2.0 STEP 2: DESCRIPTION OF THE EXISTING SITUATION

The purpose of this step is to describe the existing road system in relation to the current *Forest Plan* direction (USDA FS-643). The current *Forest Plan* for the CNNF consists of two plans, the Land and Resource Management Plan, Chequamegon National Forest (USDA FS 1986a); and the Land and Resource Management Plan, Nicolet National Forest (USDA FS 1986b) (*Forest Plans*). Currently, the forest is managed as one administrative unit.

2.1 Physical Perspective

The physical perspective of the CNNF consists of level to undulating topography, with elevations ranging from 600 to 1,800 feet above sea level. All of the land within the forest was glaciated. This glaciation resulted in deposition of up to 600 feet of sediment on the underlying bedrock, though the depth of this unconsolidated sediment varies greatly, and there are localized bedrock exposures. Soils that developed on this sediment are about 22 percent silt loams, 34 percent sandy loams, 16 percent sands, and 28 percent wet mineral and organic soils (USDA FS 1998h). The soil resource varies by glacial landform and ranges from silty soils on ground moraines to sandy soils on outwash plains. The climate of northern Wisconsin is continental, with cold winters and moderate to heavy snows. (Albert 1995)

2.1.1 Forest Plan Direction

The *Forest Plan* direction is described for the CNF and NNF and includes management prescriptions, road densities, goals, and objectives. The CNNF is divided into Management Prescription Areas, which are smaller areas of land managed for specific activities, prescribed to meet specific goals, and guided by site-specific policies. The management areas are described below for both the CNF and NNF.

Chequamegon National Forest

The CNF *Forest Plan* stated that providing "a safe, economical, and efficient transportation system that has minimal effects on the environment" was a major management problem identified during the planning process. In order to resolve this roads issue, the *Forest Plan* prescribed construction or reconstruction of an average of 25.9 miles of road annually on the CNF. The CNF *Forest Plan* advised that arterial and collector roads be maintained and reconstructed to provide for "safe and economical transport" through the forest, and that local roads be designed, constructed or reconstructed to fulfill natural resource management needs. Road closures in semi-primitive non-motorized areas were recommended to control road densities, especially in gray wolf habitat areas (USDA FS 1986a).

The CNF *Forest Plan* specified that local road density should be based on the "optimum economic road density for logging the area," as long as densities were within prescribed levels for individual Management Prescription Areas (USDA FS 1986a). Desired road densities range from 0 to 3.6 miles of road per square mile of forest within CNF management areas. The *Forest Plan* also prescribed the

following environmental measures: erosion control measures for road construction areas with erodable soils or inadequate regeneration; revegetation of temporary or short-term roads; obliteration of all existing roads not needed for administrative or public use; closure of all newly constructed/reconstructed roads to public motorized traffic unless the roads are needed to meet management area objectives; and closure of an equivalent mileage of similar standard road for every newly constructed/reconstructed road in timber wolf habitat (USDA FS 1986a).

The 1986 *Forest Plan* states that the CNF has eighteen Management Prescription Areas, which include 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 5, 6, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, and 9. The management areas are shown on Figures 2A – 2F. The desired land condition emphasized in each Management Prescription is as follows:

Management Prescription 1.1
Desired land conditions include even-aged management, short rotation hardwoods, fiber production, motorized recreation, wildlife game species, and a roaded natural setting. Road densities will not exceed an average of 3.6 miles of forest system road per square mile.

Management Prescription 1.2
Desired land conditions include even-aged management, short rotation hardwoods, fiber production, motorized recreation, wildlife game species, and a semi-primitive motorized setting. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 2.1
Desired land conditions include uneven-aged management, long rotation hardwoods, sawtimber production, motorized recreation, non-game wildlife species, and a roaded natural setting. Road densities will not exceed an average of 3.6 miles of forest system road per square mile.

Management Prescription 2.2
Desired land conditions include uneven-aged management, long rotation hardwoods, sawtimber production, motorized recreation, non-game wildlife species, and a semi-primitive motorized setting. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 3.1
Desired land conditions include even-aged management; long rotation mixed northern hardwoods; sawtimber and veneer production; motorized recreation; both game and non-game wildlife species; and a roaded natural setting. Road densities will not exceed an average of 3.6 miles of forest system road per square mile.

Management Prescription 3.2
Desired land conditions include even-aged management; long rotation mixed northern hardwoods; sawtimber and veneer production; motorized recreation;

both game and non-game wildlife species; and a semi-primitive motorized setting. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 4.1
Desired land conditions include even-aged management; long and short rotation softwoods; sawtimber and fiber production; motorized recreation; both game and non-game wildlife species; and a roaded natural setting. Road densities will not exceed an average of 3.6 miles of forest system road per square mile.

Management Prescription 4.2
Desired land conditions include even-aged management; long and short rotation softwoods; sawtimber and fiber production; motorized recreation; both game and non-game wildlife species; and a semi-primitive motorized setting. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 5
Desired land conditions include Congressionally designated wildernesses; protection of the wilderness character and recreational experience; and preservation of the natural ecosystem. Roads will not be developed in this management area.

Management Prescription 6
Desired land conditions include semi-primitive non-motorized recreation; non-game wildlife; and uneven-aged management of softwoods and hardwoods. Local roads in this management area will be closed to public, motorized traffic. Access by special use permit will be allowed.

Management Prescription 8.1
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and the Riley Lake and Moquah Barrens wildlife management areas. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 8.2
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and protection of the St. Croix National Scenic River. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 8.3
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and preservation of the North Country National Scenic Trail, Ice Age National Scenic Trail, and Rock Lake National Recreational Trail. Non-motorized traffic is permitted.

Management Prescription 8.4
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and protection of the Moquah Research Natural Area. No additional roads will be developed in this management area.

Management Prescription 8.5
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and protection of the potential scenic river corridors that include the South Fork Jump River, South Fork Flambeau River, and East Fork Chippewa River. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 8.6
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and protection of the St. Peter's Dome Area. No additional roads will be developed in this management area.

Management Prescription 8.7
Desired land conditions include preservation of unique ecosystems; research of forest and rangeland management; protection of unique areas of national significance; and the Tucker Timber Area. Roads will not be developed in this management area.

Management Prescription 9
Desired land conditions include minimum management and investments; protection of environmental values; and protection of the health and safety of the public. Roads will be developed only as needed for access or to protect resources.

Nicolet National Forest
The NNF *Forest Plan* listed managing the forest road system as a major public issue and management concern identified during the forest planning process. The *Forest Plan* described conflicting public attitudes toward the road system, with some people favoring more roads within the NNF and others opposing new road construction. Opposition was primarily due to the potential for negative effects of roads on wildlife, aesthetics, and the nature experience of the forest. In response to these conflicting public concerns, the *Forest Plan* mandated construction of 93 miles of new road, 200 miles of reconstructed/upgraded road, and closure of 694 miles of existing low standard road by 1996. An additional 79 miles of road construction and 352 miles of road closure/obliteration in the period from 1996 – 2005 were projected (USDA FS 1986b). Desired road densities range from 0 to 4 miles of road per square mile of forest within NNF management areas, with lower road densities of 2 miles per square mile proposed in wolf habitat and primitive areas (USDA FS 1986b).

NNF forest-wide standards and guidelines state that road construction and reconstruction should be designed "to be suitable for transporting forest products and accommodating planned motorized recreation uses" (USDA FS 1986b). Standards and guidelines also state that arterial and collector roads should be maintained at Maintenance Level 3 or higher. Additional guidelines for visual management associated with road closures, construction/reconstruction, obliteration, and road signs are also provided (USDA FS 1986b).

Per the 1986 *Forest Plan*, the NNF has sixteen Forest Management Prescription areas, which include 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 4.3, 5, 6.2, 6.3, 8.1, 8.2, 9.1 and 9.2. The management areas are shown in Figures 2A – 2F. The desired land condition emphasized in each Management Prescription is as follows:

Management Prescription 1.1
Desired land conditions include mixed forest with large aspen component, wildlife emphasis, and roaded natural recreation. Road densities will not exceed an average of 4 miles of forest system road per square mile.

Management Prescription 1.2
Desired land conditions include mixed forest with large aspen component, wildlife emphasis, and semi-primitive motorized recreation. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 2.1
Desired land conditions include uneven-aged hardwood forest, wildlife associated with shade tolerant vegetation, and roaded natural recreation. Road densities will not exceed an average of 4 miles of forest system road per square mile.

Management Prescription 2.2
Desired land conditions include uneven-aged hardwood forest, wildlife associated with shade tolerant vegetation, and semi-primitive motorized recreation. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 3.1
Desired land conditions include even-aged hardwood forest, wildlife associated with a variety of timber stands, and roaded natural recreation. Road densities will not exceed an average of 4 miles of forest system road per square mile.

Management Prescription 3.2
Desired land conditions include even-aged hardwood forest, wildlife associated with a variety of timber stands, and semi-primitive motorized recreation. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 4.1
Desired land conditions include upland softwood forest, wildlife associated with coniferous vegetation, and roaded natural recreation. Road densities will not exceed an average of 4 miles of forest system road per square mile.

Management Prescription 4.2
Desired land conditions include upland softwood forest, wildlife associated with coniferous vegetation, and semi-primitive motorized recreation. Road densities will not exceed an average of 2 miles of forest system road per square mile.

Management Prescription 4.3
Desired land conditions include softwood wetland forest, wildlife associated with wetlands, and limited recreation. Roads will be constructed in this area only when there is no other feasible alternative location.

Management Prescription 5
Desired land conditions include Congressionally designated wilderness. Roads will not be provided, except those needed to access private lands.

Management Prescription 6.2
Desired land conditions include diverse forest with a variety of tree species, low improved road density, and semi-primitive non-motorized recreation opportunities.

Management Prescription 6.3
Desired land conditions include wildlife emphasis primarily on wetlands that are unsuitable for timber management. Roads will be provided only as needed for access to adjacent areas or to protect resources.

Management Prescription 8.1
Desired land conditions include forested areas that provide a setting for unique biological, geographical, or cultural values. Only roads that comply with special management area objectives will be provided.

Management Prescription 8.2
Desired land conditions include forested areas that provide research opportunities geared towards improvement of forest benefits. Roads will be provided only if they comply with special management area objectives.

Management Prescription 9.1
Desired land conditions include Natural Succession Forest. Roads will be provided only as needed for access to adjacent areas or to protect resources.

Management Prescription 9.2
Desired land conditions include river corridors. Roads will be provided only as needed for access to adjacent areas or to protect resources.

2.1.2 Roadway Maintenance Levels

Roads on the CNNF are maintained according to the Maintenance Level assigned to each road system. The Maintenance Level defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (FSH 7709.58). Maintenance Level 1-5 roadways are defined for reference below; however this Roads Analysis only evaluated Maintenance Level 3, 4, and 5 roadways.

Maintenance Level 1
Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Roads receiving level 1 maintenance may be of any type, class or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.

Maintenance Level 2
Maintenance Level 2 is assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. These roads may be used for transporting timber.

Figure 2-1. Maintenance Level 2 Roadway

Maintenance Level 3
Maintenance Level 3 is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either

Figure 2-2. Maintenance Level 3 Roadway

native or processed material (FSH 7709.58). Typically, these roads are local or minor collector roads (USDA FS 1986a).

Maintenance Level 4

Maintenance Level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated (FSH 7709.58). These roads are usually collector or minor arterial roads (USDA FS 1986a).

Figure 2-3. Maintenance Level 4 Roadway

Maintenance Level 5

Maintenance Level 5 is assigned to roads that provide a high degree of user comfort and convenience. These roads are double-lane, paved and connected to public highways (USDA FS 1986a). Some may be surfaced with aggregate and dust abated (FSH 7709.58).

Figure 2-4. Maintenance Level 5 Roadway

Table 2-1. Percent of Roadway Miles per Maintenance Level

Road Jurisdiction	Total Miles	Percent of Miles per Maintenance Level 3*	Percent of Miles per Maintenance Level 4*	Percent of Miles per Maintenance Level 5*
Forest Service	2352	31%	53%	16%
State	282	0%	0%	100%
County	215	0%	25%	75%
Local	176	11%	57%	32%

* Approximate; based on GIS estimates.

2.1.3 Forest Highways

Forest Highways are a subset of existing Federal (non-Forest Service), State, County, and local roads that provide the backbone transportation network within National Forests. Forest Highways form a link connecting Public Forest Service Roads to Federal, State, County and town roads. They provide access to local

community services such as school bus routes, postal mail service, commercial supply routes, and access to residential properties. These roads are managed, maintained and remain under the jurisdiction of the responsible Federal (non-Forest Service), state, county or town road entity.

The CNNF has 55 designated Forest Highways covering 485 miles with a current 5-year transportation improvement program of over $6 million. Designations and project selections occur through joint consultation with the Forest Service, State, local Counties and the Federal Highway Administration (FHWA). Selected projects are then included in the Forest Highway program for the current fiscal year and at least the next 4 years. Funding is administered through the FHWA in the Federal Lands Highway Program. Project funding is allocated annually by formulas to the responsible state or county road entity for construction and reconstruction of designated Forest Highway projects within National Forests.

2.1.4 Public Forest Service Roads

The current NFS roads will have a new subset of roads that will be designated as Public Forest Service Roads (PFSR). The PFSR program is designed to complement and extend public access beyond that provided by the Forest Highway Program. PFSRs will link county and state collector roads, and will access large blocks of the National Forest lands, specific recreation sites and wildernesses, and will remain under USDA Forest Service jurisdiction, which is different than Forest Highway designation criteria. This will provide a “seamless” transportation network, such that changes in jurisdiction and boundaries will seem transparent to users. Improving roads designated as PFSRs will reduce erosion; improve water and air quality; implement the clean water act more rapidly; and reduce accidents and fatalities.

The CNNF has 2533 roads covering approximately 1940 miles that are proposed as potential PFSRs. The USDA Forest Service, in consultation with local transportation authorities, State agencies, and the FHWA, will complete PFSR designation and project selections. The USDA Forest Service will select projects that will be included in the program for the current fiscal year and at least the next four years.

As this is a new designation for existing roads, funding of this new program is still under consideration. Funding of the PFSR program could be obtained through:

- Increased appropriations in the regular USDA funding bill
- Increased authorization in existing Forest Highway category in the Federal Lands Highway Program under Transportation Economic Assistance-21
- Creation of a new PFSR category in the Federal Lands Highway Program in addition to current USDA and Forest Highway funding
- Collection of user fees derived from recreational traffic using the PFSRs.

2.1.5 Scenic Byways

A number of roads on the CNNF are designated Scenic Byways. Having either a State or Federal designation, the purpose of this program is to recognize the unique scenic, cultural, historic, natural, recreational and archaeological qualities of interest to travelers along a particular corridor and to promote the proper management of those attributes.

The State of Wisconsin designates roadways with outstanding natural features, low traffic volumes, and a low density of adjacent development as Rustic Roads. Rustic Roads are marked with brown, white and yellow signs and typically are a minimum length of 2 miles. General maintenance on a Rustic Road is at a level necessary for public travel by auto, bicycle or hiking, while preserving the scenic qualities of the roadway (Wisconsin Administrative Code 1995).

2.2 Biological Perspective

Roads are more than just travel routes; they are a means of social, cultural, and economic exchange. However, roads can also negatively impact flora, fauna, and the ecology of natural landscapes. Research focusing specifically on biological and ecological impacts of road networks has been a fairly recent phenomenon; however, many effects of roads on specific species and ecosystem processes are well known. This research provides valuable information to assist land managers in designing more sustainable road systems. General information on forest flora and fauna, biological effects of roads, current landscape patterns, and aquatic resources affected by road conditions and their distribution on the CNNF follow.

2.2.1 Biotic Community

The Forest Service completed an *Analysis of the Management Situation for Wildlife* on the CNNF and published it in 2001. The study stated that CNNF is located at the transition between the eastern deciduous forest biome and the boreal forest biome, an area in which ecological conditions for a broad diversity of plant and wildlife species are found. The study also indicated that the CNNF is considered to be regionally, and perhaps globally, important as a population source for many animal and plant species. The extensive forests of the upper Great Lakes region, including National Forests within Wisconsin, Michigan, and Minnesota, have been identified as one of only several areas within the United States where sufficient habitat exists for conservation of songbirds (USDA FS 2001a).

The CNNF harbors many sensitive species of plants and wildlife. Three Federally listed threatened and endangered (T&E) species occur on the CNNF: bald eagle (*Haliaeetus leucocephalus*), gray wolf (*Canis lupus*), and Fassett's locoweed (*Oxytropis campestris* var. *chartacea*)(USDA FS 1998l). In addition, there are eight known occurrences of Regional Forester Sensitive (RFS) animal species and nine RFS plant species on the CNNF: northern goshawk (*Accipiter gentiles*), Canada lynx (*Lynx rufus*), cerulean warbler (*Dendroica cerulea*), black tern (*Chlidonias niger*), zebra clubtail (*Stylurus scudderi*), lake sturgeon

(*Acipenser fulvescens*), pugnose shiner (*Notropis anogenus*), extra-striped snaketail (*Ophiogomphus anomalus*), goblin fern (*Botrychium mormo*), ternate grape fern (*Botrychium ternatum*), blunt-lobed grape fern (*Botrychium oneidense*), ram's-head lady's slipper (*Cypripedium arietinum*), butternut (*Juglans cinerea*), algal-leaved pondweed (*Potamogeton confervoides*), Deam's rock cress (*Arabis missouriensis* var. *deamii*), New England violet (*Viola novae angliae*), and Jacob's ladder (*Polemonium van-bruntiae*) (USDA FS 1998l). The CNNF also has known occurrences of 158 additional State threatened and endangered species or species of concern that are not Federally listed or RFS species, including pine marten (*Martes americana*), northern blue butterfly (*Lycaeides idas nabokovi*), dwarf bilberry (*Vaccinium caespitosum*), trumpeter swan (*Olor buccinator*), spruce grouse (*Dendragapus canadensis*), and wood turtle (*Clemmys insculpta*) (USDA FS 1998l). The CNNF contains sensitive or rare plant communities, which include approximately 10 percent of the State imperiled (globally rare) pine barren plant community in Wisconsin (USDA FS 1998l). CNNF plant communities contain the majority of, and in some cases the only, populations of several State listed plant species (USDA FS 2001a).

The CNNF also provides important habitat for many game species and non-game species of fish and wildlife. The results of the Forest Service's *Fish and Wildlife General Assessment* that was published in 1998, indicate that the forest contributes the majority of individuals to statewide populations of the State endangered pine marten, the State threatened spruce grouse, the Regional Forester sensitive northern goshawk and the common fisher (*Martes pennanti*) (USDA FS 1998j). The CNNF land base, in particular, is seasonally used by nearly one-half of the wolf population in Wisconsin; however, no wolf packs have yet colonized the Nicolet side of the forest (USDA FS 1998j). The CNNF also contains an estimated one-third of suitable habitat in Wisconsin for the regionally declining sharp-tailed grouse (*Tympanuchus phasianellus*) and one-seventh of its known statewide population (USDA FS 1998j). Additionally, in 1995, 25 eastern elk (*Cervus elaphus*) from Michigan were reintroduced into the Chequamegon National Forest land base as part of an experimental study (USDA FS 1998j). This elk herd, numbering approximately 85 to 90 animals in early 2002, remains the only population of elk in Wisconsin (WDNR 2002; USDA FS 1998j).

2.2.2 Effects of Roads on Biological Organisms

Non-native, invasive species are presently threatening the existence and altering the composition of biological communities on the CNNF. Approximately twelve percent of all known vascular plants in the forest are non-native (USDA FS 1998l). Many of these species are widespread and naturalized throughout the forest, including areas within designated Wilderness, which makes their eradication difficult (USDA FS 1998l). However, removal of these exotic species to limit their distribution is an important aspect in restoring native ecosystems and ecosystem functions (USDA FS 2000a).

Addressing ecosystem restoration is one of the primary goals of *Forest Plan* revision because the Forest Service recognizes the importance of sustainable ecosystems in ensuring preservation of ecological processes, biological diversity,

and forest productivity over time (USDA FS 2000a). Although restoration does not necessarily imply returning the forest to a "pristine" condition, it does necessitate management for some conditions such as old-growth; structural diversity; large forested fragments; corridors to provide landscape connectivity; recovery of viable populations of rare species and possible reintroductions of extirpated species; and maintenance of a full spectrum of seral stages (USDA FS 2000a). In order to achieve these conditions, it may be necessary to eliminate road construction and reconstruction in some areas, and obliterate and revegetate existing roads in other areas.

2.2.3 Landscape Patterns

The current *Forest Plans* do not address landscape patterns, the structure and composition of which is often a side-effect of all prescribed management activities (logging, road building, mining etc.). The existing *Forest Plans* prescribe a high level of even-aged timber management (ie. clearcutting) and promote early successional forest types and edge habitat (USDA FS 1986a; USDA FS 1986b). This type of forest management benefits certain game wildlife species such as deer and grouse. However, this management strategy also produces a landscape pattern in which small patches of forest dominate, large forest patches are lacking, and old growth forest patches are isolated from each other (USDA FS 2001e). Only nine percent of the upland forest on the CNNF exists in large patches of several hundred acres or more (USDA FS 1998l).

Landscape patterns on the CNNF can have profound effects on wildlife with large home ranges that require extensive forested areas and corridors for traveling between isolated stands. Species that are sensitive to edge environments are also negatively affected by forest edges resulting from fragmentation (USDA FS 2001a). These species include many neotropical migratory birds and woodland raptors, which suffer from increased predation and brood infestation by parasites, and are often out-competed by other birds for habitat and nesting sites (USDA FS 2001a). The current *Forest Plans*, road system, and forest management priorities do not provide large patches of habitat that approximate interior forest conditions needed by area sensitive, edge sensitive, or isolation sensitive wildlife species. The *Forest Plans* also do not take into account the implications of forest fragmentation on wildlife habitat at a regional or landscape scale.

2.2.4 Aquatic Resources

The *Forest Plans* do not provide specific direction for managing aquatic resources within the CNNF (USDA FS 2001b). The format of the *Forest Plans* makes consideration of aquatic resource issues difficult because Management Areas are based primarily on terrestrial considerations, while aquatic resource issues tend to be distributed by watershed, stream, or lake types (USDA FS 1999a). The *Forest Plans* provide no direction for dealing with road segments that are parallel and adjacent to streams or lakes, blockage of fish passage caused by roads, sedimentation at road-stream crossings, and management of roads contributing to poor water quality (USDA FS 1999a). While the existing *Forest Plan* generally provides mitigation measures for erosion created by new

road-stream crossings or new timber harvests on a site-specific basis, effects of management actions on the entire system are not considered on a regional or landscape scale (USDA FS 1999a).

The CNNF has sixteen 4th level watersheds, which contain 2,020 lakes, 2,000 miles of streams, 75,000 acres of riparian habitat, and 347,000 acres of wetland (USDA FS 1999a). The U.S. Environmental Protection Agency (USEPA) has developed the Index of Watershed Indicators (IWI), which is a water quality rating system based on 14 condition and vulnerability indicators of watershed health (USEPA 1999). Condition indicators help assess general water quality and determine whether water supply can meet present human demands and uses. Vulnerability indicators help assess where pollution discharges and other human activities are negatively affecting a watershed. IWI ratings range from 1 to 5, with ratings of 1 given to the healthiest watersheds, and ratings of 5 given to watersheds with more serious water quality concerns. For most watersheds within the CNNF, the IWI water quality rating is 3 (USEPA 1999). A rating of 3 is generally acceptable, indicating "less serious" problems pertaining to water quality and fairly "low vulnerability" to stressors such as pollutants and nutrient loadings (USEPA 1999). However, watersheds with IWI ratings of 3 have aquatic conditions that are considered below State or tribal water quality goals (USEPA 1999). Thus, these watersheds can still benefit from actions to minimize and prevent water quality degradation in the future. Several CNNF watersheds (Bad-Montreal, Upper St. Croix, and Menominee) received IWI ratings of 1, which are given to watersheds with "better" water quality standards that exceed State or tribal water quality goals and exhibit low vulnerability to pollutants (USEPA 1999).

The State of Wisconsin completed a *Unified Watershed Assessment* in 1998 as required in the Federal Clean Water Action Plan (WDNR 2000). The purpose of this assessment was to identify watersheds statewide with water quality issues and to prioritize watersheds needing funding for protection and restoration projects. Fifty-two watersheds were analyzed and classified into five categories: highest restoration priority, other restoration needed, meeting standards, very high quality, and need more information (USEPA 2001). Watersheds of the CNNF were all classified as "meeting standards" and not prioritized for restoration projects (USEPA 2001).

Although water quality within the CNNF appears to be good, site-specific effects of the current CNNF road system on aquatic resources remains a major concern. Forest roads can adversely impact watersheds, especially when poorly maintained. Erosion often degrades water quality through sedimentation, addition of nutrients and pollutants, and interference with hydrological processes. These impacts can also cause alteration of water characteristics, such as temperature and dissolved oxygen, which are important for survival of aquatic life. A key goal of the nationwide Forest Service Natural Resources Agenda (Agenda) is watershed restoration and maintenance (USDA FS 1998a). The Agenda states that watershed health concerns should be an overriding priority in development of future forest plans and management. This roads analysis identifies road areas that contribute to water quality problems and will help

provide a basis for decisions made during the *Forest Plan* revision, while prioritizing future watershed and project specific analyses.

2.3 Social Perspective

An important aspect of National Forest management is to ensure that CNNF activities support the needs of local communities (USDA FS 2001d). A recent assessment of the social and cultural setting in northern Wisconsin indicates that a large portion of the local population surrounding the CNNF still lives rurally. Furthermore, the cultural traditions of the local people are tied to the land and natural resources of the forest through their employment and recreation (USDA FS 2001d).

2.3.1 Population Demographics and Employment

The area surrounding the CNNF has no large cities or urban centers and few population centers greater than 10,000 people (USDA FS 2001d). Per capita income is among the lowest in the State in several of the 11 counties (Ashland, Bayfield, Forest) containing CNNF land (USCB 2000). The majority of the population within and around the CNNF is Caucasian (95 percent) (USCB 2000). The only significant minority group residing near the CNNF is Native American Indians, who comprise roughly 4 percent of the population statewide (the majority resides in northern Wisconsin), and a larger proportion of the population of some counties containing National Forest land (USCB 2000). Currently, northern Wisconsin is not as diverse as the general U.S. population, with only 4.7 percent of residents within 125 miles of the CNNF classified as minority, compared to minorities composing 14.1 percent of the total U.S. population (USDA FS 1998g).

According to the 2000 U.S. Census, approximately 212,872 people live in the 11 counties that contain portions of the CNNF (USCB 2000). These residents occupy 144,998 housing units (USCB 2000). Based on this figure and given that the forest comprises approximately 21 percent of the lands in the 11 counties it occurs in, an estimation can be made that approximately 44,703 people inhabit 30,450 houses within forest administrative boundaries. However, these numbers may actually be lower, because they assume equal distribution of people and housing units across the region, which may not be accurate. Population density of the 11 counties in which the CNNF occurs ranges from 9.9 people per square mile in Forest County to 35.7 people per square mile in Oconto County (USCB 2000).

Member Tribes of Great Lakes Indian Fish and Wildlife Commission (GLIFWC) pursuant to their treaty rights on ceded lands, which occur within the administrative boundaries of the CNNF, represent a portion of the population that is affected by road decisions. These members consist of the Tribes included in the Bad River Band of Lake Superior Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of the Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community of the Mole Lake Band, Red Cliff Band of Lake Superior Chippewa Indians, Fond du Lac Chippewa Tribe, Mille Lacs Band of Chippewa

Indians, Bay Mills Indian Community, Keweenaw Bay Indian Community, and the Lac Vieux Desert Band of Lake Superior Chippewa Indians.

Some local residents are employed in logging, tourism, or recreation based businesses. According to 2000 U.S. Census data for the counties in which CNNF land lies, an average of 2.8 percent of the population classified themselves working in the "farming, fishing, and forestry" occupations, with the lowest percentage (1.9 percent of respondents) recorded in Florence County and the highest percentage (3.8 percent) recorded for Langlade and Taylor Counties (USCB 2000). A slightly higher average of 5.9 percent of respondents indicated that they worked for the "agriculture, forestry, fishing and hunting, and mining" industries, with the highest percentage (11.4 percent) in Taylor County and the lowest percentage (2.5 percent) in Vilas County (USCB 2000). An estimate of the number of local residents employed in a recreation occupation is difficult to determine, as these professions are included as a subset of "service" occupations. However, an average of 10.8 percent of respondents in the CNNF counties stated that they worked in the "arts, entertainment, recreation, accommodation, and food services" industries, with the highest percentage of respondents working in this industry (16.8 percent) living in Sawyer County (USCB 2000).

These population demographics highlight the importance and need for safe roads that provide access to people inhabiting and working in areas within or near CNNF administrative boundaries. Road networks are improving and expanding to meet public needs. Roadways completely dominate the landscape in most forested areas of northern Wisconsin (WDNR 1995). Tourism, recreation, and housing interests are spreading out to more areas of undeveloped land, requiring construction of more and more roads, particularly in Oneida, Sawyer, Vilas, and Washburn Counties of northern Wisconsin (WDNR 1995).

2.3.2 Tourism and Recreation

Tourism and recreation are important social activities in most National Forests for both residents and non-residents. A national assessment of recreation stated that the most significant trends in the U.S. affecting recreation are age structure of the population; overall population growth; differences in participation by race and ethnicity; geographic shifts in population; changes in family structure; changes in amounts of available leisure time; economic trends; participation trends in specific recreation activities; increased concern about preserving natural resources; and migration of people to amenity areas (USDA FS 1998g). Other national recreation trends include more "destination" oriented trips in the future, lower levels of back country use, and decreasing percentage of the population willing to "camp out" (USDA FS 1998g). These trends apply to recreation use in northern Wisconsin and necessitate the maintenance and improvement of the road system and recreation services sector on both public and private land.

A *General Assessment on Recreation* was performed by the Forest Service and published in 1998. It estimated that tourists spend nearly $9 billion annually in

the Lake States region, and that about $6 billion of this spending is captured in the region's economy. This spending is estimated to generate $3.2 billion in income for the region and supports an estimated 214,000 jobs. Seasonal homes account for 20 percent of all tourism spending in the Lakes States region. The study indicated that growth in the number of seasonal homes was seen as the most significant trend affecting future forest management activities in the region. The U.S. population is aging and many retirees are moving closer to places offering more recreational opportunities. This trend is true in Wisconsin. The study stated that in 1994, seven of the ten counties with largest growth rates were in southern Wisconsin, but by 1996, the top ten counties with largest growth were all north of Green Bay. Property values are also increasing near the CNNF, largely due to this influx of retirees and seasonal homes. In 1996, Forest County had the second highest growth rate in Wisconsin, behind Door County, which had the highest growth rate. Vilas County property values were up 16.1 percent in 1996, and experienced the largest tax levy increase of 17 percent in Wisconsin, followed closely by Ashland County (USDA FS 1998g).

Results of a 1991 survey of visitors to the CNF indicate that 99 percent of visitors were caucasian; the most frequent visitor age category was 25-44 year old males; males out-numbered females 80 to 20 percent; and 85 percent of the visitors were residents of Wisconsin (USDA FS 1998g). According to forest reports in 1996 and 1997, the CNNF has a lower recreational use than other National Forests in the Eastern Region, and has one-sixth the amount of visitor days as compared to Wisconsin State Parks (USDA FS 1998g). However, the CNNF provides recreational opportunities in northern Wisconsin due to its large size, extent of forest, natural resource benefits, and opportunities for solitude.

The CNNF provides a great diversity of recreational opportunities, which include: 49 campgrounds; 1,175 developed campsites; two visitor centers; eight visitor information sites; 1,060 miles of hiking, biking, and ski trails; 393 miles of equestrian trail; 179 miles of all terrain-vehicle (ATV) trails; 67 miles of interpretive trails; and five wilderness areas (USDA FS 1998g). Most of these recreational opportunities depend on forest roads for access. In addition, developed self-guided auto tours are a popular way for recreational users to learn about natural history, local people, and forest products of the CNNF. Auto tours such as the Heritage Scenic Byway, Great Divide Scenic Byway, and Lakewood Auto Tour not only offer visitors an opportunity to enjoy the beauty of the CNNF, but also pass through several communities. The result of increased visitation stimulates local economies. It is also projected that tourism and recreation demand on the CNNF will increase in the future, which will also create a need for more access (USDA FS 1998g).

2.4 Cultural Perspective

Part of the USDA Forest Service's goal of "retaining vital and resilient communities" involves maintenance of existing diversity of local cultures and traditions surrounding the CNNF (USDA FS 2001d). For many rural communities located within or near the forest, local culture/tradition depends on resource-based employment, such as logging or recreation-related work (USDA FS 2001d). Recreation-related businesses on the

CNNF are usually family run and/or passed on from generation to generation (USDA FS 2001d). Growing populations of seasonal residents and tourists also create their own culture, which revolves primarily around the recreational opportunities and beauty provided by the landscape (USDA FS 2001d). Maintenance of traditional employment, recreational opportunities, and the aesthetic quality of the CNNF are key criteria in the *Forest Plan* revision, and in deciding future management activities (USDA FS 2001d). Future forest planning efforts must also focus on supplying a sustainable amount of culturally related special forest products for Native Americans and on preserving historical sites that provide important cultural ties to the past (USDA FS 2001d).

2.4.1 Native American Federal Trust Responsibility

The USDA Forest Service has special legal obligations to Native American Indian tribes. Many National Forests lie within territories on which Native Americans have retained their hunting, fishing and gathering rights and represent unique landscapes where local Indian tribes can fulfill their cultural needs and "live off the land" (USDA FS 2001g). There is a large population of Native American Indians within and near the CNNF that use forest products daily for food, heat, medicines, tribal traditions, and to supplement their income (USDA FS 2001g).

Special forest product demand is expected to continue to increase amongst the general population and Federally-recognized Indian tribes in the future (USDA FS 2001g). Historically, American Indians have used special forest products for religious, ceremonial, medicinal, subsistence, and economic purposes (USDA FS 2001g). Great Lakes Region Chippewa Indians have a vast number of traditional uses for vascular plants, hunt dozens of wildlife species, and trap fur-bearing animals (USDA FS 2001g). Tribal members also gather forest products such as birch bark and maple sap that are either consumed or can be sold to local businesses (USDA FS 2001g). Increasing numbers of tribal members exercise their gathering rights on National Forest lands within ceded territories each year (USDA FS 2001g). Bands of the Lake Superior Chippewa Indians retain the right to gather wild plants, hunt, and trap for tribal use based on various treaties, legal proceedings, and cooperative agreements with the USDA Forest Service (USDA FS 2000d). These Bands have gathered special forest products in Wisconsin since 1995 using a tribal permit system, which includes permits for off-reservation natural resource harvesting within the National Forests for both tribal and commercial use.

The Federal Government has a special trust responsibility to Federally recognized Indians tribes. For the USDA Forest Service, trust responsibilities are essentially those duties that relate to the reserved rights and privileges of Federally recognized Indian tribes as found in treaties, executive orders, laws, and court decisions that apply to the National Forests and Grasslands. As affirmed by Federal courts, members of the tribes of the GLIFWC, as treaty signatories, retain the right to hunt, fish, and gather on lands ceded to the United States Government. These lands occur within the administrative boundary of the CNNF.

Indian tribes are the largest minority group in northern Wisconsin comprising approximately four percent of the population and a larger proportion of the population of some of the counties with National Forest land. The culture, or lifeway, of tribal members is dependent, in part, on hunting, fishing, trapping, and gathering of plants and animals. The natural resource needs of tribes cannot be met with the limited amounts of land on reservations. Some of the tribes have rights reserved in treaties with the federal government, which guarantee the authorization of hunting, fishing, gathering activities off-reservation on public lands. These rights exist on National Forest lands.

A number of Ojibwe tribes have tribal ceded territory rights to hunt, fish, and gather on the CNNF. These tribes are Bad River Band of Lake Superior Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of the Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community of the Mole Lake Band, Red Cliff Band of Lake Superior Chippewa Indians, Fond du Lac Chippewa Tribe, Mille Lacs Band of Chippewa Indians, Bay Mills Indian Community, Keweenaw Bay Indian Community, and the Lac Vieux Desert Band of Lake Superior Chippewa Indians.

2.4.2 Heritage Resources

An important aspect of culture involves preservation of historical sites that link present generations to past events, times, and people that have made significant contributions to human history. One of the goals of the USDA Forest Service is to "protect and restore heritage resources for the education and use of future generations" (USDA FS 1998d). Various laws, regulations, and executive orders also mandate the protection and management of heritage sites (USDA FS 1998d). Heritage resources are the remains of past human activity and can include archaeological sites and historic structures (USDA FS 1998d). Some remains are visible and others can be deeply buried or submerged in water (USDA FS 1998d).

As of 1993, the Wisconsin counties comprising parts of the CNNF contained between 51 and 300 known heritage sites per County except for Forest County, which has between 300 and 1000 known sites (USDA FS 1998d). The CNNF began actively inventorying heritage resources in 1974 (USDA FS 1998d). As of 1998, the CNNF had surveyed approximately 80 percent of the forest and found approximately 2100 heritage sites, ranging from 10,000 year-old campsites to 20th century homesteads (USDA FS 1998d). This survey of the CNNF produced over one-half of all known heritage sites in all of the 15 counties of northern Wisconsin. Archaeologists have found a wide range of cultural periods represented by heritage resources on the forest, including evidence of paleo-indian people (10,000 b.p.), archaic people (7,000 b.p.), woodland people (3,000 b.p.), unknown prehistoric people, historic American Indians (400 b.p.), and recent occupation by people involved in exploration, fur trade, the historic logging industry, forest management era, and settlement/recreation era (USDA FS 1998d). The largest percentage of archeological sites in northern Wisconsin is related to the historic logging industry, which is an important part of the culture

and history of people presently living near the CNNF. Many transportation structures, such as bridges and roads, can also be considered heritage sites depending on their age and historical circumstances.

Improved roads provide access to many of these important archaeological sites and historic structures. As a result, looting and vandalism are constant concerns. One national study performed in 1993 found at least $1.4 million worth of damage was done to heritage resources in the U.S. through looting or vandalism. In the last decade, there has been some damage from erosion, looting and vandalism to heritage sites on the CNNF (USDA FS 1998d). However, damage has been localized to a minimal number of sites and seems to be occurring less frequently in recent years (USDA FS 1998d). It is important to note that any ground disturbance associated with road construction, reconstruction, or obliteration activities, as well as installation and routine maintenance of utility cables, can potentially affect subterranean heritage resources. Thus, this roads analysis will identify known heritage resources potentially affected by road related activities in order to inform future forest planning activities.

2.5 Economic Perspective

The economic setting of the CNNF is rural in nature with an emphasis on natural resource based economies (USDA FS 2001d). Industries using forest commodities such as non-timber forest products and wood fiber dominate the commodity-oriented sector of the economy (USDA FS 2001d). Revenues from extraction of mineral products also contribute to the commodity-oriented economy. The non-commodity part of the economy is dominated by outdoor-based recreation and tourism and includes hunting and fishing revenues (USDA FS 2001d). The demand for special forest products (non-timber), timber, minerals, wildlife (for viewing, trapping, and hunting), and recreational characteristics, such as sense of wilderness and solitude, will continue to increase in the near future. All of these products/uses have economic benefits associated with them and are highly dependent on the presence of roads for access and extraction. Conflicts between traditional uses of forests, recreational demands, and concerns for natural ecosystem processes are intensifying and will continue to occur in the future and affect local economies (WDNR 1995).

2.5.1 Timber

Timber management is an important aspect of overall management of the CNNF. Timber supply, consumer demand, employment opportunities, and revenues paid to local governments are indications of the economic importance that timber extraction activities have on the CNNF (USDA FS 2000e). From 1986 through 1995, the CNNF provided nearly 1.4 billion board feet of sawtimber and pulpwood valued at $37.5 million (Haugen et al. 1998). During the last decade, demand for timber has risen dramatically with National Forest prices increasing more than seven-fold for some wood products (USDA FS 1998e). Constant price increases for both pulpwood and sawtimber are predicted for the northern U.S. from 2000 to 2040, and demand is also expected to increase for all types of timber products/groups provided presently by the CNNF (USDA FS 2000e).

During the period 1983-1995, the CNNF provided about 7.5 percent of all the timber harvested in Wisconsin (USDA FS 1998n). The CNNF is very productive land with an estimated 96 percent of all its forest lands having the potential to produce 20 or more cubic feet of wood per acre per year (Haugen et al. 1998). The economic value of timber is increased when the number of jobs provided by the forest products industry to the State is considered (Haugen et al. 1998). Sawtimber and pulpwood products from the CNNF help contribute to a statewide forest products industry that employs the second largest number of employees in Wisconsin (USDA FS 2000e).

Total revenues paid by the Federal government to local County and Township governments in Wisconsin have increased from about $1.1 million in 1991 to $2.1 million in 1997 (USDA FS 1998n). These payments are made to compensate local township and county governments for lands taken out of the property tax base. These funds also include 25 percent of gross Federal revenues received through activities that generate income on the CNNF, such as primarily timber sales (USDA FS 1998n). In 2000, $2.2 million was paid to local governments from the 25 percent Fund program alone due to increasing revenues from timber sales (USDA FS 2000g). Federal payments in lieu of taxes (PILT) to Wisconsin totaled an additional $350,894 in the year 2,000, with approximately $262,818 (or 75 percent) of these payments going to the 11 counties in which the CNNF lies (USDA FS 2000g). Thus, total revenues paid to Wisconsin from both the 25 percent Fund and PILT programs have increased by approximately $450,894 since 1997.

While Federal money generated from logging on National Forests is important to local communities, it is noteworthy that private landowners own 62 percent of all timberlands in Wisconsin with only 38 percent managed by public agencies (USDA FS 2000g). Of this publicly owned timberland, only 37 percent is managed by the Forest Service, 50 percent is managed by local counties, and 13 percent is managed by the State (USDA FS 2000g). Currently, Bayfield, Sawyer, Price, Oneida, Forest, and Ashland Counties, which all include parts of the CNNF, each support more than one-half million acres of timberland (Schmidt 1996). Bayfield County continues to be the leading county in Wisconsin in terms of total amount of timberland, managing 740,000 acres in 1983 and 772,000 acres in 1996 (Schmidt 1996).

Management of these County, State, and private industrial timberland properties for wood fiber products ensures that an ongoing supply of goods will be available in the local area in the future and that timber markets are not solely dependent on timber extracted from the CNNF (USDA FS 2001d). In addition, another source of wood fiber exists in numerous small, scattered parcels of private, non-industrial lands in the area that contribute to the local timber market (USDA FS 2001d). However, many local wood fiber industries within and around the CNNF are still partially dependent on sawtimber and pulpwood from the forest (USDA FS 2001d). Therefore, CNNF forest management activities, such as altering access routes and timber management practices, still have economic (and social) effects on local communities. Forest management practices and timber removal activities also have effects on non-commodity parts of the economy.

These non-commodity sectors are dependent on biological diversity, recreational experiences, and game and non-game animal habitats that drive local economies revolving around wildlife uses such as hunting, and bird watching.

2.5.2 Minerals

A *Resource Assessment on Mineral Resources* was performed by the Forest Service and published in 1998. Although specific information on annual revenues for mineral extraction on the CNNF is unavailable, annual revenues from mineral resources in the National Forests nationwide exceed $200 million. On the CNNF, approximately 1,472,000 acres of land are accessible to mining interests; however, 48,000 of these acres are removed from mining activities due to Congressional and Forest Service decisions. Mineral extraction from the CNNF comprises 34 percent of the Forest Service Eastern Region's hard rock activity (277 existing gravel pits) and 8 percent of its mineral materials activity. Mineral extraction will likely continue and increase in the future since approximately 90 percent of the minerals within the forest are presently accessible by road. The land base of the CNNF also has great hard rock potential (45 percent of land), oil and gas potential (12 percent of land), and mineral materials potential (over 95 percent of land), extraction of which has the possibility of generating significant economic benefits (USDA FS 1998m).

2.5.3 Special Forest Products

Demand for special forest products is expected to increase in the future. Thus, anticipated increases in demand and commercial sale of special forest products in the future offers potential diversification of the forest products portion of the commodity-oriented economy from its present reliance on timber and pulp. Special forest products are thought to be important in sustaining rural communities and contributing to their economic diversification (USDA FS 1998i). The present road system is vital not only in providing access for special forest product collectors, but also in determining which resources will be extracted from different areas of the forest.

However, local overharvesting of some special forest products near improved roads is seen as a potentially serious problem for the CNNF in the future (USDA FS 2000d). Special forest products such as club moss and American ginseng could be at risk in some areas of the forest due to developing commercial markets, and increasing tribal needs (USDA FS 2000d). This harvesting pressure could result in the need for temporary or permanent road closures in the future in order to protect a sensitive species of plant (or wildlife) and/or to allow time to investigate management alternatives to protect various species (USDA FS 2000d).

2.5.4 Wildlife

In 1996, 63 million people in the U.S. participated in wildlife watching activities either at their homes or away from home (USDA FS 2001a). More people travel each year in the U.S. to watch wildlife than to travel to all professional sporting

events combined (USDA FS 2001a). The USDA Forest Service estimates that 33.4 million visits were made to National Forests in 1994 just to view wildlife, resulting in $869 million in public benefits (USDA FS 2001a). Birders alone were estimated to have spent $5.2 billion in 1991 on goods and services related to bird feeding and watching (USDA FS 2001a). In Wisconsin, nearly one-half of the adult population surveyed statewide in 1990 said that they enjoyed some form of nature or wildlife activities during the last 12 months (USDA FS 2001a). Fifty-seven percent of respondents said that they had taken at least one trip away from home during the last year to view birds and other wildlife, with 28 percent saying they had taken four or more trips to view wildlife (USDA FS 2001a). Wisconsin was the fifth ranked state in 1991 in retail sales generated by "nonconsumptive bird use", with consumers spending an estimated $224.5 million (USDA FS 2001a).

The CNNF is also an important area for extractive or consumptive uses of wildlife. The forest appears to be an important source of raptors (primarily goshawks) extracted for falconry uses, with over 300 licensed falconers living in the Lake States (Wisconsin, Minnesota, and Michigan). Wildlife trapping serves as a source of secondary income for many local residents and continues to be an important part of tribal cultures. Wisconsin had almost 8,000 licensed trappers in 1996 and 1997, with 39 percent of trappers reportedly using most of the northern third of the State. The highest pelt price during these two years was $45 for bobcat and otter. Overall, Wisconsin trappers sold nearly 400,000 pelts valued at a total of $4.4 million during 1996 and 1997 (USDA FS 2001a). It is not known how much of this revenue from wildlife trapping is captured by local economies.

Hunting continues to be an important economic use of the CNNF. While participation in hunting in Wisconsin has generally decreased in recent years, expenditures by hunters and use of CNNF land have increased. However, a majority of hunters in Wisconsin continue to hunt on privately owned land. The entire forest is open to hunting and generally accessible by automobile or truck due to an estimated 10,000 miles of road. Five wilderness areas and 16 semi-primitive non-motorized areas make up 112,695 acres of the forest, but still contain old roads and over 500 miles of non-motorized trails, which provide additional access to hunters (USDA FS 2001a). The contribution of State hunting revenues to local economies is unknown.

Demand for fishing opportunities within the CNNF and State of Wisconsin are not well documented. In 1996, it was estimated that over 1.5 million people fished in Wisconsin. Sixty-four percent were residents and 36 percent were non-residents. Fishermen spent $1 billion in Wisconsin during 1996 on fishing expenses and sportfishing in Wisconsin created the equivalent of 30,410 full time jobs, $565 million in wages, $75 million in state tax revenue, and $61 million in Federal tax revenue. Resident fishing license sales in the 11 counties in which the CNNF lies accounted for 12 percent of total resident sales in the state. Non-resident fishing license sales in these counties accounted for approximately 24 percent of the statewide total. Together, resident and non-resident fishing license sales in the CNNF counties comprised 16 percent of all statewide fishing

license sales. The contribution of fishing revenues to local economies is unknown (USDA FS 2001a).

Although it is difficult to quantify economic benefits provided to local economies from consumptive and non-consumptive uses of wildlife, access to hunting, fishing, bird watching, and recreational areas of the CNNF is undoubtedly important in sustaining local community businesses that often revolve around tourism and recreation.

2.6 Political Perspective

In a speech announcing the Forest Service's Natural Resource Agenda for the 21st Century, Forest Service Chief Mike Dombeck said, "In order to keep our watersheds productive, we must work across fence lines in a voluntary and collaborative manner with other Federal, State, and interested private landowners" (USDA FS 1998a). In 1992, the Scientific Roundtable on Biological Diversity for the CNNF concluded that the future of biological diversity depends on regional planning efforts that coordinate land management across the landscape and various resource management agencies and ownership (Crow et al. 1994). The Roundtable scientists concluded that, except for fire control efforts, little formal coordination existed between the CNNF and other public resource management agencies, with even less coordination between public and private ownerships (Crow et al. 1994). Analysis of the present CNNF road system is an important step toward such a regional planning approach.

The CNNF land base is located within the northern portion of Wisconsin and has land holdings within eleven county boundaries, which include Ashland, Bayfield, Florence, Forest, Langlade, Oconto, Oneida, Price, Sawyer, Taylor, and Vilas counties. Within the county jurisdiction, there are 64 townships that also have local jurisdiction. They include Alvin, Argonne, Armstrong Creek, Barksdale, Bayview, Bell, Blackwell, Breed, Caswell, Chippewa, Chelsea, Cleveland, Clover, Conover, Delta, Doty, Draper, Drummond, Eisenstein, Emery, Fence, Fifield, Florence, Ford, Freedom, Gordon, Grandview, Grover, Hammel, Hiles, Hunter, Iron River, Jump River, Keystone, Lac du Flambeau, Lakewood, Laona, Long Lake, Marengo, Mellen, Molitor, Morse, Mountain, Namakagon, Phelps, Pilsen, Popple River, Port Wing, Riverview, Ross, Round Lake, Shanagolden, Spider Lake, Three Lakes, Tipler, Townsend, Tripp, Wabeno, Washburn, Washington, Westboro, Winter, Wolf River, and Worcester townships. The CNNF region includes a variety of cities that range in population. A few of the cities include Ashland, Bayfield, Crandon, Hayward, Medford, Mellen, Park Falls, Rhinelander, and Washburn. An overview of the CNNF is shown on Figure 1.

During 1999, the USDA Forest Service and ten of the tribes of the GLIFWC entered into a Memorandum of Understanding (MOU) that established standards by which the two parties will act consistently across National Forest lands within the areas ceded in the treaties of 1836, 1837, and 1842. This MOU is based on the principle of government-to-government interactions between the Untied States Government and the Federally recognized Indian tribes. It establishes a framework for a cooperative government-to-government relationship and recognizes the tribal exercise of treaty-protected ceded territory gathering rights.

Different landscape objectives and goals, such as maintenance and improvement of public access, creation of forest fragments of varying sizes, and consideration of watershed health in management, can be jointly met by providing for different needs across different public land ownerships. Meeting these needs depends on the degree of cooperation between agencies and across legal boundaries. For example, large, unmanaged tracts of land occur primarily on National Forest land, smaller unmanaged tracts exist on State forests, and even smaller natural areas exist in County forests, all of which provide habitat for different wildlife species (WDNR 1995). Thus, a regional planning approach could direct management of some larger forested tracts for area sensitive or edge sensitive species on Federal land, while retaining smaller tracts of land for edge species such as deer and grouse on State and County ownerships.

Roads vital to community access and local economies cross a variety of land ownerships (Federal, State, and County), and cooperative agreements could aid in maintaining key roads in light of declining agency budgets. This analysis will assist regional planning efforts to determine areas that would benefit from road rehabilitation, restoration, closure, construction, and jurisdiction changes, while taking into consideration the conflicting uses of roads and their environmental effects.