APPENDIX A. SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION – CHIPPEWA AND SUPERIOR NATIONAL FORESTS

Wildlife Habitat Management **A-2**
Timber Management **A-7**
Fire Management **A-12**
Fish Habitat Management **A-16**
Old Growth **A-21**
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Riparian Management **A-31**
Recreation **A-36**

The regulations to implement the National Forest Management Act require, as part of the planning process, an analysis of the management situation (AMS). The purpose of the AMS is to identify the need for change (if any) from the direction in the current Forest Plan. The AMS is also the determination of the ability of the planning area to supply goods and services in response to society's demands. Detailed Analysis of the Management Situation papers were prepared for the following topics: Fire Management, Fish Habitat Management, Old Growth, Rare Natural Resources, Recreation, Riparian Management, Timber Management, and Wildlife for both the Chippewa and Superior National Forests. These documents are detailed and contain much additional information compared to those included in the following summaries. The complete AMS and other resource assessment documents are included in the official planning record.

This section of the appendix provides a summary of the AMS for each of the above topics. The AMS was developed for both the Chippewa and Superior National Forests in the joint Forest Plan revision process. The intent of the summary is to give an overview of each resource, anticipated demands for the resource, and a discussion of the change needed in a revised plan. The format of the AMS summary is generally as follows:

1. Introduction
2. Projection of Demand – Assessment of the Demand from the Forest, and Assessment of ability to produce Goods and Services
3. The Need for Change – Problems with the Existing Direction, Assessment of the Need and Opportunity to Change Management Direction

Additional information not contained in the summary (but contained in the planning record) includes:

- National Direction
- Direction from the 1986 Forest Plans
  - Goals, standards, and guidelines
  - Projected outputs and activities
  - Future activities projected under current management
  - Expected future conditions if current management were to continue.

Wildlife Habitat Management

Introduction

Wildlife is generally defined as all wild plants and animals (Hunter 1990). This definition reflects an evolution over the last century in the public's perception that 'wildlife' is more than game animals and other vertebrates, and includes all the plant and animal species that are part of an area's ecosystems.

Wildlife habitat is defined as a place where the physical and biological elements of ecosystems provide a suitable environment for the food, cover and space resources needed for plant and animal livelihood (FSM, 2605).

Although these definitions include fish and threatened, endangered, and sensitive plants, animals, and communities, these are addressed in separate sections of the *Analysis of the Management Situation.*

The overarching wildlife resources issue is the desire the public and Forest Service has to reevaluate and reconsider current direction to determine 1) whether Forest Plans adequately address national law and policy for protecting, restoring and managing to maintain wildlife diversity and 2) whether the plans provide appropriate wildlife resources goals and objectives. Appropriate management should be determined by evaluating 1) the important factors related to the broad, changing, and sometimes contradictory, social and economic demands and desires that the public has for wildlife populations and habitats, and 2) factors related to the range of ecological capabilities and potential of the land as understood by documented ecological information or educated guesses about conditions.

Projection of Demand

Assessment of Demand for Goods and Services from the Forests

As with most of the demands for other goods and services from the national forests, the public's demand for wildlife habitat includes a very wide range of desires. Within this range, habitat demands may complement or directly conflict with each other. Therefore, the starting points for identifying what the public demands are those national and regional demands that have been incorporated into the laws and policy that guide Forest Service management. These requirements include:

- Manage National Forests for outdoor recreation, range, timber, watershed, and fish and wildlife and give equal consideration to the value of all the renewable resources, including wildlife, when managing forests (Multiple Use Sustained Yield Act of 1960).
- Manage forest lands to maintain or improve biological diversity at the genetic, species, and ecosystem levels, maintain viable populations of existing native and desired non-native vertebrate species, and protect and enhance the diversity of plant and animal communities (National Forest Management Act of 1976).
- Cooperate with the State in wildlife conservation programs (Sikes Act of 1960).
- Move away from commodity or single species management toward sustainable development and ecosystem health (Draft 1995 Resource Planning Act).
- Serve the American public by maintaining diverse and productive wildlife, fish, and sensitive plant habitats as an integral part of managing National Forest ecosystems (Forest Service Manual 2603).
- Provide diverse opportunities for esthetic, consumptive, and scientific uses of wildlife, fish, and sensitive

plant resources in accordance with National, regional, State, and local demands (Forest service Manual 2603).

On the State and local levels the public is in general agreement with these goals and objectives and demands healthy sustainable wildlife populations. But for most wildlife species, particularly animals, it is difficult to very precisely assess, quantify or put economic values on those demands. In Minnesota the MN DNR's *Status of Wildlife Populations, Fall 1996 and 1983-1995 Hunting and Trapping Harvest Statistics* (Dexter, compiler 1996) provides a picture of some of the economic and social values associated with game species: over one million licenses and permits were sold in 1996. The U.S. Fish and Wildlife survey identified two million people in Minnesota who either feed birds or are active bird watchers (US Fish and Wildlife Service 1993). Green (1995) writes: ``According to a recent study prepared for a technical paper for the Generic Environmental Impact Statement on Timber Harvesting in Minnesota [Southwick Associates 1991] the economic gain from wildlife photography, nature observation, and related travel in Minnesota is now about equal to that from more traditional hunting pursuits." Clearly, demands for wildlife include all wildlife.

The many demands for wildlife habitat on the Minnesota National Forests, including the overall legal and policy ``demands" shown above, are documented in the *Wildlife Habitat Management* (USFS 1997a) and *Habitat Fragmentation* (USFS 1996a) Forest Plan Revision reference papers and their addenda.

Similarities in present demands and those from the last planning period include continuing to place an emphasis on managing areas of the Forests for popular game species white-tailed deer, moose, ruffed grouse, some species of concern, and other species associated (for some habitat requirements) with young forest, aspen forest, edge habitats and small forest patch sizes.

The greatest difference in demands since the last planning period is that there is now explicitly a greater demand for habitat for species associated with: older forest; old large trees; large contiguous forest patches with less edge; conifer forest; areas with low road or trail density; within stand compositional and structural diversity; and un-fragmented forests.

Other changes include greater demands for the Forests to: work cooperatively with other landowners and manage at larger landscape scales; focus on ecosystems rather than just individual species; and use a more scientifically valid method for monitoring indicator species.

The Forests' Ability to Supply Goods and Services, i.e., Wildlife Habitat or Populations

The physical and biological composition, structure, and ecological function of every acre of National Forest land provide the ``goods and services" of wildlife habitat. Through forest management the National Forests, in general, have a good ability to supply a wide array of habitats. Management choices include maintaining, restoring, or altering (either decreasing or increasing) both the amounts, quality, and distribution of habitats and the rates and direction of habitat change. These choices are neither *good* nor *bad* for wildlife as a whole: depending upon the species a management scenario may benefit, negatively affect or have no impact on an individual species.

This ability, however, varies by issue (desired habitats) and by scale.

On the smaller scales–such as stands or microhabitats within stands or lakes and streams - the Forests generally have a very good ability to provide desired habitat conditions. In fact, these are the scales at which many species habitat requirements are best understood. Examples of habitats at this scale that the Forests have a good ability to supply include: woody debris; reserve areas and wildlife trees; stand horizontal and vertical structural diversity; protection of spawning areas, nests, dens, or large old trees; diversity of tree species within stands; buffer zones between habitats; and an array of age classes of stands. These conditions can be addressed by selecting and implementing a variety of management activities or ``tools" such as protecting sites from any manipulation,

harvesting trees using a variety of techniques, planting trees, or using prescribed fire.

On larger landscape scales - from ecological subsection to land type association to Management Area - the Forests also have a very good ability to address many of the issues. This is because the patterns of land owned by National Forests include large blocks of relatively contiguous land. Examples include: providing regenerating young forests adjacent to mature forests; managing to maintain a variety of patch sizes; and providing habitat linkages or corridors; and providing a mix of forest cover types within the forest matrix. The challenge is understanding what configuration of patch sizes and distributions of forest types and ecosystem processes wildlife species require - there is less research at the larger landscape scales.

On the largest landscape scales, from international to ecological section the ability of the Forests to provide desired habitats may diminish for some habitats, but still be very good for others. For example, the National Forests may not have enough habitats to meet the all the needs of a species - or the Forests may have a significant amount of habitats that are lacking outside the Forests.

The ability to supply these services is also dependent on scale of time for which the public has a demand for those populations or habitats. For example, the Forests' ability to provide a large amount of white pine old growth forest habitat in the next ten years is limited, but across a 100 year planning horizon, the ability increases.

The Need for Change

Known Problems with Existing Direction

Management Area Direction

Wildlife objectives are identified, but not reflected in timber management outputs

With some exceptions, notably the aspen habitat conditions for deer and young forest for moose on the Superior, generally wildlife objectives are not explicit or measurable in the Forest Plan.

The wildlife direction favors popular game species such as deer, grouse, moose, and woodcock in the specific Management Area direction. Recent interest in ecosystem management and management for all species would call for a more balanced wildlife direction

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No specific objectives exist to reforest areas to supply some distribution of all age classes of all forest types, yet this need is implied within the wildlife goals and objectives for both Forests. Protecting minimum viable populations is directed by wildlife indicator species.

The Chippewa's current Forest Plan does not identify specific habitat objectives related to older forests.

Direction to manage within the 40 acres limitation, unless a 60-day public review period is used, has resulted in small stand size that is not characteristic of the natural disturbance regimes that have driven the evolution of species native to the area.

In general the wildlife objectives do not address ecosystem-based management principles of promoting the natural structure, pattern, and connectivity of habitats or of looking at wildlife resources at landscape scales larger than the National Forests.

The variety of management tools (such as the variety of silvicultural methods) available to achieve wildlife objectives is limited.

Wildlife Management Activities

Construction and maintenance of the number of openings identified in the management practices for both Forests is now recognized as unrealistic. We do not have the ability to maintain this number of openings with the limited budgets available. Creating and maintaining openings may not be a cost-efficient or necessary practice while clearcutting continues to provide a shifting supply of temporary openings. There may be exceptions perhaps along the north shore of Lake Superior. This area is considered critical for migrating birds that do not fly across the lake and use openings for foraging.

The construction and maintenance of nest boxes is recognized as a replacement for cavity trees in decadent trees or snags. An ecosystem management approach would suggest we manage to replace these cavity trees in the future and limit our structures to the time periods and locations where we have not yet succeeded in replacing the cavity trees.

The need for the level of impoundments stated in the management practices for the Chippewa is no longer thought to be appropriate.

Management Indicator Species and Standards and Guidelines

Management direction in the existing Forest Plans is not always related to the ecological differences that are present on the landscape. For example, guidelines for some MIS on the Superior directs planting of tree species on sites that historically have not supported such tree species. Ecologically, these tree species are not adapted to locations MIS would indicate should have that type of habitat.

Ecological information has improved substantially since 1986 when the current Plans were approved and needs to be incorporated.

The two Forests used different criteria to select indicators. The Superior identified 34 indicator species and the Chippewa identified 14. Standards and guidelines vary between the two Forests when addressing similar wildlife needs in similar habitats. While there is an ecological basis for some of these differences, there is also an ecological basis for much closer coordination and consistency.

Need and Opportunities for the Forests to Establish or Change Management Direction

It is apparent that there is a need to change management direction to: more clearly define ecosystem management objectives for wildlife; emphasize communities and ecosystems not just individual species; manage wildlife habitat with consideration for wildlife's needs across landscapes larger than the National Forests; and to incorporate increased scientific understanding of wildlife; and address the changed variety of public demands for wildlife habitat.

Because every acre of the National Forests is wildlife habitat and therefore is affected by any forest management, Forest Plan revision provides the most appropriate context within which to address wildlife resource issues.

Assessment of Ability to Resolve Issues and Concerns Through Planning Process

The ability of the National Forests to resolve issues and concerns through the planning process varies by the issue and by the scale and time for which the public may have a concern over the issue. As long as biological diversity is maintained or enhanced through Forest management activities, determining the balance of desired wildlife habitats and populations is based on what the public wants. Because there are conflicting desires for habitat conditions the planning process is unlikely to resolve everyone's issue and concern. But the process does provide a systematic means to garner and consider the wide range of views in the formulation of new or revised

management direction. It also offers the chance to resolve, or at least reduce the intensity of, some wildlife related issues.

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Timber Management

Introduction

Allowable sale quantity (ASQ) is defined as the maximum amount of chargeable timber volume that can be sold from a plan area over a ten-year planning period. "Chargeable" pertains to the timber volume that has been included in the growth and yield projections on suitable timberland used for the calculation of the ASQ. A "plan area" is the forest. Each forest plan that provides for a timber sale program must establish an ASQ. ASQ is a ceiling for a ten-year planning period that may not be exceeded. It is not a future sale level projection nor target, and does not reflect all of the factors that may influence future sale levels.

Opinions vary greatly on what the ASQ should be for any given forest, or how it should be determined. The range includes setting the ASQ at the maximum sustainable harvest level calculated at biological potential to no timber harvest on national forest lands, or an ASQ of zero. Although ASQ is defined as a ceiling, it has often been perceived as a firm target to be met, even at the expense of other resources.

Forest Plan ASQs were calculated from on-the-ground inventories of standing trees using FORPLAN, a linear programming model, and timber growth and yield models. Total volume is then estimated by multiplying acres by predicted yield per acre in units of cubic feet and converted to millions of board feet.

The National Forest Management Act requires that ASQ be calculated as a non-declining flow of timber over time, unless a conscious decision is made by the Regional Forester to select a departure schedule with higher volumes in early years, and decreasing volumes over time. Some believe the Forest Service should shift its ASQ focus from volume harvested to acres managed/sold.

National Forests in Minnesota have been unable to offer timber for sale at the forest plan projected ASQ levels over the past few years. However, between 1986 and 1991, forests provided local communities with greater than average ASQ (Chippewa & Superior National Forest Plan Five-year Reviews). Timber industry expansion in Minnesota, increasing demand for standing wood, and increasing stumpage prices have surpassed what was projected when the 1986 forest plans were prepared. ASQ levels need to be recalculated to reflect those new conditions - forest plan standards and guidelines, national direction on ecosystem management, and other stewardship responsibilities of national forest land managers.

This issue is appropriately addressed during revision because there is potential for significant changes to ASQ on each forest. USDA Forest Service regulations 36 Code of Federal Regulation 219 require either a significant amendment or revision if there is a proposal to make changes that are significant (36 Code of Federal Registration 219).

In addition, ASQ is directly affected by age class distributions and silvicultural management activities. A balanced age class of each forest type that is scheduled for harvesting will provide an even flow of forest products. Harvest volumes are related to the silvicultural method used, with even-aged methods providing more volume than uneven-aged methods on the same amount of acres.

Projection of Demand

Assessment of Forests' Ability to Supply Goods and Services

The following table depicts updated information for the Chippewa and Superior. The acreages not appropriate for timber management will vary by alternative identified for the revision of the Forest Plan, thus identifying the amount of suitable lands is not possible at this time. The figures shown for items 1 through 4 will generally not vary, regardless of alternative.

APP-A1 Current Land Status Acres on the Chippewa National Forest

	Chippewa National Forest	1986	*1998	Change () Indicates reductions
	Gross Acres		1,599,660	
1	Total Land Area (net)	661,161	666,166	5,005
2	Non-forest land and water	65,300	69,812	(4,512)
3	Legally withdrawn from timber production	9,514	8,731	(783)
4	Lands not physically suited (low site prod.,regen. limitations,etc)	34,089	78,808	44,719
5	Lands not cost efficient for timber production and managed for other emphasis: campgrounds, summer homes, admin. sites, TES species	73,226	27,606	(45,620)
6	Suitable for timber management	479,032		
	Tentatively Suitable for timber management		481,209	2,177

APP-A2 Current Land Status Acres on the Superior National Forest

	Superior National Forest	1986	*1998	Change () indicates reductions
	Gross Acres		4,218,442	
1	Total Land Area (net)	2,134,992	2,171,326	36,334
2	Non-forest land and water	31,630	74,337	42,707
3	Legally withdrawn from timber production	**750,183	856,503	106,320
4	Lands not physically suited (Low site prod.,regen. limitations,etc)	142,447	163,523	21,076
5	Lands not cost efficient for timber production and managed for other emphasis: campgrounds, summer homes, admin. sites, TES species	565,697	116,390	(449,307)
8	Suitable for timber management	645,035		

APP-A2 Current Land Status Acres on the Superior National Forest				
	Superior National Forest	**1986**	***1998**	**Change () indicates reductions**
	Tentatively Suitable for timber management		960,573	315,538
* 1998 figures reflect more accurate acre determination using GIS ** This figure was incorrect in 1986 and should have included approximately 50,000 acres more of Wilderness				

An Assessment of the Demand for Goods and Services from the Forest

The following information is from *Timber Demand Analysis, Final Report*, prepared by Laurence H. Reeves on October 21, 1997. Several macro trends influence timber demand: robust economic growth, population growth, and recycling programs. The economy of the mid-1990s has been one of fairly robust growth, and is expected to increase at a rate of 2 to 3 percent for the next 50 years.

In addition, population growth, including net immigration, is increasing at roughly 1 percent annually. Combining these two factors, along with housing trends that include larger homes, it seems likely lumber and panel demand will continue to increase into the 21st century to build new homes and repair older homes. This does not include other uses for lumber, such as manufacturing and shipping. The popularity of community recycling programs, however, has in part contributed to a slower growth in pulpwood demand than what was predicted in the 1989 Resource Planning Act (RPA) Timber Assessment.

According to the 1993 Resource Planning Act Timber Assessment Update, lumber consumption and production will increase into 2040. In the North-central region, hardwood lumber production is expected to decrease slightly, and softwood lumber production is expected to double between 1990 and 2000, and then remain at 2000 levels through 2040, with wastepaper becoming an increasingly important source of wood fiber, up from 27 percent of total wood fiber used in 1991 to an estimated 44 percent in 2040.

In Minnesota, the pulpwood sector of the timber industry will have the most impact on future timber demand since over three-quarters of the timber harvested in Minnesota is for pulpwood. For pulpwood, statewide production and receipts have decreased slightly since peaking in 1994, but there is nothing to indicate this trend will continue. Pulpwood production and demand are expected to stay constant at roughly three million cords annually through this decade. Mill expansions may increase demand by up to 15 percent starting into 2000.

Sawtimber receipts between 1988 and 1990 have decreased, based on the DNR sawtimber survey. However, this data is old and the data points close together, and the national trend indicates an increase demand for lumber. Thus, the best guess is that demand will stay constant or increase. If an increase does occur, there is no indication that it will be drastic.

It should be noted that the predictions given in the 1993 *Resource Planning Act Timber Assessment Update* for lumber do not seem to represent the scenario in Minnesota. In Minnesota, demand for hardwood sawtimber will be greater than the demand for softwood sawtimber through 2000.

Under these scenarios, the State's total timber demand should stay between 3.8 (current level) and 4.3 million cords through the year 2000, possibly through 2005, baring any major shifts in pulpmill technology. Fuelwood demand is likely to continue declining at a slow pace through 2000, but should eventually level off.

Pulpwood and sawtimber prices have generally stabilized or decreased slightly since peaking in 1995. While prices will not fall to pre-1993 levels, it seems likely pulpwood prices will not exceed 1995 levels until 2000. The

exception to this is hardwood sawtimber prices, which have continued to increase into 1996, although at a slower rate than during the 1993-1995 price surge. Overall, sawtimber prices should continue to slowly increase (hardwood more than softwood) into 2000.

The Need for Change

Known Problems with Existing Direction

Both forests are experiencing difficulty achieving the desired sell levels. The Land and Resource Management Plan standards and guidelines direct the size and adjacency requirements of harvest blocks. This factor, coupled with the standards and guidelines direction for wildlife habitat, were not analyzed with the FORPLAN linear program used to set the ASQ. Lower than projected volumes per acre have further contributed to an inability to achieve the ASQ. These lower volumes are thought to be related to the natural senescence of older stands, mortality from insect epidemics (forest tent caterpillar and eastern spruce budworm), and wind events.

Clearcutting has been an issue for years. Current direction in the "Draft 1995 Resource Planning Act Program" indicates the amount of clearcutting will be reduced. Both existing forest plans scheduled clearcutting and other even-aged management practices. Two-aged and uneven-aged management were not selected for scheduling when calculating the amount of volume to be harvested.

Direction was given in 1992 (Chief Robertson memo) to manage natural resources using an ecological approach to create diverse, healthy, productive, and sustainable ecosystems. There is a need to change to incorporate this direction in revised Forest Plans

There is a need to address the problems with timber sale outputs and to re-look at harvest methods.
The land suitability classification is required to be reviewed and if changes in classification occur, it will directly relate to changes in ASQ.

New computer analysis technologies are available to address management using spatial considerations and advances have been made in calculating growth and yield information. The Washington Office Service Center in Ft. Collins, Colorado recommends using the Forest Vegetation Simulator (FVS) for developing growth and yield figures for planning.

Spatial models are available that will disaggregate the analysis areas into mapped polygons in Geographic Information Systems. Other modeling alternatives exist that include spatial concerns in the analysis phase that handles scheduling, goal attainment and economics. These new technologies should improve the calculations of ASQ and allow ties to the existing inventory that will assist land managers in implementing the management plans.

Assessment of the Ability to Resolve Issues and Concerns Through the Planning Process

The issue for ASQ is tied to how much timber volume is harvested from these two national forests. Actual annual timber sell volumes are determined through the Federal budget process at the national level. The dollars required to prepare timber sales are divided between the various Regions of the Forest Service along with the target sell volumes. The Regions allocate their dollars and volume targets to each Forest limited by the ASQ values determined for each forest.

ASQ is not a target. The sell volume target is determined each year for each forest through the budget process. Normally, the budget is proposed by the Executive branch and approved by Congress. Occasionally, the Judicial branch has also been involved with setting timber sell levels for given years.

Another issue is the silvicultural method used to harvest the timber. Clearcutting, and to some extent the other even-aged harvest methods, are controversial. Economics vary by harvest method/objective (generally favoring clearcutting and aspen management) and add to the controversy. The issues of Forest age-class distribution, uneven-aged versus even-aged prescriptions, and timber supply will be analyzed in the draft environmental assessment that will be prepared for the Forest Plans.

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Fire Management

Introduction

Fire management is defined as all activities required for the protection of wildland values from fire, and the use of fire to meet land management goals and objectives (US Forest Service Manual 5100). The three components of fire management are: 1) Fire prevention (elimination or reduction of unwanted human caused fires); 2) Wildfire suppression (confinement, containment or control of unwanted fires); and 3) Prescribed fire (fire used for specific resource objectives) (Prescribed Fire and Fire Effects Working Group of the National Wildfire Coordinating Group, 1996).

Past emphasis on fire prevention and vigorous fire suppression at all costs has limited the use of fire as a management tool; and it is now time to define the appropriate role of fire as an ecological process and agent of change. Arriving at such a policy requires an understanding of historic fire frequency; intensity and severity of fires (known collectively as "fire regimes"); size and patterns of fires; and the relationship of fire to other natural disturbances such as floods, wind, insects and disease. Implementing a policy, which would increase the acreage treated with prescribed fire substantially, requires protective measures for public safety, facilities and property, air and water quality, and soil productivity. A part of the analysis for such a program would compare the costs and risks to ecosystem health, and the public welfare of not implementing the policy.

In Minnesota, the short interval fire-adapted species like red and white pine had an average fire return interval of 22 years in Itasca State Park (Frissell, 1971). In the Boundary Waters Canoe Area Wilderness, a natural fire rotation of 50-100 years was documented by Heinselman, with more frequent, low intensity surface fires in the red and white pine (25 years), and less frequent, high intensity surface and crown fires occurring in jack pine and spruce-fir types (50-80 years) (Heinselman, 1973).

Changes in the historical fire regimes in these ecosystems today have produced live and dead fuel buildups in the understory of the red and white pine. In addition, little natural regeneration is occurring in these stands due to lack of disturbance. Jack pine in the Boundary Waters Canoe Area Wilderness is expected to decline as well without fire. At the same time, increases in the spruce-fir type has led to increased frequency of spruce budworm epidemics which, in turn, produces an increased fuel hazard from the bug-killed trees (Stocks, 1985). Effects of lack of fire on wildlife are also of concern. Probably one of the most dramatic examples is the decline of sharptail grouse as a result of fire exclusion from the grassland-brushland ecosystems of the Minnesota, as documented by Berg (1979).

The northern and eastern part of the Superior, including the Boundary Waters Canoe Area Wilderness, tend to be more droughty due to the shallow soils, and can have a significant summer fire problem if rainfall is below normal. Vegetation in this area tends to be more boreal with a higher component of spruce-fir. Re-occurring spruce budworm outbreaks help create large amounts of dead woody fuel, which is compounded by windthrow from thunderstorm microbursts on a regular basis. This fuel complex has helped produce several large, high intensity wildfires in the last few years (Superior National Forest, 1996).

Timber harvest, followed by post sale prescribed burning, has been useful in treating this fuel complex outside the Boundary Waters Canoe Area Wilderness. Within the Boundary Waters Canoe Area Wilderness, prescribed natural fire is just beginning to help breakup the somewhat homogenous age class and vegetation types which have been conducive to spruce budworm outbreaks.

The net effect of the alteration of historic fire return intervals has increased fuel accumulations above historic

levels over large, continuous areas. The possible consequences include:

- Increased risk of large, severe fires
- Increased risk of losing key components that define ecosystems
- Increased risk of serious injury or loss of life to firefighters and the general public
- Increased risk of health effects due to smoke and visibility impairment
- Increased risk of property loss and damage to landscapes that have economic value to people
- Increased fire suppression costs

Fire Management is an appropriate issue for revision because changes in national fire management policy, based on advances in the field of ecology, directs that "fire, as a critical natural process, will be integrated in land and resource management plans and activities on a landscape scale" (USDA and USDI 1995).

Projection of Demand

Assessment of the Demands for Goods and Services from the Forests

Timber harvest creates disturbance and affects fuel loading. However, there are indications, such as increased fuel loading, that more disturbance or fuel treatment can or should occur. Large catastrophic fires nationally have highlighted the need for fuel reduction.

The wildland urban interface, as well as fuel loading, has increased. These two factors combined have increased the demand for fire suppression and fuel treatment. They have also increased risk levels, increased complexity of suppression, and increased the need for interagency coordination and cooperation.

Assessment of the Forests' Capacity to Supply (Produce) Goods and Services

Fire suppression resources are shrinking but still provide needed services. Nationally, a shift is starting and expected to continue into the future, that more resources are invested up-front in fuel treatment, resulting in less suppression resources needed in the future. In addition, fire fighter safety has received number one priority.

Forest Service knowledge of fire regimes and effects of fire exclusion has increased. This has prompted national direction and policy to reduce fuels and to incorporate fire into ecosystem management. Public comments indicate a desire for more prescribed fire and alternative silvicultural practices to clearcutting.

Need for Change

The 1986 Forest Plans were not formulated with the knowledge and understanding of fire's role as a critical ecosystem process. The process used to define an appropriate and achievable Desired Future Condition for the two Forests must be based on an understanding of fire's role, patterns of spatial and temporal distribution, and effects on other ecosystem processes and components.

For example, large acreages on both Forests are not suitable for timber harvest so no management activities occur. Currently, with the exception of the riverine sedge meadow wetland restoration projects on the Chippewa, these areas have not been addressed to determine if fire was an important ecosystem process, and if it should be reintroduced. Forests could increase the use of prescribed fire during the next planning period to accomplish fuel hazard reduction and ecosystem management resource objectives

Known Problems with Existing Forest Plan Direction

Prescribed fire/fuels and wildfire suppression are not adequately addressed by the plans. Fire suppression activities and techniques are similar for both. The following addresses wildfire and prescribed fire/fuel separately but there is considerable overlap. The intent is that both sections mesh. General Forest-wide direction for fire needs to be developed and then be more specific for wildfire and prescribed fire/fuels fuels, where appropriate.

Wildfire Suppression

The Plans need to be updated to reflect current National Policy:

a) The protection of human life is the highest priority. This is a change from former policy that states, "Lives and property will have priority". Implementation of the new policy would require the development of strategies for the protection of property and natural/cultural resources.

b) Fuels need to be managed to reduce the potential (and cost) of large wildfires. Since the Forests were formed, fire suppression has reduced the acreage that would have burned naturally. Fire exclusion has resulted in unnatural fuels buildups that may lead to large high intensity fires. The plans do not provide direction on how to assess and manage fuel hazard.

c) There needs to be a stronger link between the Forest Plans and fire planning. Forest Plans do not adequately incorporate wildfire management issues so there is little or no direction for development of Fire Management Action Plans and Wildland Fire Situation Analysis.

d) Fire suppression costs ideally should not exceed the value of the resources to be protected.

The direction in the Forest Plans varies. The amount of detail varies. Standards and guidelines are lacking or are not adequate. One example concerns standards for fire line construction. Soil and visual impacts and cleanup standards are not addressed. A consistent approach is needed to encourage understanding by the public and from a tactical Minnesota Incident Command System perspective.

Fire protection strategies for urban interface are not addressed. During the last 10 years, there has been significant development of residential and seasonal dwellings in the forests. Should these areas be identified? What should be considered interface? What is the appropriate response in these areas? What responsibility do residents have who build in these areas?

Management direction for individual or groupings of management areas needs to be improved. Depending on historic fire frequency, forest types, and site factors, there is potential for developing specific management area strategies. In addition, direction needs to be provided for old growth, Research Natural Areas, urban/interface, etc.

Prescribed Fire/Fuels Management

The plans need to reflect current national policy:

a) Mimic natural fire regimes
b) Reduce fuels to avoid catastrophic fires
c) Identify fire dependant ecosystems
d) Be proactive versus reactive.

The role of fire in the ecosystem is not addressed, and management areas do not reflect ecological boundaries/fire regimes. The goals/objectives/outputs for fire are not based on ecology. The application of silvicultural treatments does not consider disturbance regimes such as fire. Adequate monitoring of the effects of prescribed

fire on the ecosystem has not occurred.

Prescribed natural fire is only allowed in the wilderness but may be appropriate in other areas. For example, prescribed natural fire may be needed in areas that do not receive other types of treatment or along the periphery of the wilderness.

Standards and guidelines are absent; they need to be improved or may be not be appropriate. Clarification of the policy that states that activities will not adversely affect soil productivity is needed. The Superior Plan excludes fire from specific ecological land types when used as a silvicultural tool. How is this interpreted in the context of fire in the ecosystem? Natural fire burned these sites and impacted site productivity. Should sites be protected from adverse fire impacts?

Assessment of Need and Opportunity to Change Management Direction

As described under "Known problems with existing direction", there is a well-documented need for the forests to change current management direction. The need for change is particularly evident if the Forests are to accomplish the following: 1) ecosystem management that includes natural disturbance or fire regimes, 2) implementation of standards and guidelines that make desired changes happen and 3) meet national direction to incorporate fire into forest planning.

An Assessment of the Ability to Resolve Issues and Concerns through the Planning Process

Issues about the role of fire and natural disturbance regimes are broad in scope and best addressed at a forest level. Allocation of resources and determination of outputs such as fuel reduction acres, are also best decided through the forest plan. The issues relating to fire are intertwined with other resources and issues and so cannot be addressed separately.

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Fish Habitat Management

Introduction

Fish habitat management is defined by the USDA Forest Service as managing habitat to maintain, at the least, viable populations of all existing native and desired non-native fish species. Habitat goals for fish species are to be established and implemented through the Forest planning process (Forest Service Manual 2601.2.)

Programmatic goals for managing fish habitat were not defined, and very few habitat protection measures were included in the Forests' 1986 Forest Land and Resource Management Plans (Forest Plans). Both Forests deferred fish habitat management until professional expertise could be added for program development.

The 36 Code of Federal Regulations (CFR) governing management of the National Forests direct the agency to maintain diverse and productive fish and wildlife habitats as an integral part of managing National Forest ecosystems. At the National Forest level, aquatic systems are managed in partnership with state natural resource agencies and Native American tribes. States manage fish and other aquatic organisms and regulate their harvest, while National Forests manage aquatic habitats and provide public access to lakes and streams on National Forest lands.

Without clearly defined goals and objectives in Forest Plans, fish habitat may not receive adequate consideration in the planning and implementation of forest management activities. These activities include road construction and maintenance, timber harvest, recreation management and water access, and wildlife impoundment construction and maintenance.

Fish habitat goals and objectives are also needed to provide direction for restoring and improving fish habitats degraded by past land management activities, especially historic logging activities, which often resulted in damming and clearing of logs, limbs and rocks from streams for log-driving activities. These activities are believed to have resulted in a great simplification of aquatic habitats. Many streams on the Chippewa and Superior National Forests were used for log driving, and many display characteristics of habitat simplification.

The Minnesota National Forests are especially water-rich, providing over 32 percent of the total water found within the National Forest System. Lakes, streams, and wetlands within the Chippewa and Superior National Forests provide habitat for 66 species of fish. Recreational fishing opportunities abound on the Chippewa and Superior National Forests, and provide the impetus for thousands of visitors annually.

This issue is important for Forest Plan revision because of:

- The magnitude of the resource – over 347,000 acres of lakes and 923 miles of streams on the Chippewa National Forest, and over 411,000 acres of lakes and 2,250 miles of streams on the Superior
- Providing and protecting fish habitat is closely tied to the issues of biodiversity, road management, riparian area management, silviculture techniques and allowable sale quantity (ASQ)
- The degree of public interest in providing and protecting fish habitat, as highlighted by a number of national policies and directives, which are discussed below

Projection of Demand

Assessment of the Demand for Goods and Services from the Forests

The current demand for fish habitat-related goods and services from both National Forests is high and is expected to increase. This is well exemplified by trends in recreational fishing. The number of anglers in the U.S. rose by 20 percent during the decade from 1980 to 1990 (USFWS, 1993). Over 14 percent of all freshwater fishing in the 50 states that took place in 1991 occurred in the three states of Minnesota, Michigan and Wisconsin. Minnesota has about 1.5 million resident anglers (38 percent of the states' population) and about 734,000 non-resident anglers. Anglers' expenditures in Minnesota totaled about 457 million dollars in 1991. In terms of both quantity and quality, the Chippewa National Forests' 1,321 lakes and 924 miles of streams and the Superior National Forests' 1,977 lakes and 2,250+ miles of streams are an extremely significant source of fishing opportunities in Minnesota. In combination, the two National Forests encompass over 50 percent of the total miles of trout stream in Minnesota.

Assessment of the Forests' Capacity to Supply (Produce) Goods and Services

Vast acreages of lakes, streams, and wetlands cover both the Chippewa and Superior National Forests. On the Chippewa, there are over 347,000 acres of fishable lakes and 923 miles of streams. The Superior encompasses over 411,000 acres of fishable lakes and 2,250 miles of streams. Combined, the two National Forests provide over 32 percent of the total water found within the National Forest System. Thirty-percent of all Minnesota lakes over 10 acres in size and 50 percent of all Minnesota trout streams are found within the boundaries of these forests.

Sixty-six species of fish can be found within the waters of the Minnesota National Forests. On the Chippewa, these waters range from eutrophic to oligotrophic, and provide habitat for a variety of warm- and cool-water fish species, including panfish, black basses, walleye, northern pike, and muskellunge. Three of the State's largest lakes are found within the Chippewa National Forest, providing exceptional walleye and muskellunge fishing (Chippewa National Forest Final Environmental Impact Statement, 1986). Past and present stocking programs have increased the distribution and enhanced populations of game fish species in many lakes. However, unlike the Superior, the geology and hydrology of the Chippewa is not conducive to cold-water species, and less than one percent of the lakes and streams are stocked and managed for trout species.

Waters of the Superior National Forest tend to be soft, chemically infertile, and biologically less productive than the Chippewa's. Lakes and streams with low alkalinity and soft water have lower buffering capacity and an increased susceptibility to changes in pH. In these soft water lakes, acid rain and its effects on aquatic biota are of concern to land managers. Atmospheric deposition of mercury in lakes and rivers, and its accumulation in fish tissues, are also of concern on both the Chippewa and Superior National Forests. Fish consumption advisories, which are issued by the Minnesota Department of Health, are in place for many Forest lakes.

Nearly 12 percent of the Superior National Forest is covered by lakes and streams, which provide quality-fishing opportunities for warm- and cool-water species. In fact, the Forest contains the largest group of quality lake trout waters in the contiguous United States (Superior National Forest Final Environmental Impact Statement, 1986). In addition, 32 percent of the lake acres and 46 percent of the stream miles within the Superior National Forest are managed for inland trout species. Stocking above barrier falls has increased the distribution of brook trout in many streams along the North Shore of Lake Superior; and those streams that provide marginal trout habitat have been stocked with brown trout. In addition, some larger tributaries to Lake Superior have been stocked with steelhead and chinook salmon (DNR 1989).

Need for Change

Known Problems with the Existing Direction or Situation

The Chippewa and Superior National Forest Plans lack goals and objectives for managing fish habitat. Goals and objectives are needed in order to fulfill the earlier described national directives and as a basis for prescribing habitat manipulation (improvement). While fish habitat improvement projects under current Plans have improved fish habitats at specific locations, a long-term vision and strategies for fish habitat improvement are warranted for both National Forests.

The setting of goals and objectives for fish habitat should be founded in our understanding of the natural capabilities and limitations of aquatic ecosystems. Aquatic habitat inventory data and associated classification of aquatic systems on the two Forests is inadequate to fully characterize these capabilities. However, where available, limited knowledge of historical conditions (such as whether or not streams ever supported native trout) or influences (such as the impacts of turn-of-the-century log drives on streams) can be used to help set reasonable goals.

Goals for managing fish habitat are also needed as a basis for establishing a clear working relationship with our fish resource management partners (DNR and Tribal). Current Forest Plans do not adequately recognize Tribal involvement in cooperatively managing fish resources, including their authority to regulate Tribal member commercial and subsistence fishing harvest, or their role in fish population assessments, enforcement activities, and water quality monitoring.

Current Forest Plans do not provide adequate direction for integrating the protection and improvement of fish habitat with other resources. An assessment of fish resources in a whole watershed context is needed to meet the Forest Service Natural Resource Agenda. Because of the critical link between riparian area condition and the quality of fish habitat, problems with current riparian area direction (inconsistent definition and management direction) need to be addressed.

While current Forest Plan standards and guidelines, including State of Minnesota Best Management Practices, are important in protecting the quality of water in which fish reside, they do not provide enough direction for proactive management, or protection, of fish habitat. For example, while filter strips along lakes and streams limit the amount of mineral soil exposed along water bodies, they do not limit vegetation removal. Vegetation is crucial to providing in-stream and in-lake structure (or large woody debris), shade, decomposing leaf litter, and bank stability.

Monitoring of fish habitat, more specifically the selection of management indicators for fish/fish Management Indicator Species, needs to be re-examined on both Forests. Specific data regarding the status and abundance of Management Indicator Species are difficult to obtain, and doubt exists whether the indicator species selected in current Forest Plans ("commonly fished" species) are representative of all aquatic communities or are adequate indicators of effects of management activities on aquatic habitat. There is need to consider the utility of other indicators (especially invertebrate species) in addition to, or in lieu of, existing Management Indicator Species. Tracking of aquatic community status may be needed in revised Plans to effectively monitor whether aquatic resources goals are being achieved.

As mentioned above, Forest Plans of the two Minnesota National Forests are not consistent in their management goals pertaining to fish and wildlife population viability. There is no logical reason for the differences.

Current Plans fail to clearly state that Threatened or Endangered fish species have not been found on either Forest, or that R9 Sensitive species such as Pugnose Shiner (at four known locations on Chippewa National Forest; unknown on Superior National Forest) and Lake Sturgeon (possibly on Superior National Forest) have been

found. Current Plans also fail to address other aquatic communities or species of concern, such as native lake trout populations on the Superior.

There is need to re-think the current management guideline which excludes habitat management for beaver along all State Designated Trout Streams within the Superior National Forest. Recognizing that many "designated" reaches do not in fact support trout, there may be opportunities to refine this guideline, where actual supporting site level steam data is available, to allow management on some reaches for beaver or other resources that have in the past been viewed as incompatible with trout.

Current Forest Plans do not identify, or direct how to manage in response to, exotic aquatic species (i.e. purple loosestrife & rusty crayfish - here now; and Eurasian Water Milfoil & Zebra Mussel - potential threats).

Current Forest Plans do not identify or take into account effects of Forest Service or non-Forest Service shoreline development or in-lake (or in-stream) recreational uses on fish habitat. Considering these effects may result in changes in guidelines on National Forest land for three related resource areas:

- Land Adjustment - Better understanding of these effects may lead to direction designed to maintain or improve the National Forest role in providing undeveloped shoreline.
- Management of shoreline special uses - Improved direction may be needed on monitoring and administering FS shoreline special use permit sites to address threats to fish habitat such as leaky fuel tanks, inadequate septic systems, and inappropriate removal of shoreline vegetation.
- Providing lake and stream access - Improved understanding of aquatic system capabilities (e.g., fish productivity or sensitivity to changes in water quality) on individual lakes and streams contributes to re-evaluation of the types and distribution of Forest Service-provided water access across both National Forests.

Current Forest Plans do not identify research questions that need to be addressed to more fully understand aquatic resources. Potential aquatic research topics may include: groundwater protection (i.e. springs, seeps) and its importance to aquatic resources and the effects of watershed condition on aquatic resources.

The current Chippewa Forest Plan allows for stabilization of eroding National Forest shoreline on artificially regulated lakes only in cases where National Forest or private developments are threatened by lakeshore or stream bank recession. This severely hampers protection of fish habitat, particularly on the large Mississippi Headwaters reservoirs (Cass, Winnibigosish and Leech Lakes) where shoreline erosion measured in units of miles continues to degrade fish habitat through sediment deposition. The current guideline needs to be changed to encourage, rather than restrict, shoreline stabilization wherever doing so will protect or enhance fish habitat.

Assessment of Need and Opportunity to Change Management Direction and the Ability to Resolve Issues and Concerns through the Planning Process

Forest Plan revision presents a prime opportunity to integrate goals and objectives to meet the demands placed on fish habitats with demands placed on other resources in the National Forests of Minnesota. Recently improved (though still very limited) understanding of natural capabilities of, and historical influences on, aquatic ecosystems can be used as a basis for developing goals and objectives that are ecologically sustainable and reasonably achievable.

- *Riparian management* - Riparian areas provide habitat components which are essential for fish production and protection (for example large woody debris, bank stability, leaf litter inputs and shade)
- *Road management* - Road construction and maintenance can have lasting impacts on fish habitat. Stream crossings have the potential to degrade fish habitat through increased sedimentation and blockage of fish passage to preferred habitats.
- *Biodiversity* - This is of concern to aquatic, as well as terrestrial, communities. Across the nation, the

diversity of aquatic species is diminishing in lakes and streams, as degraded habitats support an increasingly limited number of species.

The strong public involvement component associated with Plan revision presents a particularly good opportunity for the Minnesota National Forests and its principal partners in fish resource management (DNR and Tribal) to help identify and clarify their respective roles, and develop fish habitat management goals and objectives for the National Forests that are reasonably well supported.

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Old Growth

Introduction

Old growth is generally defined as a forest that developed relatively free from catastrophic (stand replacement) disturbances over a long period. A variety of specific definitions of old growth exists, incorporating differing emphases on various old growth values, species, ages, and disturbance regimes. Part of the issue pertains to selection of a definition of old growth appropriate for Forest Plan revision, and associated values and management activities.

Values of old growth forests include scientific and educational values, as well as aesthetic, recreational, spiritual, economic, and cultural values. Old growth forests provide opportunities to develop baseline knowledge for monitoring and ecological study, and provide a major contribution to biological diversity. Old growth forests provide special habitats for native plants, and important habitat features for wildlife (Green 1995, Juday 1988, Rusterholz 1989, Vora, 1994; USDA Forest Service, 1995).

Old growth forests are a part of a range of forest seral stages and successional processes. Very little old growth forest remains in Minnesota and the Lake States region. There is currently about 1.1% as much primary forests (those that have never been logged) in the Lakes States as there were prior to European settlement (Frelich and Reich, 1996).

Much of the northern coniferous forest is in transition from its pre-settlement status. Marked changes in the species composition and age structure of forest communities have occurred (Tester, 1995). While some people advocate providing existing and future old growth forest communities, others are concerned for reductions in timber production that may result from old growth designation, development, and management.

Old growth is an appropriate issue for revision because allocating how much of a resource is needed and where and how it should be managed, is a primary purpose of Forest Plans. In addition, the social and ecological issue of defining and designating old growth is closely related to other Forest Plan revision issues, including biodiversity, habitat fragmentation, age class distribution, allowable sale quantity and fire management.

Current Management

National Direction

The National Forest Management Act (NFMA) and forest planning regulations, on which the Forest Plans were based, provide no specific direction concerning old growth forest management. Forest Plans that incorporate old growth planning do so primarily in response to the need to fulfill NFMA, and planning regulation requirements to provide habitat contributing to plant and animal diversity (Tyrrell 1996).

Many definitions for old growth exist, incorporating a variety of viewpoints and treatment of associated issues. At a national level, the USDA Forest Service is utilizing a broad definition for old growth: "Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics, which may include tree size; accumulations of large, dead, woody material; a number of canopy layers; species composition; and ecosystem function" (Delfs 1993). Under this definition, some maturing second growth forests could be included, if allowed to approach old growth conditions through appropriate management direction (USDA Forest

Service 1995).

Current Forest Plan Direction

Chippewa National Forest

The 1986 Chippewa National Forest Plan (USDA Forest Service 1986) defines old growth as any forested stand that is beyond Forest Plan rotation age. Under this plan, forest stands may be harvested after they attain old growth rotation age, which is generally about 1-1/2 times normal Forest Plan rotation length. Old growth designated in the Opportunity Area planning process, an implementation phase of the 1986 Forest Plan, resulted in designation of a variety of forest types, including both early and late successional species, mostly distributed as small, isolated stands. A total of 25,000 acres (4% of forested land base) were designated as old growth.

Two reports were authored by an interdisciplinary team, with limited public involvement: "Old Growth" (USDA Forest Service, 1991), and "Old Growth Report No. 2: Candidate Old Growth Complexes" (USDA Forest Service, 1993). Recommendations from these reports included conducting an inventory of stands potentially and currently exhibiting ecological old growth conditions, using MN DNR methodology (Rusterholz, 1996). This inventory was completed for red pine, white pine, lowland hardwoods, and upland northern hardwoods. The analysis for this inventory was completed in November 1995. Thirty-five hundred (3,500) acres (83 stands) are now numerically ranked and awaiting decision regarding future management status.

The reports recommend revising the 1986 Forest Plan old growth definition to focus on long-lived species, and exclude timber commodity production. The reports developed the old growth "complex" concept, intended to provide larger patches of old growth distributed on a landscape scale. Over 70 complexes were proposed, ranging in size from 100-6,000 acres. A total of approximately 36,000 acres (6.5% of forested land base) were proposed. The intent, while these reports were being developed, was to amend the Forest Plan. Full public involvement on the issue was postponed, pending the Forest Plan revision process.

Superior National Forest

With the exception of fire management, the BWCAW is not a topic of Forest Plan revision efforts, although the associated environmental analysis will likely include consideration of the area's contribution towards old growth values. Outside the BWCAW, the 1986 Superior National Forest Plan (USDA Forest Service, 1986) provides old growth values through a focus on standards/guidelines for plant and animal indicator species that use mature and old-aged forests. Indicator species are plants and animals selected to represent community and habitat conditions that USDA Forest Service management activities may affect. The indicator species concept is based on the premise that population levels of selected species serve as an indication of change in availability of a habitat type or condition.

The 1986 Forest Plan generally defined mature and old-aged forests as those exceeding 40-years old (Final Environmental Impact Statement, Superior National Forest, 1986; p. B-22). Application of the cumulative standards/guidelines for indicator species results in direction that about 186,000 acres occur in a "mature" condition (approximately 16% of forested land base), and includes all forest types (early and late successional species). Harvest activities are permitted within old-age/mature forests under the 1986 Forest Plan. Distribution or location of mature forests, as well as quantity, is a feature in some indicator species' standards/guidelines.

In 1992, the Superior convened an old growth team to review this issue on the Forest. The team developed definitions for three categories of mature forests (USDA Forest Service, 1992):

> *Old Growth*: Ecosystems consisting of long-lived or late successional species with old growth characteristics (i.e., large snags, coarse woody debris, canopy layers, gaps, tree sizes). Minimum age for most forest types was set as 100 years; white/red pine was 120 years.

Old Forest: Ecosystems consisting of short-lived or early successional species grown to an old age on an extended rotation with old growth characteristics. Minimum ages varied from 55 years for aspen to 60 years for jack pine, balsam fir, and paper birch.

Future Old Growth: Comprised of long-lived species grown to eventually replace current old growth, or provide old growth where it does not currently exist. These stands are developing many old growth characteristics, and have minimum ages ranging from 50 years for upland black spruce, to 70 years for white/red pine.

The current Forest Plan does not provide for old growth as newly defined by the 1992 Old Growth Report, except as it occurs in wilderness, Research Natural Areas, and selected river corridors and lakeside riparian zones. For all forest types external to BWCAW, the team reviewed how existing forest conditions might provide for the new definitions. Approximately 100,000 acres (9% of forested land base) would meet the minimum age criteria for old growth; about 75% of this occurs in lowland types. Approximately 460,000 acres (39% of forested land base) would meet the minimum age criteria for old forest; about 200,000 acres (17% of forested land base) would meet minimum age criteria for future old growth. This assessment of forest conditions was independent of location; hence, distribution of old growth/old forest on a forest-wide basis is not indicated.

Somewhat similar to the Chippewa, an inventory of stands potentially currently exhibiting old growth characteristics is underway, using MN DNR methodology. Only red/white pine is being inventoried, amounting to approximately 28,000 acres. This inventory is about 50% completed. No harvest will occur until old growth is comprehensively considered through the Forest Plan revision.

Expected Future Conditions under Current Management

In applying 1986 Forest Plan standards for indicator species to the 1992 old growth definitions, it is apparent that ample old growth and old forest acres are present to meet current Forest Plan quantitative standards, with the exception of red and white pine, and white spruce types. This shortcoming was to be addressed on an individual project basis, as projects are developed. In general terms, this has resulted in no harvest of red/white pine or white spruce qualifying for old growth age criteria, until the Forest Plan revision comprehensively considers the old growth issue.

Many of the stands meeting existing old growth criteria, and others that have high potential for meeting these criteria in the not too distant future, would be available for timber management activities. Therefore, the pool of stands with old growth potential could be reduced, perhaps substantially.

Need for Change

Known Problems with the Existing Direction or Situation

Neither Forest Plan addresses old growth issues as they are defined today. The Chippewa Forest Plan addresses old growth as any designated stand beyond Forest Plan rotation age. Once reaching the designated age, these stands can be harvested (USDA Forest Service, 1986). The Superior Forest Plan jointly addresses old forest and mature ages in managing large blocks to benefit wildlife indicator species (USDA Forest Service, 1986).

The Chippewa and Superior National Forest old growth reports have provided interim management direction while awaiting Forest Plan revision. Application of this interim direction is variable, as administrative decisions derived without NEPA analyses are not considered to have the weight of those decisions incorporating full public involvement. The response of local administrative unit managers to stand condition and natural disturbance (i.e.,

wind, beaver flooding) within designated or proposed old growth stands is not consistent; and there appears to be confusion over the direction and intent of interim management guidelines. In addition, a decision regarding management direction for inventoried potential old growth stands has not yet been made, pending Forest Plan revision.

Assessment of the Ability to Resolve Issues and Concerns through the Planning Process

While some of the old growth issues can be considered more emotional than scientific, other issues such as definition, allocation and distribution can be resolved through planning. Defining and designating old growth is closely related to other Forest Plan revision issues, including biodiversity, habitat fragmentation, age class distribution, allowable sale quantity, and fire management.

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Rare Natural Resources

Introduction

Rare natural resources are plants, animals, and natural communities that are defined as threatened, endangered, sensitive, special concern, or very uncommon. Definitions and criteria for listing species and managing these species or communities come from law and policy at federal, tribal, state, and national forest levels.

Rare natural resources have been identified as a forest plan revision based on: increasing public concern over their management; increasing national emphasis on ecosystem management to balance existing single-species management emphasis; and availability of new inventories and scientific information on many of the National Forests' rare species and communities.

The issue for rare natural resources is how Minnesota National Forests should be managed so that rare species and natural communities will continue over time to exist in geographically well-distributed populations and patterns. This issue encompasses concerns about the adequacy and consistency of management direction in the current forest plans: are the national forests managed to a) restore, protect, and enhance rare natural resources while providing for other sustainable multiple uses of the forests and to b) prevent any need for listing species as federally threatened or endangered?

This issue is divided into three broad components:

1. Sensitive species identification
2. Rare species management
3. Rare natural communities

Specific concerns that apply to each of the three areas include:

- How to define and identify rare natural resources
- How to prioritize management
- How to determine appropriate levels of inventory, research, monitoring, and evaluation
- How to determine the role national forests should play in conservation of rare natural resources at different landscape scales
- How to improve collaborative management with other agencies and land owners
- What conservation management strategies to adopt; and whether a holistic ecosystem management approach could diminish the need to manage for individual species or rare natural communities

Projection of Demand

Public demand for the protection of rare natural resources is voiced at the national to local scale through many federal and state laws and national to local management policies.

At the national level, threatened and endangered species continue to be an important issue. The Endangered Species Act of 1973, currently up for reauthorization by Congress, is the subject of intense national debate over whether or how to reauthorize it. The draft 1995 Resource Planning Act (RPA) program highlights threatened and endangered species as a potentially serious resource situation. The official federal list of threatened and endangered plant and animal species continues to grow. Continuing declines in species populations will require significant measures to maintain unique species and their habitats, including reducing access to lands where

human activities are inconsistent with species recovery. It is also noted that these measures will greatly increase the costs of responsible land and resource management (USDA 1995a, Draft RPA Program).

Protecting biodiversity, including increasing efforts to protect sensitive species, is a priority management action for protecting ecosystems on the National Forests. Cooperative conservation strategies are emphasized through interagency, multi-species, and natural community approaches (USDA 1995a, Draft RPA Program). These actions will help to reduce the need for federal listing of species found on National Forest System lands.

On the regional level (roughly the northeast quarter of the United States), threatened, endangered, and sensitive species and communities continue to be an important issue.

In the Lake States (those bordering the Great Lakes), rare species and communities are a component of the biodiversity issue. The Northwoods Broad-scale Issue Identification Project (USDA 1995b) outlined some of the concerns. They are of special concern because of their inherent scarcity across the Lake States. A number of these species and communities are protected through a variety of special land or species designations. Many rare species and communities, however, are potentially at risk due to incomplete inventories. Frequently, information is unavailable on the range, location, life history, and ecological associations of these species and communities. This creates challenges when lands are under consideration for some form of management activity.

In Minnesota, rare natural resources and their management are important issues on at least four levels where the Minnesota National Forests share rare natural resources and there are opportunities for cooperative management: State of Minnesota; American Indian Tribes; Counties; and Canada.

State of Minnesota

Through laws, regulations, and policy the State of Minnesota has established priorities and strategies for protecting the State's biological diversity including rare natural resources. Among these are:

- More effectively integrate management of endangered species, native plant species, and natural communities with the resource management priorities among different departments within the MN Department of Natural Resources (MN DNR) and other units of government.
- Promote a philosophy of natural resource management that considers actions from an ecosystem perspective.
- Continue to inventory and research to promote recovery of endangered species and threatened natural communities.
- Expand activities to include protection and management of common native plants and natural communities before they become endangered.

To help promote protection of biodiversity, the State's Endangered Species Statute (MN Statutes 84.0895) gives legal clout to protection to of threatened and endangered species and mandated the establishment of an official State list of threatened, endangered, and special concern species. In addition to identifying rare species, the State also provides for protection rare natural communities. Scientific and Natural Areas may be designated to preserve both rare communities and high quality natural communities before they become rare.

The obligations of a federal agency are clearly defined with regard to federally listed species, but less well defined with regard to State listed species. However, there is general national direction to coordinate with State agencies to inventory, protect, manage, and plan for threatened, endangered, and sensitive species (Forest Service Manual 2670.32,.44-.46; 2671.1). In addition, the Forest Service is directed, when considering what species to place on the Region 9 sensitive species list, to examine State lists of endangered, rare, endemic, unique, or vanishing species, especially those listed as threatened under State law (2672.5). Except for federally listed species and migratory birds, the State of Minnesota has responsibility on National Forest lands for species populations, while

the National Forests have responsibility for habitat management on forest system lands.

The Minnesota National Forests have had a good working relationship with the State. Examples of coordination include:

- An ongoing Memorandum of Understanding (1/3/88) and Supplemental Agreements for cooperative wildlife management
- Cooperation between the Chippewa and the State in conducting "County Biological Survey" (the systematic survey of whole counties for the rare features they contain) on National Forest lands in Cass County
- Free interchange of information on rare features through the MN DNR Natural Heritage database
- State assistance in identifying appropriate methods of rare plant inventory
- National Forests' inclusion of State listed species during field inventory
- Jointly funded rare species and natural communities research programs on the Forests

Nevertheless, there is an opportunity to improve coordination. Given the similar ecosystem management goals and objectives of the State and National Forests, how can cooperative natural resource management be more fully integrated at the State landscape level to assure maintenance of biological diversity? Should the National Forests place a priority on managing for State species or for maintaining the natural range of variation in habitats across the land without emphasizing species?

American Indian Tribes

American Indian tribes, governments, and resource management agencies have direct interest in the management of National Forest lands. A number of partnerships and Memoranda of Understanding between tribes and the National Forests of Minnesota have been or are in the process of being developed. These provide opportunities to improve cooperative management between the tribes and the National Forests, including the management of rare natural resources

Through this coordination, certain plant and animal species of traditional importance and sensitivity may be identified and become the basis of a new listing of "species of concern," differing from those previously mentioned.

Counties

Federal law addressing threatened and endangered species and Minnesota law addressing State endangered and threatened species guide management on county land. The Minnesota National Forests share both their physical boundaries and rare species and natural communities with counties. There may be opportunities to enhance coordination for the benefit of rare natural resources.

Canada

The Superior National Forest shares its northern border with Canada. Though the Chippewa National Forest does not, both Forests share some rare natural resources such as bald eagles and gray wolves. Management decisions by Canadian Wildlife Service, the Ontario Ministry of Natural Resources, or the Minnesota National Forests may affect the resources of both Canada and Minnesota.

Currently there are a number of both formal and informal partnerships between Canada and the Superior National Forest coordinating rare natural resource management, but there may be opportunities to increase the level of coordination. Canada is in the process of developing its National Endangered Species Act and listing. That list may also lead to cooperative management efforts, as our federal listing recognizes species under threat in other sovereign nations. The Forest Plans currently do not address the Binational Scientific Agreement and should

possibly do so.

In addition to the above laws and policies, ongoing scoping on the Minnesota National Forests has shown increasing public concern over rare species and the management of rare communities. Some public want to see an increased priority and management emphasis placed on rare natural resources. There is a perception that the national forests do only the minimum amount need to maintain the viability of many species. They want that to change to greater than minimum management. Other public are concerned that increasing emphasis on rare species and rare natural communities would constrain other management activities such as timber harvest. There is a feeling that a decrease in timber harvest would adversely impact local timber-based economies unnecessarily.

Need for Change

The overriding need for change comes from the increased public and agency concern over how rare natural resources are managed and the adequacy of current Forest Plans. The new scientific information on many of the National Forests' rare species and communities and a desire for more consistency of management approach between the Forests also increases the need for change. Responding to these concerns, the National Forests believe there is a need to change the forest plans for the following reasons.

Threatened and Endangered Species

- Goals for both wolf and bald eagle populations/breeding areas have been greatly exceeded: forest plan goals are outdated.
- The current plans do not include management guidance on the lynx. Because of its status and the high public interest in this species, the forest plans should address this species.

Identification of Sensitive Species

- The Chippewa and Superior National Forests, the State of Minnesota, and Minnesota's American Indian bands use different definitions for rare species (other than standard definitions for federally listed threatened and endangered species). The lack of consistency had led to confusion for both the public and land managers about what species are - or are not - at risk.
- Region 9 species lists in the current plans are outdated and do not include criteria for keeping lists up-to-date.
- The Chippewa "forest sensitive species" list is outdated since the publication of the State 1996 list.
- The Superior "candidates" are obsolete and the "species of concern" list is outdated since the publication of the State 1996 list.

Sensitive Species Management and Rare Natural Communities

Adequacy and consistency between the Minnesota Forests in developing strategies to maintain the viability of sensitive species on the Forests, Minnesota, the Lakes States, and Region 9 are a concern.

- The Minnesota Forests take different approaches to some areas of sensitive species management, but in general, both take a single-species approach. For most species this approach, especially for plants, is reactive to other management activities. For example, guidelines and standards are applied to protectively buffer known individuals or habitats against activities such as timber harvest or road building. With this approach, rare species management is often seen as a constraint to accomplishing those activities. In addition, the effectiveness of this approach in ensuring long-term viability of species is uncertain.
- Forest plans do not address or emphasize cooperative management between the two forests or among other landowners in conserving rare species or communities at a variety of large landscape scales.

- Generally, sensitive species management on the forests is a single-species or single-community approach. This is generally reactive to other forest management activities and is seen as a constraint to other activities. The effectiveness of emphasizing this approach, rather encompassing a broader ecosystem management approach, is uncertain
- Specific measurable management goals, objectives, standards, and guidelines are lacking for many aspects of management such as:
    - How to determine what species, habitats, or communities should receive highest priority for management
    - Appropriate levels and methods of inventory, research, monitoring, and evaluation of rare natural resources
    - Development of conservation management strategies
    - Whether to restore species that were formally native to the Forests, but no longer occur here.
- Forest plans do not specifically define or address management of rare natural communities except with regard to Research Natural Areas (Chippewa) and Special Interest Areas (Superior). These areas can be managed to provide for their special or unique biotic, aquatic, or geologic values or rare plants and animals. Since the Forest Plans were adopted in 1986 national and Region 9 policy has evolved to direct Forests to develop strategies to ensure appropriate management of "communities of genuine concern."

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Riparian Management

Introduction

The Forest Service defines riparian areas as "geographically delineable areas with distinctive resource values and characteristics that are comprised of the aquatic and riparian ecosystems". Aquatic ecosystems are further defined as "the stream channel, lake...bed, water, biotic communities and the habitat features that occur therein" and riparian ecosystems as "a transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water". (Forest Service Manual 2526.05, Washington Office Amendment 2500-94-4).

The issue of riparian management on the Chippewa and Superior National Forests has two principle components:

- Definition of riparian areas
- Management of riparian areas

Definition of riparian areas is a source of conflict due to lack of clarity about what specific portions of the forest landscape are being referred to by the term "riparian". For example there are divergent points of view on whether or not streams which lack year round flow are to be considered part of the aquatic ecosystem, and thus a riparian area. Some are concerned that the above definition fails to recognize the important role in energy transfer and potential aquatic and terrestrial habitat recruitment that can be played by streamside or lakeshore vegetation not requiring free or unbound water.

Management of riparian areas is an issue because some people feel the way the Minnesota National Forests have been managed has been focused too much on mitigating impacts of activities such as timber harvest, roads, trails, or recreation site development. These people generally feel this reactive approach to management needs to be replaced or supplemented by a more proactive approach, such as by establishing specific goals and objectives for riparian areas. Such goals and objectives would define a desired future condition designed to maintain key ecological functions of riparian areas. These key functions include regulating the flows of materials and energy, and controlling productivity, both within and between the aquatic and terrestrial environments. More specifically these functions regulate water quality, forest productivity, landscape connectivity, water flow, terrestrial and aquatic nutrient cycles, seed dispersal, gene flow, and fish and wildlife habitat.

Other people are concerned that any change in the way riparian areas are managed will mean increased constraints on established management activities, primarily those related to silviculture and timber harvest. Further, since most recreation and rural development is water based, rural economies likewise may be influenced by changed riparian management policies. These concerns are heightened by the above-discussed lack of clarity in definition and the resulting uncertainty about the possible magnitude or breadth of impact that changes in riparian policy may have on established activities such as commercial timber production.

The topic of riparian management appears to be important in Plan Revision due to:

- *The magnitude of riparian resources on both National Forests.* In combination, wetlands, lakes, streams, and the transition zone along perennial streams comprise more than 505,000 acres on Chippewa National Forest and more than 1,090,000 acres on Superior National Forest. This represents 32% and 28%, respectively, of the total area within the boundaries of the Chippewa and Superior National Forests. The Chippewa contains 1,321 lakes and 923 miles of streams. The Superior contains 1,977 lakes and more than 2250 miles of streams. Wetlands alone represent 29% and 26%, respectively, of lands under federal management on the Chippewa and Superior National Forests.

- *The effect that alternative riparian management approaches may have on at least three of the principle decisions made in Forest Plans.* These principle decisions are: development of desired future conditions (36 Code of Federal Regulations 219.11(b)), establishment of management area prescriptions (36 Code of Federal Regulations 219.11) , and establishment of salable timber sale quantity (36 Code of Federal Regulations 219.16).
- *The degree of public interest in riparian forest management.* This interest has been heightened by a number of national, State, and local initiatives as discussed elsewhere in this Analysis of the Management Situation and in other Plan revision documents.

Projection of Demand

Due to the sheer magnitude of riparian resources (water and areas influenced by proximity to water bodies) on both National Forests, the ability of both Forests to supply riparian-related goods and services on a quantitative basis is large. In combination, wetlands, lakes, streams and the transition zone along perennial streams comprise more than 505,000 acres on Chippewa NF and more than 1,090,000 acres on Superior NF. This represents 32 percent and 28 percent respectively, of the total area within the boundaries of the Chippewa and Superior National Forests. The Chippewa contains 1,321 lakes and 923 miles of streams. The Superior contains 1,977 lakes and more than 2,250 miles of streams. Wetlands alone represent 29 percent and 26 percent, respectively, of the lands under federal management on the Chippewa and Superior National Forests.

National Forest lands may be nearly exclusive sources of some riparian conditions (e.g. large blocks of undeveloped lake and stream shoreline in public ownership).

A challenge arises from the reality that not all goods and services capable of being produced by/in riparian areas are compatible. For this reason choices must sometimes be made between the types of goods and services to be provided by specific riparian areas. The challenge then becomes how to distribute the possible goals for riparian areas across the Forest-wide landscape so as to best meet the many and varied (and sometimes conflicting) needs of the Forests' stakeholders.

The current demand for riparian-related goods and services from both National Forests is high and is expected to increase. This is well exemplified by trends in recreational fishing. The number of anglers in the U.S. rose by 20 percent during the decade from 1980 to 1990 (USFWS, 1993). Over 14 percent of all freshwater fishing in the 50 states that took place in 1991 occurred in the three states of Minnesota, Michigan and Wisconsin. Minnesota has about 1.5 million resident anglers (38 percent of the states' population) and about 734,000 non-resident anglers. Anglers expenditures in Minnesota totaled about 457 million dollars in 1991. In terms of both quantity and quality, the Chippewa NFs' 1,321 lakes and 924 miles of streams and the Superior NFs' 1,977 lakes and 2,250+ miles of streams are an extremely significant source of fishing opportunities in Minnesota. In combination, the two National Forests encompass over 50 percent of the total miles of trout stream in Minnesota.

Need for Change

Known Problems with the Existing Direction or Situation

As mentioned in the Introduction to this Analysis of the Management Situation (AMS) on Riparian Management, the problem with existing direction in the Forest Plans of both the Chippewa and Superior National Forests has two principle components: definition and management.

The Definition Component

The Chippewa Plan defines "riparian areas" as "land adjacent to perennial streams, lakes and reservoirs and including other well developed riparian vegetation (primarily intermediate streams). This land is specifically delineated by the transition between the aquatic ecosystem and the adjacent terrestrial ecosystem and defined by soil characteristics and distinctive vegetation communities that require free and unbound water". (Chippewa NF Plan Page C-13).

The Superior Plan Environmental Impact Statement (EIS) defines "riparian" as "an area of land or water which includes stream channels, lakes, adjacent riparian ecosystems, floodplains, and wetlands" (Superior NF, EIS Page G-18).

Clearly there is lack of continuity between the two Forests regarding the specific position on the landscape being referred to when the term "riparian" is used. This mirrors the wide range of opinions within the overall scientific community about the meaning of this term and the exact locations on the land it is intended to describe (Laursen, 1996). Those interested in riparian management on the National Forests in Minnesota express divergent points of view on whether or not streams which lack year round flow are to be considered part of the aquatic ecosystem, and thus a riparian area. Views also diverge on the relative importance of "dry ground" streamside or lakeshore vegetation in providing large woody debris to adjacent stream or lakes or to the riparian area itself.

Lack of agreement on definitions makes it exceedingly difficult to communicate with stakeholders having interests in both Minnesota National Forests, to determine geographic scope of riparian management practices, or to predict or quantify the impacts these practices might have on other resources or outputs.

The Management Component

From the earlier discussion of standards and guidelines, it's apparent that the two National Forests in Minnesota are not entirely consistent in the way riparian management guidance is provided in current Plans. Both Forest Plans provide riparian direction using a somewhat disjointed or piecemeal approach. Neither Forest Plan comprehensively addresses the protection or enhancement of riparian ecological functions. In combination, this leads to confusion on the part of stakeholders who deal with both Forests and view both Forests as having similar aquatic or riparian resources.

Some people are concerned that current management of riparian areas on the Minnesota National Forests focuses too much on mitigating impacts of activities such as timber harvest, roads, trails, or recreation site development. A more proactive approach to management, such as establishing specific goals and objectives for riparian areas, should possibly be considered. Such goals and objectives would define a desired future condition designed to maintain key ecological functions of riparian areas. These key functions include regulating the flows of materials and energy, and controlling productivity, both within and between the aquatic and terrestrial environments. More specifically these functions regulate water quality, forest productivity, landscape connectivity, water flow, terrestrial and aquatic nutrient cycles, seed dispersal, and fish and wildlife habitat.

Current riparian management direction on both Forests (i.e., filter strips, shade strips, Best Management Practices) (BMP) was principally developed to protect water quality. Scientific findings make it clear that the functional benefits of areas near water can, as discussed above, far exceed those related to water quality protection (Laursen, 1996). Guidance for protecting or enhancing these other benefits (i.e., providing controlled inputs of organic litter and large woody debris, or providing habitat or travel corridors for wildlife) is not addressed in current Forest Plans.

Increased or changed riparian management direction might affect management activities (primarily commercial timber production and recreation developments) that have come to be relatively commonplace in Minnesota's National Forests. A common conceptual approach to management of riparian resources in forests is to designate

zones or corridors along water, primarily streams (Laursen, 1996). Standards and guidelines designed to protect or enhance riparian resources are then implemented within those zones. In applying this approach to Minnesota Forest s, questions abound as to how wide these zones should be, what activities are appropriate within their boundaries, or whether management direction should be the same for all riparian areas. There is a need to better understand and articulate the tradeoffs involved in changing management direction for these zones. Tradeoffs are probably inevitable between commodity and non-commodity uses, between competing non-commodity uses and between competing commodity uses.

Some people feel that current approaches to riparian management on the Chippewa and Superior, including use of water quality-based Best Management Practices (BMPs), are adequate, and that no change in direction is needed. There also appears to be a misunderstanding among some people about the overall role and responsibility of the Forest Service in management and protection of riparian resources.

Assessment of the Need and Opportunity to Change Mgmt Direction, and the Ability to Resolve Issues and Concerns through the Planning Process

There is a need to agree on definitions and to provide management direction to protect, enhance, or possibly restore a wide range of (or all) riparian ecological functions. Plan Revision represents a unique opportunity to establish the elements of this new direction that are needed at an above-project scale. The new direction would need to have full public recognition of the resulting tradeoffs in outputs of goods and services that may result.

Because views of riparian management are so divergent and polarized, and because human demands on riparian areas continue to increase, it is unrealistic to expect the planning process (or any other process) will completely resolve all related issues and concerns. The planning process does, however, provide a systematic means to garner and consider this wide range of views in the formulation of new or revised management direction. The process does offer the chance to resolve, or at least reduce the intensity of, some riparian-related issues, and concerns.

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Recreation

Introduction

The Forest Service suggests in the *Strategy for Recreation, Version 3, April 1999*, that protection and maintenance of the essential character of the national forests and grasslands will enhance the recreation setting and experiences while establishing a Forest Service brand of recreation. Utilizing landscape or broad scale planning enhances the planning process by allowing consideration of an area's site-specific characteristics, while allowing for analysis of the relationships between different uses and biological processes.

The Chippewa and Superior National Forests' Plan revision process offers opportunities to further refine recreation management on each Forest in the context of new Forest Plans. People have identified a variety of issues related to recreation throughout the plan revision process. Many of these issues have been outside the scope of this plan revision. Two issues that will be addressed through the revision process are the forest recreation settings and off-road vehicles.

There are two issues identified within the scope of this plan revision and pertinent to recreation:

1. Forest settings
2. Recreational motor vehicle access

Forest settings can be described in the context of social interpretation–people's perceptions of environment. Vegetation, distance from developments including roads, and whether motorized vehicles are allowed, all combine to create a picture of potential experiences, opportunities, and benefits a visitor may have.

A forest setting is the condition of an area of land and/or water as interpreted by visitors. Multiple factors influence a forest setting, including, but not limited to: vegetation, access to the area, aesthetics, types of recreational activities, and amount of solitude. The issue of forest settings is that many people feel the range of recreation-related forest settings are skewed or limited to one form of recreation over another.

The topic of forest settings is important in Plan revision due to:

- The degree of public interest in quality recreation experiences that range from experiences of remoteness and solitude to highly developed facilities and numerous encounters with other visitors
- The degree of public interest in accessing the Forest

Terminology for motorized recreational vehicles that are used primarily off roads has changed since the 1986 Forest Plans when we identified all types of these vehicles as "Off Highway Vehicles (OHV)." To be consistent with Minnesota Department of Natural Resources, we now define these vehicles as recreational motor vehicles–RMVs. Recreational motor vehicles is a broad category consisting of: all terrain vehicles; motorized, off-highway motorcycles; off-road vehicles; and snowmobiles..

> *Motorized, off-highway motorcycles–OHMs*–are vehicles traveling on two wheels that have a seat or saddle designed to be straddled by the operator and have handlebars for steering control. Motorcycles may be legal for highway use and still considered OHMs if used for off-highway operation on trails or natural terrain.
>
> *Off-road vehicles–ORVs*–are motorized, recreational vehicles capable of cross-country travel on natural terrain, such as four-wheel-drive trucks.

All terrain vehicles–ATVs–are motorized, flotation-tired vehicles with at least three, but no more than six, low pressure tires, with an engine displacement of less than 800 cubic centimeters and total dry weight of less than 800 pounds. ATVs with a total dry weight of more than 800 pounds are classified as ORVs.

The use of the Chippewa and Superior National Forests by recreational motor vehicles (RMVs) will be addressed in terms of compatibility with the unique settings and resources of the National Forests. The issue is defining the role of the Forests in providing access to recreational motor vehicles and becoming consistent in user policies across federal and state lands.

The topic of RMV access is important in Plan revision because it provides an opportunity to:

- Address the management of RMV trail systems, including the amount of development;
- Provide consistency of access policies between state and federally owned land;
- Provide opportunities for motorized trails to reflect increased demand;
- Determine effects it may have on providing non-motorized opportunities.

Projection of Demand

National Trends

America's national forests and grasslands offer the single largest source of outdoor recreation opportunities in the United States. Over the next 50 years, we expect demand to increase from 800 million to 1.2 billion visits to the national forests per year. In addition, people are asking for a broader spectrum of benefits and services to enrich their experiences. (Natural Resource Agenda, 1998). The Forest Service currently receives over one-third more visitors than any other federal agency.

The following information is taken from *"Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends",* H. Ken Cordell, Principal Investigator.

Across American communities and groups within society, outdoor recreation has remained enormously popular over the years. Although new forms of participation have appeared, an underlying, basic motivation for outdoor recreation participation still is to have the opportunity to experience nature by viewing it, traveling through it, and for a short time at least, living it.

Traditional land, water, snow, and ice settings are very much in demand to satisfy the growing appetite both for traditional outdoor recreational activities as well as to serve demand for a growing list of new activities driven by better access and by rapidly evolving technology and information availability.

Both long-term and short-term trends point to continued growth in outdoor recreation across all segments of the population, some more than others. Growth seems particularly strong in viewing and learning activities and in "new" activities like snowboarding. If these trends continue, pressures for places to recreate and for recreation infrastructure to support recreation seekers will continue to build. There is evidence particularly of growing pressures on the public lands and the recreation opportunities those lands represent. Growing pressure is likely to take many forms and will require a variety of management responses. Level to decreasing public funding for outdoor recreation access, service, and facility development and maintenance will represent major challenges in the near as well as long-term future.

The biggest changes taking place in factors influencing recreation behavior over the next half century relate to increases in population and real income. It has also been established that supply factors such as proximity and availability of recreation resources are important in determining whether and to what degree individuals recreate. Given this information, the following table contains Northern regional trends for numbers of visitors and

percentages of increase/decrease over the next 20 years within recreation opportunities the national forests of Minnesota provide.

APP-A3 Percent Change in Participation Levels Over Time By Activity

Activity	1995*	2000	2010	2020
	Millions of Recreation Visitor Days (RVDs)	% change from 1995	% change from 1995	% change from 1995
Sight-seeing	52.30	+2	+11	+23
Cross Country Skiing	4.40	+3	+15	+23
Non-consumptive wildlife activities	56.00	+1	+10	+21
Visiting historic places	40.80	+2	+13	+20
Horseback Riding	5.60	+1	+7	+18
Visiting a beach or waterside	57.70	+1	+9	+17
Biking	27.90	+1	+10	+17
Non-pool swimming	38.40	+1	+8	+16
Family Gathering	58.10	+2	+9	+16
Walking	62.60	+1	+7	+15
Picnicking	47.00	+1	+8	+15
Downhill Skiing	8.40	0	+6	+13
Motorboating	22.00	+1	+6	+13
Canoeing	8.00	0	+6	+13
Fishing	25.60	0	+5	+12
Hiking	20.60	-1	+4	+11
Off-road driving	11.20	-1	-1	+6
Snowmobiling	4.90	-2	0	+5
Developed Camping	18.00	-20	+11	+4
Rafting/Floating	6.90	-3	-6	+1
Backpacking	6.00	-4	-7	-1
Hunting	8.40	-2	-3	-2
Primitive Camping	10.90	-4	-8	-2

* Current Participation Levels in Millions, Northern Region**.** The Northern Region includes: Minnesota, Iowa, Wisconsin, West Virginia, Vermont, Rhode Island, Pennsylvania, Ohio, New Hampshire, New Jersey, New York, Missouri, Michigan, Massachusetts, Maryland, Maine, Indiana, Illinois, Delaware, and Connecticut.

APP-A4. Change in Participation Levels

Activity	1995: Current Participation Levels in Millions of RVDs, Northern Region	2020: Projected Participation Levels in Millions of RVDs, Northern Region
Walking	62.6	72.0
Non-consumptive wildlife activities	56.0	67.8
Visiting a beach or waterside	57.7	67.5
Family Gathering	58.1	67.4
Sight-seeing	52.3	64.3
Picnicking	47.0	54.0

APP-A4. Change in Participation Levels		
Activity	**1995: Current Participation Levels in Millions of RVDs, Northern Region**	**2020: Projected Participation Levels in Millions of RVDs, Northern Region**
Visiting historic places	40.8	50.0
Non-pool swimming	38.4	44.5
Biking	27.9	32.6
Fishing	25.6	28.7
Motor boating	22.0	24.9
Hiking	20.6	22.9
Developed Camping	18.0	18.7
Off-road driving	11.2	11.9
Primitive Camping	10.9	10.7
Downhill Skiing	8.4	9.5
Canoeing	8.0	9.0
Hunting	8.4	8.2
Rafting/Floating	6.9	7.0
Horseback Riding	5.6	6.6
Backpacking	6.0	5.9
Cross Country Skiing	4.4	5.4
Snowmobiling	4.9	5.1

Minnesota Trend Information

Demographics

Minnesota's population will surpass 5 million by the year 2020 (State Demographer), growing by five percent over the next two decades. The Minnesota's aging white population will grow by only six percent between 1990 and 2020, with births barely exceeding deaths between 2015 and 2020. The state's younger minority population, with higher birth rates and substantial immigration, will nearly triple (175% increase) between 1990 and 2020. The number of persons age 45 and older is projected to increase nearly 70 percent. Growth in the state's elderly population and the aging of the *Baby Boom* generation will push Minnesota's median age from 32.5 in 1990 to age 40 by 2020. Persons age 65 and older will out-number children in most Minnesota counties. Statewide, the number of children under age five is projected to decline by 11 percent by 2020. Aging will be especially pronounced outside of the emerging St. Could - Twin Cities - Rochester corridor. Recreation participation generally declines sharply with age. (MN DNR, SCORP 1995-1999).

Recreation Participation

Boomers soon will enter their most productive, highest earning years. Many two-career families may enjoy more discretionary income, but less leisure time. Such households must plan their time, even leisure time, very carefully. Boomers have tended to vacation more frequently, but closer to home and for shorter periods of time than their predecessors (three days or less). Travel is becoming more destination-oriented than in the past with pleasure travel dependent on time–not money. There is a growing demand for eco-tourism and outdoor experiences to contrast work involvement (computers, technology). With strong competition for free time and dollars, recreation providers will need to provide a quality experience that matches consumer expectations. Management will be even more critical than marketing.

In terms of outdoor recreation participation, residents are likely to participate in more activities than non-

residents. A resident is more likely to swim, hike, fish, sightsee, be involved in guided or unguided nature observation, boat, sunbathe, canoe, and visit historic sites than a non-resident. A non-resident is more likely to visit friends or relatives, eat in a restaurant, shop for non-food items, and golf.

The MNDNR was able to provide 1986 through 1998 recreation information in terms of activities related to Revision/Recreation issues of forest setting and OHV use. That statistical information is included in the following table.

APP-A5. MNDNR Number of Licenses, Registrations, and State Forest Camper Nights

Activity License or Boat Registration	1986	1998	% Change
Hunting Licenses	757,125	855,793	+6%
Fishing Licenses	1,503,882	1,205,299	-11%
Recreational Motor Vehicle Registrations*	23,738	93,612	+60%
Snowmobile Registrations*	180,782	277,650	+21%
Boat Registrations Motorized **	500,077	598,021	+9%
Boat Registrations: Non-motorized **	155,202	182,076	+8%
Camper Nights	55,729	97,903	+27%

* This figure includes three expiration classes: the present year, and each of the two succeeding years.

** Includes all boats except non-motorized boats nine feet or less, duck boats during the duck season, rice boats during the wild rice harvest season, and seaplanes.

Recreation Economics

Outdoor recreation is a major component of the Minnesota economy. Hunters, anglers, snowmobilers, and registered boat owners are among those who contribute nearly $3 billion annually to the state's economy. Outdoor recreation provides income and employment for thousands of state residents, and an economic boost for local economies. (MN DNR, SCORP 1995-1999).

Chippewa and Superior National Forests Trends and Interpretation

Given the national survey that reflected regional information gathered and interpreted by Ken Cordell et al and MNDNR use information, we can begin to infer demand changes for the Minnesota National Forests. Activities can be grouped to enable analysis in terms of the issues of recreation setting and recreational motor vehicles.

We know that the Chippewa and Superior National Forests provide many of the same recreational opportunities; however, the emphasis of visitors on each Forest varies. The Superior, outside the BWCAW, receives a lot of use focused on trails and rustic camping in campgrounds and more primitive camping opportunities in the summer, while winter brings snowmobiles and dogsleds to the trails. The Chippewa's summer use is concentrated primarily in water-related recreation including fishing and campgrounds associated with lakes. Winter use focuses on trails, including snowmobile and cross-country skiing.

National–Regional survey information indicates demand will increase for most developed and undeveloped recreation opportunities. Activities related to water all show increases of at least 12 percent over the next 20 years. Corresponding visitor demand on the Minnesota National Forests should reflect that trend toward

increased motor boating, visiting a beach, canoeing, and fishing. Other activities associated with trails also show gains in participation, such as cross-country skiing, walking, biking, snowmobiling, and off-road driving. Camping related activities show a more stable outlook, at times decreasing then increasing. Developed camping participation was expected to increase, while more primitive camping participation was expected to slightly decrease. This may be the result of an aging population developing an increased liking for more developed amenities such as RV camping. Undeveloped activities, such as hunting and backpacking will remain approximately level with a slight decrease in participation. Off-road driving will remain level with a slight increase in participation.

Minnesota registrations and licenses purchase information comparing 1986 through 1998 show growth in outdoor activities that utilize boats, snowmobiles, and recreational motor vehicles. The 21 percent and 60 percent increase of snowmobile and recreational motor vehicle registrations, respectively, have resulted in a steady demand for increasing the numbers of appropriate trails on the Chippewa and Superior NF. Camping increases in state managed campgrounds has also been reflected in the Chippewa NF campground use increases. Motorized and nonmotorized boat registrations are up, perhaps reflected in continuing construction of boat accesses and an increase in BWCAW permits (where people are required to use nonmotorized watercraft).

Use of the National Forests has been measured in recreational visitor days (RVD). An RVD indicates any cumulative 12-hour block of time spent in the Forest, and is included in the following table (APP-A6). During the last planning period, visitor use data has been limited in terms of statistical accuracy. During the years 2000 and 2001, both the Chippewa and Superior researched recreation use by total number of visitors. The result was statistically sound information on how many visitors we have and what they do while visiting National Forest System land.

Visitor use as measured using the National Visitor Use Monitoring Results for each Forest is also shown in App-A6. Results of the National Visitor Use Monitoring on the Chippewa National Forest were 2.1 million national forest visits or 5.5 million RVDs. Results for the Superior National Forest were 4.0 million national forest visits or 9.3 million RVDs. Of the total for the Superior, the BWCAW accounts for 0.3 million visits or 1.3 million RVDs.

APP-A6. Recreational Visitor Days by Forest

National Forest	1986 RVD*	1997 RVD	2000 RVD
Superior	1,725,000	2,510,000	9,276,293
Chippewa	1,588,600	1,707,300	5,493,596

* Use of the forest is measured in recreation visitor days (RVD), indicating any cumulative 12-hour block of time spent in the Forest

Given statistical and empirical data, demand for a variety of forest settings and recreational motor vehicle access to the Chippewa and Superior National Forests will both continue and increase.

The overall recreation supply on the Forests can be described in terms of "practical maximum capacity". Practical maximum capacity is defined as the level of use that would not degrade the physical capabilities and natural resources of the Forests. Table APP-A8 depicts the maximum practical capacity for each Forest by ROS class.

Potential future recreation demand is addressed in Cordell's *Projections of Outdoor Recreation Participation to 2050*. According to that report, days spent and numbers of participants in winter, water-based, and developed land activities will, in general, grow faster than the population. These activities generally occur in roaded natural and semi-primitive motorized ROS classes. Hunting and fishing, along with other dispersed land activities, are not expected to increase in activity days or participation numbers as fast as the population is growing. Non-consumptive wildlife activity is an exception to this trend; however, it is not limited to dispersed settings. That is, non-consumptive wildlife activities would occur in all ROS classes.

It appears for the most part that the existing ROS classes with associated maximum practical capacity can meet the existing use and potential recreation demand. However, the Chippewa National Forest has little inventoried Semi-primitive Non-motorized ROS acres and associated capacity to address potential increases in the non-consumptive wildlife activities.

Table APP-A7: Minnesota National Forests ROS Inventory (percent)

ROS Inventory Class	Chippewa NF	Superior NF
Primitive	0	22
Semi-primitive Non-motorized	1	19
Semi-primitive Motorized	34	44
Roaded Natural	62	14
Rural	3	1
TOTAL	100	100

Source: Percents of National Forest land derived from Minnesota National Forest inventory criteria and GIS mapping, project file. Water acres are not included. BWCAW acres are included on the Superior National Forest.

Table APP-A8: Minnesota National Forests Maximum Practical Capacity (RVD's per year)

ROS	Chippewa NF	Superior NF
Primitive	0	519,913
Semi-primitive Non-motorized	51,054	2,175,895
Semi-primitive Motorized	1,685,083	5,612,512
Roaded Natural	7,551,995	5,227,268
Rural	1,204,700	1,681,680
TOTAL	10,492,832	15,216,668

Source: Project files summarize how capacities were determined.

Need for Change

Based on information presented in this document, there is an indication of a need to change the 1986 LRMP. The following is a summary.

The Chippewa and Superior National Forests each represent a variety of recreational opportunities in Minnesota with many similarities and some differences between Forests. Revising the Forest Plans creates an opportunity to ensure our standards, goals, objectives, and policies are similar when appropriate to enhance our visitor's and stakeholder's recreation opportunities and experiences. Opportunity exists to discuss, explore, and define the role of the National Forests in Minnesota as recreation providers in terms of Forest settings. What is the National Forest niche amongst other recreation providers? What is our ability to provide for that niche?
Demand is expected to increase for all forest settings, including recreational motor vehicle access opportunities. Trail construction has not matched planned construction. Opportunity exists to define consistent RMV access policies between Minnesota National Forests and other adjacent public landowners such as the MNDNR and

counties. Through Plan revision, we can also begin to address the issues of Forest Setting and Recreational Motor Vehicle access over the next decade. We will be able to look at current conditions and move toward our defined goal as providers of quality recreational benefits and experiences.

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