non-native invasive species and from disturbance from personal watercraft.

All alternatives have management direction to increase the long-term capability of the riparian area to provide LWD. Alternative 1 is weaker due to less riparian management direction. Alternative 1 substantially increases the number of back-in accesses on lakes that allow PWC use, but total numbers of back-in and carry-in accesses change little from the existing condition.

Overall risk for NNIS introduction is only slightly higher than exists now. For Alternative 2, the number of back-in, carry-in and no access lakes changes little from the existing condition, but the number of lakes where PWC use is allowed is increased. Overall risk for NNIS introduction is similar to Alternative 1. For Alternative 3, the potential for NNIS introduction and disturbance of shallow water habitat is much higher than for the other alternatives due to large increases in the number of lakes that have back-in access and allow PWC use. Alternative 4 has the lowest risk of NNIS introduction and of shallow water habitat disturbance from PWCs. Alternative 4 has a large reduction in the number of lakes managed for motorized, back-in access and a large increase in the number of lakes managed for non-motorized use are responsible for the lower risk to bass habitat of all the alternatives.

Recreation

Many people, both residents and visitors alike, seek out the recreation opportunities and settings afforded on the Hiawatha National Forest. Recreationists participate in a wide variety of activities; however, the Need for Change process identified three main areas of change to the recreation settings and activities on the Forest. These include changes to:

- The Recreation Opportunity Spectrum objectives for the Boot Lake, Delias Run and Buck Bay Creek areas.
- The allocation of watercraft access facilities and recreation settings on inland lakes across the Forest and on the Great Lakes.
- The allocation of motorized and non-motorized trails and routes to provide loops and connections to facilities.

Motorized and non-motorized recreation opportunities would continue to be provided under all alternatives (reference the alternative comparative charts). Alternatives 1 and 3 generally allow for more development and more motorized forms of recreation. Alternative 4 prescribes for less development and more non-motorized forms of recreation. Alternative 2 provides a mix of both motorized and non-motorized recreation opportunities and activities.

Recreation Opportunity Spectrum (ROS). Under Alternatives 1 and 4, Forest visitors would find more acres of semi-primitive non-motorized (SPNM) and SPNM emphasis recreation opportunity spectrum (ROS) objectives than in Alternatives 2 and 3. This would result in slightly more acres available to experience remoteness, independence, closeness to nature, and self-reliance in Alternatives 1 and 4, than in Alternatives 2 and 3. Alternatives 1 and 4 would be more responsive to users who desire more non-motorized areas on the Forest over time. However, more acres do not necessarily equate to quality SPNM settings. The difference between Alternative 1 and Alternatives 2 and 3 are a result of the changes proposed to Delias Run, Boot Lake and Buck Bay Creek areas. The Forest would maintain approximately the same overall recreation settings and opportunities in Alternatives 1-3, and increase these slightly in Alternative 4; however the allocated acres would be different between the alternatives. This is because Delias Run, Boot Lake and Buck Bay Creek areas are within MAs that emphasize vegetative treatments, but recreation use would be managed under SPNM emphasis, in Alternative 1.

In Alternatives 2-4, the SPNM emphasis acres in Delias Run, Boot Lake and Buck Bay Creek would be changed to semi-primitive motorized (SPM). This would result in recreation settings in these areas that are more consistent with the existing condition. Certain roads and trails could remain open to motorized use and/or additional loops or connections could be established. Influences from private lands and/or uses that occur on roads and trails that are not under USFS jurisdiction could continue to affect the recreation setting for these areas; however, it is more likely that these activities would be complementary to SPM ROS objectives for the area.

Watercraft Access. The state of Michigan retains regulatory authority over the water and beds of most of the rivers, lakes and streams. The planning direction in the revised Forest Plan is directed at managing inland and Great Lakes watercraft access facilities and settings. The authority to regulate the types and kinds of watercraft access facilities that are constructed on national forest lands and to regulate the launch and retrieval of watercraft from national forest lands is within the authority and management responsibilities of the USDA Forest Service.

By designing and managing for certain desired access facilities and types of watercraft to launch and retrieve on inland lakes from national forest lands and facilities, a variety of motorized and non-motorized recreation settings and opportunities can be provided. It also affords the ability to reduce user conflicts and complaints, and to address resource concerns for species viability and wildlife habitat(s).

Personal watercraft use emerged on the Forest subsequent to the development of the 1986 Forest Plan. Increasingly, the Forest receives complaints about PWC use on inland lakes. Commonly known as jet skis and jet/air boats, the size and maneuverability of the PWC causes it to be used differently than other motorboats. Other concerns expressed include accelerated shoreline erosion and effects to wildlife, particularly loons. It is because of the PWCs' unique characteristics and specific complaints that cause PWCs to be analyzed separately from other motorized watercraft.

Alternative 2 prescribes a variety of accesses on inland lakes that closely reflects the current condition for watercraft access facilities and motorized/non-motorized and PWC use. It would slightly reduce the number of back-in accesses on inland lakes and increase the number of carry-in accesses. In Alternative 1, a variety of watercraft access facilities (e.g. no facilities, carry-in and/or back-in) would be provided on inland lakes and motorized launching and retrieving of watercraft would generally not be restricted from forest lands (other than in certain areas like Wilderness, SPNM).

Inland lake settings would be managed for higher levels of motorized watercraft access under Alternative 3 and lower levels under Alternative 4. Alternatives 1 and 2 would remain fairly consistent with the existing condition; however, Alternatives 2-4 would express desired motorized/non-motorized/and personal watercraft (PWC) settings to manage toward across the Forest. This is designed to provide choice on inland lakes for users to choose the setting that best meets their personal preferences and access facility needs. Alternatives 1-3 allow for the development of an additional Great Lakes boat access, while alternative 4 would retain the existing number of Great Lakes accesses.

Motorized (OHV and snowmobile)/Non-Motorized Trails and Routes. Off-highway vehicles use has become a national as well as, a local issue. The Chief of the Forest Service has identified unmanaged recreation, especially impacts from unmanaged OHVs, as one of four threats facing national forests and grasslands. All alternatives provide for coordination with other public entities where possible, to provide a safe system of looped and connected trails and routes for OHV and snowmobile use. Likewise, all alternatives prohibit cross-country travel by OHVs. No alternatives considered opening all forest roads to OHV use because of safety concerns and impacts to other resources.

The underlying focus of Forest Plan allocations of motorized trails and routes for Alternatives 2-4 is to create loops between trails and roads that are open to OHV and/or snowmobile use and connections to facilities. The maximum allowable miles prescribed in the alternatives are designed to complement the existing system of OHV and snowmobile trails and routes by creating connections and loops, although some new trail/route development could occur.

Alternative 2 provides more mile of potential OHV and snowmobile routes than the existing condition and Alternative 4, and fewer than Alternative 3. Alternative 4 would focus on creating loops and connections primarily through changes in the existing trail/route system. Alternatives 2 and 4 prohibit cross-country travel for snowmobiles, and Alternatives 2-4 implement a “closed unless posted/designated open” policy on the Forest for OHVs. Alternatives 1-3 maintain a 15-acre OHV/snowmobile area on the Forest.

An analysis of the Forest’s non-motorized trail system indicates that there are adequate miles of trail to accommodate user needs (recreation demand) on the Forest; however, the Forest has received complaints about the mix of recreation uses on some trails. All alternatives will allow additional miles of non-motorized trail construction. The revised Forest Plan will focus on shifting from longer, back-packing trails (identified in the 1986 Plan) to shorter loops and connections to recreation facilities and existing trails, to reflect changes in use patterns since 1986. It also focuses on accommodating mountain biking and increased horse use which have evolved since 1986, and reducing conflicts between uses on the existing trail system.

Scenic (Visual) Quality

The Forest provides a variety of settings and visual perspectives, ranging from sandy Great Lakes shorelines, to wetland marshes; from red pine plantations and conifer stands to northern hardwood stands that form canopies over roadways.

The 1986 Forest Plan established visual quality objectives (VQO) to manage the scenic quality of the Forest and to prescribe objectives for resource activities to maintain or improve the Forest’s scenic quality. No changes to the VQO were identified to occur in the NOI. The 1986 Forest Plan prescribed VQO independent of management areas, therefore, no changes would occur to the visual quality as a result of management area allocation.

The Forest will continue to be managed to meet the assigned VQOs and the goal to maintain a natural-appearing forest will be met. Forest visitors will continue to experience a relatively unaltered perception of the forest overall, resulting in a recreational experience that will maintain the desired setting. The desired conditions for Management Areas 5.1 to 9.1 place a greater emphasis on maintaining the area's natural appearance and an element of minimal disturbance.

Individual stand VQOs may change through project level analysis to a rehabilitation classification or maximum modification (MM) for areas where salvage treatments occur, or for areas of large opening management and/or Kirtland's warbler habitat development.

In all alternatives, the greater potential to impact and/or affect VQO results from vegetative treatment and road-building activities. Most management areas contain a mixture of even-aged and uneven-aged harvest treatments; however, in management areas where uneven-aged management is emphasized, the ability to mitigate effects to the scenic quality could be more easily achieved due to the natural screening provided by vegetation that is left.

The Forest's transportation system is largely in place and most road construction would be for temporary roads. Fisheries habitat improvement and recreation facility developments likewise have the potential to affect VQOs; however, these are generally mitigated by choice of material, design and vegetation restoration and become less evident to the casual visitor over time.

Research Natural Areas

The Hiawatha's research natural areas (RNAs) and candidate research natural areas (cRNAs) provide examples of those unique or special ecological communities in the Eastern Upper Peninsula. These areas usually exhibit minimal evidence of human disturbance, with vegetative composition resulting primarily from natural ecological processes rather than human-induced influences. There are currently 3 RNAs and 21 cRNAs designated on the Forest.

There is no change to established RNAs under all alternatives. Under Alternative 1, the boundaries of the cRNAs would remain unchanged. Under Alternatives 2-4, minor boundary adjustments were made to 5 cRNAs. Of more significance, Ramsey-Lost Lakes and Ogontz Lake Plain cRNAs were merged, the boundary was adjusted, and was renamed Lost Lakes cRNA. These cRNAs were combined to capture the best examples of large and small dunes and to provide a more intact and centralized representation isolated from management activities and natural disturbances by non-forested wetlands.

Summerby Swamp cRNA was modified to include all of section 10 and portions of sections 11, 14 and 15 south of Highway 123. This addition was identified in field investigations as an area with high ecological and biological significance. The area contains several federally and Region 9 listed plants and animal species and ecologically significant and rare community types.

These changes increase the acreage of cRNAs and RNAs from approximately 18,500 to 20,370 (some private land is within the boundaries). Research Natural Areas and cRNAs are assigned Management Area 8.1 unless they are embedded in other MA's such as wilderness. These changes adjust boundaries to ecosystem boundaries. They make adjustments to include important influence zones that will ensure, for example, continued important water flow into the represented area.

Wild and Scenic Rivers

The Hiawatha National Forest has five designated National Wild and Scenic Rivers (Indian, Carp, Whitefish, Sturgeon and East Branch Tahquamenon). As part of Forest Plan revision, final river corridor boundaries and comprehensive river management direction were developed for the Whitefish, Sturgeon and East Branch Tahquamenon Rivers.

All alternatives will protect and/or enhance the rivers free-flowing condition and outstandingly remarkable values, in accordance with the provisions of the National Wild and Scenic Rivers Act. All alternatives will also provide final river corridor boundaries, corridor carrying capacity determinations and zoning recommendations for consideration by local governments.

Alternative 1 will maintain final river corridor boundaries at the ¼ mile mark on each side of each river, and retain 1986 Forest Plan management area direction (with minor changes to incorporate provisions of the Michigan Scenic Rivers Act of 1991 and new science) to manage, protect and enhance the rivers' free-flowing condition, and outstandingly remarkable values (ORVs).

Alternatives 2-4 incorporate final river corridor boundaries that were identified and located with respect to the location of the ORVs and landscape features that make the boundaries identifiable on the ground. Alternatives 2-4 provided modified management direction that incorporates the provisions of the Michigan Scenic Rivers Act of 1991, new science, desired future conditions for each river, and river-specific enhancements within the river corridors.

The Forest also has four rivers legislatively identified as “study rivers” with interim river corridor boundaries for ¼ mile on each side of the river from the ordinary high water mark. All alternatives are sufficient to protect the eligibility of these study rivers for future consideration for potential designation under the National Wild and Scenic Rivers Act. Alternative 1 will retain the 1986 Forest Plan management direction for study rivers. Alternatives 2-4 incorporate modified management area direction for the study rivers.

Heritage Resources

Heritage resources can be broadly defined as all historic (after A.D. 1650) and prehistoric (pre-European or before A.D. 1650) sites possessing historical, cultural and/or archaeological value. Such sites consist of the physical evidence for human occupation, activities, or events and the place or places where the evidence survives in a context that allows for research, interpretation, preservation and/or use as an educational tool for connecting people with cultural and natural history.

While there are a small number of 17th and 18th century fur trade era sites, most of the historic period sites date to the 19th and early 20th centuries. Logging camps, residential cabins, farmsteads, relics from European settlers and early recreational or hunting camps are the most common sites on the Hiawatha. Approximately 2,900 sites have been identified and more than half of the sites have been field verified and documented in accordance with federal law (36 CFR 61) and Forest Service direction. Nearly 100 inventoried sites have been listed on or have formally been determined to be eligible for the National Register of Historic Places.

Monitoring identified three earth-disturbing activities influenced by Forest Plan revision decisions that that could negatively affect heritage resources. They are:

1. Damage from timber harvest related activities, such as skidding, decking, heavy equipment use and road construction.
2. Damage from construction, maintenance and operation of recreation facilities, such as trails, boat launches, and parking lots.
3. Damage from recreation activities, such as erosion from OHV use, foot traffic and dispersed campsite use.

These disturbing activities have occurred in the past and have resulted in relatively low impacts. This suggests that timber harvest, recreation construction and recreation use levels would have to increase substantially to significantly change the risk of damaging heritage resources. The USDA Forest Service has a national measurement and tracking system that establishes standards for managing heritage resources. These standards are incorporated into the goals, objectives and guidelines that are common to all alternatives.

Social and Economic Environment

Social Environment. The Forest provides a range of uses, forest settings, visitor experiences, products, goods and services. Forest Plan revision has the potential to affect the mix of uses, values, products, services and experiences. Quality of Life refers to the features and opportunities on the national forest that attract and keep residents in the area. Sense of Place refers to the features and opportunities on the national forest that make it unique.

All alternatives provide for a diverse range of opportunities for recreation, personal consumption and use of forest products that contribute to lifestyles and quality of life for both visitors and residents. For many persons, “Sense of Place” is tied to the Forest and to the many opportunities it provides. All alternatives will continue to contribute to a sense of place for existing users while also serving to enhance community attractiveness to new residents and visitors.

Motorized and non-motorized recreation opportunities would continue to be provided under all alternatives. Those persons requesting the elimination of recreation vehicle use (OHV and/or snowmobile) on trails and roads, or the opening of all forest roads to OHV use, would likely perceive a continued adverse effect to their quality of life and sense of place under all alternatives.

Inland lake settings would be managed for higher levels of motorized watercraft access under alternative 3 and lower under alternative 4. Alternatives 1 and 2 would remain fairly consistent with the existing condition. Alternatives 2-4 would express desired motorized/non-motorized/and PWC settings to manage toward across the Forest, providing choice for inland lakes for users to manage the setting that best meets their quality of life and sense of place choices. Those persons desiring limited motorized watercraft or PWC access facilities would prefer alternative 4, followed by Alternative 2. Those desiring higher levels of motorized watercraft access facilities (including PWC) would prefer alternative 3, followed by alternative 1.

Local communities and governments have expressed concern that forest management support or enhance local economic development. For many residents of the Upper Peninsula commodity uses of forest products are part of their way of life. Some consider these activities and the jobs they support as essential elements of their quality of life and sense of place.

Other concerns center on the desire to provide amenities and opportunities that will serve to attract and keep new residents. All alternatives would provide for a larger ASQ than in the 1986 Plan, supporting the interests expressed by local community governments to support the wood products industry, and provide receipts to support for schools and roads. Additionally, all alternatives provide a full range of recreation opportunities and adequate capacity to continue to aid in attracting and keeping residents in the area and provide economic support to local businesses.

Economic Environment. The Hiawatha National Forest provides multiple economic benefits to the Nation, Michigan and local communities. Economic benefits that are contributed regionally include market and non-market commodities like timber, minerals, tourism, sightseeing, hunting, fishing, boating, etc. Forest Plan decisions, when implemented, can contribute to economic sustainability by providing for a range of uses, values, conditions, products and services.

All alternatives protect the reserved rights and privileges defined in treaties, executive orders, laws and court decisions related to the national forests and grasslands, and maintain trust responsibilities and cooperative efforts to support economic development for federally recognized tribes. Based on the economic analysis in the Draft Environmental Impact Statement:

- ▶ Under full implementation of the Plan and contingent upon sufficient budget allocations, all alternatives show a potential for increased employment opportunities. Alternatives 2 and 3 show the greatest potential for increased employment opportunities.
- ▶ The activities that support the largest number of job opportunities (derived from Forest activities) are Timber, followed by Recreation and Forest Service Expenditures.
- ▶ The greatest potential generated labor income is under alternative 3, with the greatest increase occurring in the Manufacturing sector.
- ▶ Payments to States for Chippewa County were elected under the Secure Rural Schools and Communities Self-Determination Act of 2000 (SRSCS) and would not change, unless SRSCS is not re-enacted by Congress after 2006.
- ▶ Payment to the remaining counties is estimated under the 25% Payments to States and could vary based on the alternative selected and revenues generated.
- ▶ Alternatives 2 and 3 have the greatest potential revenue receipts, generating an estimated \$3.1 million (25% Payment), with alternatives 1 and 4 generating an estimated \$2.7 million (25% Payment).

Transportation System

There are 4,232 miles of roads within the Hiawatha National Forest's proclamation boundary. Approximately 3,944 miles of these roads are owned and maintained by the Forest. To better manage the road system, the Hiawatha established road density guidelines, which sets a maximum road density for each management area.

Throughout the next planning period, the Hiawatha will build new roads and decommission others. Much of the road construction and decommissioning will be due to managing for timber harvests. Road density is affected when new roads have to be built to access timber harvest sites. To maintain road density levels, some roads must be decommissioned to offset the new roads being constructed.

Total miles of construction/reconstruction or decommissioning will have slight variations between alternatives and could affect all forest activities. The goals, objectives and desired conditions for the transportation system do not change between alternatives, as they provide general direction for meeting the environmental, social and health concerns of the public.

Lands and Special Uses

Lands. Forest Service policy directs national forests to consolidate National Forest System lands through purchase, donation and exchange. Since the 1986 Forest Plan was approved, approximately 15,000 acres have been added to the Hiawatha National Forest. Based on the assumption that current funding trends will remain the same for the next planning period, the projected increase of less than 3 percent net NFS ownership should continue to be valid. The effects of the implementation of all alternatives will be fewer miles of boundary line per acre of National Forest land, consolidation of ownership into contiguous parcels and elimination of small scattered tracts.

Special Use Permits. The Forest administers approximately 370 special use permits annually. About 40 percent of the permits are for recreation special use and 60 percent are for non-recreation special use. The objectives, standards and guidelines for special uses management have not changed from the current Forest Plan and are the same across all alternatives.

Minerals

Leasable Minerals. There is a low potential for oil and gas development on the Hiawatha's leasable lands. Current exploration has not resulted in economic quantities of oil or gas. Well permit records maintained by the state of Michigan show only one well permit issued within the Forest boundaries in 1929 with "dry hole" results. No areas are currently under lease on the Forest. The only foreseeable future activities may be additional speculative exploration.

Common Variety of Minerals. The Forest has 30 developed pits for the extraction of common variety minerals that produces an annual average of 27,000 tons of sand and 163,000 tons of pit run gravel. Approximately 60 percent of the pit run material produced was for Forest Service use and 40 percent was sold for public use. All of the sand produced is sold to the public. The amount of land available for the development of common variety mineral resources is the same for all alternatives. If new sites are developed, expected effects are increased risk of introduction and spread of NNIS, visual impacts of a open pit area, loss of vegetation and site productivity for timber production, and potential sedimentation into adjacent streams or water bodies. Implementation of standards and guidelines common to all alternatives would prevent these potential impacts. The environmental effects of developing and expanding individual sites will be disclosed on a project specific basis.

To Find out More About Forest Plan Revision

The Hiawatha National Forest is committed to helping citizens and organizations understand the impact the proposed Forest Plan may have on activities. Full sets of all official documents may be found in the following locations:

- ▶ **Local college libraries.** Bay de Noc Community College, Lake Superior State University, Michigan Technological University and Northern Michigan University.
- ▶ **Local Libraries.** Many of the libraries in communities within the boundaries of the Hiawatha National Forest have received printed copies and CDs of the draft EIS and proposed Forest Plan.
- ▶ **Hiawatha National Forest Web Site:**
http://www.fs.fed.us/r9/hiawatha/revision/rev_welcome.html.

CDs and limited quantities of printed copies of the draft EIS and proposed Forest Plan are available at the following Hiawatha National Forest locations:

- ▶ **Supervisor's Office**
2727 N. Lincoln Road, Escanaba, MI 49829
Phone: 906.786.4062
- ▶ **Manistique Ranger District**
499 E. Lake Shore Dr., Manistique, MI 49854
Phone: 906.341.5666
- ▶ **Munising Ranger District**
400 E. Munising Ave., Munising, MI 49862
Phone: 906.387.2512
- ▶ **Rapid River Ranger District**
8181 U.S. Hwy. 2, Rapid River, MI 49878
Phone: 906.474.6442
- ▶ **St. Ignace Ranger District**
1498 W. U.S. Hwy. 2, St. Ignace, MI 49871
Phone: 906.643.7900
- ▶ **Sault Ste. Marie Ranger District**
4000 I-75 Business Spur, Sault Ste. Marie, MI 49873
Phone: 906.635.5311