

Chapter III
Affected Environment



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Chapter III describes the existing environmental conditions by element that will or could be affected by any of the alternatives if they were implemented.

Major Changes to Chapter III

A number of changes were made to the Draft Environmental Impact Statement in Chapter III. A section on noise was added to the discussion on the physical environment. Also, the section on water quality was expanded.

In the biological environment section, seven animals and 17 plants were recommended for consideration to the Regional Forester for inclusion on the R-9 list of sensitive species. In addition, the list of management indicator species was reviewed for appropriateness and completeness. As a result, several additions and substitutions were made.

These changes, and all those made throughout this document, are due to the review of the draft documents by both the public and the Forest Service. The changes which are found in the Final Environmental Impact Statement are the result of attempts to make this document as responsive to the public as possible.

Overview

This chapter describes the existing environmental conditions that will or could be affected by any of the alternatives if they were implemented. The conditions are described as they were in the past 3 to 5 years (1980 to 1984). The changes in these conditions are described in Chapter IV-Environmental Consequences.

This chapter is organized by major components of the environment: physical, biological, economic, and social. Only those environmental conditions that will be affected by one or more of the alternatives are described here.

Introduction to the Forest Environment

The Ottawa National Forest is located in the western end of Michigan's Upper Peninsula in a glaciated area known as the Canadian Shield. Unlike the relatively flat central and eastern Upper Peninsula, the area is characterized by rolling to steep hills, deeply dissected river valleys, and bedrock outcrops and escarpments. Topographic relief averages 100 to 300 feet, but reaches 1,000 feet.

The bedrock underlying the Forest consists of sandstones, granites, gabbros, and basalts with potential for copper, nickel, and iron mining.

There are three major kinds of soils on the Forest: 1) acid, sandy, dry soils formed on nearly level to sloping outwash plains, 2) acid and calcareous, loamy, moist soils developed on nearly level to moderately steep moraines, and 3) calcareous, clayey, dry-moist soils formed on nearly level to rolling glacial lake plains. Other landforms and soils important to management of the Forest include extremely steep river gorges and wet organic deposits scattered across the Forest.

An abundance of water is one of the greatest natural resources of the Forest. Its drainage is almost entirely to the St. Lawrence-Great Lakes system. A small portion of the south central section of the Forest is drained by headwaters of the Wisconsin River, a tributary of the Mississippi.

There are more than 500 lakes over 5 acres in size within the boundaries of the Forest. Most are located in the southern half of the Forest.

Wetlands occupy about 12 percent of the Forest and include treeless bogs, emergent wetlands, lowland conifer, lowland hardwoods, and balsam fir types.

The climate of the western end of the Upper Peninsula is normally cool with long winters and short summers. The average annual precipitation is 30 to 36 inches with an average annual snowfall of 74 to 142 inches. Snowfall usually begins about mid-November and stays on the ground through late April.

The length of the growing season is about 100 days.

Physical Environment

Soil Productivity Most soils have sandy loam and silt loam textures that are moderately well drained. Forest management practices can cause adverse impacts to soil productivity.

Erosion potential increases with steepness of slope and deficiency of internal drainage. Certain landtype associations and portions of other landtype associations have erosion potential conditions. Presently, surface erosion of soil is a very minor problem.

Soil compaction can reduce soil productivity by reducing soil aeration, reducing the ability of water to move in the soil, and decreasing root penetration. Soil compaction can occur when sufficient soil moisture is present in the upper portion of soils during timber harvest. Presently, there is no reliable information on the effects of soil compaction on soil productivity. This is a research proposal identified in Chapter III of the Forest Plan.

Whole tree harvesting, prescribed burning, and some mechanized site preparation methods can adversely affect soil productivity by causing nutrient depletion, organic material removal, and severe soil scarification and displacement. Whole tree harvesting has become a common practice on the Forest, particularly in aspen and jack pine types on sandy and clayey soils. Presently, there is no reliable information on the effects of whole tree harvesting in the western Upper Peninsula. Chapter III of the Forest Plan identifies this as a research proposal.

Prescribed burning is a minor practice on the Forest and largely used for slash disposal with some site preparation. Mechanized site preparation equipment that severely scarifies and displaces the upper, nutrient-rich soil is no longer used on the Forest.

Minerals Federal mineral ownership is only about 11 percent of the National Forest system lands, and about 7 percent of all the lands within the boundary. Therefore, the federal mineral estate will probably be of little importance to the overall supply of minerals coming from the Ottawa National Forest.

Currently, there is an increased interest in oil and gas, uranium, nickel, copper, diamonds, and silver exploration.

Common variety minerals (sand and gravel) occur extensively in the southern portion of the Forest. These deposits are lacking in the northern portion of the Forest simply because the glacial landforms (for example, glacial lake plain) do not normally contain extensive deposits of gravel. Clay borrow of high quality does exist in large quantities in the northern portion of the Forest and is very suitable for lining landfills, lagoons, and settling ponds.

Mineral materials are used by Forest Service, local counties, Forest Service contractors, and individuals who own property in or adjacent to the Forest. Disposal is authorized through contracts and permits on a case-by-case basis, usually requiring a fee.

Visual
Resource

The Forest offers a wide range of scenic variety including steep to level landforms, rock outcrops and ledges, lakes and rivers of all sizes and shapes, and a mix of vegetation dominated by northern hardwoods which naturally presents a variety of ever-changing scenes with the seasons.

The southern two-thirds of the Forest is a relatively level to rolling landscape broken up with small streams and numerous lakes. Visual variety can best be described as minimal to common, with pockets of distinctive variety created by large, tall, and old growth vegetation and very large and small but unique water bodies. Foreground, with some middleground views, are most common with distant or background views the exception.

The northern third of the Forest landscape is generally rugged and broken up with the many major river systems working their way to Lake Superior. Areas of high relief, steep landforms, and rockforms in this area provide common to distinctive visual variety.

Forestwide, the predominance of level to rolling landscape and the abundance of roads, highways, and lakes make visual resource management to provide quality for the general public most critical in foreground areas.

The Forest Service Visual Management System was used to determine visual quality objectives for all National Forest System lands within the Forest. The system involves classifying the variety class (amount of variety and diversity) of all landscapes, and determining sensitivity levels (user concern for the visual environment) for all travel routes, use areas, and water bodies. By combining the values of these two visual conditions, a visual quality objective (VQO) for that area of land can be determined and mapped.

The visual quality objectives are then used to describe the degree of alteration that may occur to the visual resource on any lands within the Forest or management area.

The five visual quality objectives are preservation, retention, partial retention, modification, and maximum modification. Each of the visual quality objectives describes a different degree of acceptable alteration of the undisturbed landscape.

Currently, the only area on the Forest with a preservation VQO is the McCormick Research Natural Area (RNA) within the Cyrus H. McCormick Experimental Forest. This VQO only applies to wilderness and other special classified areas such as RNAs.

Areas such as the Sylvania Recreation Area and Black River Recreation Area are currently designated retention VQO.

Areas such as U.S. Highway 2, Forest Highway 16, and many other main collector road travel corridors providing access to public and private recreation areas are designated partial retention VQO.

The remainder of the Forest is designated modification and maximum modification VQOs.

An integrated resource management process is used to coordinate and modify timber, wildlife, and road construction management practices so they will meet, exceed, or enhance the VQO listed for the area where the project will be implemented.

The need to maintain areas of high visual quality while creating additional variety such as diversity of vegetative types, all within the desired condition for each management area, is currently recognized. It bears a direct relationship to the location and amount of each management area prescription.

Some vegetative types and the kind of management practices often implemented make meeting any of the VQOs from partial retention to maximum modification relatively easy. Such is the current condition on the Ottawa since more than 60 percent of the existing vegetation is mostly second growth northern hardwoods. The silvicultural system most often utilized to manage northern hardwoods along travel routes and near use areas and waterbodies is the uneven-aged system. Therefore harvest cutting methods such as selection cutting is emphasized in foreground areas of travel routes, use areas, and water bodies with retention and partial retention VQOs.

Refer to Final EIS Chapter VII - Glossary for definitions of all visual management system terms. Also refer to National Forest Landscape Management Volume 2, Chapter 1 of the Forest Service Visual Management System for more complete information about the visual management system process.

Cultural
Resources

The Forest Service is required by law, regulations, and Presidential Executive Order to inventory, protect, and enhance cultural resources on the lands it manages. Cultural resources are the remains of sites, structures, or objects used by humans in the past.

Cultural resources are the physical remains left by people who occupied or visited areas during historic or prehistoric times. These remains provide valuable insights into the life styles of past inhabitants and travelers through the region which includes the Ottawa National Forest. A varied cultural record has been left during the past 10,000 years of human use.

The first group of people to use this area followed a wandering way of life, hunting big game, fishing, and gathering plant foods. Later groups of prehistoric people developed farming and a settled way of life. The prehistoric exploitation of native copper occurred during this period.

The first Europeans in this region were explorers, missionaries, traders, and trappers. They were followed by miners, loggers, settlers, and farmers.

The Cultural Resource Overview of the Ottawa National Forest was completed in 1979 by Michigan Technological University. This study was the first Forestwide assessment of cultural resources and located some 227 prehistoric and historic sites within the Forest boundaries. An intensive archival search, completed in 1984 by the Mid-American Research Center, Inc. of Loyola University, identified an additional 642 historic sites.

A total of 196,974 acres has been inventoried to date. These inventories have been done through contracts and through the use of cultural resource professionals and paraprofessionals. To date, some 1,230 historic and 40 prehistoric sites have been identified on the Forest. Based on Forest inventory data, the current cultural resource density may be as much as one site for every 350-500 acres. Cultural resources occur throughout all management areas, although the site density tends to vary somewhat with environmental conditions.

Eventually, all cultural resources that may meet the criteria will be evaluated for National Register of Historic Places eligibility. Cultural resources threatened by erosion, natural deterioration, vandalism, or adverse project effects are given first priority for mitigative measures and evaluation. All potentially significant cultural resources are protected until their significance is formally determined. Severe vandalism at identified sites has not been observed, although occasional incidents have been reported at the nineteenth-century Norwich Mine Site which is currently being formally evaluated. To date, five cultural resource sites have been formally evaluated. Only one, the White Deer Lake Camp located in the Cyrus H. McCormick Experimental Forest, is considered eligible for the National Register of Historic Places. This historic property has recently been dismantled in accordance with 36 CFR 66 and in consultation with the Michigan State Historic Preservation Officer and the Advisory Council on Historic Preservation.

Fire

Fire protection for the Ottawa National Forest is a joint effort between the Forest Service and the Michigan Department of Natural Resources (MDNR). The Forest Service is responsible for initial attack on fires on National Forest System and private lands in the southwest quarter and eastern one-half of the Forest, a total of approximately 920,000 acres. The MDNR takes action on the remainder of the lands within the Forest, 343,711 acres, and on lands north of the Forest including the Porcupine Mountain Wilderness State Park, lands in the middle of the Forest known as "the hole in the donut," and the Cyrus H. McCormick Experimental Forest. The peak seasons for wildfire activity on the Forest are from mid-April to early June and the month of October. During the past 5 years, the Forest reported an average of 7 fires per year with a total of 177 acres burned.

Prescribed burning and logging residue (slash) burning is used by the Forest Service to prepare some areas for tree planting and eliminate slash and slash piles. About 300 acres have been burned during the last 5 years.

Wildfire is not a major problem on the Ottawa National Forest. High humidity, frequent rainfall, the predominance of broad-leaved trees, and normally cool temperatures combine to keep available fuel moist and limit the chance of ignition. Good vehicle access and an established prevention program have all contributed to keeping the fire problem minor.

Riparian Areas

The riparian area resource on the Forest, by definition, occupies lakes, streams, floodplains, wetlands, and a strip of land (minimum of 100 feet) adjacent water bodies. Vegetation within wetlands varies from sparsely vegetated marshes to densely forested wetlands. The National Forest Management Act requires that no management practice cause adverse changes to water conditions or fish habitat in these areas.

Riparian areas have provided the location for much of the Forest's developed recreation facilities and use, habitat for many wildlife and plant species, and some timber products.

Some of the forested wetlands provide northern white cedar, black spruce, tamarack, and hemlock. Wetlands provide important winter range for deer. These areas also provide habitat conditions for great blue heron and osprey. Lakes and streams are important habitat for the common loon and bald eagle.

Because of excessive road costs, very little road construction, if any, has occurred in wetlands. Some roads have been relocated out of these areas in recent years. Presently, vegetation management is limited in these areas due to low quality timber products, high costs, lack of markets for these products, and in some cases, uncertainties about adequate regeneration.

Water
Quality

Water from the Forest drains almost entirely to the St. Lawrence-Great Lakes drainage. A very small portion of the southcentral portion of the Forest is drained by the headwaters of the Wisconsin River, a tributary of the Mississippi River. There is an ample supply of both surface and ground water to meet demands for various uses.

Water resources on the Forest are used for recreation uses such as canoeing, pleasure boating, fishing, hunting, and swimming. Total public ownership along the rivers and streams is less than 60 percent.

Local hydroelectric power is developed from the drainages of the Sturgeon and Ontonagon River systems. Several impoundments, Prickett Lake, Bond Falls Flowage, and Victoria Reservoir, provide recreational uses as well as maintaining adequate water flow for this electrical power production.

There are more than 500 lakes and 1,500 miles of streams and rivers within the Forest.

Lakes are recharged primarily by ground water or surface water. Ground water lakes are of relatively sterile, cold, clear water supporting trout and salmonoid fishes. They are generally highly susceptible to changes resulting from activities causing surface flows directly into the lake. The lakes fed by surface waters are more fertile, often brown in color, and warm. They support populations of walleyes, bass, northern pike, muskellunge, and many others. These lakes are fed by streams and wetlands. Activities within their watersheds, which often occupy large areas of land, can result in sediments and nutrient loads being introduced into these lakes. These lakes are therefore considerably more susceptible to water quality changes than those primarily fed by ground water.

Forest stream water quality and flow characteristics are reflected by the glacial deposits through which they flow. The highly colored streams of the west and southern portions of the Forest result from the drainage from forested land and from ground water influence. The red-colored streams of the northern portion of the Forest are the result of drainage and natural soil erosion of a flat, heavy textured, and rather impermeable soil mass. Most of these streams have naturally exhibited violent fluctuations of flow, carrying heavy sediment loads in the spring after snowmelt and discharging relatively low sediment-free volumes in the summer months.

Water quality is considered in good condition as determined by over 15 years of monitoring of lake and stream biological and chemical characteristics. The Forest is in compliance with federal and state laws governing potable water and wastewater disposal.

Ground water is largely found in aquifers of sand and gravel in glacial drift, bedrock, sand layers in glacial lakebeds, and outwash deposits. Water yields are low from bedrock and lakebed aquifers and high when from outwash deposits.

Some lakebed aquifers yield water with moderately high levels of chlorides, but still largely satisfactory for domestic use. High levels of iron can occur in many wells. Most ground water is considered moderately hard (60-120 mg/l of calcium carbonate) with some wells containing over 200 mg/l of calcium carbonate.

The relationship of water resources, glacial deposits, and bedrock types on the Forest relates to the concern over the potential acidification of some poorly buffered lakes on the Forest. Most susceptible are the small, headwater lakes on noncalcareous outwash plains and sandy till (for example, Clark Lake and High Lake in the Sylvania Recreation Area). Determining effects of atmospheric deposition (acid rain) on terrestrial and aquatic ecosystem is a research need identified in Chapter III of the Forest Plan.

Air
Quality

The western Upper Peninsula is not known to be in violation of air quality standards, and air quality conditions appear to be excellent. The Class II designation for additional increment in air pollution appears adequate for future economic growth. Temporary loss of air quality occurs on the Forest from prescribed burning and road use and construction activities that generate dust and sometimes smoke. This loss occurs in localized areas and for short periods of time.

The Forest coordinates with the state of Michigan to ensure that air pollution impacts to forest resources are minimized and to comply with air quality regulations.

Recent research results indicate some degree of acid deposition is occurring in the Forest. Further monitoring and research is being undertaken to determine the magnitude of the problem and potential corrective measures.

The United States Environmental Protection Agency, Region V, Eastern District Office, Westlake, Ohio surveyed lakes and streams throughout the United States, including lakes on the Ottawa National Forest, to determine effects, if any, of atmospheric deposition (acid rain).

Research is currently being done in the following areas:

The North Central Forest Experiment Station, Grand Rapids, Minnesota is working on assessing acid rain impacts to all Lake States National Forests.

The North Central Forest Experiment Station, Grand Rapids, Minnesota is researching the effects of acidification of low-based saturated sand soils from the Ottawa National Forest and other Lake States Forests.

Noise

Noise on the Forest comes primarily from five sources:

- Vehicle use (trucks),
- Campground use,
- Timber harvest practices,
- Mills, both lumber and minerals (White Pine Copper Mine),
- Low-flying military aircraft.

Noise is usually local, with the distance at which noises are audible being a function of the noise level of emitting source, topography, density of vegetation, weather conditions, and time of day.

Vehicle use on US-2 and US-45 can be heard in the Sylvania Recreation Area during the night time hours as well as mill noise from Land O'Lakes, Wisconsin. Mill noise from the White Pine Copper Mine at White Pine, Michigan can be heard from the North Country Scenic Trail when the wind is blowing from the north. Military aircraft noise is common over the entire eastern half of the Forest at anytime of the day.

In May of 1985, the Forest requested that the U.S. Air Force consider moving the low-level flight training corridor to the east or west of the Sturgeon Gorge wilderness study area as a part of the U.S. Air Force's public involvement process requesting comments regarding proposed training corridors. In 1986, the Air Force responded positively by moving the low-level flight training corridor to the east away from the Sturgeon Gorge wilderness study area.

Wild/Scenic
Inventory
Rivers

In August 1979, the President directed that federal agencies should protect wild and scenic inventory rivers. These were rivers identified by the Heritage Conservation and Recreation Service (HCRS) of the U.S. Department of the Interior, in 1979, as having potential for inclusion in the National Rivers System.

Within the State of Michigan, there are more than 60 rivers and segments of rivers identified for study in the January 1982 National Park Service, United States Department of the Interior, Nationwide Rivers Inventory list of possible candidates. Fifteen of these rivers are within the boundaries of the Ottawa National Forest.

These rivers are the Black; Brule; Ontonagon; Ontonagon, East Branch; Ontonagon, Middle Branch; Ontonagon, South Branch and Cisco Branch; Ontonagon, West Branch; Paint (including the North Branch); Paint, South Branch; Presque Isle; Presque Isle, East Branch; Presque Isle, South Branch; Presque Isle, West Branch; Sturgeon; and Yellow Dog.

Currently, these rivers and a minimum 1/4-mile wide corridor on each side of them are being protected to ensure present

environmental values are not changed until each is studied by the Forest.

A complete discussion about the wild/scenic inventory rivers can be found in the Final EIS Appendix Volume, Appendix D - Wild and Scenic Inventory Rivers Evaluation.

Research
Natural Areas

Research Natural Areas (RNAs) are a part of a nationwide network of ecological research areas. They are established for scientific and educational purposes. No manipulation of the vegetation will be done in them. The Ottawa National Forest contains one such RNA, the McCormick Research Natural Area. It is located in the Cyrus H. McCormick Experimental Forest, 30 miles northwest of Marquette, Michigan in Marquette County.

This RNA was designated on January 21, 1971, to preserve excellent examples of undisturbed forests of northern hardwoods and their associated Society of American Forester (SAF) types. At 3,572 acres, it is one of the largest RNAs in the eastern United States. There are 12 different forest types (Society of American Foresters forest types) and three nonforest types represented in the area.

Six additional candidate areas on the Forest were identified and field evaluated for potential addition to the nationwide RNA system. Five areas were rejected from further consideration because the desired vegetative types were too small, too oddly shaped, too disturbed, or not representative of a desired vegetative type.

Two additional candidate areas, Sturgeon River Gorge and Sylvania, are currently being protected for evaluation to determine their suitability for RNA designation. The proposed Sturgeon River Gorge 210-acre RNA is located in the Sturgeon River Gorge Roadless Area, approximately 7 miles north of Sidnaw, Michigan in Baraga County. The principal vegetative features are undisturbed eastern hemlock stands and maturing stands of paper birch. Also included are geologic features related to the formation of the Sturgeon Gorge by glacial lake drainage and to the subsequent development of the river. The features include an existing oxbow lake that lies mostly on public land, terraces, escarpment terraces, an abandoned oxbow lake and minor drainages, and a rim-to-river section of the west slope of the gorge.

The 2,740-acre Sylvania candidate RNA is located within the Sylvania Roadless Area. Natural and unique features include undisturbed hemlock, sugar maple, hemlock-yellow birch and associated vegetative ecosystems, lakes, shorelines, eagle nest, blue heron rookery, and glacial landforms not represented in other RNAs.

A complete discussion about the existing McCormick RNA, additional candidate areas evaluated, and the Sturgeon River Gorge and Sylvania RNAs can be found in the Final EIS Appendix Volume, Appendix E - Research Natural Area Evaluation.

Roadless
Areas

Roadless areas were inventoried during the second Roadless Area Review and Evaluation (RARE II). Four areas, Sturgeon River Wilderness Study Area and Little Silver Addition (now combined and known as Sturgeon Gorge Roadless Area), Sylvania, and Cascade Falls (now known as Norwich Plains Roadless Area) were identified to be studied for their wilderness potential.

In the final RARE II EIS, the Sturgeon River Wilderness Study Area, Little Silver Addition, and Sylvania were recommended for wilderness designation. Cascade Falls was recommended for non-wilderness designation.

In October 1982, the United States Court of Appeals for the Ninth Circuit upheld a lower court decision that the RARE II Final EIS was inadequate to support nonwilderness designations for roadless areas in California. As a result, in 1983, the Secretary of Agriculture announced that unless specifically covered under legislation by Congress, all roadless areas considered in RARE II would be further evaluated in the Forest planning process.

Consequently, the Forest solicited additional public comment in late summer 1983. As a result of public interest, one area, the Cyrus H. McCormick Experimental Forest, was added to the Forest's roadless areas to be further evaluated for wilderness designation or study.

Roadless areas on the Ottawa National Forest further evaluated are listed in Table 3.1.

Table 3.1
Roadless Areas Further Evaluated

<u>Area Name</u>	<u>Acres in Federal Ownership</u>	<u>Total Acres</u>
Sturgeon Gorge	14,849	16,766
Sylvania	18,327	18,327
Norwich Plains	7,684	9,576
Cyrus H. McCormick Experimental Forest	16,850	16,887
Total	57,710	61,556

Currently, there are no designated wilderness areas within the Ottawa National Forest. However, there are four designated wilderness areas in the Upper Peninsula of Michigan.

Table 3.2 lists existing wilderness areas and the managing agency in the Upper Peninsula of Michigan.

Table 3.2
Existing Wilderness Areas

Wilderness Area Name	Managing Agency	Size (acres)
Porcupine Mountain Wilderness State Park (State of Michigan designated area)	Michigan Department of Natural Resources -Parks Division	40,903
Isle Royale National Park	National Park Service	131,880
Seney Wilderness Area	U.S. Fish and Wildlife Service	25,000
Huron Islands	U.S. Fish and Wildlife Service	100

The roadless areas listed in Table 3.1 on the Ottawa National Forest were further evaluated as a part of the Forest Plan planning process in 1984-1985.

A complete discussion of the roadless area further evaluation process and results can be found in the Final EIS Appendix Volume, Appendix C-Roadless Area Evaluation.

Transportation and Roads

Many miles of road are found throughout the Forest, some areas with many more roads than others. These roads, in the form of arterial, collector, and local roads constitute a network of roads. This network provides access needed for management and utilization of Forest resources for a variety of uses.

Arterial roads are primary travel routes that are or connect with state, federal, and Forest highways. Collector roads provide connections between arterial roads and areas of the Forest including the local roads within each area. They are typically graveled or paved and normally provide year-round service but may be limited to intermittent use. Principal access routes to the Forest are U.S. Highways 2 and 45 and Michigan Highway 28. There is a good distribution of arterial and collector roads on the Forest, but some need reconstruction.

Arterial and collector roads are the travel routes for people who live and work within the Forest borders. They provide access to recreation opportunities on public and private lands. These roads provide access to lake and stream fishing sites and hunting areas. And, they are a means to, and an important component of, unique recreational settings sought out by local residents and valued by nonlocal visitors and the tourist industry that serves them. These roads also serve as access to valuable timber products and to move these products to markets. They are used by harvesting and transport operations on both National Forest

System lands and private lands that are intermingled with federal ownership.

Essentially, the collector and arterial road system is in place. The remaining roads on the Forest are local roads.

The term, local road defines the type of road used to connect collector roads to specific locations with defined projects or a series of projects or developments.

Resource management objectives for an area consider costs of road construction and characteristics of the land to help define the standard and placement of local roads in a location within each area. These, in turn, define the time period or seasons of operation during which the road is passable and the type of uses and/or vehicles it is designed to serve. Not all local roads are passable by passenger car, and most are dead-end roads.

Developed recreation areas are typically served by collector roads providing the possibility of year-round access. In areas where multiple-use objectives include primarily timber harvest, a low standard of road may be called for, serviceable only to logging equipment within a limited season of operation such as winter-only roads. Temporary roads, extensions off of local roads into the project location itself, are frequently used in conjunction with local roads during timber sales. These roads are short-term in nature and are designed to have minimal effect on the land.

After the completion of a specific project, the local road may remain open or be closed to passenger vehicles depending on the management objectives of the area. These roads are valuable for a wide range of dispersed recreation activities from use as hunter trails to access for those who regularly visit the Forest to collect firewood or gather other kinds of forest products.

This network of three road types (arterial, collector, and local) helps define an area's visual and recreational setting. The type and density helps define the possible accessibility for concentration and frequency of use. The road network and its management also influence the utility of an area as habitat for certain wildlife species. Roads can produce a visual appearance ranging from a human-made broken landscape to a more natural appearing, primarily undisturbed setting. The network also influences the ease and efficiency of access for timber harvest as well as a wide range of management activities.

The network also helps define the spectrum of recreation opportunities an area can support. Areas with relatively few roads, low use, and little evidence of management activities can offer near semiprimitive character. This setting and the backcountry experiences it offers are sought by many recreationists.

So too is the need for areas with denser, higher standards of roads. These areas offer easy accessibility to a greater proportion of the general public for a wide range of recreation uses. These areas provide a recreation setting of a more roaded character.

The Forest uses a classification system to help define current areas on the Forest in terms of their existing character and recreation setting objectives. This is called the Recreation Opportunity Spectrum (ROS), which defines recreation settings in a range from urban to primitive. The Ottawa National Forest has two of these classes, roaded natural and semiprimitive nonmotorized. Refer to Forest Plan Appendix F - Recreation Opportunity Spectrum for further details on this system.

Some areas of the Forest are traversed by a high density of road while others have very little. The existing density ranges from about 1 to 2-1/2 miles per square mile. The difference is due in part to the influence of landform and construction costs on previous management decisions. In addition, there are some special areas on the Forest with very few or no roads whatsoever.

Current direction emphasizes roaded natural recreation opportunities along with a moderate amount of land that is currently being managed for semiprimitive nonmotorized recreation opportunities.

Table 3.3 shows the current distribution of National Forest acres by ROS class.

Table 3.3
Current Distribution of ROS Classes

ROS Class	Acres (thousand acres)
Roaded natural	820
Semiprimitive nonmotorized	<u>106</u>
Total	926

Road management techniques are used to control the season of use, the type of use permitted, and whether the road is to remain open or closed.

Generally, the higher the standard of road, the longer the season of operation over that road and the heavier amount and type of traffic the road will bear. Road closure can be accomplished by putting a barrier such as a gate at the head of the road and signing or by using natural materials such as earth, stumps, and rock. If closed to vehicle traffic, the road may be reopened at some future time for intermittent uses. Also, closed roads may be used for foot travel and for some kinds of off-road vehicles (ORVs) such as snowmobiles and all terrain vehicles (ATVs) in some areas.

The current rate of new road construction and reconstruction is shown in Table 3.4.

Table 3.4
Current Rate of New Road Construction and Reconstruction

Local Road Construction	Year				Annual Average
	1981	1982	1983	1984	
	(miles per year)				
New construction	17.7	28.1	49.0	70.0	41.2
Reconstruction	27.0	0	4.5	0	7.9

The effects of new local road construction are discussed in Chapter IV of this document. Since the arterial and collector road system is essentially in place, the response to the transportation problem was measured in terms of the amount of new local road construction planned, the mix of standards to which those roads would be constructed, and the mix of ROS class that would be provided.

Over the years, a system of local roads has resulted from the piecemeal approach to management of individual vegetative stands and opportunities. This process began even prior to the establishment of the Ottawa National Forest in the 1930s. Overall, there are many more roads than needed to serve long-term management objectives. Because of this piecemeal approach and the standard of many of these roads, the roads that do exist may not be in the proper location or standard to meet management objectives. Many of these roads are not open nor have they been used for passenger vehicle traffic in many years. This is due to natural conditions such as wet soils, ditches, down trees, and regrowth of vegetation that has been allowed to occur. These are best referred to as existing old roads or travelways. However, these travelways can and are being used for foot trails and by some types of ORVs.

If properly planned and managed, much of the long-term road network can be built from the existing system of roads, resulting in a decrease of existing road mileage. As a result, management objectives for each area can be achieved more efficiently. Building this efficient network uses, to the extent desirable, existing roads.

Some existing roads are periodically reopened and maintained or reconstructed to a higher standard to serve a specific need or project. Other existing roads that are not needed are obliterated or allowed to convert naturally to a vegetated condition. In some situations, additional new local roads need to be constructed. Some of this new construction has been on old roads that are found on the ground but do not exist on Forest road inventories. However, care has been taken in recent years through the transportation planning process not to build roads over existing known hunter and fishermen access trails.

When achieved, the overall desired network of, and standards of roads for an area will effectively contribute toward the management objectives of the entire area. They will become an integral part of achieving desired wildlife habitat, visual quality objectives, recreational settings objectives and providing access for recreational uses and transportation of timber products to market, and other resource management.

Biological Environment

Vegetation

The Ottawa National Forest consists of approximately 926,000 acres of National Forest System land. About 870,000 acres of that are forested and approximately 828,000 acres have been identified as being tentatively suitable for timber production.

At the time of initial settlement, the dominant vegetation was sugar maple, eastern hemlock, and yellow birch that occurred on moist sites (ground and terminal moraines). On drier sites (outwash plains and glacial deltas), red pine, white pine, red maple, northern red oak, and some eastern hemlock occurred. On sites of the glacial lake plain, which can be very dry to very wet during the year, eastern hemlock, northern white cedar, and balsam fir dominate.

White pine was harvested between 1880 and 1910 throughout the Forest. As the supply of white pine became low, hemlock was substituted and harvested from 1900 to 1930. Logging of hardwoods began around 1920 and continued to the 1960s. Most of the aspen originated between 1910 and 1940 as "early successional" vegetation following logging and post-logging fires.

The present Forest is predominantly a deciduous forest. Northern hardwoods and aspen are the major cover types (see Table 3.5). Mixed stands of deciduous-coniferous species are also common. The majority of the aspen and balsam fir types are mature or overmature. The northern hardwood type consists primarily of immature pole timber and small saw timber. There is an imbalance of age classes present (see Table 3.6). The majority of stands are 40 to 79 years old.

Table 3.5
Percentage of Total Forest Composition by Working Groups

Working group	Thousand acres	Percentage
Northern hardwoods	423	46
Aspen-paper birch	186	20
Balsam fir and jack pine	84	9
Spruce-red and white pine	58	6
Lowland conifer	57	7
Hemlock	28	3
Nonforest/nonproductive	90	9
Total	926	100

Table 3.6
Age Class Distribution for Tentatively Suitable Acreage
of the Forest

Age Classes (years)	Thousand acres	Percentage
0-9	33	4
10-19	33	4
20-39	37	4
40-59	285	35
60-79	219	26
80-99	49	6
100-119	18	2
120+	46	6
Uneven-aged	69	8
Two-aged	39	5
Total	828	100

Based on qualitative knowledge of the early forest (mid 1800s), the present forest is more diverse in terms of cover types and age class distribution. However, as the forest has matured, the aspen type has and is being naturally converted to northern hardwood and balsam fir stands. The hemlock type has been reduced as an important component of the northern hardwood type, partially as a result of the control of wildfire. The present mix of vegetative types and age classes provides diverse habitats for a variety of wildlife species.

Diversity could be improved through achieving a more balanced age class distribution and striving for an improved location, mix, and arrangement of types and age classes.

The inherent site capabilities of the Forest and the variety of site conditions provide an opportunity to establish and maintain a variety of vegetative conditions. The range of potential vegetative conditions is influenced by the dominant landforms and materials that resulted from glaciation, the landforms influenced

by bedrock control and outcropping, and the landforms created by post-glacial erosional processes.

For example, potential vegetation through natural succession on the Drumloid Ground Moraine-Landtype Association 7 (LTA 7) (refer to Forest Plan Appendix D - Ecological Classification System for additional information) is dominantly northern hardwoods, such as sugar maple, basswood, white ash, and some red maple. Often, inclusions of aspen and balsam fir exist where natural or human-made disturbances have occurred. Within this landform are small, wet areas, exhibiting lowland conifers such as black spruce, white cedar, balsam fir, and tamarack.

For comparison, Outwash Plains-Landtype Association 14 (LTA 14) has potential vegetation dominated by red maple, northern red oak, balsam fir, and white pine through natural succession. Some inclusions of aspen, jack pine, and white birch exist where natural or human-made disturbances have occurred. However, much of this landform has had plantations of jack pine and/or red pine established on it.

These two landforms illustrate the range of potential vegetation possible.

Basic potential vegetation differences among the landforms were considered in determining what management prescriptions could be applied throughout the Forest.

Insects and Diseases

Insects and diseases of the Forest are many and are primarily endemic. The spruce budworm or forest tent caterpillar occasionally reach epidemic proportions on parts of the Forest with large acreages of overmature stands, a high risk condition. This results in mortality of individual trees and, in areas of repeated heavy defoliation, stand mortality.

Various types of heart rots, root rots, cankers, and leaf rust are the most common disease problems on the Forest.

The most dramatic disease problem in recent years was the Dutch elm disease. Dutch elm disease has resulted in the mortality of a substantial amount of elm over the past 10 years. Any remaining elm is considered high risk.

Management of insect and disease problems has generally been limited to salvage and sanitation activities, accomplished to the extent possible through commercial timber sales.

Future outbreaks of insects and diseases can be minimized by working toward conditions that feature a greater variety of cover types and age classes, avoid large acreages of overmature trees, and maintain stands in a more vigorous growing condition. Avoiding regeneration of certain species on sites or locations that create high risk conditions for certain insect or disease problems will also help minimize insect and disease problems in regenerated stands.

Management
Practices

Management practices and the location, design, and timing of them can be utilized to work toward more desirable vegetative conditions within the capability of the land, to provide desired wildlife habitat, timber products, and visual variety and to enhance recreational values.

Some management practices, such as harvest-thinning, produce timber products and provide raw materials for the manufacture of lumber, veneer, plywood, particle board, paper, and other wood products.

Practices such as harvest-clearcutting and harvest-shelterwood result in temporary openings being created within the Forest. These temporary openings provide desired habitat conditions for certain species of wildlife while displacing others. Clearcutting is also a source of public concern, due to the potentially adverse visual impacts.

The acreage of even-aged regeneration cutting (harvest-clearcutting and harvest-shelterwood) provides a good indicator of the amount of temporary openings created. These temporary openings provide valuable habitat for some species of wildlife for 5 to 15 years following regeneration harvest. About 33,000 acres of 0- to 9- year age class currently exist on the Forest and provide an estimate of the current acreage of temporary opening. However, over 5,000 acres per year are being created presently through harvest-clearcutting and harvest-shelterwood cutting.

Management practices that manipulate the vegetation include:

- Harvest-clearcutting,
- Harvest-thinning,
- Harvest-selection,
- Harvest-shelterwood,
- Reforestation-artificial,
- Reforestation-natural,
- Release,
- Precommercial thinning.

Table 3.7 shows the annual acreage of each of these vegetation management practices accomplished during the period 1980 to 1984, and the average annual acreage for the 5-year period.

Table 3.7
Annual Acreage of Management Practice Accomplished During the Period 1980-1984

Management Practice	Year					Annual Average
	1980	1981	1982	1983	1984	
	(acres per year)					
Harvest-clearcut 1/	2,920	6,407	4,701	3,918	6,099	4,817
Harvest-thinning 1/	3,505	5,050	5,270	5,980	7,127	5,390
Harvest-selection 1/	285	1,353	4,037	693	753	1,424
Harvest-shelterwood 1/ (seed)	94	129	602	509	417	350
Harvest-shelterwood (removal)	111	225	-	296	130	151
Reforestation-artificial	780	1,020	1,140	760	1,112	962
Reforestation-natural (with site preparation)	2,810	2,780	2,090	3,440	2,864	2,797
Release	1,250	1,130	1,450	1,460	1,248	1,308
Precommercial thinning	5,940	2,360	310	40	100	1,750

1/ Based on acres of timber sold.

Harvest-clearcutting is practiced on approximately 4,800 acres per year, with emphasis in the harvest and regeneration of aspen, balsam fir, and jack pine. Planned potential yield in the most recent timber management plan for the Ottawa National Forest (1977) includes 7,851 acres per year of harvest-clearcutting, with over 5,000 acres per year in the aspen type.

Harvest-thinning is practiced on approximately 5,390 acres per year, with emphasis in northern hardwoods and moderate amounts in red and white pine types. The planned potential yield in the most recent timber management plan included over 13,000 acres of harvest-thinning.

Harvest-selection is practiced on about 1,400 acres of hardwoods per year. The planned potential yield in the most recent timber management plan included approximately 2,500 acres per year of harvest-selection in hardwoods.

Very minor amounts of harvest-shelterwood and harvest-thinning have been practiced in the past.

Reforestation-artificial is being practiced on about 960 acres per year. About half this acreage was conversion of low quality hardwood and aspen stands to conifer species such as red pine, jack pine, white spruce, white pine, and black spruce. The majority of the remaining acreage was conversion of jack pine and balsam fir to longer lived conifers such as red pine and white spruce, or artificial regeneration of the jack pine type.

An average of 1,630 acres per year of tree planting was planned in the most recent timber management plan. Of that, 550 acres per year was conversion of aspen or hardwoods to conifers and 890 acres per year of balsam fir and jack pine conversion to red pine or white spruce.

Release is being practiced on approximately 1,300 acres per year. The majority of that release (1,100 acres) is the release of conifer plantations, primarily red pine.

Chemical use, including aerial application of herbicides, has been used in the past to accomplish the release practice. Release is accomplished using nonchemical methods, ground applications of herbicides, and aerial application of herbicides. Over the past 5 years (1980 to 1984), 79 percent of the release was accomplished using nonchemical methods, 10 percent by ground application of herbicides, and 11 percent by aerial application of herbicides.

Precommercial thinning has been practiced on about 1,750 acres per year. This practice has been emphasized in hardwood poletimber stands to concentrate growth on individual trees with the greatest potential for high value sawtimber and veneer.

Timber
Production

There are approximately 816,800 acres of National Forest System land tentatively suitable for timber production. (Refer to Final EIS Appendix Volume, Appendix B, Part 6, Timber Resource Land Suitability.)

Timber harvest has increased about 22 percent over a 10-year period, from 41 million board feet (MMBF) per year in the period 1970 to 1974 to about 50 MMBF per year in the period 1980 to 1984.

Based on the most recent Forest timber management plan (1976), the potential yield is approximately 112 MMBF per year and the programmed allowable for the plan period (1976-1983) was about 76 MMBF per year.

Current volumes of timber sold by species/product group are shown below in Table 3.8.

Table 3.8
Volume of Timber Sold by Species/Product

Species/Product	1980	1981	1982	1983	1984	Average Annual	
						(thousand board feet)	(thousand board feet)
Softwood sawtimber	6,233	3,708	4,032	2,842	8,207	5,004	926
Softwood pulpwood	14,713	10,707	13,452	9,776	21,495	14,029	2,209
Hardwood sawtimber	8,366	8,572	11,951	6,643	4,523	8,011	1,482
Hardwood pulpwood	8,296	10,489	12,088	9,983	14,476	11,066	1,743
Aspen sawtimber	6,834	5,200	3,678	3,427	5,137	4,855	898
Aspen pulpwood	12,761	11,147	10,511	9,845	19,035	12,657	1,993
Total	57,203	49,823	55,712	42,506	72,873	55,623	9,251

The substantial increase in volume sold in recent years reflects the improving markets for hardwood pulpwood due to the expansion of existing pulp mills and the construction of a new pulp mill that utilizes hardwood pulpwood. This trend is expected to continue.

Timber consumption was estimated for hardwood, softwood, and aspen products (See Table 3.9). A demand analysis was prepared that included discussions with local and regional mills to better understand recent trends in Forest timber sales and to aid in developing consumption projections for the Forest.

Major increases were foreseen in all pulpwood markets with less significant changes in sawlog consumption. A discussion of demand estimates is presented in the Final EIS Appendix Volume, Appendix B - Description of the Analysis Process, Part 4.

Table 3.9
Expected Timber Consumption (Demand)^{1/}

Species/Product	Decade				
	1	2	3	4	5
	(thousand cubic feet per year)				
Softwood sawtimber	680	680	780	890	980
Softwood pulpwood	2,870	3,920	4,600	5,250	5,780
Hardwood sawtimber	2,120	2,530	2,520	2,960	3,340
Hardwood pulpwood	3,290	5,590	6,770	7,950	8,930
Aspen sawtimber	960	1,500	1,800	2,170	2,560
Aspen pulpwood	3,180	4,800	5,800	6,770	7,600
Total timber	13,100	19,000	22,300	26,000	29,200

^{1/} These figures represent initial estimates of demand which timber consumers have for timber products from the Ottawa. They have not been adjusted to reflect uncertainty nor do they reflect the possibility that other timber products may be acceptable substitutes in many cases. Refer to Final EIS Appendix Volume, Appendix E - Parts 6 and 7 for additional discussion.

Timber Revenues Value of timber sold and harvested has averaged over \$1 million per year over the past 5 years as shown in Table 3.10 and Table 3.11.

Table 3.10
Forestwide Value of Timber Sold by Year (1980-1984) and Average Annual Value for the 5-Year Period

1980	1981	1982	1983	1984	Average Annual
(thousand dollars)					
1,297	1,011	1,591	925	1,403	1,245

Table 3.11
 Forestwide Value of Timber Harvested by Year (1980-1984) and
 Average Annual Value for the 5-Year Period

1980	1981	1982	1983	1984	Average Annual
(thousand dollars)					
1,113	995	1,142	1,287	1,659	1,239

When deflated to 1978 dollar terms, the average annual value of timber sold would equal approximately \$915,117 per year.

Management Cost

The direct costs of timber production are very difficult to isolate and measure since these management activities produce multiple benefits over a long period of time, in addition to the revenue produced in the short-term from the sale of timber.

Costs associated with vegetative management have averaged about \$1,222,000 per year during the period 1980 to 1984. These costs include the preparation and administration of timber sales, planning and inventory, reforestation, timber stand improvement, and wildlife management. These costs however, produce many benefits in addition to current timber revenues.

Wildlife habitat and vegetative diversity (cover types and age classes) are improved primarily through vegetation management accomplished through commercial timber sales. Recreation and visual resource values are also increased through management of the vegetation in a manner that works toward and maintains desired vegetative conditions, while at the same time producing timber products.

Vegetation management costs, in conjunction with costs for road construction and maintenance, recreation, lands, and landline location, produce a wide range of benefits available from the Forest over a long period of time. Costs such as road construction, landline location, and cultural resource surveys are one-time capital investments that contribute to producing benefits for many years into the future.

Forest management also involves a variety of long-term investments in vegetation management such as reforestation, timber stand improvement, and commercial thinnings.

These vegetation management practices ensure a long-term sustained yield of timber in the future, improve the growth and quality of residual trees, allow them to reach a mature size in a shorter period of time, and increase the value and economic efficiency of an area for timber production.

However, all of these costs have historically been included in the timber decision variable for estimating annual program budgets. Some concerned citizens have assumed these costs are exclusively tied to current timber production generated from

annual timber sale programs. This assumption, along with the recognition of only current year timber receipts, has resulted in some concern over the cost of timber sales in relation to the revenues of those sales.

However, these costs should not all be viewed as charged completely against a current timber sale or an annual program of sales. This is because they produce many future benefits in terms of timber revenues and a variety of nonmarket benefits, as well as the added value of the inventory of forest resources in the future.

For example, a road constructed in conjunction with a timber sale provides for the benefits associated with that timber sale as well as benefits associated with future timber sales that utilize the same road system at a later date. This same road system may also help provide annual recreation benefits by providing access for motorized recreation activities (if road remains open) or nonmotorized recreation activities (if road is closed intermittently).

The vegetation management accomplished through those timber sales also provides for maintaining a variety of habitat conditions for game and nongame species of wildlife, enhancing visual resources for providing visual variety, and enhancing dispersed recreation benefits including hunting.

Capital investment in local road construction should decline dramatically in later decades (fourth decade and beyond). Once an area of the Forest has been made accessible, reentry at a later time will utilize the same transportation system with significantly reduced cost.

Because of the long-term nature of forest management investments, a longer planning horizon must be used for evaluating the economic efficiency of different investment alternatives.

Using present net value over a long period of time indicates that all of the alternatives are economically efficient. However, some may provide a greater net economic benefit or respond in a more positive manner to the Forest's management problems.

Wildlife

There are more than 300 wildlife species believed to be resident on the Forest. A comprehensive list of these species is on file in the Forest Supervisor's office.

The number of wildlife species found on the Forest and their population level are a direct result of the amount, quality, and variety of animal habitats available. Many animal habitats are associated with vegetative communities that can be described by forest composition and age classes.

A number of predatory birds from the bald eagle to the tiny saw-whet owl inhabit the Forest. Heron rookeries may be found in wooded swamps. Streams and lakeshores provide habitats for shore

birds such as the spotted sandpiper. A variety of woodpeckers, including the pileated woodpecker, inhabit older stands in the Forest. Many species inhabit portions of the Forest where timber has been harvested in the past 10 to 15 years and new growth now exists. Species such as the chestnut-sided warbler, ruffed grouse, and golden-winged warbler inhabit areas covered with young deciduous trees. The Lincoln's sparrow prefers young conifers. The brilliant scarlet tanager prefers maturing hardwood stands, while the black-throated green warbler nests in maturing conifer stands.

Various mammals also are found in the wide variety of habitats and habitat conditions within the Forest. White-tailed deer inhabit all areas but are more abundant where a portion of the vegetation is in young stands of aspen or oak or where there are sod or brushy openings. In winter, deer beds are common snow prints under the protective cover of hemlock. Beaver build dams and lodges in the streams. Gray squirrel nest in maturing hardwoods, especially where there are some oaks in the stand. The northern flying squirrel is found in the mature and older stands where tree cavities provide dens and where dense canopies permit a growth of arboreal lichens in the upper portion of the trees.

The reptiles and amphibians primarily are associated with aquatic and wetland habitats, but a few seek drier conditions. The garter snake and ring-neck snake seek the sun on stony south-facing slopes. The smooth green snake is seen in cut-over aspen stands and sod meadows. The five-lined skink and red-bellied snake are inhabitants of moist woodlands.

Herbaceous openings are uncommon but are purposely maintained throughout the Forest. They provide forage for deer, rabbits, and other grazers. They also provide habitat conditions necessary for woodcock, bluebirds, field sparrows, and other species that would be far less abundant or would not exist without this habitat.

The prevailing condition is that current habitat of the Forest is mostly 40- to 79-year old northern hardwoods and aspen, a result of the 1900 to 1940 era of logging. In contrast, over the past 20 years, less than 8 percent of the Forest has been cut and returned to young-growth habitat and 20 percent has been retained in large-tree habitat of stands older than 100 years. This has favored habitat of the barred owl, rather than the white-tailed deer and ruffed grouse.

Vegetative diversity is the key to managing the habitats for the great variety of species found on the Forest. Vegetative management provides diverse vegetative types, including herbaceous openings, aspen, oak, hardwood, pine, and lowland conifers. Vegetative management also provides habitat conditions ranging from regenerating stands of young trees to older stands that contain trees with big tops, cavity trees, snags, and down logs on the ground. It also provides for the spatial and temporal arrangements of these habitat elements. The vegetative

environmental conditions described earlier provide additional discussion about vegetation and wildlife habitat.

The present approach to management of these complex habitat conditions on this Forest is an integrated interdisciplinary approach to vegetation management that includes stand examination, timber sale design and layout, contract preparation and administration, and post-sale habitat and timber stand improvement. The aim of this coordinated approach is to obtain the desired objective for management of several resources efficiently and economically, through commercial timber sales to the extent possible.

Also, there is national direction and Forest tradition to work together with the Wildlife Division of the Michigan Department of Natural Resources in management of the Forest wildlife habitat. State and Forest biologists and land managers of the two agencies meet annually to discuss common concerns and coordinate projects for the coming year. District Rangers and Forest biologists consult routinely with State biologists, as needed.

Wildlife species commonly hunted on the Forest are white-tailed deer, ruffed grouse, black bear, and snowshoe hare. Of these, deer and grouse are of primary local interest.

The deer population is somewhat low compared to other areas of the state. An estimated 22,000 deer are within the Forest boundary, averaging about 10 deer per square mile (1980 data), reflecting the growth of forest vegetation the past 30 years or so. However, the Forest offers a quality hunting experience with more big bucks in a more rugged remote setting and where the probability of encountering other hunters is low in many areas of the Forest.

The grouse population, also somewhat low, reflects the prevailing hardwood pole timber forest condition. However, the experienced grouse hunter often takes the daily limit.

The bear population is moderate, estimated to be about 2,400 bear within the Forest boundary, averaging about 1 bear per square mile (1980 data). Bear are occasionally seen in the woods and are sometimes a nuisance in campgrounds, residential areas, and garbage dumps. Bear hunting is considered to be good, attracting many hunters from out-of-state. However, the use of baiting, radio-collared dogs, and two-way radios in hunting, coupled with the high prices being paid for bear anatomical parts, could have a deleterious effect on the bear population.

Demand for hunting, birdwatching, and other recreational uses of wildlife is low. The Forest could accommodate greater use of the wildlife resource by the public than is occurring or is anticipated. Demand projections show less than a 1-percent increase in wildlife-based recreation each decade (see Final EIS Appendix Volume, Appendix B, Part 4, Economic Efficiency Parameters).

Management
Indicator
Species

Management indicator species are animals or plants selected in the Forest plan as representatives of Forest management's effects on fish and wildlife habitat. They were selected for one or more of three reasons. They are (1) emphasis species, species to be managed as key resources on the basis of issues, concerns, and opportunities, (for example, endangered, threatened, sensitive, harvest, or special interest species), (2) indicators of special habitat conditions or species that require special habitat such as riparian or old growth vegetation, and/or (3) indicators of cumulative forest ecosystem change, generally species with large home range and requiring a diversity of habitats. Most management indicator species are selected to serve more than one purpose.

The following section discusses wildlife management indicator species and the habitat each represents. Fish management indicator species are addressed below.

Emphasis species are selected on the basis of issues, concerns, and opportunities (for example, endangered, threatened, sensitive, game, or special interest species). They serve mainly to indicate themselves, but their habitats will in fact support many species with similar needs. Species selected as emphasis species for the Ottawa National Forest are white-tailed deer, ruffed grouse, bald eagle, and brook trout.

Special habitat indicators are representative of habitat elements, cover types, or seral stages that represent habitat conditions that have wide-area significance. Species selected because of special habitat needs are white-tailed deer, ruffed grouse, osprey, bald eagle, goshawk, blackburnian warbler, common loon, American bittern, barred owl, northern pike, and brook trout.

Cumulative ecosystem change indicators are indicative of many characteristics of the forest ecosystem and reflect large scale interactive effects of practices that are insignificant when assessed individually. These are animals that require a mix of cover types, seral stages, and special habitat elements, and occupy large home ranges. Species selected as cumulative effects indicators are white-tailed deer, black bear, goshawk, brook trout, smallmouth bass, and barred owl.

Table 3.12 lists the wildlife management indicator species and the key habitat for each species.

Table 3.12

Wildlife Management Indicator Species of the Ottawa National Forest

	Species	Key Habitat
Mammals	White-tailed deer	Aspen forest cover type. Thermal cover (hemlock, swamp conifer, and balsam fir forest cover types).
	Black bear	Remote habitats with less than 1.5 mi./sq.mi. of roads open to public travel.
Birds	Common loon	Existing loon breeding habitat (51 known lakes). Other bog lakes relatively free of human disturbance with: - islets or isolated bays, with grass or moss and poor predator access, - adequate forage base, especially yellow perch.
	American bittern	Wetland habitat with: - large areas of sedge meadows having emergent vegetation (sedges, cattails, rushes) for nesting, - shallow marsh having open water areas for feeding, and - other wetlands.
	Osprey	Existing and potential breeding areas: - free from human disturbance, - within or adjacent to wetland, - within 1 mile of major stream, - with supercanopy white pine.
	Bald eagle	Existing and potential breeding areas: - free from human disturbance, - within 1/2-mile of large lake, - with supercanopy white pine or yellow birch.
	Northern goshawk	Forest cover of 40-year age class and older, all forest types.
	Barred owl	Large areas of mature forests with: - cavity trees of 20"+ DBH for nesting, especially in riparian areas, - heavily wooded swamps near open country for hunting, and - mixed or coniferous woods for roosting and hiding.
	Ruffed grouse	Regeneration of aspen/paper birch forest , cover types, well distributed over managed aspen areas.
	Black-burnian warbler	Hemlock and swamp conifer forest cover types, 40-year age class and older.

Selection
Rationale

White-tailed Deer - This species was selected as a management indicator species because:

- Local public interest in deer is high.
- It is the trophy game animal of the Forest.
- There is management concern for the species by personnel of Michigan Department of Natural Resources and the Forest Service.
- The species is a biological indicator of wildlife that require sunlight at or near the ground (as opposed to tree-top wildlife).
- Deer populations are, and historically have been, influenced significantly by vegetative management practices. Deer are primary consumers of vegetation (forage and browse).
- Deer are essential to the maintenance of viable populations of many of the flesh-eating birds and other animals of the Forest. Within the food chain, deer represent the primary consumer of energy and nutrients upon which other species are dependent.
- Population-habitat relationship models have been developed in Northern Wisconsin that provide opportunity for estimating potential deer population responses through the several Forest planning alternatives.
- There is no other animal of the Forest with as much public interest and management concern.

Black Bear - This species was selected as a management indicator species because:

- There is local public interest in black bear.
- The species has recreational value as big game.
- Black bear represents wildlife species requiring remote, young-growth habitat. (The gray wolf also was considered in this category, but was not selected because of its low population density.)

Common loon - This species was selected as a management indicator species because:

- The species is a biological indicator of northern lakes.
- It is of local public interest.
- There is a historic public attitude that identifies the species with the spirit of the north woods.
- It may be sensitive to fisheries or recreation management activities.
- There is management concern for the species by personnel of Michigan Department of Natural Resources and the Forest Service.

American bittern - This species was selected as a management indicator species because:

- The species is a biological indicator of wetlands.

Ruffed Grouse - This species was selected as a management indicator species because:

- There is local public interest in grouse as a game bird.
- It represents wildlife species associated with aspen, the second most common forest cover type on the Forest.

Bald Eagle - This species was selected as a management indicator species because:

- The species is federally listed as threatened in Michigan.
- It is of public interest as the National symbol.
- There is local sentiment and interest in the eagle.
- It represents wildlife species that are affected by lake-front development and water-oriented recreation.
- It is a biological indicator of water quality.

Osprey - This species was selected as a management indicator species because:

- The species is Michigan listed as threatened.
- It is of local public interest.

Northern Goshawk - This species was selected as a management indicator species because:

- The species is a biological indicator of wildlife species that reside in mature northern hardwood-hemlock.
- It is sensitive to forest management practices.
- There is management concern for the species by personnel of Michigan Department of Natural Resources and the Forest Service.
- It is a nongame bird.

Barred owl - This species was selected as a management indicator species because:

- The species is a biological indicator of deep forests.

Blackburnian Warbler - This species was selected as a management indicator species because:

- The species is a biological indicator of mature spruce-fir and lowland conifer, the third and fourth most common forest cover types on the Forest.
- It is a nongame songbird.

The selection process for management indicator species is further described in the Forest planning records.

Fish

About 61 fish species occur in 535 lakes and 1,535 miles of stream on the Forest. The most important species sought by fishermen are walleye, northern pike, smallmouth bass, largemouth bass, muskellunge, bluegill, yellow perch, pumpkinseed sunfish, brook trout, rainbow trout, coho salmon, chinook salmon, and lake trout.

Management of fish and fish habitat is jointly planned and carried out in cooperation with the Fisheries Division, Michigan Department of Natural Resources, with emphasis given to the

management of lakes with recreation developments and to top-quality trout streams.

Fishing use on lakes with recreation developments is heavy, especially on lakes with campgrounds. However, the quality of fishing varies, depending on the quality of habitat of individual lakes.

Stream fishing is heaviest on those stream reaches easily accessible, which is about 10 percent of the Forest's stream mileage.

In general, fishing is quite good on the Forest in regard to both the ROS setting in which the fish are caught and the kinds, numbers, and sizes of fish caught.

Currently, the Forest directs its management activities at improving existing fish habitats. Recently, these kinds of projects include placement of walleye spawning reefs in lakes with recreation developments and fish covers in top-quality trout streams.

The Michigan Department of Natural Resources will continue to use chemical, mechanical, or manual means to manipulate fish populations in cooperation with Forest priorities.

Demand for fishing is projected to increase about 18 percent over the next 10 years. This demand can be supplied. However, the quality of fishing will depend on maintaining or improving the existing fishery habitat on lakes with recreation developments and top-quality trout streams.

Refer to the Final EIS Appendix Volume, Appendix B, Description of the Analysis Process, Parts 3 and 4, for more information.

Management
Indicator
Species

Three fish species were selected as management indicator species. See the discussion above under "Wildlife" for the purpose of management indicator species.

Fish species selected because of special habitat needs is northern pike.

The species selected as cumulative effects indicators are brook trout and smallmouth bass.

Table 3.13 lists the fish management indicator species and the key habitat for each species.

Table 3.13
Fish Management Indicator Species of the Ottawa National Forest

	Species	Key Habitat
Fish	Brook trout	Clear, cold streams with: - stable and vegetated stream banks, - silt free spawning gravel stream bottom.
	Small-mouth bass	Deep clear lakes of moderate productivity with: - extensive gravel or rubble shoals - sunken logs in near-shore areas, and - pH of 5.7+ for reproduction. Cool clear streams and rivers greater than about 35 feet width with: - abundant shade and cover, - deep pools, - moderate current, and - gravel or rubble substrate.
	Northern pike	Mesotrophic and eutrophic lakes, and warmwater streams, with: - marshes for spawning, - maximum surface temperatures less than 30°C, and - large populations of white sucker (preferred prey).

Selection Rationale

Brook Trout - This species was selected as a management indicator species because:

- There is local public interest in brook trout as a game fish.
- The species is a biological indicator of water quality.
- It is sensitive to changes in stream habitat conditions.

Smallmouth Bass - This species was selected as a management indicator species because:

- The species is a biological indicator of mesotrophic lakes and large rivers.

Northern Pike - This species was selected as a management indicator species because:

- The species is a biological indicator of eutrophic lakes.

Endangered,
Threatened,
and Sensitive
Species

There are no plant species known to occur on or near the Forest that are federally listed as endangered or threatened or that are recommended by the Smithsonian Institution as potentially endangered or threatened.

Federally listed endangered and threatened animal species of the Ottawa National Forest are listed on Table 3.14a.

Table 3.14a
Endangered and Threatened Species of the Ottawa National Forest

Species	Status 1/
Mammals Gray wolf	E
Birds Bald eagle	T
Peregrine falcon	E

1/ Status codes:

E Federally endangered

T Federally threatened

Gray Wolf is federally listed as endangered within the state of Michigan. A local population of gray wolf is believed to consist entirely of lone wolves from Minnesota or Ontario. Reliable reports of individual wolves are occasionally received. The nearest evidence of gray wolf breeding in recent years is from 60 miles south of Ironwood, Michigan in north-central Wisconsin.

A population objective for gray wolf on National Forests is included in the Regional Guide for the Eastern Region in support of the national recovery plan. The objective for the Ottawa National Forest is to provide habitat for 4 packs, or 24 animals, by year 2020.

Habitat for gray wolf, as directed by the Regional Forester, is minimum territory of 64,000 acres per pack with road densities less than 1 mile of road per square mile of area open for passenger vehicle use. Currently, more than 400,000 acres within the Forest boundary could potentially provide habitat of this quality. To take advantage of this potential habitat requires management of the transportation system by closing some existing roads and most newly constructed or planned roads to passenger vehicle use.

Bald eagle is federally listed as threatened within the state of Michigan. In 1984, there were 29 active bald eagle breeding areas within the Forest or within 1 mile of the Forest boundary.

A population objective for bald eagle on National Forests is included in the Regional Guide for the Eastern Region in support of the national recovery plan. The objective for the Ottawa National Forest is to provide habitat for 65 active pairs by year 2030.

Habitat for bald eagle, as identified in the recovery plan and in local nest records, is upland areas of at least 125 acres per breeding area, within 1/2-mile of lakes 200 acres or larger, with an overstory of white pine or yellow birch trees with mean diameters of 32 inches.

Peregrine falcon is federally listed as endangered. There is no record of a local breeding population of peregrine falcon within or near the Forest, but there may have been prior to 1940. Peregrine falcon are occasionally seen during migration.

A population objective for peregrine falcon on National Forests is included in the Regional Guide for the Eastern Region in support of the national recovery plan. The objective for the Ottawa National Forest is to provide habitat for 1 active pair by year 2030.

A potential peregrine falcon breeding area on the Forest has been located and evaluated.

Sensitive plant and animal species will be identified by the Regional Forester after completion of all Forest Plans in the Eastern Region. These are species where National Forest planning has indicated that the maintenance of a viable population, as required by National Forest Management Act Regulation (36 CFR 219.19), is in question and management programs and activities have or would have an adverse effect or are listed on the State of Michigan list of endangered and threatened species or are of local or regional concern. Seven animals and 17 plant species are recommended for consideration by the Regional Forester for inclusion on the R-9 list of sensitive species. They are listed in Table 3.14b. Refer to Final EIS Appendix Volume, Appendix H, Endangered, Threatened, and Sensitive Species, for further information.

Table 3.14b
Plant and Animal Species Recommended for Consideration for
Inclusion on the R-9 List of Sensitive Species

<u>Species</u>	
Mammals	Marten Lynx
Birds	Common Loon Osprey Red-shouldered hawk Merlin
Fish	Lake sturgeon
Plants	<u>Arenaria macrophylla</u> , big-leaf sandwort <u>Calamagrostis lacustris</u> , a reedgrass <u>Calypso bulbosa</u> , fairy slipper <u>Carex assiniboinensis</u> , a sedge <u>Collinsia parviflora</u> , small flowered collinsia <u>Dryopteris felix-mas</u> , male fern

Table 3.14b (continued)

Gentiana linearis, closed gentian
Gratiola lutea, hedge-hyssop
Myriophyllum farwellii, water milfoil
Nuphar microphylla, yellow water-lily
Orchis rotundifolia, small round-leaved orchid
Oryzopsis canadensis, rice grass
Panax quinquefolius, ginseng
Pellaea atropurpurea, purple cliff-brake
Petasites sagittatus, sweet coltsfoot
Pterospora andromedea, pinedrops
Woodsia obtusa, blunt-lobed woodsia

Range

Demand for grazing is very low and this situation is expected to continue. Presently, there are two special use permits issued for livestock grazing. Individual requests are considered on a case-by-case basis.

It is Forest policy that the range resource would not be promoted or developed for use until there was a turnaround in current trends of farmland abandonment and reversion of pastureland to forest. The basis for this policy is a 1977 range overview which studied the potential suitable grazing lands on the Forest and local livestock operations in the adjacent five-county area and the 1979 range assessment to estimate potential grazing capacities and demand.

Recreation

The Ottawa National Forest has the capability to provide a wide range of both developed and dispersed recreational activities in a variety of forest settings. The settings and the recreational activities available are defined by the Recreation Opportunity Spectrum (ROS). (Refer to Forest Plan Appendix F - Recreation Opportunity Spectrum for complete description of ROS System).

Current recreation use objectives on National Forest System lands stated in terms of ROS classes is shown on Table 3.15.

Table 3.15
Existing ROS Classes on National Forest System Lands

ROS Class	Acres
Semiprimitive nonmotorized	106,000
Semiprimitive motorized	0
Roaded natural	820,000
Total	926,000

Dispersed recreation demand included all recreation activities not accounted for by wildlife-based, developed, or fishing recreation. These activities include backpacking, hiking,

cross-country skiing, and driving for pleasure. A variety of uses is compatible with some or all Recreation Opportunity Spectrum (ROS) classes.

The range of recreation opportunity settings which can be provided on the Ottawa National Forest includes roaded natural, semiprimitive motorized, and semiprimitive nonmotorized.

Activities such as driving for pleasure and developed recreation uses are compatible with roaded natural ROS. However, these activities are not compatible in a semiprimitive nonmotorized ROS class. The Forest can also provide a lower density use in semiprimitive classes to satisfy a recreation demand that roaded natural areas, with higher use capacity, cannot supply.

The correlation between the demand for ROS classes and the demand for activities is not well established. While it is difficult to correlate the two, a demand exists for a variety of activities within a mix of recreational settings. In light of the abundance of roaded natural class acres available on the Forest as well as those roaded natural-type areas that dominate other ownerships and the Nicolet and Chequamegon National Forests, the Forest has a unique ability to expand the amount of semiprimitive acres.

Dispersed recreation use activities on the Forest include hunting, fishing, hiking, canoeing, cross-country skiing, and snowmobiling. Some of the dispersed recreation facilities provided include 67 miles of the North Country National Scenic trails, 41 miles of cross-country ski trails, 106 miles of hiking trails, more than 200 miles of snowmobile/all-terrain (ATV) trails, and more than 70 miles of canoe trails.

Dispersed recreation use in the Forest occurs throughout the year, not just on National Forest System lands, but also private lands open for use under the state of Michigan Commercial Forest Act.

Off-road-vehicle (ORV), snowmobile, and ATV use is managed under the current Ottawa National Forest Off-Road Vehicle Plan, in cooperation with the Michigan Department of Natural Resources-Forestry Division and private cooperators. Generally, all trails are constructed and maintained by the MDNR and private cooperators. The Forest Service assists in granting special use permits, locating trail corridors, and, recently, relocating trails on abandoned railroad grades purchased by the federal government in Gogebic County.

Hiking trail development by the Forest Service has focused on the North Country National Scenic Trail during the past few years with emphasis on purchasing rights-of-way across private lands in Gogebic and Ontonagon counties.

Most of the Forest developed sites are located on the southern half of the Forest where the majority of the lakes are. These sites range in size from large developed recreation site complexes such as Black River Harbor to small 3-unit campgrounds

such as Robbins Pond. All developed sites are managed under the roaded natural ROS classification.

Recreation use at developed sites normally begins around Memorial Day and continues through Labor Day with the heaviest use occurring from early July through late August.

Developed site use in 1984 totaled about 250,000 recreation visitor days (RVDs). Camping, picnicking, and boating are the major activities at these sites.

The Forest has a practical capacity (40 to 60 percent of total capacity) to provide more than 800,000 RVDs of developed recreation use annually during the normal summer use season. This is more than enough capacity to meet planned and projected demands for the next two decades.

Since the completion of the Black River and Sylvania campgrounds, no new sites have been developed. Some rehabilitation work, including parking area and trail reconstruction, has been done at sites such as Rainbow and Sandstone Falls observation facilities on the Black River.

Table 3.16 lists the number, type, and capacity of the Forest's existing developed recreation sites.

Table 3.16
Existing Developed Recreation Sites

	Number of Sites	Capacity (PAOT) 1/	Season Practical Capacity 2/ (recreation visitor days/year)
Observation sites	4	320	29,400
Campgrounds (family)	27	2,100	377,000
Picnic areas	18	1,505	125,500
Swimming areas	9	1,535	53,100
Boating sites	45	1,358	138,800
Interpretive and Information centers	3	410	27,270
	106	7,228	751,070

1/ Persons at one time capacity

2/ Approximately 40-60 percent season total capacity

Recreation sites and activities are also provided by other government agencies and private enterprise in mostly rural or roaded natural opportunity setting.

Some of these recreation sites operated by others within and adjacent the Forest are listed in Table 3.17. Many but not all of these sites offer higher development level facilities including electricity, shower facilities, firewood, paved roads, lighting, reservations, lodging, and more. This is in contrast to the typical forest environment most Forest Service facilities provide.

Table 3.17
Some Recreation Sites or Areas Managed by Others Within and
Adjacent the Ottawa National Forest

Site	Manager
Lake Gogebic State Park	Michigan Department of Natural Resources (MDNR)-Parks Division
Porcupine Mountain Wilderness State Park	MDNR-Parks Division
Bewabic State Park	MDNR-Parks Division
Lake Gogebic County Park	Gogebic County, Michigan
Ontonagon County Park on Lake Gogebic	Ontonagon County, Michigan
Bergland Township Park on Lake Gogebic	Town of Bergland, Michigan
Bond Falls Park	U.P. Power Company
Golden Sands Tent & Trailer Park on Golden Lake	Privately owned and operated
<u>Sylvania Outfitters, Watersmeet</u>	<u>Privately owned and operated</u>
Indianhead Mountain Resort and Ski Area	Privately owned and operated
Blackjack Mountain Ski Area	Privately owned and operated
Powderhorn Mountain Ski Area	Privately owned and operated
Wolverine Nordic Ski Complex	Wolverine Ski Club (nonprofit club)
Johnson Nordic Ski Trails	Privately owned and operated
Copper Peak Ski Flying Hill	Gogebic Range Ski Corporation (nonprofit corporation)

Refer to Final EIS Appendix Volume, Appendix B-Description of the Analysis Process, Parts 3 and 4, Forest planning records, and Recreation Information Management (RIM) data for more information.

Economic Environment

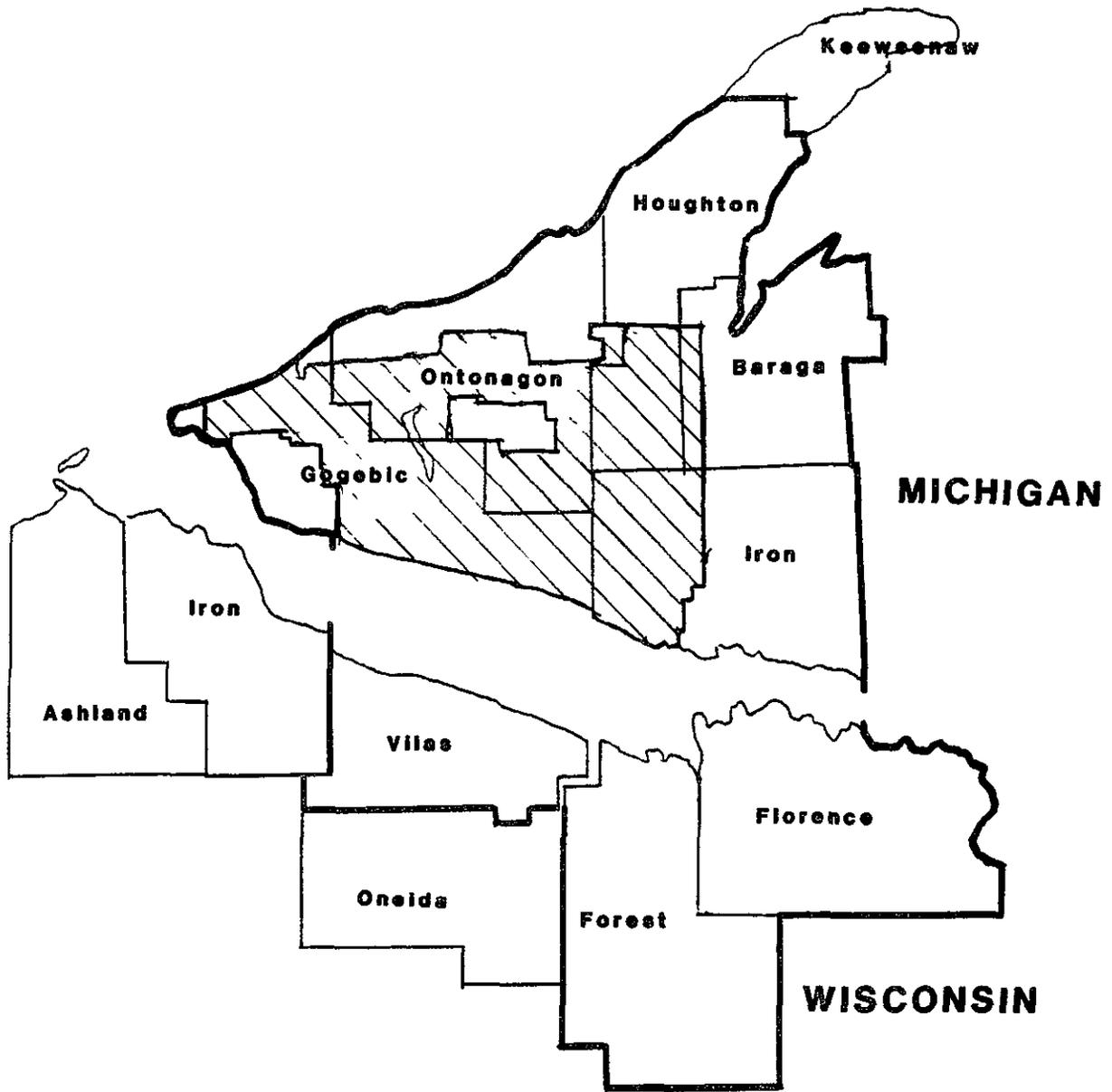
This section examines the economic environment of the Ottawa National Forest and surrounding area. Population, income, employment, and economic base are described for the area. Current budget levels by cost category, returns to treasury, and payments to counties are also described.

Economic Impact Area The area used for estimating local economic impacts of the Forest consists of Gogebic, Ontonagon, Houghton, Baraga, and Iron counties of Michigan, and Florence, Forest, and Vilas counties of Wisconsin. See Figure 3.1.

The Michigan counties were included because they contain a significant amount of National Forest land. The Wisconsin counties were included because of their economic reliance on timber from the Forest.

FIGURE 3.1

**Economic Impact Area
Ottawa National Forest**



Population
Characteristics

In 1980, the average population density of the economic impact area was 41 people per square mile (western Upper Peninsula of Michigan-17 people per square mile; Florence, Forest, and Vilas counties of Wisconsin-49 people per square mile) as compared to the state average of 163 people per square mile and a national average of 64 people per square mile.

During the last 60 years, people have been moving away from the western Upper Peninsula of Michigan while the population of the Wisconsin counties in the economic impact area has increased. There were about 154,000 people in the western Upper Peninsula in 1920 and 90,000 people in 1980.

Population centers are the Hurley (Wisconsin)-Ironwood-Bessemer-Wakefield area, Iron River, Ontonagon, Houghton-Hancock, and Baraga-L'Anse of the western Upper Peninsula and Crandon, Eagle River, Florence, Laona, Minocqua-Woodruff, Rhinelander-Tomahawk, and Ashland-Mellen of the Wisconsin counties.

Income

The 1979 median household income was \$10,408 for the Ottawa National Forest economic impact area compared to a state median household income of \$19,223 for Michigan. Total income within the impact area was approximately \$239 million in 1977.

Employment and
Unemployment

Approximately 22,900 individuals were employed within the impact area in 1977.

Unemployment rates for the economic impact area of the Forest during 1980 were similar to the state of Michigan average of 11 percent. However, since 1980, unemployment rates in the Forest economic impact area have risen significantly when compared to the average state of Michigan unemployment rate because several major and small industries have closed or reduced services in the past 4 years.

Major industries that have closed in recent years are a copper mine and processing mill, an iron mine, a major plywood manufacturing plant, and a clothing manufacturing plant. A major railroad transportation system was terminated and another reduced services. Several other small manufacturing industries, service industries, and retail trade outlets also have closed or reduced services.

Industrial
Development

There are indications that the further closing of additional industries and/or the reduction of services in the area may be ending.

The major copper mine and processing mill has reopened. The major plywood manufacturing plant will also reopen in the fall of 1986. The tourism and recreation-related industries continue to grow, however, at a slower rate than in the 1970s. Some of these

industries are expanding to year-round operations, especially those associated with the major downhill ski areas in the extreme western end of the impact area. Both within and outside the Forest economic impact area, several forest-related industries are currently being constructed including a major national pulp mill. Others are expanding or considering new construction or expansion.

Forest Budget

The current budget level was estimated using a 5-year base period (1980-1984). The budget items for each year were deflated to 1978 dollar terms and an average annual budget was calculated. To make this current budget comparable to the budget projections for the alternatives, several budget items were omitted. These items were not included in the analysis because they are not predictable, they are operated out of project cost, or they are directed by Congress as a special program such as Jobs Bill or Young Adult Conservation Corps.

The Forest total budget trends for the Ottawa National Forest are shown in Table 3.18.

Table 3.18
Total Forest Budget by Fiscal Year ^{1/}

	Actual Dollars	1978 Dollars
1980	5,957,193	4,867,027
1981	6,712,163	5,081,107
1982	6,110,955	4,363,222
1983	7,049,000	4,934,300
1984	6,936,468	4,779,226
Average		4,804,976

^{1/} Includes all appropriations

The current level budget by cost category is presented in Table 3.19.

Table 3.19
Current Level Budget by Cost Category in 1978 Dollar Terms

Cost Category	1978 Dollars
Recreation	448,785
Vegetation management	1,222,104
Local road construction	355,094 3/
Road maintenance, bridges, dams, facilities	777,580
Lands and landlines	301,214
Fisheries	86,769
General administration	466,048
Other 1/	230,288
Total 2/	3,887,882

1/ Includes range, minerals, soil and water, and fire mangagement cost.

2/ Does not include cost of dwelling maintenance, fighting forest fires, insect and disease control, nursery expansion, Working Capital Fund-nursery, Working Capital Fund-equipment, and works programs such as Senior Community Service Employment Program, Youth Conservation Corps, and Young Adult Conservation Corps.

3/ Approximately \$155,094 is purchaser credit, \$200,000 is appropriated funds.

Returns to
Treasury

Forest receipts over the past 5 years (1981-1984) have averaged over \$1.3 million per year, as shown in Table 3.20.

Table 3.20
Forest Receipts by Fiscal Year For the Period 1980-1984

Year	1980	1981	1982	1983	1984	Average Annual
	(thousand dollars)					
Actual receipts	1,192	1,191	1,089	1,440	1,807	1,344
Deflated to 1978 terms	974	902	777	1,008	1,245	981

Ninety-six percent of the total receipts are generated by timber sales.

Returns to
Local
Governments

All counties within which National Forest System lands are located receive annual payments in lieu of taxes (PILT). These payments consist of 25 percent of gross receipts plus PILT funds, which bring total payments to counties up to a minimum of about \$0.75 to \$0.85 per acre. Counties that receive payments include Baraga, Gogebic, Houghton, Iron, Marquette, and Ontonagon.

The actual payments to counties over the past 5 years (1981-1984) deflated to 1978 terms are shown in Table 3.21.

Table 3.21
Payments to Counties by Fiscal Year for the Period 1980 to 1984

	Fiscal Year					Average Annual
	1980	1981	1982	1983	1984	
	(thousand dollars)					
Actual payments	791	780	707	807	913	800
Deflated to 1978 terms	647	591	505	565	629	587

Social Environment

This section examines the social environment of the Ottawa National Forest and surrounding area. The social history, social groups, and lifestyles of individuals, groups, and/or organizations that affect and/or are affected by management of the Forest are described.

Social Impact Area

Only Michigan counties were included in the area for which social factors were considered. The state boundary seems to effectively separate social interaction between Wisconsin and Michigan communities, with minor exceptions in the Ironwood, Watersmeet, and Iron River areas.

Social History

The history of the western Upper Peninsula of Michigan is related primarily to the discovery and extraction of copper, iron, and timber.

Until the mid 1800s, the region in and around the present boundaries of the Ottawa National Forest was frequented only occasionally by Indians, explorers, missionaries, and fur traders. During this time, the primary cultural group was the Chippewa or Ojibway, which included about 25,000 people. Seasonal exploitation of natural resources predominated. Fur trade stations were developed at the mouths of the major rivers.

Although the Indians knew copper ore existed in the region, it was not until the early 1800s that commercial mining of copper began in the Keweenaw Peninsula north and east of the Forest.

Explorations for other minerals continued throughout the region, with the first commercial discoveries of iron ore in the late 1800s in what is now known as Gogebic and Iron counties. It was these discoveries that shaped, and are still shaping, the socio-economic patterns of the region.

With the mines came the discovery of and the need for lumber. Timber to build homes, shops, company buildings, and support the deep mine shafts was abundant.

Thus, both mining and logging were beginning to make their mark on the region. As the pine was cut in the eastern portion of the region, logging slowly moved to the west, and with it came the railroads to what is known now as the Gogebic Range.

Towns sprang up wherever mining and logging operations were located. Every day saw more immigrants arriving, mainly from England, Ireland, Finland, Italy, and Sweden, to work in the forest and down in the mines.

A trend of population growth continued until it peaked around 1920. By this time the native timber resources of the region, especially the pine, were virtually depleted. New open pit iron ore mines were being opened further to the west in the state of Minnesota. These new mines were more economical and safer to work than the deep ore shafts of the western Upper Peninsula.

Thus the outmigration of people began. Mines were closing, but not until the region had played a most important role in providing the wood and iron that helped build the army that fought in World War I.

Population decline continued as mines closed. However, the copper mine at White Pine, Michigan has recently been purchased and has reopened. The timber industry along with its support industries remains as an important contributor to the economic base of the region.

However, another industry began to develop. Following World War II, the increasing popularity and availability of the automobile began to set the stage for a new industry, tourism. Because of the natural beauty of the region, accessible natural resources, and the hospitable nature of the people, a small but important industry began to focus on recreation opportunities as a year-round opportunity. This growth continues today. Although the outmigration of people has continued into the mid 1980s, the first signs of population stabilization in over 60 years are now beginning to appear.

Today, the growing awareness of the western Upper Peninsula as a year-round recreation center, new growth in educational institutions and training centers, and the discovery by small industries of the hard-working character of the region's people are some of the visible indicators of a new and expanding social and economic base. Many descendants of the earliest inhabitants live within or near the Forest boundaries and contribute to the region's workforce such as the Lac Vieux Desert band of the Chippewa Indian Tribe living in and around Watersmeet, Michigan.

The Ottawa National Forest faces many different types of demands. Some of these demands are expressed by people who live within its borders and whose livelihood is tied to resources on the Forest. Other demands or interests come to the Forest from individuals or groups who visit the Forest, while yet another group holds interest in the Forest as a national resource with the ability to provide many benefits, some unique, such as wilderness. The Forest has addressed, in its planning process, concerns important to these groups.

Social Group
Descriptions

Just as the vegetation, soils, and wildlife vary across the Forest, so do the work routines, interests, and lifestyles of the people and communities in and around the Ottawa National Forest.

Eight social groups representing the existing publics who are particularly affected by the management of the Forest were identified from the social resource management project completed in 1980.

Not every person or business fits neatly into these categories. The categories do not necessarily apply to specific persons. They are useful only to understanding this Forest's possible effect on the various publics using or interested in the Forest.

Logging/Forest
Products
Industry

The economy and the jobs of these interests are closely linked to the forest management policies of the Forest Service, Michigan Department of Natural Resources, and industrial forest landowners.

Both small and large logging operators are directly concerned with aspects of timber management such as sale size and purchaser-built roads which other interests understand only indirectly. They have an investment in equipment that results in long-term commitments requiring continuously available stumpage of species they can harvest and sell. They are interested in cutting schedules by species, area, time, and value.

These interests also include corporate businesses with long-range goals. They have a substantial capital investment and a mission directed by top management and based on backing by stockholders. The Forest tends to be only one, although an important, source of supply.

Some businesses are small in comparison with those in the pulp and paper industry. They are interested in the long-range flow of required raw materials in an economically efficient manner.

Because of their distance from timber markets, these interests are very vulnerable to economic cycles. Mills quit buying from loggers in the western Upper Peninsula first in an economic decline and start buying here last during an upswing. Local mills have high transportations costs because of their distance from markets.

Forest management direction that responds to the interests of this social group would:

- Provide an appropriate level of timber production.
- Provide a variety of species and products consistent with market demand.
- Provide for a variety of sale sizes and harvest methods consistent with resource management objectives.
- Provide for a transportation system that allows for access to and efficient transportation of forest products to market.

- Provide for reconstruction and maintenance of bridges, major culverts, and collector roads.

Transient
Recreationists

These interests tend to be out-of-area residents who visit the Forest to take advantage of recreation opportunities. Most come for nonconsumptive uses such as sightseeing and snowmobiling or are making a campground or fishing lake their destination.

They expect a high quality experience that compares favorably with their experiences in other places. They have an interest in cool-water fishing, in forest wildlife, in interpretive facilities, and in places to hike, drive, and camp. Their impressions are commonly based on the visual quality of the Forest and the attractiveness of its roads and recreation facilities.

An important subgroup is deer and bear hunters who return annually to pursue their sport. They frequently hunt with local friends or relatives and also tend to have traditional use patterns, especially if a hunting camp is involved.

Forest management direction that responds to the interests of this social group would:

- Provide for a variety of recreation opportunities.
- Provide high quality developed and dispersed recreation facilities.
- Provide conditions that provide habitat for game and nongame wildlife species.
- Meet visual quality objectives compatible with the sensitivity of travel routes, use areas, and water bodies.
- Provide for quality lake and stream fishing through habitat improvements where recreation developments exist.

Recreation
Property Owners

These interests have permanent residences and jobs elsewhere. They own property within the Forest boundary in the form of hunting camps, summer homes, and cottages. Those living outside the assessment area invest considerable time and money in reaching and maintaining their property here.

Important considerations in owning forest property include local support for property boundary marking, road access, rights-of-way, and law enforcement, in addition to the fishing and wildlife values enjoyed by other recreationists.

They generally spend two weeks to a month at the property in one visit and weekends at other times. They seem to have established use patterns of the Forest.

Forest management direction that responds to the interests of this social group would:

- Provide for a variety of recreation opportunities.
- Provide forest conditions that provide habitat for game and nongame wildlife species.
- Meet visual quality objectives compatible with the sensitivity of travel routes, use areas, and water bodies.
- Provide for quality lake and stream fishing through habitat improvements where recreation developments exist.
- Provide for cooperative law enforcement.
- Provide for rights-of-way acquisition and/or special uses.
- Provide for reconstruction and maintenance of bridges, major culverts, and collector roads.

Tourism
Industry

These interests include local resort, motel, and restaurant owners, sporting goods dealers, and other accessory services including local guides. Many are small, family-owned businesses located along travel routes and lake shores. They often have a special interest in nearby National Forest System lands and lakes and in management activities that occur thereon. Some are seasonal business people who go elsewhere in winter.

Forest management direction that responds to the interests of this social group would:

- Provide for a variety of recreation opportunities.
- Provide for a range of recreation uses that involves activities throughout the year.
- Provide high quality developed and dispersed recreation facilities.
- Provide forest conditions that provide habitat for game and nongame wildlife species.
- Meet visual quality objectives compatible with the sensitivity of travel routes, use areas, and water bodies.
- Provide for quality lake and stream fishing through habitat improvements where recreation developments exist.
- Provide for relocation and upgrading of existing segments of the Forest snowmobile/all-terrain vehicle trails system.

Local Rural
Residents

These people, including American Indians, have lived most of their lives in the small communities and rural areas in and around the Ottawa National Forest. They have chosen to remain here, despite economic adversity. The lifestyle that keeps them

here includes historic patterns of Forest resource use, including hunting, fishing, firewood gathering, berry and mushroom gathering, and harvesting of other minor forest products. The Forest offers a quiet, informal, uncrowded place to live and to raise a family. Local residents have established use patterns that may include expectations of access to certain roads, hunting grounds, and open areas. In some cases, use of the resource is for subsistence rather than recreation.

Forest management direction that responds to the interests of this social group would:

- Provide a variety of recreation opportunities.
- Provide forest conditions that provide habitat for game and nongame wildlife species.
- Provide for quality lake and stream fishing through habitat improvements where recreation developments exist.
- Provide for a transportation system that allows for access to the forest for recreational purposes including firewood gathering and hunting.
- Provide for reconstruction and maintenance of bridges, major culverts, and collector roads.

Local
Government

These interests include county commissioners, township and zoning boards, and state and local economic development groups. Forest management actions affect their revenue through availability of jobs created, through payments to counties in lieu of taxes and for 25% of Forest Service receipts, and through changes in the taxable land base. The availability of land for community and industrial expansion and cooperative programs of law enforcement and road maintenance also concern these groups.

Forest management direction that responds to the interests of this social group would:

- Provide for exchange of land needed for community and industrial expansion including sanitary waste facilities.
- Provide payments to counties in lieu of taxes and for 25% of Forest Service receipts.
- Establish landownership adjustment programs that are coordinated with local units of government.
- Provide for increased income and employment within local communities.
- Provide for cooperative law enforcement.
- Provide for reconstruction and maintenance of bridges, major culverts, and collector roads.

National and
Regional Special
Interests

Each of these interests have a common organizational value that is generally affected by national or regional policy or practice. Their interest in the Forest is based on broad philosophical goals and how Forest Service policies and practices may affect their members, directly or indirectly.

These are concerned with management direction for semiprimitive and roaded natural areas, with timber harvest methods and cutting schedules, with management of essential habitat for endangered and threatened plants and animals, with maintenance of viable populations of all wildlife species, and with management decisions for wilderness, research natural areas, wild/scenic inventory rivers, and national recreation and scenic trails.

Currently, wilderness, fishing, hunting, snowmobile, and wildlife management interests are active within the Forest.

Forest management direction that responds to the interests of this social group would:

- Provide a variety of recreation opportunities.
- Provide forest conditions that provide habitat for game and nongame wildlife species.
- Provide adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species.
- Maintain critical habitat for threatened and endangered plant and animal species.
- Provide for an appropriate number and amount of wilderness or wilderness study.
- Provide for study of wild/scenic inventory rivers.
- Provide for completion of the North Country National Scenic Trail.
- Provide for a level of timber harvest activities consistent with integrated resource objectives.
- Meet visual quality objectives compatible with the sensitivity of travel routes, use areas, and water bodies.
- Conserve soil and water resources and avoid significant or permanent impairment of the productivity of the land.

Corporate
Landowners

Much of the private land within the Ottawa National Forest is owned by large corporations. Mining and timber companies originally purchased the land prior to the creation of the Ottawa National Forest. Some of these companies kept their land holdings when others were selling to the federal government in the 1930s. Today, timber and utility companies constitute the major corporate landowners.

These interests are concerned about the ease of managing their land holdings. Changes in access caused by the construction or closure of Forest Service roads and management of adjacent Forest lands are of great interest. Some companies have scattered parcels and are interested in consolidating their lands.

Forest management direction that responds to the interests of this social group would:

- Provide for land exchange programs to consolidate both National Forest and corporate lands.
- Provide for rights-of-way acquisition and/or special uses.
- Provide for reconstruction and maintenance of bridges, major culverts, and collector roads.
- Provide for property boundary location in conjunction with landownership adjustment plans.

Summary of
Social and
Economic
Conditions

A basic assumption is that no major changes in the economic base are expected within the economic impact area within the next 10 years. Current trends are assumed to continue.

Specifically, this means the role of mining in the economy continues to dwindle as only one copper mine reopened. The importance of recreation and recreation services grows, primarily through the expansion of existing downhill ski areas, especially as year-round resorts.

Commercial and manufacturing sectors of the economy continue to fluctuate, seeking a level appropriate to the size and skills of the population remaining in the area. Wood manufacturing and production assume a greater share of the economy, but supplies of wood are not a limiting factor in that growth.

Some new sources of recreation-related industry and employment are moving into the area. Recreation residence development on private land in and around the southern half of the Forest could bring in people. Overall, population declines continue but at a slower rate than in the past 20 years and may even be beginning to stabilize.