

**Turtle-Flambeau Scenic Waters Area**  
**MASTER PLAN**  
**&**  
**ENVIRONMENTAL ASSESSMENT**



**Wisconsin Department of Natural Resources**  
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**Final**

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# I. INTRODUCTION & EXECUTIVE SUMMARY

The Wisconsin Department of Natural Resources proposes to establish the Turtle-Flambeau Scenic Waters Area (TFSWA) in south central Iron County. In 1990 and 1991, the department purchased 22,343 acres of the Turtle-Flambeau Flowage bottom and surrounding shoreline for \$9.4 million. The department proposes to purchase an additional 20,386 acres of lands surrounding the flowage to protect, maintain, and enhance the TFSWA's scenic qualities, outstanding water and wetland resources, plant and wildlife communities, and diversity of outdoor recreational opportunities (see Figure 1). Subdivided lands or lands with significant capital developments will be excluded from the project. The estimated acquisition cost in 1995 dollars is \$4.5 - \$6 million. The projected annual tax payments to local government is \$192,357.

A primary objective of the master plan is to maintain the wild scenic character of the flowage shoreline and surrounding uplands. The master plan classifies project lands into five land use classification areas: Scenic, State Natural, Wild, Demonstration Management and Habitat Preservation. These areas will be divided into shoreline, viewshed and backland zones. The shoreline and viewshed zones will be managed to promote later successional species; the backlands zone will be subject to manipulation to encourage a diversity of habitats. The TFSWA will link surrounding federal, state and county conservation lands. The Wild Area and State Natural Area will complement a Wilderness Area designation and landscape-level old-growth patterns on other conservation lands east of the TFSWA.

The TFSWA Master Plan proposes to designate 60 developed island campsites, including two group sites and one site that meets Americans with Disabilities Act requirements. The department will maintain six boat access sites and develop a self-guided nature trail near Fisherman's Landing. The Deadhorse Lake Ruffed Grouse Management Demonstration Area will continue to provide public education opportunities. Secondary roads and trails will remain open to public foot access but will be closed to motorized traffic to reduce user conflicts and maintain a wild scenic character. The plan proposes to improve navigation at three bridge/culvert crossings by removing or upgrading the structures. Removal or burial of overhead utility lines will be encouraged where economically and environmentally feasible to enhance natural aesthetics. The plan will establish a "voluntary quiet area" on the eastern 1/5 of the flowage to provide a setting for quiet sports. It will encourage slow-no-wake operation of power boats but will not prohibit motorboat or snowmobile access on flowage waters. The estimated capital development cost for the TFSWA is \$336,651.

The annual cost of operating the TFSWA will vary depending on the intensity of management required during a given year. However, the projected average annual cost of operating the property in 1995 dollars is \$120,000.

## II. GOAL STATEMENT & OBJECTIVES

### *GOAL*

To preserve the scenic qualities of the Turtle-Flambeau Scenic Waters Area (TFSWA); protect plant and wildlife communities, especially endangered and threatened species; provide interpretive and educational information; and accommodate compatible recreational opportunities for the general public.

### *OBJECTIVES*

- Protect, maintain and enhance the generally "wild" and undeveloped scenic beauty of the 327 miles of flowage shoreline.
- Protect, maintain and enhance wildlife populations, with particular emphasis on rare, endangered and threatened species found in the TFSWA.
- Inventory, conserve and maintain those areas containing unique biotic communities.
- Maintain a quality fishery and fishing opportunities for the many anglers who visit the flowage annually.
- Maintain or enhance facilities for the diversity of outdoor recreational opportunities which are available on the flowage, including boating, canoeing, camping, hunting, trapping, nature observation, and snowmobiling.
- Provide recreational access for the elderly and people with disabilities.

### III. BACKGROUND INFORMATION

#### A. Regional History

Wisconsin's first settlers, Paleo-Indians, entered northern Wisconsin from the south or southwest approximately 10,000 years ago. Paleo-Indian sites in northern Wisconsin are rare and the probability of finding any archaeological sites within the Turtle-Flambeau Scenic Waters Area (TFSWA) is unknown.

Archaeologists refer to the various time periods the people inhabited a region as "cultures" and one "Old Copper Culture" site is located north of the flowage. By A.D.100, the "Hopewell Culture" brought distinctive artifacts and burial customs to Wisconsin. While no sites have been found near the flowage, it is likely that the Hopewell used the Turtle and Flambeau Rivers for transportation. The possibility of finding campsites on high, dry areas bordering the flowage is high.

By the middle of the 17th century, several indigenous groups resided in northern Wisconsin, including the Winnebago, Menominee and Santee Dakota. Nearby, the Huron acted as middlemen between the French fur traders and the people who collected the rich resources in Wisconsin. In 1649, the Huron were displaced by the Iroquois, and a massive westward movement of people ensued. The Chippewa, one of these new groups, settled in northern Wisconsin before the turn of the century.

The expansion of the fur trade stimulated travel throughout northern Wisconsin. In addition, disease and warfare produced a profound reorganization of population and tradition among native groups. Traditional routes through the north woods were expanded and permanent villages were established by major river or trail confluences. One primary transportation route from Lake Superior into the interior north woods circled the flowage area.

A major Chippewa village located near Mercer was seasonally occupied by the end of the 17th century and permanently occupied from 1763 to at least the reservation period. Local residents remember Chippewa camps near Mercer until the first decades of this century. The closest documented fur trade post was located on Flambeau Lake, approximately 20 miles south. Campsites for collecting and processing of fish, game, rice, maple sugar and possibly birch bark canoes probably existed within the flowage area. Since these camps would probably have been placed along major streams, flooding the flowage may have inundated some sites.

The depletion of animals and fashion changes in Europe ended the fur trade in the mid-19th century. In 1826, the Chippewa sold mineral rights to the United States government but retained land rights. In 1854, the Treaty of LaPointe gave the Chippewas a cash settlement of \$90,000 and three reservations. Two of the reservations, the Bad River and the Lac du Flambeau, are partly located in the same county as the flowage. The Chippewas also retained rights to collect food from surrendered lands, and they continue to travel to traditional hunting, fishing and ricing lands today.

With lands now available for development, the federal government, in 1854 and again in 1858, offered railroads inexpensive land to extend rail routes into northern Wisconsin. By 1880, rail lines reached north to Ashland and rail became an important commercial mode of travel in the wooded area.

In the early 1880s, iron mining became an important industry in Iron County. In 1882, Edward and John Hayes established the Germania mine on the Montreal River near Hurley.

The lumber industry, following close on the heels of the mining industry, largely shaped the history, growth and physical appearance of Iron County. As stands of pine trees in the central part of the state were exhausted, lumber interests looked for new resources. Simultaneously, new railroad lines made Iron County accessible for the first time and the mining boom created a demand for sawn timber to build mines and the towns that sprang up to support them. Sawmills were established at Van Buskirk, Gile and Park Falls. Logs from Mercer and Manitowish were floated down the Manitowish and Turtle Rivers, into the Flambeau River, to the sawmill.

Logging was a high volume industry and a good mill could require up to ten timbered acres a day. By the 1890s, most desirable pine trees had been cleared from Iron County. While considerable hemlock and hardwoods remained, these trees were too heavy to log by current methods. As smaller mills were established closer to areas of hardwood growth and railroad lines, hardwood logging became feasible on a moderate scale. Camps also became more mobile as rail cars increasingly housed various necessities, including the bunk house. This type of logging, only common in Iron County after World War I, ceased by the late 1920s.

Cash crop agriculture never reached significant levels in Iron County; at best, the logging camps and mines in the area created a demand for small-scale truck farming. Most farmers were forced to supplement their income by working in the mines or lumber camps in the winter. This dual economy allowed homesteaders to survive in the poor agricultural area. Some settlers turned to subsistence hunting and fishing to supplement a small garden plot. Wildlife in the area was sufficient to provide a constant source of food. Deer, grouse and fish were staples, while bear, beaver and muskrat were also available.

Hearty crops such as potatoes and rutabagas were grown in the area. Hay was also grown for livestock. By the 1940s and 1950s, most of the small, subsistence farms were either abandoned or absorbed by larger operations. Today, dairy farming, especially in more fertile northern Iron County, is the principal agricultural activity and most crop fields grow hay.

Unmanaged logging soon took its toll on the area. The vast barren areas were burned rather than replanted in the hopes of providing good farm land, but farming was clearly not destined to be a major industry in Iron County. The area was more suited for timber management. The Wisconsin State Legislature passed a law in 1927 providing aid and subsidies as incentives for counties to acquire tax delinquent parcels of land to reclaim the woodland and establish county forests. By 1933, over 22,000 acres of county land were entered under the county forest crop law in Iron County; since then, that number has grown to just over 170,000 acres. Today, Iron County forests are primarily managed for timber production as well as wildlife, recreation and watershed protection.

Although hunters and anglers came to Iron County since the early years of the 20th century, it was not until the 1920s and 1930s that they came in significant numbers. Previously, the difficulty of getting to Iron County meant that only the wealthier and more determined could--and would--make the trip. In addition, the first "resorts" were very rough. Little more than logging camps, most resorts were located near rail towns or along major water routes. Hunters and anglers came largely from Milwaukee and Chicago and stayed for a few weeks at a time. Local residents who could no longer find work in the disappearing lumber camps were hired as guides.

## **B. History of the Turtle-Flambeau Flowage**

The Turtle-Flambeau Flowage was created in 1926 by the Chippewa and Flambeau Improvement Company (CFIC) as a water retention reservoir to provide flood control and a dependable supply of water for down-stream hydroelectric generating stations. The creation of the Turtle-Flambeau Flowage and improved transportation significantly altered tourism in Iron County. The flowage flooded 16 named lakes and many acres of upland (Figure 2). Many early resorts were located in the area that is now flooded and were forced to move -- some to higher ground, others out of the area. As compensation for property lost during the land acquisition stage, property owners were offered money or land. Since most chose to take the cash settlement, the land along the flowage today is very sparsely developed.

The flowage, in turn, also attracted more tourists. What had been good fishing before became even better, and more people came to test the waters. In the 1930s, a large Civilian Conservation Corp (CCC) camp was established in the Mercer-Manitowish area (Camp 79S, Company 660). The CCC, along with the Works Progress Administration (WPA), cleared the land, improved and paved roads, and began to manage the remaining forest lands and replant areas that had been logged. This made the area more accessible and popular to tourists, and many new resorts opened to service them.

Over the years, these resorts have had many visitors, some of them notorious, adding some interesting fodder to the area's history. John Dillinger frequented the area. Al Capone, the Chicago gangster, fished in the flowage area many times, especially in the years after he was released from prison. Charlie Comiskey, founder of the White Sox baseball team, used Jerome's Hunting and Fishing Club on Trude Lake as a place for rest and relaxation for himself and his team.

## **C. Past Resource Management**

Management of Forest, Fish & Wildlife resources was limited from 1926, when the flowage was created, until the 1970's. Wildlife populations were managed from a statewide or regional perspective with no specific focus on the flowage or the immediate surrounding lands. Beginning in the 1950s, musky fingerlings were stocked in the flowage, but the first comprehensive fishery survey was not completed until 1975. A forest inventory of lands owned by CFIC was completed in 1974 and found that the majority of upland timber was mature aspen and white birch.

From time to time, water levels in the flowage have fluctuated widely. In 1943, 1947 and 1953, water levels dropped to reveal the original streams and lake beds.

In the 1950s and 1960s, efforts were made to direct campers to "designated" campsites and facilities by providing user conveniences such as toilets, drinking water wells, fire rings and picnic tables. However, there was no requirement that the developed sites be used and camping was allowed anywhere on Chippewa and Flambeau Improvement Company lands. Over 80 sites have been identified where camping has historically occurred. Undoubtedly there are other unidentified and seldom used sites. Most sites are on islands, but a few are located on the mainland. All sites are accessible by water.

In the early 1980s, the department became more actively involved in managing the flowage and surrounding lands. A "Turtle-Flambeau Flowage Management Plan," developed jointly by the department and CFIC, was completed in 1989. The plan addressed forestry, fish, wildlife, endangered resources management and recreational concerns. A recommended management and

development program was outlined and was the basis for management until the time the department acquired the flowage from CFIC.

In 1990 and 1991, the department acquired 22,343 acres of the flowage bottom and surrounding shoreline in fee from CFIC for \$9.4 million (Figure 1). The department purchased this land because of its significant resource value and because CFIC was considering selling the land on the open market.

## **1. Water Level Management**

The flowage was constructed to provide continuous water flow to the North Fork of the Flambeau River for downstream hydroelectric dams. The reservoir also provides flood protection to downstream areas. Since the Turtle Dam was built in 1926, the flowage has stored water during periods of heavy runoff and drawn down to supplement downstream flows when rainfall is lacking.

The normal full pool elevation of the flowage is 1,572.0 feet Mean Sea Level (MSL) datum. Two drawdowns occur annually. The first drawdown occurs during winter so that the reservoir is at its lowest level about the first of March. The winter drawdown is based on fall soil moisture conditions, winter frost, snow amounts in the upstream basin, and other factors. A level is sought that allows the reservoir to store spring runoff while refilling the reservoir and minimizing downstream flooding.

The second drawdown begins after the high spring flows have subsided and stream flows must be augmented to provide additional electrical generation to downstream hydroelectric facilities. Augmenting summer stream flows also aids recreational navigation and other downstream uses of the river. The summer drawdown is generally not as great as the winter drawdown and the extent of the drawdown depends on summer soil moisture conditions and rainfall. The summer drawdown generally begins in mid- to late June and is completed by about mid-September, when fall rains can again be stored and the reservoir filled.

Prior to selling the flowage property to the department in 1990, CFIC negotiated a memorandum of understanding with the department outlining the operating regime for the reservoir. The major principles of the agreement are as follows:

- a. Winter Drawdown** - Winter drawdown of the reservoir will occur annually and will not exceed 8 feet in depth (1,564.0 ft. MSL). Winter stream flows will not drop below 300 cubic feet per second (cfs) (November 20 - June 1).
- b. Summer Drawdown** - Summer drawdown of the reservoir will occur and will not exceed 1,568.0 ft. MSL. Summer stream flows (June 1 - November 19) will not drop below 300 cfs.
- c. Modification** - CFIC will begin refilling the reservoir following the winter drawdown earlier than in historical practice. CFIC shall attempt to refill the reservoir to a level of 1,571.5 feet MSL or more by April 20 each year or within one week after ice-out conditions are present on the reservoir, whichever is later. Such refill will normally be accomplished without lowering flow below 300 cfs.

## **2. Fish Management**

- a. Regulations** - Sport fishing regulations on the flowage have generally reflected statewide regulations. Until the late 1980s, statewide size and bag limit regulations were relatively

liberal to maximize angling opportunities. In recent years, public attitudes have evolved toward a desire for larger-sized fish and higher catch rates. This change is in part a result of declines in fishing quality brought about by increased pressure and habitat degradation.

In 1989, a 12-inch minimum size limit on largemouth and smallmouth bass went into effect in northern Wisconsin to improve bass fishing. This regulation is expected to increase the number of bass reaching 12 inches, but may not significantly increase the number of bass larger than 12 inches if harvest is significant.

In 1990, a statewide 15-inch minimum length limit for walleyes went into effect. Some waters were exempted from the size limit if they met certain criteria for slow growth rates or high mercury levels in fish. The flowage is exempted from the regulation based on slow growth rates.

In 1992, the minimum length limit for muskellunge was increased from 32 to 40 inches on the flowage. This regulation attempts to improve natural reproduction by allowing female muskellunge to spawn at least twice.

Two seasonal fish refuges have been established on the flowage to protect spawning walleyes: one at Siefert's Point in the Horseshoe Lake area, and the other at the inlet of the Turtle River below Lake of the Falls (Figure 3). These areas have particularly heavy concentrations of spawning walleyes in the spring. These areas are closed annually to all angling from April 1 through May 15 in order to protect spawning walleyes. An additional year-round fish refuge is established immediately below the Turtle Dam in order to protect fisheries from excessive exploitation.

**b. Treaty Fishery** - Federal court decisions in the 1980s, beginning with the Voight Decision in 1983, reaffirmed rights retained by the Chippewa in 19th century treaties to spear and net fish on waters within the ceded territory of northern Wisconsin. Spring spearing of walleyes began on the flowage in 1985. Since then, the flowage has become the largest provider of walleyes for the treaty fishery of any lake in the ceded territory, with annual spring spearing harvests as high as 6,056 walleyes (1988).

Guidelines for regulating tribal harvest were set in 1989. The federal court recognized spearing and netting as efficient harvest methods compared to sport angling, which must be regulated with appropriate safety factors to prevent over harvest. The current system sets tribal harvest quotas based on periodic walleye population estimates. Safety factors are in place to account for natural walleye population variability and the inherent inaccuracies of population estimates. For example, a population estimate is only considered reliable for quota-setting for up to two years. A regression model of lake size versus population size, which results in a more conservative tribal quota, is used after two years.

Appropriate measures are necessary to limit sport harvest on waters where the tribes declare their intent to harvest fish. This has been accomplished by reducing daily bag limits for sport anglers. Therefore, the flowage has had daily bag limits of either two or three walleyes (the state daily bag limit is normally five walleyes). Trude Lake has had daily limits as low as one walleye. It should be emphasized that reduced sport fishing bag limits are not a reaction to past over harvest, but rather are a preventative measure to prevent future over harvest. If the sport harvest is not reduced, total harvest (tribal + sport) could exceed a safe level and the fishery would be put at risk.

**c. Fishery Surveys** - Three comprehensive fishery surveys (1975, 1989 and 1992) have been conducted on the flowage. These surveys included walleye population estimates, season-

long creel surveys, and collection of data on other gamefish. The 1989 and 1992 surveys used standardized methods as part of the treaty fishery assessment program. The 1975 survey used different techniques and therefore the 1975 walleye population estimates may not be comparable to the 1989 and 1992 estimates.

From 1984 through 1992, annual fall electrofishing surveys were conducted on ten selected shoreline segments, or "index stations," on the flowage, primarily to assess annual changes in walleye reproduction. Other fishery surveys have been sporadic. In the 1980s, spring fyke netting was done during some years to collect information on size structure and growth rates of gamefish and panfish populations. In 1990, limited gillnet sampling of ciscos (lake herring) was conducted to collect baseline data on that species. In 1991, lake sturgeon were captured and radio-tagged as part of a study to assess the population that inhabits the flowage and the Manitowish River system.

**d. Stocking** - Fish stocking, an important tool in muskellunge management on the flowage, has generally not been necessary for other species. Muskellunge fingerlings have been stocked nearly annually since at least the 1950s. Small numbers of other species were stocked in the 1950s and 1960s, including walleyes in 1950, 1952 and 1956, smallmouth bass in 1951, and largemouth bass in 1963. Walleye fry were stocked in 1980, 1982, 1983, 1991 and 1992 because the flowage was used as a source of walleye eggs for a propagation program. It is department policy that at least 10 percent of the fish hatched are stocked as fry back into the water from which the eggs were collected. This generally amounts to greater numbers of fry than would have hatched and survived if spawn had not been removed from spawning walleye.

**e. Spawn Collection** - Walleyes are occasionally netted and spawned below Lake of the Falls, and the fertilized eggs taken to the Spooner Hatchery for hatching and rearing. The flowage has also been used during the 1980s and 1990s to collect sucker eggs. Suckers are propagated in a hatchery as a food source for young muskellunge.

**f. Other Fishery Benefits** - In addition to the sport fishing management, the department has a responsibility to consider maintenance of a balanced fish population for the benefit of all species that depend on the aquatic food web. In the flowage this is especially important for eagles, ospreys, loons, hooded mergansers, black terns and great blue herons. The high concentrations of these species is related to the abundance of all age classes, from young-of-the-year fry taken by small predators, up to fish as large as three pounds that can be taken by eagles.

## **D. Regional Analysis**

### **1. Surrounding Lands**

The Turtle-Flambeau Scenic Waters Area (TFSWA) is located in the north central portion of Wisconsin's northern forest region. The TFSWA is strategically located at the axis of several major federal, state and county land holdings, and industrial forests and tribal lands (Figure 1). These lands include:

**a. The Northern Highland/American Legion State Forest (NH/ALSF)**, a 220,000-acre tract that extends east and south of the flowage and covers a major portion of Iron, Vilas and Oneida Counties. The NH/ALSF was established in 1925 from government land holdings that date to 1904. The lands are managed for forest products, wildlife and recreation. The NH/ALSF has an estimated two million visitors per year. The 5,460-acre Manitowish Wilderness Area, one of four state-

managed wilderness areas, is located on the western end of the NH/ALSF along the Manitowish River and borders the TFSWA. A popular canoe route passes from the NH/ALSF through the Manitowish Wilderness Area to the flowage.

**b. The Lac du Flambeau Indian Reservation**, a 40,000-acre holding located southeast of the flowage. The lands are managed by the Lac du Flambeau Tribe and the Bureau of Indian Affairs for the benefit of the tribe. These lands have significant conservation benefits for the region. The tribe manages 126 lakes, a fish hatchery and forestry programs.

**c. Hundreds of acres of State Land Commission parcels** are also scattered southeast of the flowage. The lands consist of lake bed, wetlands and a few upland areas with poor or difficult access. These lands generally have limited forest products value but do have wetland, recreation and wildlife benefits.

**d. The Chequamegon National Forest** is located south of the flowage and encompasses approximately 845,000 acres. Forest lands immediately south of the flowage emphasize even-age management of aspen for fiber production, while providing recreation opportunities and wildlife habitat for game species. The forest accommodates an estimated 900,000 visitors per year.

**e. The Hay Creek-Hoffman Lake Wildlife Area** is an approximately 11,000-acre wildlife management and public hunting grounds directly southwest of the flowage. The Wildlife Area is actively managed for wilderness species such as deer, ruffed grouse and wildlife that prefer early successional forest types. Regeneration cuts favoring aspen reproduction are the principal management tool. Several large blocks of maple-basswood forest and many small blocks of large white pine and hemlock have been maintained. Several lowland hemlock and white cedar stands have been designated "no-cut." Eagle, osprey, and loons are also present. Motorized access is limited to preserve a more "wild" character.

**f. The Upper North Fork of the Flambeau River Natural Area**, west of the flowage, is a 1,114-acre strip of land 300 feet wide on each bank managed by the Flambeau River State Forest as a scenic river corridor. Principal recreational activities in this area are fishing and canoeing.

**g. Several large tracts of Iron County Forest land** are located north of the TFSWA. These tracts are managed to produce forest products and other benefits to the county. Recreational uses such as snowmobiling and hunting are common. Iron County also operates a public campground on the Turtle River arm of the flowage called the Lake of the Falls Campground that offers 25 campsite units with drive-up access to the sites.

**h. The Dead Horse Lake-Ruffed Grouse Demonstration Area and the Boot Lake State Wildlife Area** are within the proposed TFSWA boundary. These properties are managed by the department to demonstrate wildlife management techniques and protect wildlife habitat.

A combination of factors, including short growing season, high water table, generally poor soil, economic dislocation -- especially the great depression of the 1930s -- and recreational and forest industry economic factors, all contributed to the northern one-third of Wisconsin remaining forested. However, recent trends have combined to put renewed pressure on the northwoods landscape. These trends include second home development, rapid increase in retirees to the area, service industry development and increased recreational demands.

## 2. Social and Cultural Aspects

a. **Scientific, Historic and Archaeological Sites** - Few historical or archaeological sites have been located near the flowage. One "Old Copper Culture" site is reported north of the flowage. Historical records suggest that the Turtle and Flambeau Rivers were used for hunting and transportation for almost 2,000 years and there is a good possibility of finding archaeological artifacts in upland areas.

b. **Recreational Facilities** - Iron County has 55 restaurants and 114 lodging establishments. The county has over 63 miles of hiking trails and 19 campgrounds (Department of Development 1990). Visitors also use local trails, roads, and waters for snowmobiling, canoeing, nature viewing, mountain biking and hiking. Over 250 miles of groomed trails are available for snowmobiles.

Thirteen resorts are clustered in four locations around the flowage. The most popular recreational activities are fishing, boating, and camping. Boat landings are located at both public and private locations on the flowage. One public landing is maintained by the Iron County Forestry Department, and six improved public landings are managed by the state. Four unmarked, unmaintained landings are also located on the flowage. Sixty primitive campsites are located on islands and remote shoreline. A small 25-unit campground is operated by Iron County on the flowage.

c. **Local Institutions and Community Service** - Iron County has one savings and loan, three commercial banks or branches, and no hospital (Department of Development 1990).

d. **Population** - One of Wisconsin's least populated counties, Iron experienced a gradual decline in population over the last 50 years. From almost 10,000 in 1940, the population declined to 6,533 in 1970, in large part due to iron mine closings. Some population growth (3%) occurred to 1978. Between 1980 and 1990, the population declined 9% to 6,153, resulting in a density of 8.1 persons per square mile. The median age in the county, 42.1 years, is nine years older than the median age in the state (Department of Development 1990) and suggests that the area is attracting an increasing number of retirees. Recreation assets are now a factor in population growth.

Many Iron County residents do not stay year-round; over 37 percent of the county's 5,243 housing units is seasonal housing. More than half the people live in two cities, Hurley and Montreal. In 1990, the population of the town of Mercer was 1,425, the city of Hurley was 2,015, the city of Montreal was 887, and the town of Kimball was 499 (Department of Development 1990).

Three cities (Hurley, Montreal and Park Falls), one village (Butternut) and five unincorporated communities (Woodruff, Minocqua, Lac du Flambeau, Mercer and Springstead) are located within 30 miles of the flowage. Seasonal population estimates of Iron, Ashland, Price and Vilas Counties approach one million people.

e. **Aesthetics** - Iron County has some of the largest woodlands remaining in the Midwest. Miles of undeveloped shoreline on the flowage provide a unique outdoor experience. Despite intensive logging and fires early in the century, much of the flowage and its surrounding watershed remains relatively undeveloped forest or wetland.

The shallow water on the flowage limits some water sports, including water skiing, sailing and speed boating, preserving a "semi-wild" experience. In addition to the large reservoir, numerous lakes,

streams and rivers provide a variety of water-related "wild" type experiences. West of the flowage, the North Fork of the Flambeau River provides unique white water recreational opportunities.

**f. Land Use and Zoning** - Current county shoreline zoning requires that most permanent structures be located at least 75 feet back from the ordinary high water mark of navigable waters. However, there are a number of exceptions. Boathouses can be located within six feet of the shoreline; piers and boat hoists, including accessories such as lights, can extend into and over the water. In addition, current zoning allows clear cutting of trees and shrubs to within 35 feet of the ordinary high water mark, and 30 feet in any 100 feet of shoreline can be clear cut to the waters edge.

The department is currently developing forestry best management practices (BMPs) for water quality. These BMPs will be applied where applicable during implementation of the TFSWA Master Plan.

**g. Political Entities and Boundaries** - Iron County has two cities (Hurley and Montreal) and ten townships (Anderson, Carey, Gurney, Kimball, Knight, Mercer, Oma, Pence, Saxon, and Sherman). Hurley is the county seat. The flowage is located in the townships of Sherman and Mercer.

### **3. Economic Aspects**

**a. Tax Base and Expenditures** - In 1989, over six million dollars of property taxes were levied in Iron County, an effective 1989 per capita property tax of \$945 (compared to \$762 for the state). Almost 40% of total expenditures went towards education, 18% towards highways, 5% towards health, and 9% towards police and public welfare (Department of Development 1990).

**b. Employment and Income** - In 1991, Iron County's largest estimated aggregated employment categories were tourism (30.0%), government and household (19.6%), medicine (18.9%), manufacturing (13.8%), general service and trade (6.8%), finance/insurance/real estate (4.1%), agriculture and fisheries (3.1%), and forestry (timber) production and wood products manufacturing (3.7%). The forestry products industry is an important employment multiplier.

Trade, services and government provided almost \$20,000,000 of industry-derived income. Construction, manufacturing, mining, and transportation and public utilities provided just under \$8,000,000. Iron County's estimated median family income is \$19,800; adjusted per capita gross income was \$7,996 in 1991, compared to \$13,043 for the whole state (Department of Development 1990, State of Wisconsin 1993).

**c. Transportation** - U.S. Highways 2 (east-west) and 51 (north-south) are important industrial and recreational roads in northern Wisconsin. The county has more than 750 miles of paved highways, improved county and town roads, and forest roads. State Highway 182 is the main road south and county Highway FF is the main road north of the flowage. Popko Circle provides access to the flowage from the north, Murray's Landing Road and Flowage Road provide access from the east and south. Numerous smaller roads are located around the flowage.

The nearest rail service is located in the city of Park Falls. The closest airport with scheduled flights is in Ironwood, Michigan, and municipal airports are also located at Park Falls, Manitowish Waters and Woodruff. A private airstrip is located at Springstead. Saxon Harbor in the north provides access to Lake Superior.

**d. Agriculture** - Farming has decreased in the county over the last 50 years. Iron County now has 57 farms encompassing less than 3% of all land in the county (Department of Development 1990). There are only 10% as many farms as 1940 (Department of Development 1980). Today, dairy, cattle, and potato farms predominate and sheep raising is growing in importance.

**e. Industry** - As part of the "Iron Range," the county is named after what was once one of the area's main natural resources. The Carey and Montreal underground mines, both opened in 1886, were the last two mines to operate. Iron County's lumber operations helped fuel Wisconsin's early development and opened up the area to agriculture and settlement. Lumbering remains an important source of income for the area.

Despite substantial acreage covered by lakes and flowages, the summer resort business is modest compared to Vilas and Oneida Counties lying to the east. Nevertheless, tourism remains a major employer in the county. Springstead and Mercer, located close to the Turtle-Flambeau Flowage, have the heaviest concentration of resorts which serve hunters and anglers; major downhill ski areas are found in the Penokee and Gogebic ranges in northern Iron County and adjacent Gogebic County, Michigan. Winter sports, including snowmobiling, cross-country skiing and ice fishing, are growing in popularity and economic importance.

## IV. RESOURCE INVENTORIES

### A. Soils, Geology and Hydrology

Iron County is characterized by level to rolling topography, with large areas of swamp and marshlands. The Penokee Range, a continuation of the Upper Michigan Gogebic Range, extends forty miles into the county. Land area accounts for 473,470 acres (93.9%) and water accounts for 30,723 acres (6.1%). Iron County has four of the thirteen highest points in the state and extensive deposits of low-grade iron ore (taconite).

The flowage lies within the glacially created Superior Highland Province. A large quantity of glacial outwash and ground moraine remained after the last glacial advance. Stratified sand and gravel was also discarded by the glacier's meltwater streams. The region's irregular rolling topography and sandy soils, including the flowage's convoluted shoreline and many islands, are a result of this glacial activity.

The flowage is located at the top of the Chippewa River watershed at the junction of the Turtle and Manitowish Rivers. The flowage was created by flooding lowland wetlands, forests, 25 miles of river, and 16 smaller lakes totalling 1,476 acres. The uplands are gently rolling to hilly, approximately 1,572 to 1,680 feet above sea level. The flowage is surrounded by almost 14,000 acres of wetlands. The surrounding lands are generally low-lying, with the exception of higher ridges on the southcentral and northwest part of the flowage, including Big Island.

Field observation indicate geologic and soil variations, from ledge rock, mixed glacial till to pure sand pockets. Upland soils around the flowage are a complex of three soils: organic, silt loam (Champion-Padus) and sand (Vilas Series). Silt loams, underlaid by several feet of sandy loam, have moderate to severe erosion potential and the steepest slopes (6-20%). Sand soils are excessively drained with low fertility, low available water capacity and generally located on moderate slopes (0-3%). Alluvial soils, composed of undifferentiated material, are well drained to somewhat poorly drained. Randomly located organic soils are level and poorly drained. Because these soils have high water table and/or peat content, they are susceptible to rutting, often have development restrictions for logging roads and access trails, and possess low load bearing strength. Shorelines and islands on the flowage, especially those exposed to strong waves, are subject to wave action erosion.

The flowage averages 8 to 10 feet deep and includes approximately 327 miles of convoluted shoreline and 314 islands, landscape irregularities formed when the continental ice sheet covered the area. In surface area, the flowage is Wisconsin's seventh largest body of water. The flowage is fed by three major inlet streams, the Turtle River from the north and the Manitowish and Bear River from the east. One minor watershed, the Little Turtle River, and three feeder streams, Four Mile Creek, Otter Creek and Beaver Creek, also feed into the flowage. The North Fork of the Flambeau River is the outlet. Groundwater is relatively high near the flowage. Wetlands play an important role in groundwater recharge.

The flowage has a maximum depth of 50 feet. Water clarity is light brown with an average Secchi disc reading of 64 inches, pH of 7.65 and total alkalinity of 30. The Manitowish River has an average depth of 1.5 feet, a gradient of 2 feet per mile, an average width of 89 feet, light brown water clarity, pH of 7.6 and total alkalinity of 41. The Turtle River has an average depth of 2 feet, a

gradient of 3 feet per mile, an average width of 117 feet, light brown water clarity, a pH of 7.6, and a total alkalinity of 45.

The department has designated the Turtle-Flambeau Flowage, Trude Lake, and the North Fork of the Flambeau River as "Outstanding Resource Waters" and the Manitowish River as an "Exceptional Resource Water" under Chapter NR 102 of the Wisconsin Administrative Code. See Table 6 for more information about surface waters within the project boundaries.

## **B. Wetlands, Wildlife and Endangered Resources**

### **1. Wetland Resources**

The wetland communities found within the proposed TFSWA project boundary (Figure 4) include bogs, emergent/wet meadow, aquatic beds, scrub/shrub and forested wetlands.

A patterned bog (patterned peatland), made up of several wetland communities, is found adjacent to the Boot Lake Wildlife Area, east of the flowage. Common in Canada and northern Minnesota, they are extremely rare in Wisconsin. This complex bog community includes water tracks, sphagnum lawns and discrete areas of larger trees. Emergent vegetation in adjacent wetlands is characterized by cattail, bulrush, horsetail, sedges, sphagnum moss and various bog shrubs. Submergent vegetation includes pond weed, coontail, burr reed and musk grass.

### **2. Rare, Threatened and Endangered Species**

The flowage has the largest concentration of bald eagles and osprey breeding pairs in Wisconsin. Osprey, abundant in the 1920s to 1950s, dropped to 15 pairs in 1967 and a low of seven to eight pairs in the early 1970s. Osprey have recovered to 22 active pairs and are stable. Bald eagles have increased from three to four pairs in the 1970s to 10 pairs in 1991. Eagle and osprey appear to be stable and at maximum sustainable numbers.

Eagles and osprey are the dominant raptors on the flowage. Eagles scavenge for dead fish and hunt for larger live fish, especially suckers, bullhead and northern pike. Larger fish are important in the eagle diet because they are easy to scavenge. Osprey feed almost exclusively on live fish, especially panfish, with an average size class between six and eight inches. These panfish include perch, bluegill, crappie, and small- and medium-sized walleye and northern pike. Osprey thrive on the abundant fish and shallow waters of the flowage. Loons, also present on the flowage, eat small fish and crustaceans.

Moose, rare in Wisconsin, have been observed on or near the flowage in recent years. Unconfirmed sightings of timber wolves, once common in Iron County, have occurred near the flowage. Merlins, first found nesting on the property in 1990, have increased in numbers. Single common terns have been seen during three different years. Black terns are a "Species of Special Concern" in Wisconsin; 40-60 terns in three stable colonies are known to exist. The TFSWA may provide future habitat for resident wolves, moose, pine martin and common terns.

The TFSWA has suitable habitat for other endangered and threatened species of wildlife not yet documented on the property. These include lynx, red-necked grebe, Blanding's turtle, wood turtle, western ribbon snake and Tremblay's salamander.

At least three plant "Species of Special Concern" are found in the patterned bog community: dragon's mouth orchid, white bog orchid and sparse-flowered sedge.

### **3. Game Species and Other Furbearers**

White-tailed deer, black bear and ruffed grouse are more abundant now than prior to occurrence of the original logging. This plan will maintain these species at moderate levels. Carrying capacity for deer will be about 15 per square mile, which is the current management goal for this area. Furbearers present in the TFSWA include bobcat, raccoon, fisher, otters, muskrat and mink.

### **4. Non-Game Species**

Surveys show 124 different species of birds, 20 species of reptiles and amphibians, and 29 species of mammals occur on the property (Table 3, Table 4 and Table 5). No historical data exists prior to the creation of the flowage, but information on the forest communities present at the time indicate there is more variety of wildlife presently than at historical times. This variety will be maintained by managing early successional aspen forests while also managing for communities present during historical times, such as old-growth stands of pine and northern hardwoods. Reptiles and amphibians should increase with the rise in woody debris and forest floor habitat.

The flowage has the largest breeding population of common loons in Wisconsin. Common loons are stable at 20-21 pair since 1981, and appear to be at maximum allowable numbers.

## **C. Fisheries and Other Aquatic Resources**

The flowage supports a fairly complex fish community and fishery (Table 2). The current fish species assemblage in the flowage is largely a function of the habitat types that are present as well as the water level regime. The fish community evolves naturally as a flowage ages and, for example, as the woody cover gradually deteriorates or available nutrients decline from the high levels present in a new reservoir.

**a. Walleye** - The current habitat in the flowage and Trude Lake favors a fish community with walleyes as the dominant predator. An abundance of clean gravel and rubble shoreline is available that provides ideal walleye spawning habitat, and the two main rivers entering the flowage also have important spawning areas. In the Manitowish River, walleyes from the flowage spawn at various locations along the river where gravel is available. The largest single concentration of spawning walleyes occurs at the Turtle River inlet immediately below Lake of the Falls.

The abundant spawning habitat results in high levels of walleye reproduction and recruitment compared to most other waters in northern Wisconsin. Reproduction has never been a limiting factor, and has usually been very high.

The flowage is dominated by small and intermediate size walleyes but has few large fish. The walleye population in the flowage is heavily dominated by fish under 18 inches. In spring 1992 fyke net samples, less than 12 percent of adult walleyes were 18 inches or larger, and only 3.5 percent were 20 inches or larger.

Walleye population estimates done in spring of 1992, for adult fish 11 inches and larger, were 5.3 per acre for Trude Lake and 4.6 per acre for the remainder of the flowage. These estimates compare

with an average of 3.9 adult walleyes per acre on all walleye lakes in the ceded territory where estimates were done from 1980 through 1989.

Typical of populations with high recruitment, the walleyes in the flowage have relatively slow growth rates due to competition. The size structure of the adult stock is heavily dominated by fish under 18 inches.

Anglers on the flowage during the 1989-1990 season harvested a total of 32,703 walleyes. Open-water anglers harvested 261 walleyes averaging 15.0 inches on Trude Lake and 30,913 walleyes averaging 13.9 inches on the remainder of the flowage. Ice anglers on the flowage harvested 1,529 walleyes averaging 16.2 inches.

Also typical of waters with high walleye reproduction and recruitment, walleyes in the flowage, simply due to their sheer numbers, have a controlling influence on other species, especially panfish. Panfish and other prey populations in the flowage are kept at relatively low levels, apparently due to heavy predation by the abundant walleyes. The younger age classes of walleyes, due to their higher relative abundance, probably have the greatest impact on prey populations. As a result, few panfish survive their first year of life, but those that do survive grow well and often reach large sizes. The panfish harvest in the flowage consists of mostly larger fish; black crappie and yellow perch are the most numerous species, followed by rock bass, bluegill and pumpkinseed. Panfish fishing success, however, is often inconsistent because of their relatively low numbers.

**b. Northern Pike** - Northern pike are an abundant predator in the system. Population estimates in 1975 ranged from 1.6 to 2.5 per acre. Pike very rarely reach large sizes in the flowage. The 1989-1990 harvest of nearly 7,000 fish averaged just over 18 inches in length. Only one pike over 30 inches has been captured in all fishery surveys from 1984 through 1992. The near total absence of larger pike is probably habitat/food related rather than harvest related.

**c. Muskellunge** - Muskellunge, though they are present in relatively low numbers, provide a popular trophy fishery. Anglers in 1989 caught an estimated 494 muskellunge, of which 85 fish averaging 40.7 inches were harvested. Due to their low numbers, no estimate of muskellunge population size has been attempted. Natural reproduction of muskellunge has declined to very low levels, resulting in a fishery that is almost totally dependent on stocking. Stocking of surplus muskie fingerlings several times during the late 1980's may have made an impact, as anglers have reported having improved fishing action by smaller muskies.

**d. Smallmouth Bass** - Surveys have not targeted bass populations, but by all indications smallmouth bass populations have increased in recent years and average size improved significantly between 1989 and 1992. In 1989, the first year of the 12-inch minimum bass length limit, the 1,712 smallmouth bass harvested on the flowage averaged 11.2 inches. The 1992 average length was 13.2 inches.

**e. Lake Sturgeon** - The lake sturgeon population appears to be reduced to relatively low numbers of large, old fish, with no evidence of recruitment occurring in the system. Four individuals that were captured in 1991 in the Baraboo Lake area of the flowage measured 66, 66, 68, and 77 inches in length. These fish apparently run upriver to spawning areas in the Manitowish River above Benson Lake in Vilas County, based on the movements of a radio-tagged fish from the flowage, as well as observations of other sturgeon in the Benson Lake area. Sturgeon have been observed in the Bear River it is likely that they are from flowage populations. Reasons for the lack

of reproduction are not understood at this time, but this population may eventually disappear if rehabilitation efforts are not successful.

f. **Lake Herring** - Cisco (lake herring) are present in relatively low numbers in the flowage. They are generally confined to the deeper lake bed areas. Gill netting in 1990 and 1991 confirmed their presence in Trude, Baraboo and Merkle Lakes, with fish ranging from 7.6 to 16.5 inches. Anglers have reported catching ciscos from Blair Lake also. Habitat conditions are probably marginal for ciscos in the flowage, as in summer the fish are limited to a narrow zone of depth where temperatures are cool enough and oxygen levels are adequate.

## **D. Forest Resources**

Iron County is one of the most extensively forested areas in Wisconsin. Common tree species include aspen, maple, spruce, balsam fir, pine, yellow birch and basswood.

Upland forests near the flowage are characterized by aspen/birch, northern hardwood/conifer mix (including maple, basswood, balsam, hemlock, and spruce), oaks (red and white), and red and white pine (Figure 4). Evergreen trees, evergreen shrubs, sphagnum moss, and slow decomposition rates are characteristic of the acidic and nutrient poor bogs. Hemlock, once common, is now limited but is valuable to wildlife.

Up until the early 1900s, large white and red pine dominated the TFSWA. After the area was logged, large fires swept through, encouraging aspen growth. Since then, the area has been primarily managed for aspen.

The predominance of aspen and birch account for the relatively abundant populations of deer and grouse. Aspen comprises only 20% of the surrounding forest types, but the TFSWA is comprised of 50-60% aspen-birch types.

Northern hardwoods comprise approximately 10% of the forest lands in the TFSWA. The northern hardwoods are concentrated south of Popko Circle, the south half of Big Island, and north of the dam on the west side of the flowage. Small scattered stands exist throughout the TFSWA property. Red oak exists in scattered patches in these northern hardwood stands.

A system for classifying land based on ecological characteristics is currently being developed for northern Wisconsin. The system, called the National Hierarchy of Ecological Units (NHEU), describes the landscapes (regions) of an area based on site-specific climate, soil, landform and vegetation characteristics. The NHEU, which can be used to place an area within a wider regional or state-wide context, will be applied to the TFSWA project area.

## V. PROPOSED MANAGEMENT & DEVELOPMENT PLANS

### A. Project Boundary, Land Acquisition and Ownership Goals

The proposed perimeter boundary for the Turtle-Flambeau Scenic Waters Area (TFSWA) will encompass approximately 48,941 acres. Approximately 26,689 acres are currently owned by the state. An estimated 1,336 acres of subdivided private lands or private lands with capital developments and 530 acres of other public and private lands are within the boundary but are not proposed of acquisition. The owners of the 20,386 acres of proposed acquisition lands will have the option to sell to the state. Current landownership is delineated on the project boundary map (Figure 1).

Current landownership within the TFSWA project boundary is as follows:

<u>LANDOWNERSHIP</u>	<u>AREA (acres)</u>	<u>PERCENT</u>
<b>Land Not Included in Acquisition Costs</b>		
State-Owned Lake Bed	14,188	29.0
Existing Ownership (1990)	11,897	24.3
Private Non-Acquisition Lands	1,336	2.7
Other DNR Land	565	1.1
Township	194	0.4
Iron County	144	0.3
Dike (NSP)	135	0.4
Dedicated Conservation Lands	57	0.1
Department of Transportation Lands	39	0.1
Total Non-Acquisition Lands	<u>28,555</u>	<u>58.4</u>
<b>Land Included in Acquisition Costs</b>		
Private Lands	12,183	24.9
Private Industrial Forest	5,782	11.8
Wisconsin Land Commission	1,829	3.7
Private Lake Bed	592	1.2
Total Acquisition Lands	<u>20,386</u>	<u>41.6</u>
	=====	=====
<b>TOTAL LAND OWNERSHIP</b>	<b>48,941</b>	<b>100.0</b>

The proposed TFSWA boundary will encompass over 13,400 acres of wetlands as well as other important tributaries that provide filtering, water retention, habitat, and other functions important to protect the flowage's water quality and fish and wildlife populations. The new boundary will also help to preserve the scenic quality of the flowage and maintain and enhance public recreation opportunities.

The proposed property boundary will reduce opportunities for development and intensive land use which would negatively impact wildlife species. The new boundary will also link several major adjacent public properties (see Regional Analysis, page 10) and provide landscape-scale management opportunities for early successional, northern hardwoods, and old-growth communities through the proposed vegetative management.

There are 14,780 acres of surface waters within the project boundary, including the flowage (13,849 acres), 23 other small named lakes, and six named streams (see Table 6). The project is bounded on the north and northwest by county trunk Highway FF and Iron County Forest lands, on the east by Northern Highland State Forest, on the southwest by Hay Creek-Hoffman Lake Wildlife Area, and on the south and southeast by the Chequamegon National Forest, private lands, and state Highway 182. The Upper Flambeau River Natural Area encompasses the North Fork of the Flambeau River, where it discharges from the flowage.

The department already controls most land rights on the flowage bottom except easements and reservations listed on deeds and other recorded documents. Sixty-four easements currently exist on state land around the flowage and cover road, driveway, utility and mineral rights. A preliminary check on the department's existing ownership show mineral claims on 6,080 acres, mostly by the Wisconsin Central Railroad and Cornell University. The mineral claims are typical of land titles in much of northern Wisconsin.

There is no specific timetable for land acquisition. The first priority will be to acquire lands within the flowage viewshed. Priority will also be given to acquire remaining private lands in the Dead Horse Lake-Ruffed Grouse Demonstration Area, in areas delineated as containing significant "natural area" features, and habitat deemed important to endangered species. All acquisitions will be from willing sellers only.

The department proposes to combine three existing projects and parts of two properties and their associated acreage goals: the entire Boot Lake Wildlife Area (995.76 acres), the entire Flambeau Flowage Public Access (Springstead Landing) (8.00 acres), the entire Sardine Lake Fishery Area (west half of Mirror Lake) (40.00 acres), part of Scattered Forest Lands Project (east half of Mirror Lake) (43.95 acres), and the state owned island in Sand Lake (3.00 acres), for a total of 1,090.71 acres and incorporate them into the Turtle Flambeau Flowage Scenic Waters Area.

## **B. Land Classification**

All lands that will potentially be managed by the department in the TFSWA are classified into the department's Uniform Land Use Classification System (from the *1983 Master Planning Handbook*). See Figure 5 for the location of these proposed areas.

The purpose of this classification system is to help to describe the primary management focus for various areas within the TFSWA.

### **1. Resource Protection**

With the exception of habitat preservation areas, resource protection areas are those tracts of land or water where human influences are minimal and significant natural resources are prevalent. Management activities in these areas emphasize the maintenance of natural conditions with a minimum of human intervention and limited development.

**a. Scenic Areas** - A 300-foot strip of land along the entire shoreline (including islands) of the Turtle-Flambeau Flowage, and the entire shoreline of other navigable waters within the project boundary, will be classified as scenic area. Any other areas outside this 300-foot strip which are visible from the flowage are also considered to be part of the "viewshed" and will be classified as scenic area. A strip of land measuring 150 feet in width along either side of all public roads will also be classified as scenic area.

**b. State Natural Areas** - Several areas have been identified as having native biotic communities or other natural features which are relatively undisturbed and which provide opportunities for nature study, education and aesthetic appreciation. Natural physical and biological processes will operate in these areas with a minimum of human intervention. The largest State Natural Area designation (patterned bog site) will complement the proposed Wild Area and existing Manitowish River Wilderness Area in the Northern Highland-American Legion State Forest.

**c. Wild Area** - An area on the east side of the flowage will be managed for its natural characteristics. The Wild Area will be located next to the Manitowish River Wilderness Area in the Northern Highland-American Legion State Forest. Forestry practices will be limited to managed old-growth types. Selection cuts in order to maintain a "wild" quality will be permitted. The Wild Area will have many characteristics similar to a Wilderness Area, but some selection cutting will be allowed. No clear cutting will be allowed. Before any management activities occur in this area, the District Director and Division Administrator will approve an implementation plan that outlines under what conditions specific management activities will be used in this area.

**d. Habitat Preservation Areas** - Most backlands within the project boundaries will be managed to preserve a diversity of habitat types. Regeneration and final harvest cuts will be allowed as needed to maintain the existing aspen, red pine and oak types, but with certain restrictions designed to minimize adverse impacts on forest aesthetics. These restrictions include the following: Aspen will be allowed to reach "old age" before it is harvested (maximum rotation); no regeneration cuts will exceed 40 acres in size; regeneration cuts will be set up with irregular boundaries; and slash will be reduced so that it does not exceed two feet above the ground.

## **2. Resource Development**

Resource development areas are those areas where intensive forest management practices and other habitat manipulations are used to promote desired fish and wildlife species or which are used to test new or experimental resource management methods.

**a. Demonstration Management Area** - The project includes the Dead Horse Lake-Ruffed Grouse Demonstration Area (Figure 5). This project is funded by the Ruffed Grouse Society and administered by the department to demonstrate management practices best suited to ruffed grouse production.

## **C. Vegetative Management**

A primary goal of the TFSWA project is to preserve the "wild" scenic character of the flowage. The TFSWA will be managed to achieve wildlife and aesthetic objectives. The role of forest management on the property will not be timber production, but to facilitate these aesthetic and wildlife management objectives.

The National Hierarchy of Ecological Units (NHEU) and Kotar Habitat Classification System will be used to identify ecological capabilities of upland sites within the TFSWA boundary. This information will assist managers to more effectively identify sites on which specific plan objectives can best be met. In general, the tool suggests that the western half of the TFSWA is well suited for northern hardwoods and the eastern half is well suited to pines, but specific conditions will vary depending on the ecological capabilities of each site. Vegetative management prescriptions will be based on information derived from the Habitat Type Classification System.

Project lands have been divided into three distinct vegetative management zones: shoreline, viewshed and backland. The shoreline and viewshed zones are classified as Scenic Areas (Figure 5). Vegetative management is restricted in the Natural and Wild Areas and contributes aesthetic value.

## **1. Shoreline Zone**

A "no-cut" zone will begin at the water's edge and extend inland 300 feet on all navigable waters within the TFSWA. This area will provide large trees for aesthetics and for a wide variety of wildlife that use this habitat. Exceptions to the no-cut policy in this zone include limited cutting to maintain campsites, lake access points, designated trails, existing utility rights-of-way, and existing wildlife openings.

Tree planting may be conducted along some shoreline areas to expedite natural succession. In addition, in areas where white birch is prevalent but dying or dead, trees such as white pine, red pine and/or red oak will be planted in natural openings and in a scattered fashion to accelerate natural processes towards later successional types, depending on the ecological suitability of the site. The white pine will provide future nesting sites for eagles and osprey.

With natural succession, trees will be allowed to reach old age, die, fall over, decompose and regenerate. In time this area may have a sparse understory because little light reaches the forest floor in a mature forest. When trees fall over naturally, a canopy opening is created allowing an understory to develop. Wildlife and fish habitats will be enhanced through this process. In the event of a natural disaster (e.g., tornado or insect infestation) the trees will be left lying and not salvaged or cut.

## **2. Viewshed Zone and the Wild Area**

Any areas outside the shoreline zone which are visible from the flowage (i.e., treetops visible in any season), as well as a strip of land extending 150 feet on either side of all public roads, will be managed with primary consideration given to aesthetics.

In the viewshed zone and the Wild Area classification, only selection or salvage harvests will be allowed. Selection thinning is a management technique appropriate for managed old-growth on suitable sites. Old-growth forest stands generally are characterized by a multi-layered, multiple age and size class structure, and significant amounts of woody debris and tip-up mounds.

The aspen/white birch areas will eventually be lost as a result of selection thinning. As these stands mature, they will eventually fall down and, depending on the ecological capabilities of the site, progress towards red maple and fir/spruce. This conversion will occur over the next 40 to 80 years, depending on the area of the flowage. Red maple and fir/spruce are not as productive as aspen/white birch for wildlife or timber but may be more valuable aesthetically. Fir/spruce forests do provide thick cover for ruffed grouse, red squirrels, pine martin, fisher and deer.

Some of the existing aspen/white birch sites can support red and/or white pine forest cover types. On appropriate habitat types, these sites should be planted to pine to provide the following: species diversity along the shoreline; a better opportunity for big-tree management; and when thinned, a brush understory valuable as wildlife habitat. Some super-canopy pine will be promoted and retained for osprey and eagle nesting trees.

### **3. Backland Zone**

Areas not visible from the water and more than 150 feet from public roads will be managed to promote a diversity of wildlife habitat.

The backlands consist of a variety of forest cover types: aspen and white birch, northern hardwoods, red oak, white and red pine, hemlock-hardwood, fir-spruce and swamp hardwood. Only winter logging will be allowed in eagle and osprey nest territories and erosion-sensitive areas.

The following timber types will be maintained and/or encouraged on those sites where, according to the Habitat Type Classification System, the type can effectively be maintained or encouraged and is consistent with the objectives in the zone. Management prescriptions will be based on the ecological capabilities of each site, not on the existing vegetation types.

**a. Aspen and White Birch** - Aspen will be retained for its wildlife benefits through regeneration cuts (including clear cuts). The department is experimenting with a variety of techniques to regenerate aspen, including small clear cuts, shelterwood, and other techniques. These techniques will be used in the TFSWA, although clear cuts will be limited to a maximum of 40 acres at any one location.

Aspen is a short-lived tree and requires full sunlight to regenerate. Aspen is considered old after 60 years. To maximize the benefits for wildlife, the aspen will be managed for maximum rotation while maintaining vigor for sprouting. Ironwood, cherry, oak, and scattered pine and hemlock will be kept for additional wildlife benefits.

White birch stands will be difficult to manage due to stress from previous drought years, and attacks by birch leaf miners and bronze borers. Birch stands may disappear even with attempts to retain them. Birch will be retained as long as possible for its scenic values. Successional processes will lead to conversion to northern hardwoods or pine, depending on site conditions.

**b. Northern Hardwood** - Northern hardwood stands (including sugar maple and basswood) will be managed through an uneven-aged system using selection harvests. To maximize benefits for wildlife, 4-5 den trees per acre are left standing. Valuable food trees such as cherry, oak and ironwood will be left uncut. Thinning will occur and benefit wildlife by allowing sunlight to reach the forest floor to promote growth of the understory for cover and browse. Non-commercial thinnings may include girdling to promote standing, dead and snag-trees for woodpecker, small mammal and songbird habitat.

**c. Red Oak** - A limited number of red oak stands are scattered on the north side of the flowage and on Big Island. Red oak is a valuable food source for numerous wildlife including squirrels, deer, bear, grouse and bluejays. On appropriate sites, red oak will be maintained through clearcutting, clearcutting with leaving red oak seed trees, or shelterwood harvests. Controlled burning or other appropriate techniques may be used where feasible to promote and maintain these stands.

**d. White and Red Pine** - There are several small scattered areas of white and red pine on the property. Both species of pine are amenable to big tree management. Stands with an understory of pine will have two options for management: one is to manage for the existing dominant overstory, the other is to allow the pine understory to become the dominant tree species by removing the overstory pine.

**e. Hemlock-Hardwoods** - Only a few scattered stands of hemlock-hardwood exist within the boundary and these will be maintained wherever site conditions allow. Hemlock, valuable as wildlife food and cover, can be difficult to regenerate because it requires disturbed soils and sunlight for good regeneration. Summer logging, thinning or controlled burning may be required to provide the necessary conditions for regeneration.

**f. Fir-Spruce and Swamp Conifer** - These trees provide wildlife habitat for snowshoe hares, fisher, pine martin and ruffed grouse. On occasion, the fir-spruce type also has a component of aspen as well and some of these sites may be more suited for aspen management.

**g. Swamp Hardwood** - This forest type is primarily black ash. Where feasible, this type will be thinned using a selection method. Swamp hardwoods have value to wildlife species and provide for diversity of forest types.

#### **4. Dead Horse Lake-Ruffed Grouse Demonstration Area**

The existing diversity of habitat types will be maintained in this area. Intensive silvicultural practices will be used to diversify aspen age classes. Wildlife habitat will be enhanced through limited tree planting (see page 27, "Special Management," for more information).

#### **5. State Natural Area**

This classification offers the highest level of protection. The existing habitat types will be managed with minimum human intervention to maintain examples of forest and vegetation types native to the area. Timber harvest will be prohibited.

The existing hydrology will maintain the patterned bog. The department will discourage activities that cause soil erosion and nutrient runoff from the uplands to minimize changes in the existing chemistry.

The remaining State Natural Areas contain examples of rare old-growth hemlock-hardwoods and white and red pine stands. Anticipated management includes prescribed burns or scarification to promote hemlock reproduction, which need sunlight to grow. Some of these stands will not remain viable as old-growth communities unless they are expanded.

#### **6. Fire Control**

Fire control is the responsibility of the department. All wild fires will be suppressed per state statute. Prescribed burns may be used to maintain openings and manage forest habitat.

## D. Wildlife Management

Emphasis on forest habitat will be the focus of managing a diverse group of game, non-game, rare and threatened wildlife species. This section addresses specific wildlife issues not covered earlier under vegetative management.

**a. Openings Maintenance** - Existing openings, except those in State Natural Areas, will be maintained where feasible. Openings in the shoreline zone will be maintained by hand clearing and controlled burns to retain unique wildlife and wildflower viewing opportunities, and to provide visual variety to the TFSWA (Figure 3). These shoreline openings may also be used for grazing areas by Canada geese. Openings in other aesthetics zones will be maintained by standard techniques, including hand tools, brush mowers, controlled burns, or certified herbicides where no suitable alternatives exist. Efforts will be made to convert non-mowable openings to mowable where feasible to reduce or eliminate herbicide use (e.g., Springstead Peninsula, areas adjacent to Hay Creek-Hoffman Lake Wildlife Area).

**b. Special Management: Dead Horse Lake-Ruffed Grouse Demonstration Area** - A 400-acre management demonstration area was established in 1986 in cooperation with the Park Falls Chapter of the Ruffed Grouse Society as a demonstration project for ruffed grouse habitat management. An agreement between the department, CFIC, and the Ruffed Grouse Society (RGS) was reached where CFIC provided the land, RGS provides the funds, and the department administers the management plan. This area will be expanded to 923 acres.

Dead Horse Lake-Ruffed Grouse Demonstration Area is an area where management practices are implemented that complement forest wildlife habitat, especially ruffed grouse. Within the demonstration area are areas which provide excellent grouse habitat. Also included are sites which demonstrate less desirable grouse habitat, but which provide other natural resource benefits.

Habitat management practices will be conducted in a manner and location that accommodates public viewing. Forest management practices such as regeneration cuts (clear cuts) will be used in this area to maintain and diversify the current aspen timber type. Red oak will be planted on suitable sites to enhance acorn production.

Other forest communities present in the demonstration area include large natural white pine, red pine plantations, upland openings, wetlands and northern hardwood. These types will be managed according to ecological capabilities of the site, including even-aged and short-rotation forestry practices, hunter walking trails and food patch development.

With an informational guide, private landowners, industrial forest owner and public land managers will be able to view a variety of wildlife management practices and successional trends in forests. Public education and enjoyment through access to the area and demonstrating silvicultural practices will be priorities on this project area.

**c. Hunter Walking Trails** - Hunter walking trails will provide non-motorized access to the property for hunters as well as other recreational users of the property. Hunter walking trails will be maintained only in conjunction with openings maintenance. Trails will be mowed once every 4-6 years. Potential exists to maintain up to 15 miles of hunter walking trails.

**d. Wild Rice Management** - Wild rice is an important wildlife food and provides food and income for humans. The flowage has limited existing wild rice beds which are sporadic in

production. Because of fluctuating water levels and generally unsuitable bottom types for wild rice, no intensive management is planned.

**e. Waterfowl Management** - Waterfowl numbers on the flowage peak during spring and fall migration and bird watchers and waterfowl hunters also peak during these periods. Breeding waterfowl occur in low densities. Large trees will provide natural cavity trees for wood ducks and hooded mergansers. Formation of tree cavities will also be accelerated by artificial means, such as tree borings and addition of microbes. The current nest box program, 200 boxes, will be phased out during the next 10 years.

There is limited potential for increasing the number of mallards, black ducks and teal, so upland nest habitat, brood rearing and feeding habitat limit duck population. Some wildlife openings maintained along the shore will provide potential grazing areas for Canada geese.

**f. Fisheries** - Fish populations play a major role in the current and future wildlife associated with the flowage. Osprey, bald eagles, common loons, hooded mergansers, pied-billed grebes, great blue herons, American bitterns, belted kingfishers, black terns, otter, mink and other wildlife rely on a stable, well-balanced fishery. The flowage provides abundant forage for fish, minnows and fingerling game fish, which is critical to maintaining current wildlife use. Therefore, no special management will be done to provide additional fish for predators.

**g. Wildlife Disturbance** - Black tern nests are vulnerable to human disturbance and wave action. If nest failure due to boat wakes or human disturbance becomes a problem, the area immediately around the black tern breeding colonies will be closed to all public access, and the department will encourage slow, no-wake motoring during nesting periods (April 15 to July 30). No roads, trails or campsites will be constructed within 1,320 feet of any tern colony. Logging within 1,320 feet of any tern colony will be limited to the period August 1 to March 15.

In order to reduce the need to close areas, brochures will be used to inform flowage users of activities which are harmful to wildlife.

**h. Driftwood Removal** - Driftwood provides insect habitat, resting places and hunting perches for wildlife, and scenic beauty to the flowage. Informational brochures will be provided to encourage flowage users to respect this valuable resource and to discourage removal of driftwood from the flowage.

**i. Purple Loosestrife** - Purple loosestrife, an exotic wetland plant which has the ability to out-compete native wetland vegetation, has been discovered on the flowage near Murray's Landing. Purple loosestrife provides few benefits to wildlife. All available methods will be used to control the spread of the plant because an invasion of loosestrife into the flowage would risk the loss of wetland values. Loosestrife control is nearly impossible once established, but is effective if started early.

The flowage and tributaries, including shorelines, mud flats and wetlands, will be inspected annually. Preference will be given to hand removal of scattered individual plants. Certified herbicide will be spot applied if hand controls are not effective. Biological controls, including insects, may also be used.

**j. Endangered and Threatened Species** - Osprey and bald eagles will be monitored through statewide surveys. Management goals are to maintain the current population levels, which are at or near capacity.

Osprey management will continue to provide artificial nesting platforms. Artificial platforms will be maintained as nest sites until natural nest sites can support the current population. Attempts will be made to design platforms that have a natural appearance. Proposed forest management in the shoreline zone will promote natural nesting sites for osprey and bald eagles.

Individual campsites may be closed if human disturbance adversely affects nesting success. Management activities near osprey and eagle nests will be restricted as outlined in department code.

Black terns, a "Species of Special Concern" in Wisconsin, are common on the flowage. Artificial black tern platforms will not be used unless current conditions change and suitable nesting sites become a limiting factor for survival of these tern colonies.

Common terns, a Wisconsin endangered species, have been observed but no breeding colonies exist on the flowage. If common terns show an interest or attempt to nest on the flowage it will be designated and managed for common tern nest habitat, as specified in the department's Common Tern Recovery Plan. Management would consist of maintaining suitable habitat (i.e., open grasslands or cleared areas) by hand clearing or herbicide, addition of gravel, and if needed, seasonal control of human access to the nesting areas.

The TFSWA, as part of the 1989 Timber Wolf Recovery Program, will be valuable as a potential site for future wolf recovery.

**k. Water Level Fluctuations** - Northern States Power (NSP) has direct control over water level management on the flowage. Levels are fluctuated according to general principals for reservoir management agreed to by the department prior to acquiring the property. If certain practices are found to be harmful to black terns, waterfowl, common loons, shorebirds, turtles or amphibians, the department will attempt to negotiate modification to the present water level agreement with NSP.

**l. Non-Game Management** - Non-game species include songbirds, common loons, hawks and owls, great blue herons, pied-billed grebes, small mammals, and reptiles and amphibians. If needed, great blue herons and pied-billed grebes will be protected by developing administrative rules to close breeding colonies to public access from April 15 to July 30. The existing high quality fishery will provide adequate food supply for herons and grebes. Songbirds, hawks, owls, small mammals, and reptiles and amphibians will benefit from a diverse forest management program. Big tree management, "no-cut" areas, no whole-tree chipping, and winter logging restrictions increase accumulation of woody debris, forest floor habitat and humidity, insect and invertebrate abundance, enhance nutrient cycling, and reduce disturbance. Land management around sensitive wildlife or nest sites will be modified as needed by restricting the time of activities and creating "no-cut" buffer zones.

The flowage is the site for many past, present and future loon research projects because of the high number of loons. Common loons have been studied on the flowage for over 10 years. Annual surveys indicate a stable population of 20-24 nesting pairs. The annual surveys were suspended in 1991, but will be repeated every 5 years to monitor the long-term population trends. If a severe decline is noticed, intensive monitoring may be resumed. No special management is required in the foreseeable future. Loon nesting islands are abundant. Food supply is adequate. Artificial loon platforms have been tested and can be successful, but are not required at this time. Existing platforms will be phased out.

## **E. Aesthetic Management**

### **1. Roads**

To maintain the "wild" character of the TFSWA, ensure minimum disturbance of wildlife, reduce potential erosion and reduce motorized traffic, the department will close roads constructed for forest management activities. Road closure will be accomplished using natural barriers. Log loading areas will be converted into grassy or brush wildlife openings.

### **2. Utility Lines**

Overhead utility lines can detract from natural aesthetics. There are a number of overhead utility lines on project lands which serve private inholdings. There is also a high voltage power line which traverses the project and crosses the flowage at five locations (Figure 6). Consideration should be given to burying any new utility lines, and when feasible, existing overhead lines, within the project boundaries. A long-term goal is to relocate the existing high voltage power line outside the project boundaries if future maintenance considerations or changes in technology make this economically and environmentally feasible.

### **3. Private Lands**

Some blocks of private lands which contain capital development or which have been subdivided have been excluded from project acquisition goals. However, some of these developments are a significant intrusion on the "wild" scenic character of the TFSWA. There is also potential for new aesthetically unpleasing developments on some of these lands.

Efforts will be made to work with private landowners to restore and preserve the "wild" character of privately owned shorelines. Owners will be encouraged to plant vegetative screening, use earth tone colors on structures, and limit development within 75 feet of the shoreline.

### **4. Gravel Pits**

County- and town-owned gravel borrow sites are currently located near Popko Circle and Flowage Road. These sites will continue to be operated to maintain existing access roads. The department plans to maintain access to the flowage, so an inexpensive local source of gravel will be needed to maintain access roads.

## **F. Fisheries Management**

The flowage presently has a high quality fishery. Fishing is one of the major reasons that visitors use the flowage, and the state's purchase has made the flowage a highly visible body of water. The state's purchase did not change the department's fishery management responsibilities. As a navigable waterway, the flowage has always been the department's responsibility for fisheries management.

The proposed management goal for the flowage is to maintain the current fish species assemblage and types of fisheries now available, with improvements in quality where feasible. A large amount of data from the 1992 and 1989 fishery surveys has yet to be analyzed in detail. The following information provides potential management strategies that could be used in developing future

regulations. Future regulation changes would not be flowage-specific, but would be part of larger statewide regulations and management strategies.

**a. Walleye** - No specific regulation is proposed at this time. A regulation that would improve size structure of the walleye population (increase numbers of larger walleyes) by limiting harvest of intermediate and larger size walleyes, and concentrating harvest in the smaller size class, could be considered. Possible alternatives include a rule which allows walleyes of any size to be kept, but only one fish above a certain length; or possibly a "slot size limit" which protects a certain size range of fish while allowing harvest above and below the "slot." The flowage could potentially benefit from this type of regulation.

It should be emphasized that the size cutoffs chosen for such a rule must be restrictive enough to make an actual impact on the harvest. For example, a rule allowing anglers to keep only one walleye over 18 inches would likely have little or no effect, because few anglers catch two or more walleyes of this size.

**b. Lake Sturgeon** - An attempt will be made to rehabilitate lake sturgeon population in the flowage and the Manitowish River. This population has been reduced in numbers to a remnant population, i.e., it is now comprised of relatively low numbers of large, old fish, with no recent evidence of any reproduction. Short-term rehabilitation will be attempted by stocking fingerling lake sturgeon, using an egg source from within the same drainage. Studies will continue to try to obtain answers as to what caused the decline so that long-term management solutions can be reached. Possibilities for upriver enhancement of spawning areas will be investigated. In addition, it may be advisable to protect the remaining fish from further harvest by eliminating the hook-and-line fishing season on this population.

A potential long-term solution could be to construct a fish passageway at the Turtle Dam which would allow sturgeon from the healthier downstream population to access the flowage and upriver areas that they once were able to reach before dam construction. The feasibility of such a structure is not known at this time, but will be investigated.

**c. Smallmouth Bass** - A quality smallmouth bass fishery has developed in recent years. The average size of smallmouth increased dramatically from 11.2 inches in 1989 to 13.2 inches in 1992. Anglers in 1989 demonstrated that they will harvest many smallmouth bass as soon as they reach the 12-inch minimum length limit. Regulations, such as a 15-inch minimum size limit with a daily bag limit of two bass (similar to the present regulation on the Gile Flowage), could be enacted to maintain the fishery at this level. Without such a restriction, anglers may once again trim the larger size groups back to the 12-inch size limit.

**d. Muskellunge** - Stocking of large muskellunge fingerlings will be continued because at the present time natural reproduction fails to provide adequate levels of recruitment. Stocking in Trude Lake will attempt to continue at a level of two fingerlings per acre per year. Muskellunge stocking in the remainder of the flowage has been done at a relatively low level over the years (roughly 0.2 fingerlings per acre per year) because it is limited by the department policy which normally allows a maximum of 2,500 fingerlings total in any one body of water per year. Whenever possible, if surplus fingerlings are available, as they have been in some years, additional muskellunge will be stocked in the flowage.

e. **Fish Habitat and Water Quality** - Once the master plan is implemented, and as land is acquired, the present level of quality in the fishery, fish habitat and water quality will be protected from human-caused degradation.

f. **Habitat Improvement** - Selected habitat improvements and habitat management practices are recommended to offset a gradual loss of natural cover. Specific locations, numbers and types of improvements are not recommended at this time but in the future may include various types of fish shelters. Old-growth forest types along the shoreline will result in fallen trees providing natural fish cover. Any habitat improvements should be designed to improve carrying capacity or spawning success for fish, not simply to concentrate fish to increase harvest rates. In all cases, habitat structures should be compatible with the overall goals established in this plan for maintenance of aesthetics.

g. **Other Regulations** - No regulation changes are recommended at this time, but changes may be necessary if the habitat or fishing populations change in the future. Fish populations and the pressures on them are not static. Continuing fishery surveys could reveal potential problems or opportunities that could benefit from appropriate regulations.

h. **Water Level** - The water level regime currently in practice on the flowage has been largely favorable for the present fish community, and should be continued. However, possibilities for altering this regime by an amended agreement would be considered if future conditions warrant.

i. **Exotic Species** - Exotic fish or invertebrate species are not known to be present in the flowage. Rusty crayfish (an exotic species) have been present in the Manitowish River system upstream from the flowage since 1982. Future introductions of exotics, either accidental or purposeful, will be avoided.

j. **Future Surveys** - Future survey plans are not yet known, but will likely involve additional comprehensive surveys and monitoring on a regular basis.

## **G. Water Quality Protection**

Protecting the excellent water quality of the flowage is important to maintain current fish and wildlife populations and to maintain the aesthetic value of the flowage for TFSWA visitors. Water quality will be maintained or improved by acquiring uplands surrounding the flowage and curtailing the number of cottages and other developments that can be built in the shoreline zone. Sanitation at island campsites will be improved by limiting camping to 60 designated campsites and providing open air pit toilets at these sites (see "Campsites" in the next section for more information).

## **H. Recreational Management and Developments**

### **1. Campsites**

Camping, a popular activity on the flowage, has been allowed without charge on a first-come, first-served basis. The department intends to allow camping consistent with past activities; however, state code and resource concerns necessitate some restrictions. Camping will be allowed at no charge on a first-come, first-served basis at designated sites only. Some of the existing sites will be discontinued if they disturb sensitive wildlife species, are located on unsuitable terrain, have erosion problems, or

have soil limitations for waste disposal. The department will pursue developing an administrative rule where camping would be limited to a maximum period of 10 days at one site and no site left unoccupied for more than 48 hours. The department will continue to monitor campsite use and will work with the public, if needed, to develop a system of reservations, registration or fees.

Current sanitation facilities are deficient at all the campsites. Existing pit toilets are deteriorated, many are too close to the shoreline or without sufficient clearance above groundwater, presenting a potential for ground or surface water contamination.

A total of 60 campsites will be designated (Figure 2). Of these 60 sites, 20 will be developed with "full facilities," including fire rings, picnic tables, open air pit toilets, and perhaps tent pads; one of these will be designated for disabled access and two will provide facilities for group camping. The disabled accessible site will include full facilities plus a dock to enable those confined to a wheelchair to board a boat. These fully developed sites will be located near the Springstead landing and center of the flowage. The remaining 40 sites will have fire rings and camp toilets only.

## **2. Waste Disposal**

A policy of "carry in/carry out" will be implemented within the TFSWA. Waste containers will not be provided at any campsites. Waste containers have been provided in the past at some boat landings; however, these may be phased out if necessary to meet new waste recycling requirements for the separation of trash.

## **3. Boat Access Sites**

The flowage has six developed public boat access sites on department-owned lands (Figure 2). In addition, there is a county-owned boat access site at the Lake of the Falls County Campground on the north end of the flowage. The only other developed public boat access within the proposed project boundary is the county-owned Wilson Lake access. No new public access sites are proposed.

The six developed public access sites on the flowage are Springstead, Fisherman's, Murray's, Trude Lake Sportsman's and Sturgeon Bay. Existing undeveloped landings, including Old Trude Lake and Little Turtle, will not be maintained. Plans for each access site that will be maintained are as follows:

**a. Springstead Landing** - Springstead Landing, on the south side of the flowage, is the largest and most heavily used access on the flowage. It is also the best all-weather access to the flowage. The site has a paved parking lot that accommodates 100 car/trailer units. The paved parking lot is starting to deteriorate and should be resurfaced. Waste receptacles have been provided in the past; however, these may be phased out if necessary to meet new waste recycling requirements.

Planned improvements include poured concrete boat ramps, repaved parking area, pit toilets, boat docks and a drinking water well. All facilities will meet Americans With Disability Act (ADA) requirements.

**b. Fisherman's Landing** - Fisherman's Landing, on the north side of the flowage, receives moderate to heavy use. The site has a graveled boat ramp and a graveled parking area that accommodates 15 car/trailer units. Garbage containers have been provided in the past but may be phased out if necessary to meet new waste recycling requirements. The site should be upgraded to include a concrete boat ramp, improved parking area and pit toilets.

c. **Murray's Landing** - Murray's Landing, on the east side of the flowage, is located near the point where the Manitowish River enters. In order to assure that Murray's Landing will be promoted in the spirit of the "voluntary quiet area", the Department will design the area to reflect the natural setting with minimal development and will promote the site as a light duty landing.

Improvements to launching facilities will be limited to correcting existing erosion problems with native aggregate. Maps and information developed by the Department will inform flowage users of limited launch capabilities at this site and direct users with heavy boats to other landings.

d. **Trude Lake Landing** - This is the main access on Trude Lake. The site was recently constructed and includes a poured-in-place concrete boat ramp and a graveled parking lot that accommodates 25 car/trailer units. No additional development is proposed for this site.

e. **Sportsman's Landing** - Sportsman's Landing is the only landing on the west side of the flowage; however, the site is in a poor location (considering water depths and slope) and has limited parking. Only three or four car/trailer units can be accommodated. It is proposed to move this site to a better location approximately 300 yards to the north. A concrete boat ramp and graveled parking lot to accommodate 10 car/trailer units is proposed.

f. **Sturgeon Bay Landing** - The landing is located on the Turtle River arm of the flowage off Popko Circle West. The site has good water depth near shore for launching boats but has parking for only three cars. Because of an existing county landing to the north, the site will be managed for light duty launching. Proposed development includes some gravel and light brushing of the site.

#### 4. Voluntary Quiet Area

The flowage links several major recreational navigation routes including the Manitowish, Turtle, Bear and North Fork Flambeau Rivers. No regulatory restrictions on motor boating are proposed. Instead, a "voluntary quiet area" will be established on the eastern 1/5 of the flowage (see recreational map Figure 2). The purpose of the designation will be to establish an area for quiet sports. The department will display a map showing the location of the "voluntary quiet area." Persons using the area would be asked, not required, to observe slow-no-wake operation of power boats and pursue quiet camping and fishing activities discourage the use of radios, TVs, generators, etc., during the open water season only. The voluntary quiet area would not be in effect during the winter season.

#### 5. Roads and Access

The department will maintain road access to all developed boat landings. Secondary roads not needed for public access will be closed to motorized vehicles to eliminate potential conflicts between recreational users. Secondary roads will be open to foot travel and other non-motorized transportation, including cross-country skiing, mountain bikes, and horseback, unless specifically posted closed.

A number of town roads within the project boundary also provide access to boat landings. Popko Circle, which provides access to the north side of the flowage, is in need of resurfacing. Two bridge crossings on Popko Circle presently obstruct navigation and should be upgraded to allow for navigation.

It is necessary to maintain some administrative roads to manage the Turtle Dam and to maintain wildlife habitat. Administrative roads will be gated to prevent public vehicular access. All roads for

logging purposes will be closed and restored to natural conditions after logging operations are complete, unless they are needed for other identified administrative purposes.

A gated road and bridge leading to Big Island currently provides administrative access to department lands on the island; it also provides access to private lands and is used for maintenance of a high voltage power line. The bridge restricts navigation and detracts from the natural aesthetics of the area. Administrative access could be gained by boat, ice crossing or temporary bridge, and a goal is to eventually eliminate the permanent bridge. This could only occur if the department obtains complete land control of the island or if agreement can be reached with the other authorized bridge users on an acceptable alternate access.

## **6. Trails**

A self-guided nature interpretive hiking trail is proposed for the north side of the flowage. This trail will originate at Fisherman's Landing (Figure 2) and will be approximately two miles long. The trail will provide recreational access for the enjoyment of the flowage by the non-boating public. Pit toilets planned for Fisherman's Landing will accommodate users of the trail.

The Dead Horse Lake-Ruffed Grouse Demonstration Area contains a number of hunter walking trails (Figure 2). In addition, all administrative roads are open to hiking and hunting, except where those roads cross private lands.

A number of county-designated snowmobile trails are located within the project boundary (Figure 2). No new snowmobile or ATV trails are planned. The snowmobile trail accessing the TFSWA near Grant Lake is in a hazardous location. The department will work with Iron County and the local snowmobile club to make necessary improvements to reduce hazards and assure all trails meet department standards.

## **VI. ALTERNATIVES TO THE PROPOSED PLAN & THEIR IMPACTS**

### **A. Project Boundary, Land Acquisition and Ownership Goals**

The department has three project boundary alternatives: the boundary could be limited to current department ownership around the flowage, boundary expansion goals could be reduced, or boundary expansion goals could be increased.

A project boundary that only included lands presently owned by the department would eliminate future acquisition costs but would likely result in future degradation of flowage resources. Intensive development or management of undeveloped lands visible from the flowage would diminish the scenic qualities of the flowage, surrounding wetlands and critical wildlife habitats would not be protected, and department lands would remain inaccessible in some areas of the flowage. The potential for conflicts with adjoining private landowners would remain high and would increase with expanded public use of the flowage due to the irregular "patch work" configuration of the property.

Reducing the proposed project size would reduce future acquisition costs but would result in some of the same problems outlined above. For example, the citizen advisory committee considered excluding the large patterned bog (patterned peatland) on the southeast side of the flowage. However, the department's Bureau of Endangered Resources has identified this wetland type to be extremely rare in the state and in need of protection.

Opportunities to increase the project size are limited because national, state and county forests, as well as a state wildlife area, surround the flowage. The department considered expanding the proposed perimeter boundary in several areas but barriers exist: most of these lands are subdivided or contain substantial capital developments such as cabins, homes and resorts, would be expensive to purchase, or would not significantly further project goals.

Twelve distinct blocks of private lands were excluded from the proposed boundary because of substantial acquisition costs. This was done even though some developments, particularly those on points visible from large areas of the flowage, detract from the natural shoreline aesthetics.

A four-mile strip of mostly undeveloped land south of the flowage, west of state Highway 182 and Flowage Road, is almost entirely in private ownership. Expanding the boundary to the highway would improve administrative and public access to project lands, reduce potential conflicts with private landowners, and further protect the aesthetic qualities of the backlands area.

A block of land south of the proposed boundary and north of state Highway 182, including Boot Lake, French Lake, Ess Lake, Stone Lake, Teal Lake, and three small unnamed lakes, is privately owned and contains significant capital developments. This block could expand the boundary to the highway and add shoreline on eight lakes but would provide only marginally better administrative and public access.

A tract of undeveloped private land on the southwest corner of the proposed TFSWA next to the Hay Creek-Hoffman Lake Wildlife Area and the Chequamegon National Forest would block the boundaries of these three projects but would serve no other significant project purpose. This area

would more appropriately fit into the management plans of the Hay Creek-Hoffman Lake Wildlife Area because access is limited, and this area would not fit with the primary objectives of the TFSWA.

A tract on the southeast corner of the proposed project boundary between the Northern Highland-American Legion State Forest (NH/ALSF) and state Highway 182 would bring the entire southeast boundary out to the highway. This area does not meet the primary objectives of the TFSWA Master Plan. This area would best be administered as part of the wilderness area in the NH/ALSF.

## **B. Resource Management and Land Classification**

The department has a wide range of resource management and land classification options on the TFSWA. It would be impossible to describe all the variables that are part of the reasonable scope of department responsibility. It might be best to describe the alternatives as a sliding scale with less intensive resource management, Wilderness Area classification and natural succession on one side of the scale, and active intensive resource management to achieve a few specific objectives (e.g., maximizing timber production or developing a major campground to maximize recreational access to the TFSWA) and Resource Development Area classification on the other side of the scale. In between these extremes are other paths with greater or lesser amounts of development, management or conservation.

### **1. Less Intensive Resource Management**

With less intensive resource management, more protective land classification options (e.g., Wilderness, Natural, and Wild Area designations) could be used across the TFSWA. Timber harvesting could be reduced or prohibited and forests could be allowed to follow natural successional patterns. Ultimately, the area would be dominated by later successional species, such as maple, spruce/fir, white and red pine, and scattered pockets of swamp hardwoods and hemlock. Without active management, early successional forest species (such as aspen and birch) and edge habitat species would also decrease.

Wildlife disturbance and roads and trails could be reduced. Interior wildlife species that require lack of disturbance, large blocks of forest, closed canopy, cavity and snag tree development, and large trees would benefit. Woody debris on the forest floor would provide for plant and animal species that require decaying wood and would allow nutrients to recycle naturally. Amphibian and reptile species would increase in abundance.

These options would provide recreational settings for wilderness camping, canoeing, hunting and fishing. Camping could also be prohibited or reduced on project lands but this would affect a traditional and very popular recreational activity on the flowage and would limit opportunities for the public to enjoy and appreciate this unique resource.

Decreased forestry products would negatively affect county and private industry dependant on forest fiber production. Work force and operational costs would decrease and visitation by traditional users would also decrease.

Motor vehicle access could be limited on project lands so lower impact recreational activities would predominate. Snowmobile trails could be closed and only foot traffic allowed into the interior of the property. Motorboats could be prohibited to create a more "wild" type experience for flowage users.

Currently, however, the department does not have the authority to regulate watercraft by class or to ban motors on the flowage without statutory authorization from the state Legislature. Development costs at public boat landings would be reduced but flowage access would be restricted. This option would be unacceptable to traditional flowage users.

Except for natural fluctuations in the abundance of some species, the fishery at present is relatively stable. These fluctuations would continue, but no long-term improvements in quality would likely occur. If fishing pressure increases significantly in the future, the first noticeable impacts might be an overall decline in quality (size structure) of key species such as walleye, or a decline in both quality and numbers of other species such as crappie. The lake sturgeon population may eventually disappear if no attempt is made to rehabilitate the population.

Eliminating the Dead Horse Lake-Ruffed Grouse Demonstration Area would eliminate benefits from previous management efforts. More importantly, a valuable educational tool to demonstrate a range of management alternatives would be lost. Grouse, deer and woodcock would decrease in abundance.

Several conservation groups and individuals have asked the department to establish a Wilderness Designation in the eastern end of the TFSWA. The proposal would include water, shoreline and upland areas. The proposal was considered but rejected by the Citizen Advisory Committee based on strong local opposition to any limitation on motorized uses of the flowage.

## **2. More Intensive Resource Management**

With more intensive resource management, Resource Development and Recreation Area classifications would be more common. Management could emphasize timber production, game species and/or recreation. This alternative would require more staff and operational costs, but would result in higher visitation to the flowage.

Wildlife openings and early successional forest species -- such as aspen, oak and birch -- could be maximized to promote game species. Aspen and birch could be managed on short rotation cycles of 40-45 years. Oak stands could be managed on a 100-140 year rotation to maximize acorn production. Additional openings would be created to provide grazing areas for wildlife. Hunters would benefit from maximum game populations and local proprietors would gain from increased hunting-related sales. Public access would reach maximum acceptable levels. Clear cuts would be the primary management tool. Opportunities for viewing wildlife that prefer young forests and edge habitat would be maximized and maximum economic benefits would be realized by state, local and private incomes dependant on logging. Maximum wood products would be produced to support the wood industry.

Maximum timber production could emphasize the best quality timber possible through thinning and Timber Stand Improvements (TSI). TSI treatments and thinning would remove low quality snag and den trees. Rotation lengths would be based on economical maturity of each forest type. Wildlife and scenic values would be secondary considerations. "No-cut," managed old-growth and maximum rotation management would not be implemented. Forest and wildlife diversity and the aesthetic qualities of the flowage would decrease. Suitable habitat for "interior" species, and snag and den trees would also be reduced.

Trails and logging roads could be left open to motor vehicles but user conflicts would likely develop, particularly where vehicles could access campsites used by boaters and canoers. Additional motor vehicle access would also reduce the "wild" type aesthetics that can now be found in some areas of the TFSWA and would result in erosion problems or disturbance of critical habitat.

Management that would increase boat numbers, size, speed and type would increase the potential for conflict and detrimental effects on the wildlife. For example, nest abandonment and mortality of young birds increase as disturbance levels increase. Increased boat size and speed would result in increased wave size and strength which may destroy fragile nests created by black terns, loons, grebes and shorebirds. Management of jet skis, airboats or hovercraft would enable recreationists to penetrate deeper into the wetlands and marshes, thus disrupting many nesting and young rearing activities required by all wildlife species.

The number of camping sites could be expanded to other islands and the backlands area. This would promote public use of the flowage but would result in increased environmental impact and reduce the "wild" character of the flowage and increase management costs.

Management emphasis could be shifted from walleye to other species to diversify the fish community more than the present walleye-dominated fishery. Many anglers have expressed interest in catching other species more often, particularly panfish. There has never been public support, however, for a plan to reduce walleye. Because of walleye's abundance and tendency to dominate the fish community through predation, it would be difficult to diversify the fish community without a long-term reduction in the walleye population. Continual maintenance stocking can artificially boost numbers of other species. However, on such a large body of water it is usually unrealistic and costly to stock enough fish to make an impact except with low density species like muskellunge. Changes in water level management could alter fish community structure by changing habitat to favor or discourage certain species. Significant changes in the water level regime, however, would likely conflict with operating practices by the owner of the dam.

## VII. ENVIRONMENTAL ASSESSMENT

### A. Project Summary

This environmental assessment is a Wisconsin Department of Natural Resources analysis that evaluates probable environmental effects of the Turtle-Flambeau Scenic Waters Area Master Plan and decides on the need for an Environmental Impact Statement (EIS). This assessment assumes the master plan will be implemented in its entirety.

The attached analysis includes a project summary and analyzes the environmental impacts of the proposed master plan.

#### 1. General Description

The master plan for the Turtle-Flambeau Scenic Waters Area (TFSWA) will direct and manage most of the 48,941-acre project area for at least the next 10 years. The plan was developed by:

- a twelve-member, multi-disciplinary Department Master Planning Task Force composed of resource managers, planners and resource specialists;
- a six-member Citizen Advisory Committee;
- other department staff and specialists;
- individual members of the public and independent organizations.

The Turtle-Flambeau Scenic Waters Area Master Plan proposes to:

- Add 20,386 acres of private lands and lake bed, industrial forest lands and Wisconsin Land Commission lands to 26,689 acres of existing state lands. The additional acreage would link federal, state and county conservation lands in the region.
- Exclude from project acquisition goals 1,336 acres of subdivided or developed private lands with significant capital developments, 194 acres of township lands, 144 acres of Iron County lands, 135 acres of Northern States Power lands, and 57 acres of Dedicated Conservation Lands.
- Give priority to acquiring islands, shoreline and lands within the flowage viewshed; areas delineated as containing significant "natural area" features or importance to endangered species; and remaining private lands in the Dead Horse Lake-Ruffed Grouse Demonstration Area.
- Recognizes that Northern States Power controls water management of the flowage in accordance with the Memorandum of Understanding between the department and Chippewa and Flambeau Improvement Company dated August 23, 1990.
- Divide lands within the proposed TFSWA project boundary into three vegetative management zones: shoreline, viewshed and backland.

- Encourage old-growth forests in the shoreline zone and allow salvage or selective thinning in the viewshed zone.
- Maintain a diversity of habitat types, including early successional forest types such as aspen and birch, in areas not visible from the flowage.
- Maintain openings and hunter walking trails through open-mowing and prescribed burns to provide wildlife viewing areas and food for wildlife such as deer, bear, grouse, songbirds and reptiles.
- Maintain current fish species and high quality fisheries.
- Close some campsites when needed to protect wildlife nesting and breeding grounds.
- Restrict camping to 10 days at one of 60 designated sites.
- Maintain six developed boat access sites at the following landings: Murray's, Springstead, Fisherman's, Sturgeon Bay, Trude and Sportsman's.
- Maintain roads for public access, gate or berm administrative roads, and abandon and restore non-essential roads.
- Classify project lands into five land use classification areas: Scenic, State Natural, Wild, Demonstration Management and Habitat Preservation.

Refer to the TFSWA Master Plan for full descriptions of these proposed management and development options.

## **2. Purpose and Need**

Current department ownership around the flowage does not provide adequate land base for old-growth and big tree habitat, sensitive or early successional wildlife species, or protection of surrounding wetlands that protect fisheries and other aquatic resources. The proposed boundary will link adjacent conservation lands and decrease the potential for future adverse development near the flowage.

## **3. Authorities and Approvals**

Most of the lands will be acquired and managed under State Natural Areas Chapter 23.09 s.s. and State Parks Chapter 27.01 s.s.

Natural Resources Board approval will be needed for this project.

## **4. Estimated Cost and Funding Source**

The following is an estimate of proposed TFSWA project costs and funding sources. These costs are in 1995 dollars and do not account for future inflationary changes.

**PROJECT ITEM**

**ESTIMATED COST (IN \$)**

**Boat Landings**

Funding for the following boat landing projects will be through Sport Fish Restoration Funds (Dingell-Johnson/Wallop-Breaux).

**Springstead Landing**

Ramp, one additional . . . . .	6,000
Pier pads and boarding docks . . . . .	19,300
Bituminous surfacing . . . . .	6,600
Site restoration and demolition, etc.. . . . .	4,300
Pit toilet, accessible (1 man/woman toilet) . . . . .	27,000
New well . . . . .	4,900
Engineering and contingency costs (20%) . . . . .	13,620
<b>TOTAL . . . . .</b>	<b>81,720</b>

**Fisherman's Landing**

Ramp (poured concrete) . . . . .	20,000
Parking lot improvements . . . . .	16,500
Site restoration and erosion control. . . . .	2,500
Pit toilet, accessible (nature trail use) . . . . .	27,000
Engineering and contingency costs (20%) . . . . .	13,200
<b>TOTAL . . . . .</b>	<b>79,200</b>

**Murray's Landing**

Regrade access road (drainage problem) . . . . .	7,200
Native gravel landing (remove existing old concrete) . . . . .	4,500
Rustic pit toilet, (ADA accessible) . . . . .	25,000
Site restoration and erosion control . . . . .	2,500
Engineering and contingencies (20%) . . . . .	7,840
<b>TOTAL . . . . .</b>	<b>47,040</b>

**Sportsman's Landing**

Clear and grub . . . . .	4,600
Ramp . . . . .	20,000
Parking lot, gravel, 6" base (10 cars) . . . . .	3,000
Access road with culvert . . . . .	2,000
Site restoration, erosion control. . . . .	2,500
Archaeological survey . . . . .	1,000
Engineering and contingency costs (20%) . . . . .	6,620
<b>TOTAL . . . . .</b>	<b>39,720</b>

**Sturgeon Bay Landing**

Gravel repair . . . . .	4,000
Engineering and contingency cost (10%) . . . . .	400
<b>TOTAL . . . . .</b>	<b>4,400</b>

**Island Campsites**

Fire rings (60 @ \$100 each) . . . . .	6,000
Picnic tables, accessible (20 @ \$300/each) . . . . .	6,000
Open air camp toilets (60 @ \$110) . . . . .	6,600
Sanitary permits (cost may vary) . . . . .	7,200
Piers, accessible . . . . .	3,700
Hardened sites . . . . .	1,000
Engineering and contingency costs (20%) . . . . .	6,100
<b>TOTAL . . . . .</b>	<b>36,600</b>

**Signing**

Main entry signs, routed wood (5 @ \$1,000) . . . . .	5,000
Large directional signs (6 @ \$75) . . . . .	450
Small miscellaneous directional signs (6 @ \$60) . . . . .	360
Informational signs at landings (6 @ \$2,000) . . . . .	12,000
Contingency costs (10%) . . . . .	1,781
<b>TOTAL . . . . .</b>	<b>19,591</b>

**Nature Interpretive Trail**

Clean and grub . . . . .	3,000
Surfacing (6' x 2 miles) . . . . .	8,000
Boardwalk . . . . .	5,000
Signing . . . . .	800
Contingency (10%) . . . . .	1,680
<b>TOTAL . . . . .</b>	<b>18,480</b>

**Bridge to Big Island**

Bridge removal . . . . .	6,000
Site restoration and erosion control . . . . .	3,000
Contingency (10%) . . . . .	900
<b>TOTAL . . . . .</b>	<b>9,900</b>

**TOTAL CAPITAL DEVELOPMENT COSTS . . . . . 336,651**

**ANNUAL OPERATING COSTS**

**Labor**

Property Manager . . . . .	46,000
Seasonal Workers . . . . .	15,000
Supplies and Services . . . . .	15,000
<b>TOTAL . . . . .</b>	<b>76,000</b>

**Miscellaneous**

Forestry Management . . . . .	10,000
Wildlife Management . . . . .	4,400
Fisheries Population Monitoring . . . . .	8,000
Endangered Resources Monitoring . . . . .	2,000
Fire Control . . . . .	10,000
Law Enforcement . . . . .	10,000
<b>TOTAL . . . . .</b>	<b>44,400</b>

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**TOTAL ANNUAL OPERATING COSTS . . . . . 120,400**

**ESTIMATED LAND ACQUISITION COSTS**

Land acquisition costs will depend on parcel size, location (i.e., shoreline, upland, island), and capital improvements. The majority of proposed acquisition lands are remote, have poor access, and have relatively low real estate value (i.e., submerged land, wetland, recently logged industrial forest lands, State Land Commission holdings). The estimated value of the land is \$4 million. The estimated value of improvements is \$2 million; however, lands with significant capital developments are excluded from project acquisition goals. The estimated cost of the additional acquisition is \$4.5 - \$6 million maximum. Estimated maximum annual tax payments is \$192,357 per year. At least 20 to 60 years will be required to purchase the 20,386 acres of proposed acquisition lands. Acquisition will probably be rapid initially and slow as the project matures.

**Table 1. Potential Funding and Labor Sources for Proposed Management**

MANAGEMENT	FUNDING-MATERIALS	LABOR SOURCES	COST
<u>FORESTRY<sup>1</sup></u>			
Underplanting	State Nursery	State foresters State wildlife mgrs. WCC and YCC crews	Existing labor Free seedlings
Timber sales <sup>2</sup>	Forestry, Wildlife	State foresters State wildlife mgrs.	Variable costs
Seeding (Hemlock etc.)	Wildlife	State foresters State wildlife mgrs.	Variable costs
Prescribed burning	Forestry, Wildlife	State fire control State foresters State wildlife mgrs. WCC and YCC labor crews	10-40 acres/year @ \$50/acre
<u>WILDLIFE</u>			
Openings maintenance	Wildlife Management	Wildlife Management	20 acres/year @ \$75/acre
Openings conversion	Wildlife Management	Wildlife Management	5 acres/year @ \$150/acre
Openings seeding	Wildlife Management	Wildlife Management	5 acres/year @ \$50/acre
Trail seeding	Wildlife Management	Wildlife Management	2 miles/year @ \$60/mile
Osprey & eagle management	Wildlife Management, BER <sup>3</sup>	Wildlife Management, BER	3 nests/year @ \$75/nest
Loosestrife control	Property Management	Property Management	3 days LTE labor & \$100 supplies

<sup>1</sup> Most forest and wildlife management practices will be accomplished through forest management activities.

<sup>2</sup> Acreage variable based on property acquisition, workload, and budgets.

<sup>3</sup> Bureau of Endangered Resources.

## 5. Attached Maps

The following GIS maps are included with the master plan:

- |    |                           |          |
|----|---------------------------|----------|
| a. | Ownership Layer           | Figure 1 |
| b. | Recreation Layer          | Figure 2 |
| c. | Wildlife Layer            | Figure 3 |
| d. | Vegetative Cover Layer    | Figure 4 |
| e. | Land Classification Layer | Figure 5 |
| f. | Administrative Layer      | Figure 6 |

## B. Proposed Physical Changes

Some existing campsites will be discontinued. A total of 60 existing campsites will be maintained, including 20 with full facilities (table, open air pit toilet and fire ring), one with accessible facilities and two with small group facilities (Figure 2).

The department proposes to upgrade several boat landing sites. Springstead Landing would have concrete boat ramps, a resurfaced parking lot, toilets and a drinking water well. Fisherman's Landing would add concrete boat ramps and toilets, and improvements would be made to the parking area. Improvements to Murray's landing would be limited to grass parking area and a natural native gravel landing in keeping with voluntary quiet area. Sportsman's Landing will move 300 yards to the north and would have a concrete boat ramp and graveled parking lot added.

No additional roads are planned. One self-guided interpretive/nature trail proposed for the north side of the flowage would originate at Fisherman's Landing. Hunter walking trails will be maintained to wildlife openings.

The bridge from Popko Circle to Big Island will be removed if the department acquires complete land control on the island or if agreement can be reached with existing private landowners and easement holders on the island. The channel and the area around the bridge would be restored to improve navigation and aesthetics. A long-term goal is to remove or bury overhead utility lines within the project boundary wherever economically and environmentally feasible.

## C. Short-Term, Long-Term and Secondary Environmental Effects

### 1. Project Boundary, Land Acquisition and Ownership Goals

a. **Physical Impacts** - Present land use within the property boundary, except for some timber management, will change little after acquisition. Limiting future private development in the project area will prevent major alterations of TFSWA surface waters and allow more land to remain or return to natural vegetative land cover. The proposed land acquisitions will provide a greater degree of protection for the flowage watershed and assure stable surface water discharge. The Chippewa and Flambeau Improvement Company (CFIC), through agreements with the state, will retain overall flowage water management control. Management of the Turtle Dam is unlikely to change if the department purchases the proposed acquisition properties.

Opportunities for land degradation from mineral extraction will be minimal. No metallic mining activities currently occur in the proposed project boundary and there is virtually no likelihood that mining operations will begin because most mineral reservations have been extinguished or are extinguishable under State Statute 706.057. However, at least two mineral claims remain viable: one by the Wisconsin Central Railway Company, the other by Cornell University. A closer examination of state and Iron County land records is needed to determine if other claims are still valid. If mining were to commence within the project boundary, physical resource degradation would threaten fish and wildlife habitats.

The gravel borrow pits located near access roads will cause some minor physical degradation (dust, noise, runoff).

Opportunities for point and non-point pollution that could affect groundwater, surface water or wildlife, will not be affected on non-acquisition land, but will be reduced on the proposed acquisition lands. Private water pollution sources, including sedimentation and chemical runoff from housing and road construction, leaching from septic systems, pesticides from lawns and gardens, waste discharge, and sediment and nutrient runoff from logging, are likely to continue at present levels on lands which remain in private ownership. Noise pollution and minor sources of air pollution associated with private development (e.g., exhaust emissions from homes and motor vehicles, dust from private gravel roads, and construction projects) will also continue on privately held lands but will be eliminated on lands which the department acquires.

Department ownership will also safeguard other physical, non-water resources, including boat landings; roads and trails; camping sites; and known and unknown historical, archaeological and cultural resources such as Native American burial sites and artifacts.

**b. Biological Impacts** - Expanding the TFSWA to the boundaries of the Northern Highland-American Legion State Forest, Hay Creek-Hoffman Lake Wildlife Area, Iron County Forest lands and the Chequamegon National Forest will insure at least some connection between these forest areas and support efforts to conserve the area's biological diversity. The effects of forest fragmentation--including habitat isolation, edge effects, ecological simplification and changes in wildlife function and composition--will be reduced by managing the area as a unit instead of as individual parcels with different land use objectives. Protecting this area from future development will provide a corridor for wildlife to range between neighboring protected areas. However, the backlands areas (primarily in the Habitat Preservation Class) will still be intensively managed and forest fragmentation and disturbance will continue to occur.

Acquiring private lands will reduce incompatible or unsound timber management and reduce or prevent future vegetative clearing due to development. Rare or ecologically sensitive communities not already under state ownership, including any nesting areas and rookeries, will be conserved. Preventing upland and wetland degradation adjacent to the flowage will preserve existing functional wetland values and deter long-term degradation of the flowage.

Over 13,400 acres of wetlands, important for fish, bird and other wildlife habitat, will be guaranteed long-term protection. Maintaining wetland resources will improve water quality by trapping sediment, removing nutrients and protecting the shoreline. As long as flowage hydrology is not significantly altered and soil erosion and nutrient runoff from upland areas does not significantly alter water chemistry, the rare patterned bog community should not be affected.

c. **Socioeconomic Impacts** - Since most proposed acquisition areas are not improved properties, major property owner relocation is not anticipated. Acquiring private lands will result in increased public recreation as trail and water access is improved on the TFSWA.

The proposed land acquisition will decrease the amount of land available for private ownership in the TFSWA. Commercial interests, private owners and the general public will benefit from the quality public outdoor recreational opportunities. With the exception of non-acquisition lands, land uses which are incompatible with the TFSWA's wild character will generally be prevented. However, land use and developments on non-acquisition lands will likely remain visible from many parts of the flowage.

The state will continue to make payments in lieu of taxes on properties it has already purchased. On future acquisitions, payment in lieu of taxes will be at the *ad valorem* rate. The burden of these taxes is distributed across the state.

Pursuing the master plan objectives will not likely increase demands on local or county law enforcement or emergency services. Demands for protection of developed properties from wildfire will probably decrease with department management.

Major historical or archaeological sites are limited within the TFSWA project boundary. State ownership provides a higher degree of protection for these sites.

## 2. **Vegetative Management**

a. **Physical Impacts** - Timber harvesting may temporarily expose soils in some areas to increased erosion, nutrient leaching, and compaction from logging vehicles. Restrictions stated in timber sale contracts, based on the department's *Wisconsin's Forestry Best Management Practices for Water Quality Field Manual*, should minimize erosion problems. Revegetation will reverse the remaining impacts. Some Best Management Practices (BMPs) may include limitations on logging in riparian zones, winter logging, avoiding steep slopes, and properly locating skid trails. In addition, soil compaction is expected to be minimal because of the sandy soils present in the area do not compact easily.

The shoreline zone will provide a buffer strip which will screen timber harvests from view of the flowage and prevent eroded sediments from reaching the water.

Some noise from chainsaws and logging vehicles is expected; however, not allowing timber harvests in the shoreline zone will minimize impacts on flowage users. Fires due to department activities are unlikely.

The frequency of timber sales is expected to be low (2 to 4 per year) so physical impacts will be limited. Overall adverse physical impacts caused by logging operations should be reduced from the present condition because the intensity of forest management will be reduced and Best Management Practices will be employed.

b. **Biological Impacts** - Much of the TFSWA area is covered in aspen and white birch, the rest in northern hardwoods, swamp conifer, oak and pine. In the long term, prescribed management in the shoreline and viewshed zones and the Wild Area classification will encourage later successional forest cover types.

The creation and maintenance of openings and edge habitat in backlands can cause impacts to interior forest dwelling species. The relatively narrow shoreline and viewshed zones will increase the ratio of edge habitat to interior habitat and may not provide adequate habitat for species that require large blocks of forests to protect them from edge effects and predators that thrive in edge habitats.

Allowing older trees to remain standing may increase the prevalence of insect and disease damage because younger trees are less prone to disease. The taller, older trees are also more subject to wind damage and wind throw, but fallen trees will benefit terrestrial and aquatic species that rely on dead trees.

Permitting older, larger trees to remain standing and limiting removal of fallen trees in the shoreline zone will benefit species associated with small blocks of later successional forest stages by providing nesting and den sites and increased soil organics.

In areas where timber harvests will take place, understory vegetation damage is possible from cutting trees and using heavy machinery. Trees remaining after a timber harvest become more subject to wind throw and sun scald. Natural and artificial reforestation will change the stand composition and age structure.

Logging or off-road activities could damage protected -- but unidentified -- ground plants, or negatively alter their habitat. However, few impacts on aquatic vegetation or terrestrial vegetation are expected. Ground disturbances caused by logging do create favorable seed bed conditions for various plant species.

**c. Socioeconomic Impacts** - Buffer zones along roads and water areas will conceal the visual impact of intensively managed areas from most visitors. Negative aesthetic impacts (stumps, slash and to a lesser extent exposed soil) caused by logging operations may persist for several years.

The proposed forest management will probably decrease hunting opportunities slightly by decreasing habitat for game species in shoreline and viewshed zones (i.e, by reducing aspen and other early successional species) while increasing habitat for certain species of "watchable" wildlife.

Allowing limited timber harvesting from the flowage area will continue to provide income to local and regional contractors and wood industries. Additional secondary economic benefits will accrue as the timber is further processed.

As yet, undiscovered archaeological and historical sites could be damaged or destroyed by logging operations.

### **3. Wildlife and Endangered Species Management**

**a. Physical Impacts** - Emphasis on habitat management will remain the primary wildlife management tool. See 2.a. above for potential physical impacts.

**b. Biological Impacts** - Department management of the TFSWA will protect rare, threatened and endangered wildlife already present in the TFSWA area. The TFSWA already provides habitat for osprey, bald eagles, merlins, terns and loons, and also provides suitable potential habitat for red-necked grebes, lynx, Blanding's turtles, wood turtles, western ribbon snakes and Tremblay's salamanders.

Maintaining some openings and aspen stands will continue to provide habitat for deer, ruffed grouse, snowshoe hare, woodcock and other edge species. Management in the Dead Horse Lake-Ruffed Grouse Management Area will continue (as it has since 1986) as a demonstration project for ruffed grouse habitat management.

At least 10 bald eagle and 22 osprey nest sites exist within the TFSWA, as do at least six natural area plant communities of significance. "Supercanopy" red and white pine will provide nesting sites for osprey and eagles. The TFSWA, as part of the 1989 Timber Wolf Recovery Program, will be valuable as a potential site for future wolf recovery.

Browsing pressure under current deer and hare populations may prevent regeneration or establishment of some native vegetation such as hemlock and yew. Den or nesting sites for wildlife, and understory vegetation, will be disturbed in areas that are intensively managed. Species that prefer forest edges or open areas would prevail over forest-oriented species that prefer climax vegetation in areas where timber is harvested and openings are artificially maintained.

**c. Socioeconomic Impacts** - Emphasis on aesthetic and wildlife management over timber production management will reduce timber revenue on some lands. Considering the size of the TFSWA, however, actual revenue losses would be insignificant.

Managing for old-growth or climax forest in the shoreline and viewshed zones and the wild area classification will probably decrease opportunities for big and small game hunting because deer, grouse, snowshoe hare and fox favor early successional stages and habitat with extensive edge. Phasing out the nest box program will have little impact on hunting. The boxes receive limited use by wood ducks; most use (60%) is by hooded mergansers.

#### **4. Fisheries Management**

**a. Physical Impacts** - Proposed acquisition and management will reduce potential for erosion, excessive runoff or other shoreline degradation which could adversely affect the quality of the fishery. Management for naturally fallen trees and/or the placement of near-shore fish shelters will enhance shoreline fish habitats.

**b. Biological Impacts** - Conserving or improving the walleye population size structure will maintain walleye as the dominant predator species. The lake sturgeon population may benefit through stocking or habitat improvement. A special size and daily bag limit is not proposed but would help maintain the size structure of the smallmouth bass population.

Maintaining or enhancing current fish populations will likely have a positive effect on eagle, osprey and loon populations.

**c. Socioeconomic Impacts** - Improving the carrying capacity and spawning success of some fish populations should maintain a high quality fishing experience for visitors.

#### **5. Recreational Development and Roads**

##### **a. Campsites**

**i. Physical Impacts** - Proposed improvements to sanitary facilities and elimination of substandard campsites will minimize future impacts on water resources. Increased use,

especially at the twenty "full facilities" sites, may increase soil erosion and compaction. Any erosion or soil compaction would be very isolated, and increased turbidity of flowage waters or other significant adverse impacts are unlikely.

**ii. Biological Impacts** - Construction activities and public use of camping facilities may damage or destroy existing vegetation and disturb some wildlife. Wildlife accustomed to human activity (e.g., squirrels, chipmunks, robins) may increase.

Considering that campers have had unregulated access to the flowage for many years, the department's proposal to manage the campsites and restrict use to 60 designated sites only will likely improve rather than degrade biological resources.

**iii. Socioeconomic Impacts** - In the short-term, limits on the maximum number of visitors allowed to camp on the flowage will have little effect on public use. In some previous years, the number of visitors trying to camp on the flowage during peak periods has exceeded the supply of camping sites available. Limiting camping to designated sites will decrease the number of visitors able to camp on the flowage during peak periods. Visitors unable to use the campsites may instead use private campgrounds or local resorts.

Visitors who have previously claimed camping sites on the flowage by leaving tents or other objects in one location, or by building temporary structures on islands for extended camping, may disagree with the new 10-day limits. The general public, however, will benefit because everyone will be granted equal access to flowage camping sites.

Fire hazards could increase with greater visitation, but fire rings will reduce the risk of wild fire at most sites.

**b. Boats and Boat Access Sites**

**i. Physical Impacts** - Six developed public boat access sites already exist on the flowage. No new public access sites are planned. Improvements (e.g., concrete ramps, improved parking, pit toilets) may increase the number of boaters using these access sites. Waste and pollution from boat motors may also increase. The number of car/trailer units able to access the flowage from public sites at a given time will remain unchanged except for an additional seven units at Sportsman's Landing. Moving Sportsman's Landing 300 yards to the north and increasing its capacity from 3 units to 10 units will cause soil compaction from construction vehicles and future public use of the site. No traffic congestion is anticipated.

**ii. Biological Impacts** - Because the flowage is a relatively shallow body of water, widespread motorboat and personal watercraft use has been limited. However, noise from increases in number of motorboats or personal watercraft could reduce the wild character of the flowage or negatively affect wildlife (e.g., increase nest abandonment). Water turbidity may also increase with increased boating.

Current motorboat use on the flowage has not been detrimental to wildlife, except in isolated cases. If there is an increase in boat types, number, size and speed, there will be increased potential for conflicts and detrimental effects on wildlife because of nest abandonment and mortality of young birds. Increased size and speed would also result in increased wave size and strength which may destroy fragile nests created by black terns, loons, grebes and shorebirds. At present there has been very little use of personal watercraft. Any increase in personal watercraft, airboats or hovercraft

would enable recreationers to penetrate deeper into the wetlands and marshes, disrupting many nesting and young rearing activities required by wildlife.

Structural improvement at boat landings may damage or destroy existing vegetation. The proposed location for Sportsman's Landing will displace existing wildlife at that site.

**iii. Socioeconomic Impacts** - Improving boat access sites may increase the number of future visitors to the flowage, especially at well-used sites like Fisherman's, and Springstead Landings (all facilities at Springstead Landing will meet A.D.A. requirements). Any construction activities or increase in visitors will positively affect local economies.

Improvements at boat access sites could result in an increase in noise and trash levels. Signs requesting flowage visitors to carry out their refuse will help to compensate for any added waste from increased use.

**c. Roads and Trails**

**i. Physical Impacts** - No new public roads are planned; existing roads will be closed to motorized access unless designated as open. Administrative roads will be gated to prevent public vehicular access but will remain open for hiking, hunting and other non-motorized recreational activities. Logging roads or other existing trails which are not needed for administrative purposes will be blocked and the landscape restored. Current noise or exhaust pollution levels are not likely to change. Existing snowmobile trails will be maintained with only minor brushing or grading; no significant impacts are expected from trail maintenance. A new interpretive nature trail from Fisherman's Landing will require brushing, grading and surfacing with natural materials; adverse environmental impacts should be minimal.

**ii. Biological Impacts** - Construction of a nature trail near Fisherman's Landing and ongoing maintenance of snowmobile and nature trails will require some brushing but will have no significant adverse impact on vegetative communities. If noise becomes a significant disturbance to nesting sites, trail segments may need to be relocated. Noise from snowmobiles will result in minor disturbance to wildlife.

**iii. Socioeconomic Impacts** - Local landowners accustomed to driving on state-owned administrative roads or old logging trails may be inconvenienced by the proposed limitations on motorized vehicular access.

Permitting continued snowmobile use may increase visitation, especially winter visitation, to the TFSWA. Local businesses and resorts will benefit from this increased use.

Noise from snowmobiles, logging trucks, and department vehicles on trails and administrative roads may disturb visitors looking for a quiet recreational setting.

**6. Aesthetic Management**

**a. Physical Impacts** - Clear cuts in the backland zone will have the most significant aesthetic impacts.

There are limited controls on activities which occur on private lands within the proposed TFSWA boundary and these activities do negatively impact the wild character and natural aesthetics of the

flowage. Some additional shoreline is targeted for acquisition and future aesthetic impacts from private development will be reduced in these areas.

Certain shorelands within the proposed boundary are not being considered for acquisition and therefore negative aesthetic impacts will persist. These impacts include motor vehicle use, noise and lights from private dwellings, construction of boathouses and piers along the waters edge, clear cutting of vegetation within the shoreline zone, and other activities associated with private landholdings.

Relocating or burying utility lines within the project boundaries will have a positive impact on the natural aesthetics of project lands.

**b. Biological Impacts** - Eliminating timber harvest within 300 feet of the flowage shoreline, and placing restrictions on the types of timber harvest and management within the flowage viewshed and on land adjacent to public roads, will have a positive impact on aesthetics.

**c. Socioeconomic Impacts** - Preserving the wild scenic character of the TFSWA will increase the enjoyment of flowage visitors seeking a wilderness type experience. Hikers, snowshoers and other backland users will continue to view recent and ongoing management activities.

Timber revenue will be reduced by limiting timber management within the viewshed. Preserving the wild character of the TFSWA may increase the number of yearly visitors, benefiting local businesses that rely on tourism.

Owners of private lands on the flowage will benefit from the lack of development on the remainder of the TFSWA. Visitors seeking a wilderness experience, however, will be confronted with developments on these private lots such as boathouses and boat shelters, piers, signs and lights -- all permitted to the waters edge -- that will be visible from many parts of the flowage.

## **D. Cumulative Effects of Repeated Actions**

As Wisconsin's growing population increases demands on outdoor recreational resources, it is likely that efforts will be made to meet those demands through other land acquisitions. However, there are few opportunities remaining in the state to add large blocks of land which would provide remote water-based recreation comparable to the flowage. It is therefore unlikely that there will be additional developments comparable to the TFSWA.

## **E. Degree of Risk or Uncertainty in Predicting Impacts**

Impacts are predicted based on the assumption that lands within the project boundary targeted for acquisition will be acquired. Since lands will only be acquired from willing sellers, it is possible that significant blocks of private lands will remain within the boundary for the foreseeable future. Unforeseen developments with unknown impacts could occur on these private lands.

Noise from motorized boats is currently limited by the relatively shallow nature of the flowage and the abundance of driftwood and stumps. The advent of new types of watercraft such as personal watercraft ("jet skis"), which can navigate very shallow areas, could change traditional recreational

use patterns and the present wild character of the flowage. There are currently no state regulations which would allow us to limit the types of watercraft used on the flowage.

Exotic species, including purple loosestrife, Eurasian water milfoil, zebra mussel, buckthorn and rusty crayfish, are relatively limited in the TFSWA. Future visitor expansion may increase the risk of importing new exotics and expediting the spread of existing undesirable exotics.

An earthen dike with concrete spillway and emergency gates regulates water in the flowage. The dam was last inspected in 1987 and will again be inspected in 1997. As long as the dam is in good condition, an unforeseeable future emergency (such as a drawdown to protect a downstream threat or a dam burst) is not likely to occur. If such a "worst case" scenario were to occur, the flowage would probably revert to its pre-1920 water levels. Water and wetland resources, as well as local land use and land cover, would face significant physical, biological and socioeconomic changes.

## **F. Degree Action May Establish a Precedent or Foreclose Future Options**

It is unlikely that proposed management on the TFSWA will establish any precedent for management of other department lands or foreclose future management options.

## **G. Degree of Controversy Over the Effects of the Proposal**

Some conflict is likely from individuals who have traditionally used old trails and logging roads which will now be closed.

Conflicts may also arise from limiting the number of designated campsites and closing certain campsites which have traditionally been used.

Controversy is also likely over motor use on the flowage. The department has received requests from a number of groups and individuals who would like an area of the flowage restricted to non-motorized boats and vehicles only. Concerns have also been expressed about the limited area set aside as unmanaged forest. Reasons cited for wanting larger blocks of forest land set aside in an unmanaged classification range from the desire for more wilderness-type experiences to biodiversity concerns.

Some debate could arise concerning the loss or gain of tax revenue after the proposed acquisition. Changes in land values and taxes on properties adjacent to the project boundary may also concern local property owners. Aid-in-lieu of tax payment for state acquisitions to local taxing authorities has lessened the concern.

## **H. Summary of Issue Identification Activities**

The TFSWA Master Plan was developed over an approximately two-year period by: a six-member Citizen Advisory Committee; a twelve-member, multi-disciplinary Department Master Planning Task Force; individual members of the public and independent organizations; and other department staff and specialists. Open house public meetings were held to identify issues and solicit public input early in the process. All Citizen Advisory Committee meetings were open to the public. Many individuals and several organized groups attended and made suggestions regarding the content of the proposed plan. Natural Resources Board approval will be required before this plan can be implemented.

# VIII. COMPLIANCE WITH THE WISCONSIN ENVIRONMENTAL POLICY ACT

DECISION (This decision is not final until certified by the appropriate authority)

In accordance with s. 1.11, Stats., and Ch. NR 150, Adm. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Stats., and Ch. NR 150, Wis. Adm. Code.

Complete either A or B below:

A. EIS Process Not Required

The attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action which would significantly affect the quality of the human environment. In my opinion, therefore, an environmental impact statement is not required prior to final action by the Department on this project.

B. Major Action Requiring the Full EIS Process

The proposal is of such magnitude and complexity with such considerable and important impacts on the quality of the human environment that it constitutes a major action significantly affecting the quality of the human environment.

Signature of Evaluator <i>[Signature]</i>	Date Signed 1 AUGUST 94
Noted by District Staff Specialist or Bureau Director <i>[Signature]</i>	Date Signed 8/1/94

Number of responses to news release or other notice:

CERTIFIED TO BE IN COMPLIANCE WITH WEPA	
District Director or Director of DEAR (or designee) <i>[Signature]</i>	Date Signed 2/22/95

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

Note: Not all Department decisions respecting environmental impact, such as those involving solid waste or hazardous waste facilities under sections 144.43 to 144.47 and 144.60 to 144.74, (Stats., are) subject to the contested case hearing provisions of section 227.42, Stats.

This notice is provided pursuant to section 227.48(2), Stats.

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## X. GLOSSARY

<b>ADA</b>	Americans with Disabilities Act
<b>ATV</b>	All-terrain vehicle
<b>Backland Zone</b>	All areas within the project boundary not visible from the water and more than 150 feet from public roads.
<b>BER</b>	Bureau of Endangered Resources
<b>BMP</b>	Best Management Practices. For this plan, BMPs refer to the department's <i>Wisconsin's Forestry Best Management Practices for Water Quality Field Manual</i> .
<b>CFIC</b>	Chippewa Flambeau Improvement Company
<b>Community</b>	An assemblage of species living together in a particular area, at a particular time, in a prescribed habitat. Communities usually bear the name of their dominant plant species but include all of the microbes, plants and animals living in association with the dominant plant species at a given time.
<b>Den Tree</b>	A tree which contains one or more cavities that are used by wildlife for dens or nests in which to live and/or rear their young.
<b>Department</b>	Wisconsin Department of Natural Resources
<b>Edge</b>	The zone where two different habitat types meet. It can range from an abrupt change from one to the other (hard edge) to a gradual integration of the two (soft edge).
<b>Edge Effects</b>	The ecological impact of interfacing two or more habitat types. Edge is inherent or natural in nature but can have negative impacts if its creation alters ecological processes. In general, edge effects increase in relation to the dissimilarity between adjoining habitats.
<b>Even-aged Forest Management</b>	Forest management with periodic harvest of all trees on part of the forest at one time, or in several cuttings over a short time, to produce stands containing trees all the same or nearly the same in age.
<b>Flowage</b>	In this plan, the "flowage" refers to the Turtle-Flambeau Flowage and Trude Lake.
<b>Forest Type</b>	A group of species that commonly grows together because of their environmental requirements and tolerances.
<b>GIS</b>	Geographic Information System

<b>Habitat</b>	The place where an organism lives and its surrounding environment, including its biotic and abiotic components. Habitat includes everything an organism needs to survive.
<b>Interior Habitat</b>	That portion of a community not influenced by edge effects because it is far enough removed from its outside boundaries.
<b>MSL</b>	Mean Sea Level
<b>Navigable Waters</b>	All lakes and streams, including sloughs, bayous and marsh outlets, except farm drainage ditches, which are navigable in fact for any purpose whatsoever.
<b>NHEU</b>	National Hierarchy of Ecological Units. A system for classifying land based on ecological characteristics. The NHEU describes the landscapes (regions) of an area based on site-specific climate, soil, land form and vegetation characteristics.
<b>Non-acquisition Lands</b>	Subdivided private lands or private lands with capital developments within the project boundary that are excluded from acquisition goals.
<b>NH/ALSF</b>	Northern Highland/American Legion State Forest
<b>NSP</b>	Northern States Power
<b>Old-growth</b>	A community with dominant trees at or near biological maturity. The age of an old-growth community varies with species and site. Old-growth stands are generally characterized by a multi-layered, uneven age and size class structure; a high degree of compositional and structural patchiness and heterogeneity; and significant amounts of woody debris and tip-up mounds. Old-growth stands exhibit the functions and processes of undisturbed forest ecosystems.
<b>Prescribed Burns</b>	Prescribed burns are preplanned, ignited and managed by department personnel for management purposes. Conversely, wildfires are those ignited by natural causes, arsonists or by accident and are not preplanned.
<b>Regeneration Cut</b>	A harvest operation to establish regeneration, either naturally or artificially. This can include selection, production harvest, clearcut, shelterwood and seed tree harvesting (i.e., even- or uneven-aged management). For the purpose of this plan, regeneration cut will mean clear cut.
<b>RGS</b>	Ruffed Grouse Society
<b>Rotation</b>	The number of years required to establish and grow trees to a specified size, product or condition of maturity.
<b>Selection Harvest</b>	Harvesting individual trees or small groups of trees at periodic intervals (usually 15-20 years) based on their physical condition or degree of maturity. Usually produces an uneven-aged timber stand in hardwoods.

<b>Shoreline Zone</b>	The shoreline of all navigable waters within the project boundary from the ordinary high water mark landward 300 feet.
<b>Species Diversity</b>	The variety of species in an area. It includes not only the number of species in the area but also their relative abundance and spatial distribution. Species richness is one component of species diversity, but not the only determinant.
<b>Species of Special Concern</b>	Species on the Wisconsin Natural Heritage Working List not designated as endangered or threatened, but with a suspected problem of abundance or distribution. The purpose of this category is to focus attention on species before they become threatened or endangered.
<b>Succession</b>	Progressive temporal changes in species composition, organic structure and energy flow in a community.
<b>Thinning</b>	Cutting in an immature forest stand to reduce the tree density and concentrate the growth potential on fewer, higher quality trees resulting in larger trees that maintain a good growth rate. Selection thinning selects individual trees for removal.
<b>TFSWA</b>	Turtle-Flambeau Scenic Waters Area. In this plan, TFSWA refers to all land and water within the proposed project boundary.
<b>TSI</b>	Timber Stand Improvement. This refers to any cultural practice done in the forest stand that improves the rate of growth, quality of growth, or composition of the forest stand itself. This includes, but is not limited to: pruning, non-commercial thinning, crop tree release, and elimination of competing culls, vines, weeds and grasses.
<b>Uneven-aged Forest Management</b>	Managing the forest by periodically removing some trees from an uneven-aged stand while preserving its natural appearance.
<b>Viewshed Zone</b>	Any area outside the shoreline zone that is visible from the flowage as well as a strip of land extending 150 feet on either side of all public roads.

# APPENDIX I: FISH AND WILDLIFE IN THE TURTLE-FLAMBEAU SCENIC WATERS AREA

**Table 2.** Fish Species Found in the Turtle-Flambeau Flowage and Trude Lake

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<u>Common Name</u>	<u>Scientific Name</u>
Lake sturgeon	<i>Acipenser fulvescens</i>
Lake herring (cisco)	<i>Coregonus artedii</i>
Muskellunge	<i>Esox masquinongy</i>
Central mudminnow	<i>Umbra limi</i>
Northern pike	<i>Esox lucius</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Common shiner	<i>Notropis cornutus</i>
Bluntnose minnow	<i>Pimephales notatus</i>
White sucker	<i>Catostomus commersoni</i>
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>
Greater redhorse	<i>Moxostoma valenciennesi</i>
Black bullhead	<i>Ictalurus melas</i>
Yellow bullhead	<i>Ictalurus natalis</i>
Troutperch	<i>Percopsis omiscomaycus</i>
Burbot	<i>Lota lota</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Largemouth bass	<i>Micropterus salmoides</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Rock bass	<i>Ambloplites rupestris</i>
Walleye	<i>Stizostedion vitreum</i>
Yellow perch	<i>Perca flavescens</i>
Logperch	<i>Percina caprodes</i>
Johnny darter	<i>Etheostoma nigrum</i>

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**Table 3.** Species List of the Mammals Existing or Potentially Existing on the Turtle-Flambeau Flowage Wetlands, Iron County, WI, 1991

<u>Common name</u>	<u>Scientific name</u>	<u>Habitat</u>
Arctic shrew <sup>a</sup>	( <u>Sorex arcticus</u> )	tamarack/spruce
Beaver	( <u>Castor canadensis</u> )	alder banks
Black bear	( <u>Ursus americanus</u> )	forested swamps
Bobcat <sup>a</sup>	( <u>Lynx rufus</u> )	swamps/forests
Boreal red-backed vole	( <u>Clethrionomys gapperi</u> )	wet-soil
Coyote	( <u>Canis latrans</u> )	woodland borders, brush openings
Deer mouse	( <u>Peromyscus maniculatus</u> )	conifer, deciduous, and spruce-cedar forests
Eastern chipmunk	( <u>Tamias striatus</u> )	open hardwoods, brush areas
Eastern cottontail	( <u>Sylvilagus floridanus</u> )	near swamps
Least chipmunk	( <u>Eutamias minimus</u> )	mixed con.-decid. forests, woody debris
Lynx <sup>b</sup>	( <u>Lynx canadensis</u> )	swamps
Masked shrew	( <u>Sorex cinereus</u> )	moist forests, marsh, grass bogs, alder thickets
Meadow vole	( <u>Microtus pennsylvanicus</u> )	low moist areas
Meadow jumping mouse	( <u>Zapus hudsonius</u> )	moist grassy and brush areas
Mink	( <u>Mustela vison</u> )	rivers/streams
Moose <sup>c</sup>	( <u>Alces alces</u> )	alder/Willow swamp
Muskrat	( <u>Ondatra zibethicus</u> )	marshes/stream lakes/ponds
Northern flying squirrel	( <u>Glaucomys sabrinus</u> )	mixed conifer-hardwood forests
Northern water shrew <sup>a</sup>	( <u>Sorex palustris</u> )	swamps/bogs/cold streams
Porcupine	( <u>Erethizon dorsatum</u> )	deciduous - conifer mixed forests
Raccoon	( <u>Procyon lotor</u> )	most any water
Red fox	( <u>Vulpes fulva</u> )	swamps/thickets
Red squirrel	( <u>Tamiasciurus hudsonicus</u> )	conifer forests
River otter	( <u>Lutra canadensis</u> )	rivers/streams
Shorttail shrew	( <u>Blarina brevicauda</u> )	all habitats
Snowshoe hare	( <u>Lepus americanus</u> )	swamps/thickets
Southern bog lemming <sup>a</sup>	( <u>Synaptomys cooperi</u> )	low damp bog
Starnose mole <sup>a</sup>	( <u>Condylura cristata</u> )	low, wet ground near streams
Timber wolf <sup>a</sup>	( <u>Canis lupus</u> )	undisturbed woodlands, brush areas, swamps
Weasel	( <u>Mustela spp.</u> )	forests and brush areas
White-tailed deer	( <u>Odocoileus virginianus</u> )	aspen, oak forests, swamp conifers, openings, brush
Woodchuck	( <u>Marmota monax</u> )	forest borders, brush, fields, woody debris
Woodland jumping mouse	( <u>Napaeozapus insignis</u> )	wet bog/stream

<sup>a</sup> potential species (Burt and Grossenheider 1976).

<sup>b</sup> potential endangered (BER 1990).

<sup>c</sup> rare species occurring.

**Table 4.** Species List of the Reptiles and Amphibians Existing or Potentially Existing on the Turtle-Flambeau Flowage Wetlands, Iron County, WI, 1991.

<u>Common Name</u>	<u>Scientific name</u>	<u>Habitat</u>
American toad	( <u>Bufo americanus</u> )	abundant insects/moisture
Blue-spotted salamander <sup>a</sup>	( <u>Ambystoma laterale</u> )	deciduous/pond
Brown snake <sup>a</sup>	( <u>Storeria dekayi</u> )	freshwater marshes margins of swamps/bogs/ponds
Bull frog	( <u>Rana catesbeiana</u> )	ponds and lakes
Chorus frog	( <u>Pseudacris triseriata</u> )	swampy grass
Common garter snake	( <u>Thamnophis sirtalis</u> )	wet meadows/marshes
Cope's gray treefrog <sup>a</sup>	( <u>Hyla chrysoscelis</u> )	trees/shrubs near perm. water
Eastern newt <sup>a</sup>	( <u>Notophthalmus viridescens</u> )	ponds/lakes dense submergent vegetation
Eastern gray treefrog	( <u>Hyla versicolor</u> )	trees/shrubs near water
Eastern painted turtle	( <u>Chrysemys picta</u> )	slow-moving shallow water
Four-toed salamander <sup>a</sup>	( <u>Hemidactylium scutatum</u> )	bogs
Fox snake	( <u>Elaphe vulpina</u> )	wooded stream valleys
Green frog	( <u>Rana clamitans</u> )	shallow water/pond edge, lakes
Mink frog	( <u>Rana septentrionalis</u> )	cold water w/abundant vegetation (water lilies)
Mudpuppy	( <u>Necturus maculosus</u> )	waters with mud bottom
Northern leopard frog	( <u>Rana pipiens</u> )	freshwater
Northern ringneck snake	( <u>Diadophis punctatus</u> )	moist, cool deciduous forests, woody debris
Northern watersnake <sup>a</sup>	( <u>Nerodia sipedon</u> )	most any water
Pickerel frog	( <u>Rana palustris</u> )	slow moving water dense vegetation
Red-bellied snake	( <u>Storeria occipitomaculata</u> )	sphagnum bogs
Smooth green snake <sup>a</sup>	( <u>Opheodrys vernalis</u> )	grassy marshes
Snapping turtle	( <u>Chelydra serpentina</u> )	mud bottom lakes/ponds w/abundant vegetation
Spotted salamander <sup>a</sup>	( <u>Ambystoma maculatum</u> )	hardwood forest around pools/ flooded depressions
Spring peeper	( <u>Hyla crucifer</u> )	wooded areas near water/swamps
Tiger salamander <sup>a</sup>	( <u>Ambystoma tigrinum</u> )	damp meadows
Wood frog	( <u>Rana sylvatica</u> )	boreal and mixed hardwood forests, temporary ponds
Wood turtle <sup>b</sup>	( <u>Clemmys insculpta</u> )	cool stream, red maple swamps/marshy meadows

<sup>a</sup> potential species (Behler and King 1979).

<sup>b</sup> potential threatened species (BER 1990).

<sup>c</sup> potential endangered species (BER 1990).

**Table 5.** Species List of the Birds Existing or Potentially Existing on the Turtle-Flambeau Flowage Wetlands, Iron County, WI 1991.

<u>Common name</u>	<u>Scientific name</u>	<u>Habitat<sup>1</sup></u>
Acadian flycatcher <sup>4*</sup>	( <u>Empidonax virescens</u> )	beech-maple and hemlock forest, clearings
Alder flycatcher <sup>*</sup>	( <u>Empidonax alorum</u> )	alder swamps, lakeside thickets
American crow	( <u>Corvus brachyrhynchos</u> )	adjacent upland
American kestrel <sup>2</sup>	( <u>Falco sparverius</u> )	open country
American widgeon <sup>2</sup>	( <u>Anas americana</u> )	marshes
American robin	( <u>Turdus migratorius</u> )	open woodlands, agricultural lands, towns
American redstart <sup>2,3</sup>	( <u>Setophaga ruticilla</u> )	second growth forests, thickets with saplings
American tree sparrow <sup>2</sup>	( <u>Spizella arborea</u> )	weedy fields, woodland edges, brush areas
American bittern	( <u>Botaurus lentiginosus</u> )	marshy lakes
American black duck	( <u>Anas rubripes</u> )	marshes/lakes/streams
American goldfinch	( <u>Carduelis tristis</u> )	brush, grasslands
American woodcock	( <u>Scolopax minor</u> )	moist woodland thickets
American coot <sup>*</sup>	( <u>Fulica americana</u> )	open ponds and marshes
Bald eagle <sup>c</sup>	( <u>Haliaeetus leucocephalus</u> )	lake/river
Bank swallow	( <u>Riparia riparia</u> )	rivers/streams
Barn swallow	( <u>Hirundo rustica</u> )	marshes/lakeshores
Barred owl <sup>2</sup>	( <u>Strix varia</u> )	low, wet woods, and swamp forests
Bay-breasted warbler <sup>*</sup>	( <u>Dendroica castanea</u> )	open spruce forest
Belted kingfisher	( <u>Ceryle alcyon</u> )	rivers/lakes
Black tern	( <u>Chlidonias nigra</u> )	marshes
Black-and-white warbler <sup>3</sup>	( <u>Mniotilta varis</u> )	deciduous old growth and second growth forests
Black-backed woodpecker <sup>*</sup>	( <u>Picoides arcticus</u> )	swamps
Black-capped chickadee	( <u>Parus atricapillus</u> )	adjacent forests
Black-throated blue warbler <sup>*</sup>	( <u>Dendroica caerulescens</u> )	mixed deciduous/evergreen
Blackburnian warbler	( <u>Dendroica fusca</u> )	mixed hemlock, spruce, and hardwood forests
Blue jay	( <u>Cyanocitta cristata</u> )	oak forests
Blue-winged teal <sup>*</sup>	( <u>Anas discors</u> )	shallow ponds/lakes
Bobolink <sup>*</sup>	( <u>Dolichonyx oryzivorus</u> )	marshes during migration
Broad-winged hawk	( <u>Buteo platypterus</u> )	adjacent deciduous
Brown thrasher <sup>2</sup>	( <u>Toxostoma rufum</u> )	brush areas and woodland edges
Brown creeper <sup>2</sup>	( <u>Certhia americana</u> )	deciduous and mixed forests
Brown-headed cowbird <sup>2</sup>	( <u>Molothrus ater</u> )	fields, woodland edges
Bufflehead <sup>1</sup>	( <u>Bucephala albeola</u> )	lakes, ponds, bays

<u>Common name</u>	<u>Scientific name</u>	<u>Habitat<sup>1</sup></u>
Canada goose	( <u>Branta canadensis</u> )	Lakes/ivers marshes
Cedar waxwings	( <u>Bombycilla cedrorum</u> )	uplands near rivers
Chestnut-sided warbler	( <u>Dendroica pensylvanica</u> )	forest and wetlands edges, brush areas
Chipping sparrow <sup>2</sup>	( <u>Spizella passerina</u> )	grassy woodland edges, brush areas
Cliff swallow	( <u>Hirundo pyrrhonota</u> )	lakeshores/marshes
Common yellowthroat	( <u>Geothlypis trichas</u> )	moist thickets
Common nighthawk <sup>2</sup>	( <u>Chordeiles minor</u> )	open country
Common redpoll <sup>2</sup>	( <u>Carduelis flammea</u> )	open to brush areas, weedy fields
Common raven <sup>2</sup>	( <u>Corvus corax</u> )	conifer forests
Common loon	( <u>Gavia immer</u> )	forested lakes/ivers
Common grackle	( <u>Quiscalus quiscula</u> )	adjacent upland marshes
Common snipe	( <u>Gallinago</u> )	marshes/ponds/flooded meadows
Common goldeneye <sup>a</sup>	( <u>Bucephala clangula</u> )	lakes/ponds
Common tern	( <u>Sterna hirundo</u> )	lakes, ponds, rivers
Common merganser <sup>a</sup>	( <u>Merqus merganser</u> )	wooded rivers
Connecticut warbler <sup>a</sup>	( <u>Oporornis agilis</u> )	open larch/spruce bogs
Cooper's hawk <sup>a</sup>	( <u>Accipiter cooperi</u> )	adjacent deciduous
Dark-eyed junco <sup>2</sup>	( <u>Junco hyemalis</u> )	conifer and mixed forests, fields
Double-crested cormorant <sup>a</sup>	( <u>Phalacrocorax auritus</u> )	lakes/ivers
Downy woodpecker	( <u>Picoides pubescens</u> )	woodlots
Eastern kingbird	( <u>Tyranus tyrannus</u> )	lake/river shores
Eastern bluebird <sup>2</sup>	( <u>Sialia sialis</u> )	open fields with scattered trees
Eastern screech owl <sup>2</sup>	( <u>Otus asio</u> )	deciduous woods, lakes, shores
Eastern phoebe <sup>2</sup>	( <u>Sayornis phoebe</u> )	open woodlands near streams
Eastern wood pewee	( <u>Contopus virens</u> )	open forests
European starling <sup>2</sup>	( <u>Sturnus vulgaris</u> )	towns, farmlands
Evening grosbeak <sup>2</sup>	( <u>Coccothraustes vespertinus</u> )	conifer forests
Field sparrow	( <u>Spizella pusilla</u> )	willow and alder thickets, fields, woodland edges
Gray jay <sup>2</sup>	( <u>Perisoreus canadensis</u> )	conifer forests
Gray catbird <sup>2</sup>	( <u>Dumetella carolinensis</u> )	brush and thickets
Great-horned owl <sup>2</sup>	( <u>Bubo virginianus</u> )	all habitats
Great-blue heron	( <u>Ardea herodias</u> )	most any waters
Greater scaup <sup>2</sup>	( <u>Aythya marila</u> )	lakes, bays, ponds
Green heron	( <u>Butorides striatus</u> )	lake/stream/shore
Green-winged teal <sup>2</sup>	( <u>Anas crecca</u> )	marshes, shallow ponds
Hairy woodpecker	( <u>Picoides villosus</u> )	adjacent deciduous
Hermit thrush	( <u>Catharus guttatus</u> )	conifer and mixed forests
Herring gull <sup>a</sup>	( <u>Larus argentatus</u> )	lakes/ivers
Hooded merganser	( <u>Lophodytes cucullatus</u> )	most any water
Horned grebe <sup>a</sup>	( <u>Podiceps auritus</u> )	marshes/lakes
House wren	( <u>Troglodytes aedon</u> )	semi-open country
Killdeer <sup>2</sup>	( <u>Charadrius vociferous</u> )	short grass areas, mudflats
Least flycatcher	( <u>Empidonax minimus</u> )	woodland borders
Least bittern <sup>a</sup>	( <u>Ixobrychus exilis</u> )	cattails/reeds
LeConte's sparrow <sup>a</sup>	( <u>Ammodramus leconteii</u> )	bog meadows
Lesser scaup <sup>2</sup>	( <u>Aythya affinis</u> )	lakes, rivers, marshes, and ponds

<u>Common name</u>	<u>Scientific name</u>	<u>Habitat</u> <sup>1</sup>
Lincoln's sparrow <sup>a</sup>	( <u>Melospiza lincolni</u> )	brush bogs willow/alder thickets
Marsh wren	( <u>Cistothorus palustris</u> )	cattail marsh
Mallard	( <u>Anas platyrhynchos</u> )	most any water
Merlin	( <u>Falco columbarius</u> )	adjacent coniferous, islands
Mourning dove <sup>2</sup>	( <u>Zenaida macroura</u> )	open fields with trees shrubs
Nashville warbler	( <u>Vermivora ruficapilla</u> )	forest and wetland edges, brush areas
Northern cardinal	( <u>Cardinalis cardinalis</u> )	brush swamps
Northern oriole <sup>2</sup>	( <u>Icterus galbula</u> )	deciduous woods, elm
Northern flicker	( <u>Colaptes auratus</u> )	open country, openings
Northern goshawk <sup>2</sup>	( <u>Accipiter gentilis</u> )	conifer forests, woodland edges
Northern harrier <sup>a</sup>	( <u>Circus cyaneus</u> )	marshes
Northern pintail <sup>a</sup>	( <u>Anas acuta</u> )	marshes
Northern rough-winged swallow	( <u>Stelgidopteryx serripennis</u> )	rivers
Northern waterthrush	( <u>Seiurus noveboracensis</u> )	cool bogs/wooded swamps
Northern parula warbler <sup>a3</sup>	( <u>Parula americana</u> )	coniferous woods/swamp
Northern shoveler <sup>a</sup>	( <u>Anas clypeata</u> )	marshes
Olive-sided flycatcher	( <u>Contopus borealis</u> )	spruce/fir forest/ponds/bogs
Osprey <sup>c</sup>	( <u>Pandion haliaetus</u> )	lakes/rivers
Ovenbird <sup>4</sup>	( <u>Seiurus aurocapillus</u> )	open, dry forests with little undergrowth
Palm warbler	( <u>Dendroica palmarum</u> )	bogs
Pied-billed grebe	( <u>Podilymbus podiceps</u> )	marshes/ponds
Pileated woodpecker <sup>4</sup>	( <u>Dryocopus pileatus</u> )	adjacent dense forest
Pine siskin <sup>2</sup>	( <u>Carduelis pinus</u> )	conifer and mixed forests, alder and brush areas
Pine grosbeak <sup>2</sup>	( <u>Pinicola enucleator</u> )	conifer and mixed forests, fruiting trees
Purple finch <sup>2</sup>	( <u>Carpodacus purpureus</u> )	mixed and conifer forests
Red crossbill <sup>2</sup>	( <u>Loxia curvirostra</u> )	conifer forests
Red-breasted nuthatch	( <u>Sitta canadensis</u> )	conifer forests
Red-eyed vireo <sup>4</sup>	( <u>Vireo olivaceus</u> )	deciduous forests
Red-headed woodpecker <sup>2</sup>	( <u>Melanerpes erthrocephalus</u> )	open grasslands and woodlands
Red-necked grebe <sup>b</sup>	( <u>Podiceps grisegena</u> )	ponds/lakes
Red-tailed hawk <sup>2</sup>	( <u>Buteo jamaicensis</u> )	deciduous forests, open areas
Red-winged blackbird	( <u>Agelaius phoeniceus</u> )	marshes/swamps
Redhead <sup>2</sup>	( <u>Aythya americana</u> )	marshes, lakes, bays
Ring-billed gull	( <u>Larus delawarensis</u> )	lakes/rivers
Ring-necked duck <sup>a</sup>	( <u>Aythya collaris</u> )	wooded lakes/ponds
Rose-breasted grosbeak	( <u>Pheucticus ludovicianus</u> )	moist woodland
Rough-legged hawk	( <u>Buteo lagopus</u> )	marshes
Ruby-throated hummingbird	( <u>Archilochus colubris</u> )	woodlands
Ruffed grouse	( <u>Bonasa umbellus</u> )	aspen, brush areas
Rusty's blackbird <sup>a</sup>	( <u>Euphagus carolinus</u> )	wooded swamps
Sandhill cranes	( <u>Grus canadensis</u> )	marshes
Scarlet tanager <sup>24</sup>	( <u>Piranga olivacea</u> )	mature woodlands, elm
Sedge wren	( <u>Cistothorus platensis</u> )	grassy marshes/sedges
Sharp-shinned hawk <sup>2</sup>	( <u>Accipiter striatus</u> )	dense conifers
Short-eared owl <sup>a</sup>	( <u>Asio flammeus</u> )	freshwater marshes
Snow goose <sup>2</sup>	( <u>Chen caerulescens</u> )	marshes and grain fields
Snowy owl	( <u>Nyctea scandiaca</u> )	open marshes
Song sparrow	( <u>Melospiza melodia</u> )	brush thickets
Sora	( <u>Porzana carolina</u> )	marshes
Spotted sandpiper	( <u>Actitis macularia</u> )	most any shore
Swamp sparrow	( <u>Melospiza georgiana</u> )	open wood swamp

<u>Common name</u>	<u>Scientific name</u>	<u>Habitat<sup>1</sup></u>
Three-toed woodpecker <sup>a</sup>	( <u>Picoides tridactylus</u> )	swamps
Tree swallow	( <u>Tachycineta bicolor</u> )	most any water
Veery <sup>4</sup>	( <u>Catharus fuscescens</u> )	willow thickets along streams
Virginia rail	( <u>Rallus limicola</u> )	marshes
Warbling vireo	( <u>Vireo gilvus</u> )	deciduous forests, especially near streams
Whip-poor-will <sup>2,4</sup>	( <u>Caprimulgus vociferus</u> )	dry, open woodlands near fields
White-breasted nuthatch	( <u>Sitta carolinensis</u> )	adjacent forests
White-throated sparrow	( <u>Zonotrichia albicollis</u> )	wet coniferous
Willow flycatcher	( <u>Empidonax traillii</u> )	swampy thickets
Winter wren	( <u>Troglodytes troglodytes</u> )	thickets/coniferous swamp
Wood duck	( <u>Aix sponsa</u> )	wooded rivers/ponds
Wood thrush <sup>4</sup>	( <u>Hylocichla mustelina</u> )	deciduous
Yellow rail <sup>a</sup>	( <u>Coturnicops noveboracensis</u> )	grassy marshes/wet meadows
Yellow-bellied sapsucker	( <u>Sphyrapicus varius</u> )	adjacent open deciduous
Yellow-bellied flycatcher <sup>a</sup>	( <u>Empidonax flaviventris</u> )	alder/willow thickets
Yellow-headed blackbird	( <u>Xanthocephalus xanthocephalus</u> )	marsh
Yellow-rumped warbler	( <u>Dendroica coronata</u> )	conifer and mixed forests
Yellow-throated vireo <sup>a,3</sup>	( <u>Vireo flavifrons</u> )	deciduous/stream

a potential species (Bull and Farrand 1977).

b potential endangered species (BER 1990).

c threatened species existing (BER 1990).

1 Habitat describes most preferred types used in this area and does not apply to times and localities when birds are not present in Northern Wisconsin. Due to migration, birds may use alternate habitats at various times and locations.

2 Species identified by Springstead residents C.E. Schulz, D.R. Brush, and B.C. Schulz.

3 Area sensitive interior species which require large undisturbed forests with little human activity.

4 Interior species which require large stands of forested areas.

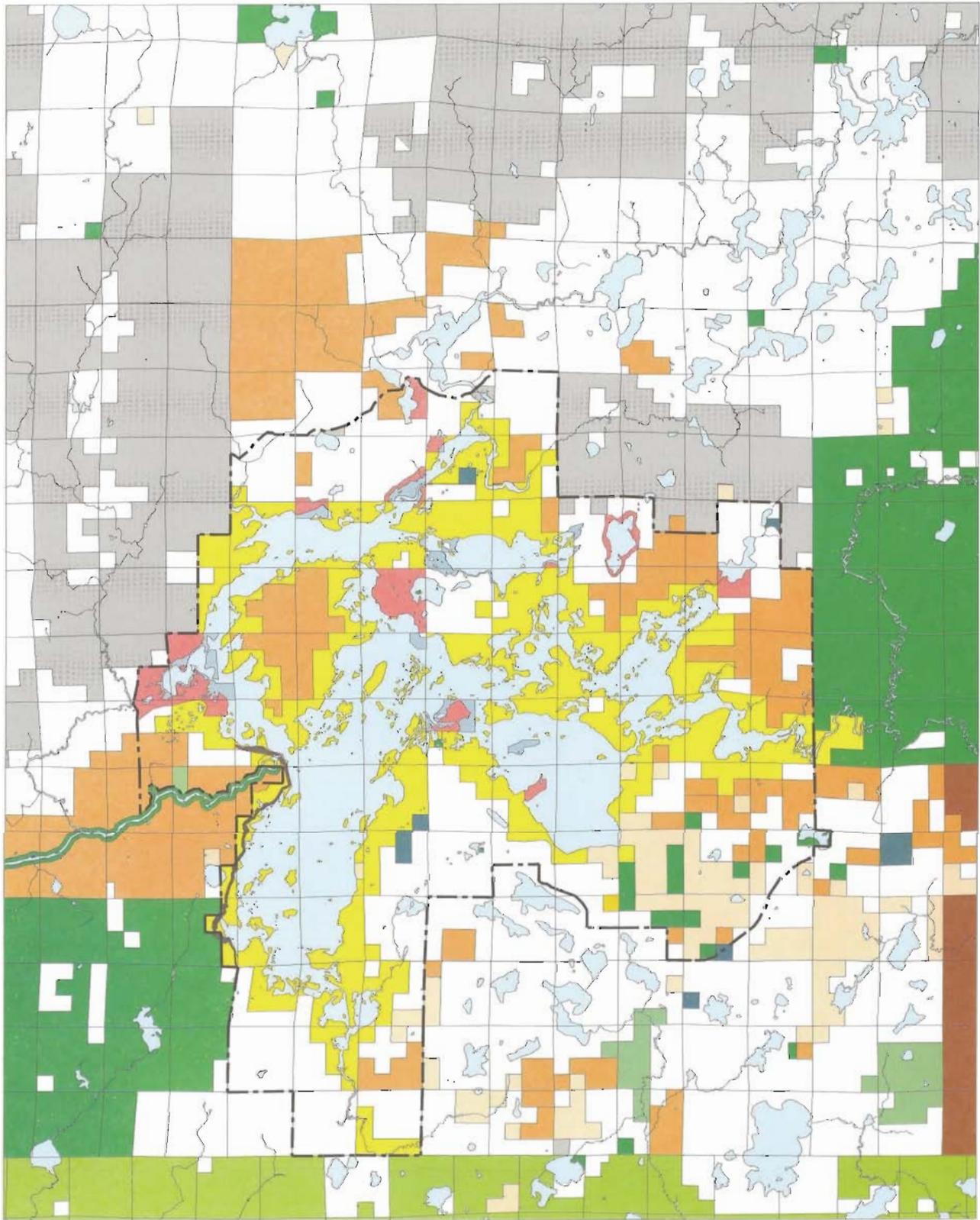
Table 6. Surface Waters Within the Turtle-Flambeau Scenic Waters Area Project Boundary.

Lake Name	Size (acres)	Max. Depth	M.P.A. (ppm)	Conductance umhos 77°F	pH	Water Color	Fisheries Values	Public Access
Altman	2.8	27	3	21	4.7	dk.br.	unknown	none
Brandt	10.9	27	3	13	6.0	lt.br.	LM Bass; Panfish	walk in
Deadhorse	14.3	30	12	27	6.8	lt.br.	LM Bass; N Pike; Panfish	none
Fawn	20.0	16	3	14	7.6	c.	LM Bass; Panfish	none
Fox	45.6	23	20	47	7.5	lt.br.	LM Bass; N Pike; Panfish	walk in
Goose	11.3	3	27	69	6.4	md.br.	minnows	walk in
Grant	107.0	10	27	62	6.4	md.br.	LM Bass; Walleye; Musky; N Pike; Panfish	none
Island	56.0	5	45	110	7.9	c.	LM Bass; N Pike; Panfish	none
Kyle	2.4	12	6	18	6.8	lt.br.	unknown	none
Lake Nine	60.1	11	3	14	5.5	lt.br.	unknown	walk in
Lipp	1.3	3	5	13	7.0	lt.br.	minnows	none
Mirror	57.5	7	3	21	5.7	lt.br.	LM Bass; Musky; Perch	walk in
Nokomis	18.4	15	7	13	6.1	c.	LM Bass; Musky; Walleye; Panfish	none
North Grant	14.3	8	29	64	6.2	dk.br.	LM Bass; Panfish	none
Otter	7.4	9	52	112	7.1	c.	LM Bass; N. Pike; Panfish	navigable
Popko	1.5	6	7	32	6.4	md.br.	Panfish; minnows	none
Reimer	12.0						LM Bass; Panfish	walk in
Ruth	4.2	12	3	13	7.4	c.	unknown	none
Sand	101.0	35	3	15	6.4	c.	LM Bass; Walleye; Panfish	none
Third Black	67.7	33	25	61	7.1	md.br.	LM Bass; Musky; Walleye; Panfish	road side
Turtle-Flambeau (incl. Trude L.)	14,300	50	32	76	7.1	lt.br.	SM Bass; Walleye; Musky; Panfish	ramp/parking
Vincent	2.9	25	3	14	5.7	lt.br.	LM Bass; Panfish	none
Wilson	155.0	21	50	105	6.9	c.	LM Bass; Musky; N Pike; Panfish	ramp/parking
Stream Name	Miles (in project)	M.P.A. (ppm)	Conductance umhos 77°F	pH	Water Color	Fisheries Values	Public Access	
Beaver Cr.	1.5	69	151	7.0	c.	minnows	navigable	
Four Mile Cr.	0.8	47	107	7.0	md.br.	minnows	road crossing	
Grant Cr.						N Pike; minnows	navigable	
Island Cr.	0.9	36	89	7.0	c.	minnows	none	
Little Turtle R.	0.7	53	121	7.5	lt.br.	LM Bass; Musky; Walleye; N Pike; Panfish	road crossing	
Otter Cr.	0.6					N Pike; minnows	navigable	

## **APPENDIX II: TURTLE-FLAMBEAU SCENIC WATERS AREA MAPS**

- Figure 1. Ownership Layer
- Figure 2. Recreation Layer
- Figure 3. Wildlife Layer
- Figure 4. Vegetative Cover Layer
- Figure 5. Land Classification Layer
- Figure 6. Administrative Layer

Figure 1



### Turtle - Flambeau Flowage: Ownership

- |                                      |                              |
|--------------------------------------|------------------------------|
| Turtle-Flambeau Land (1990 Purchase) | Industrial Forest            |
| Chequamegon National Forest          | Indian Reservation           |
| Dedicated Conservation Lands         | Iron County Land             |
| Other DNR Land                       | Township Lands               |
| Private Land                         | Dike (Northern States Power) |
| Department of Transportation Land    | State Owned Lakebed          |
| WI Land Commission Land              | Privately Owned Lakebed      |
| Proposed Non-acquisition Areas       | Project Boundary             |

Percent Ownership within Project Boundary

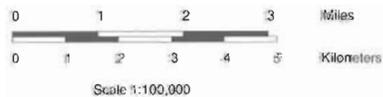
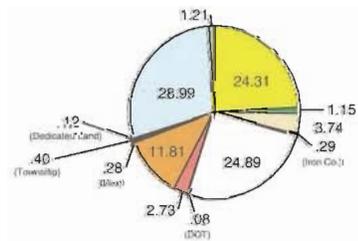
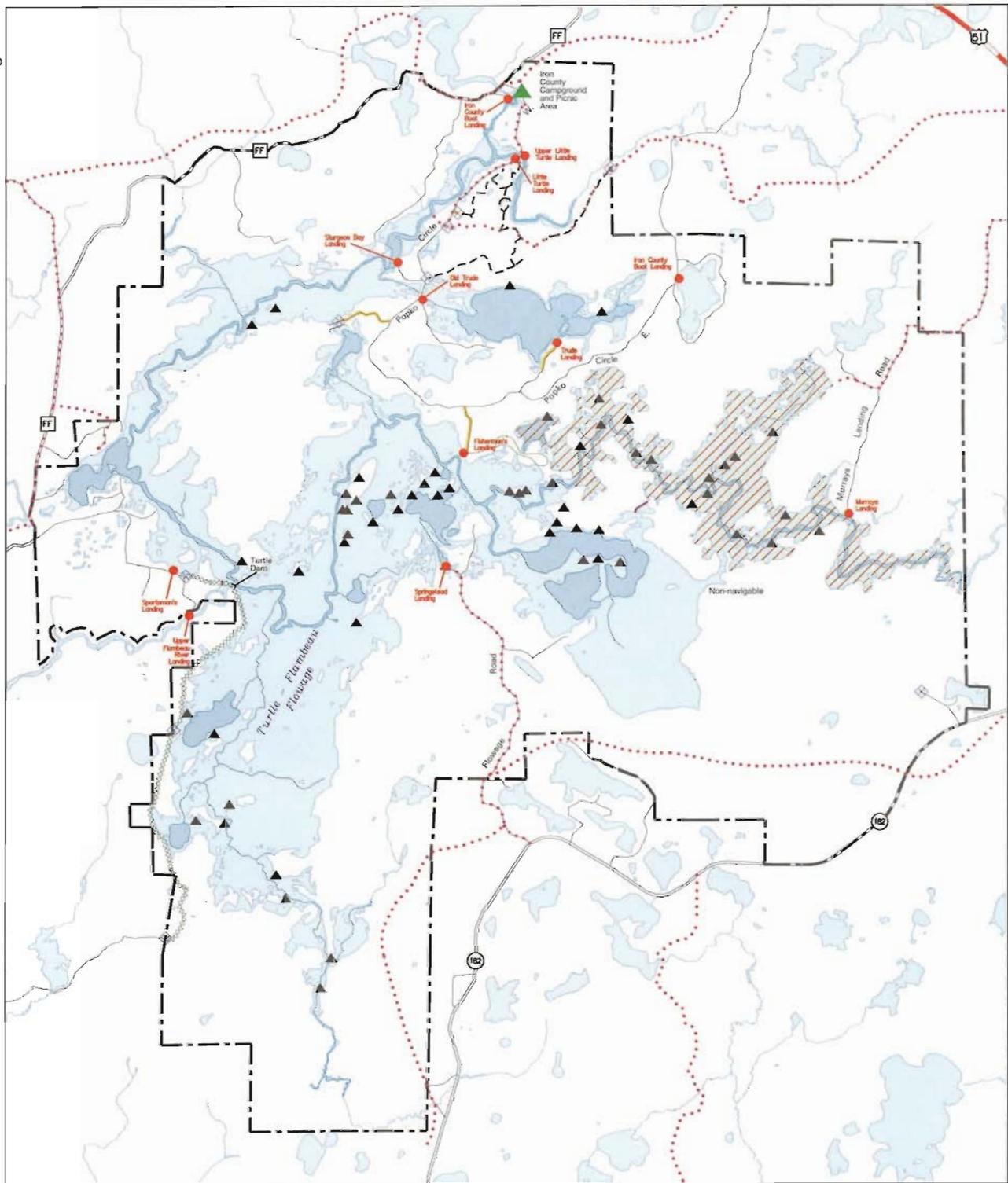


Figure 2



### Turtle - Flambeau Flowage: Recreation

- Township Road
- == County and State Highway
- U.S. Highway
- Project Roads Open to Public Vehicular Traffic
- Administrative Roads Closed to Public Motor Vehicles
- - - Hunter Walking Trails
- ..... Snowmobile Trails
- Canoe Portage
- Nature Trail
- ▲ Campsites
- Boat Landings
- ◆ Gates
- Open Water
- Original River Channel and Lakes
- ▨ Voluntary Quiet Area (Only during Open Water Season)
- Project Boundary
- Bridge
- ▲ Campground

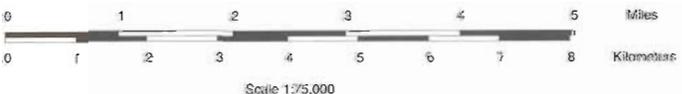
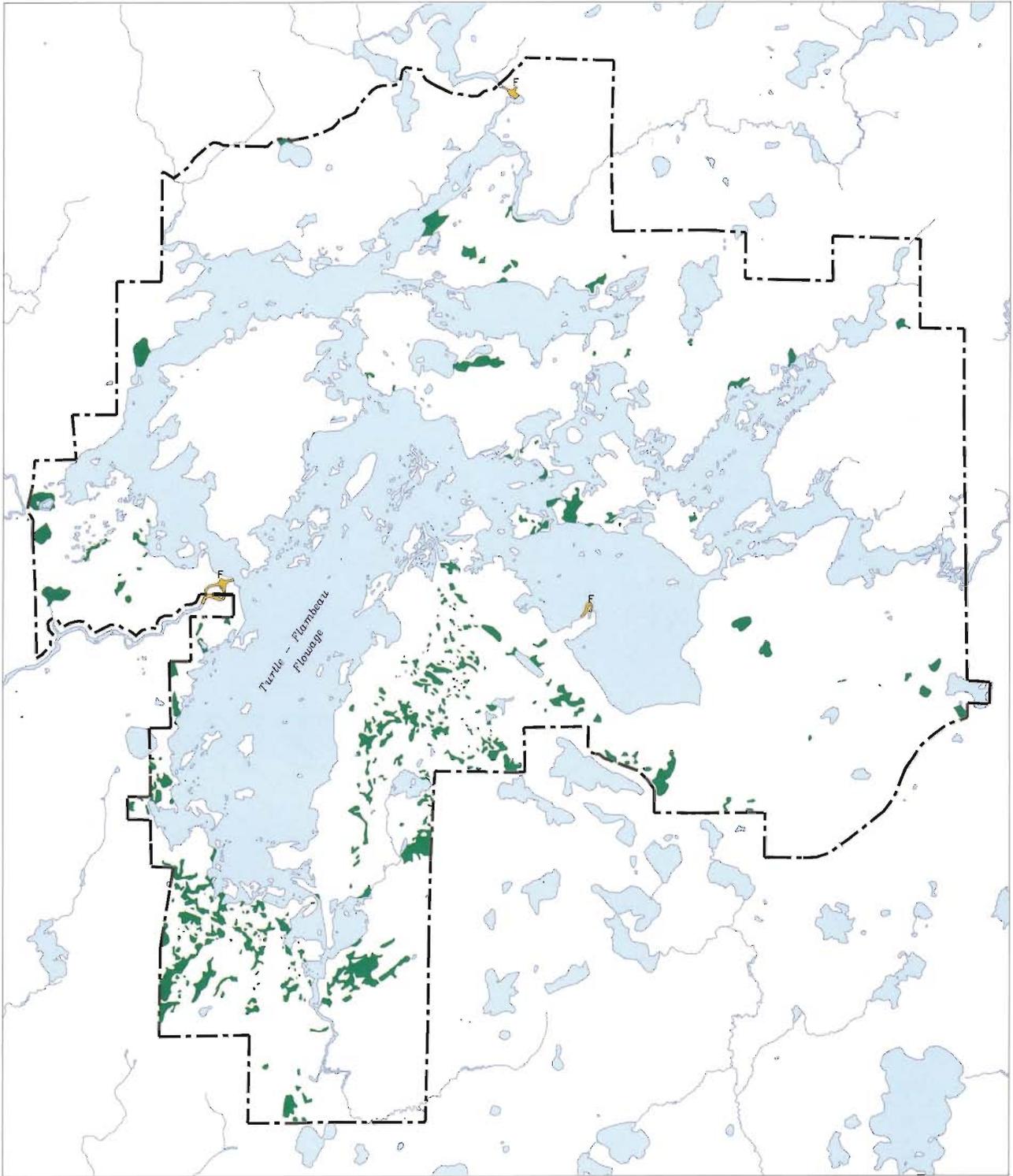


Figure 3



### Turtle - Flambeau Flowage: Wildlife

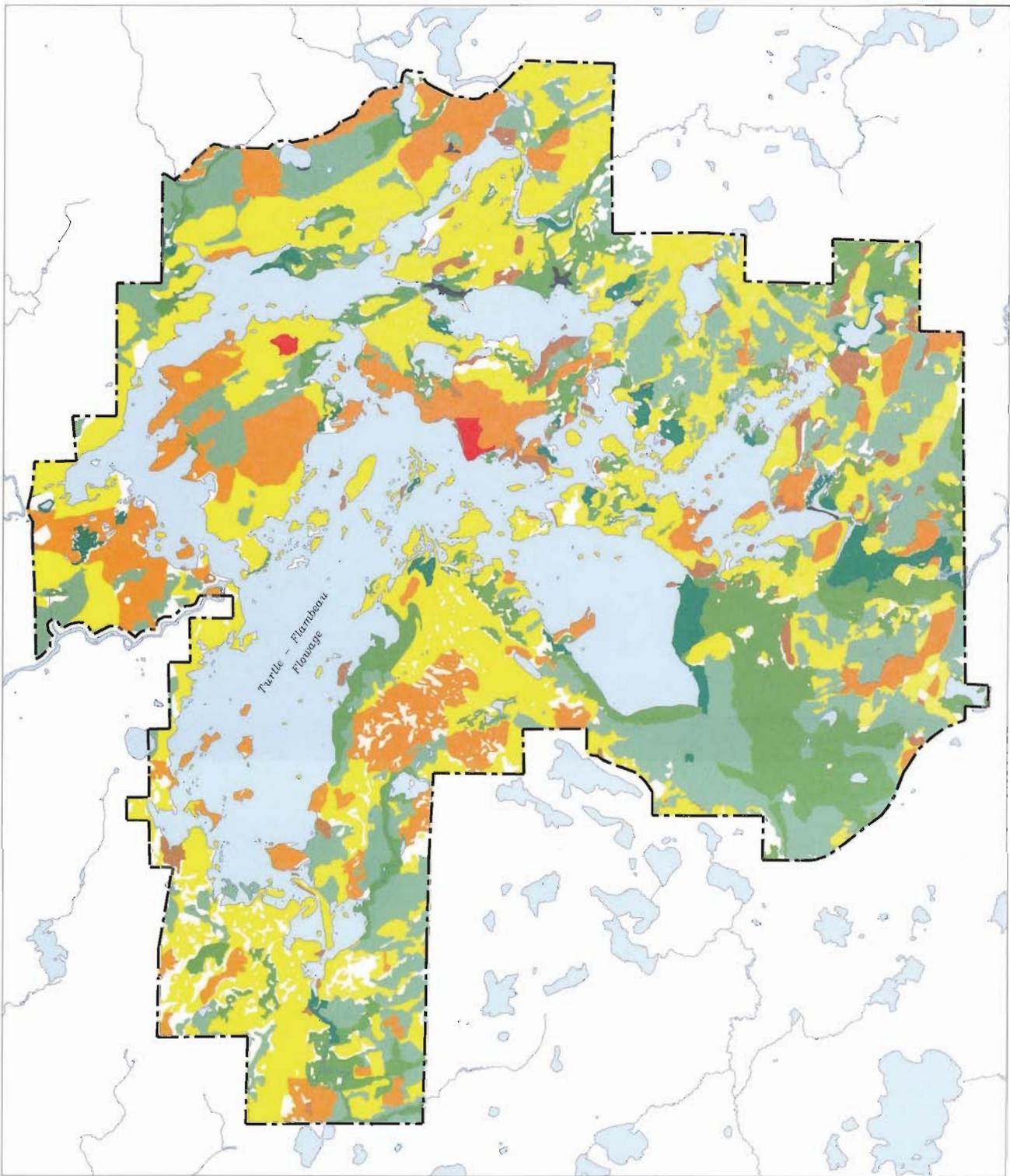
-  Wildlife Open Area
-  Fish Refuge
-  Open Water
-  Project Boundary



Scale 1:75,000



Figure 4



### Turtle - Flambeau Flowage: Vegetative Cover

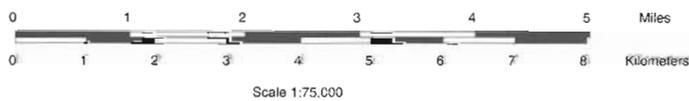
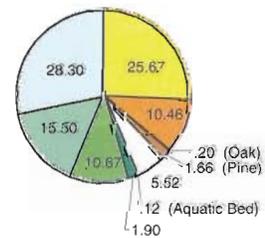
**Forested Areas**

- Aspen/White Birch
- Northern Hardwoods
- Oak
- Pine
- Open Areas

**Wetland Areas**

- Aquatic Bed
- Emergent/Wet Meadow
- Scrub/Shrub
- Forested
- Open Water
- Project Boundary

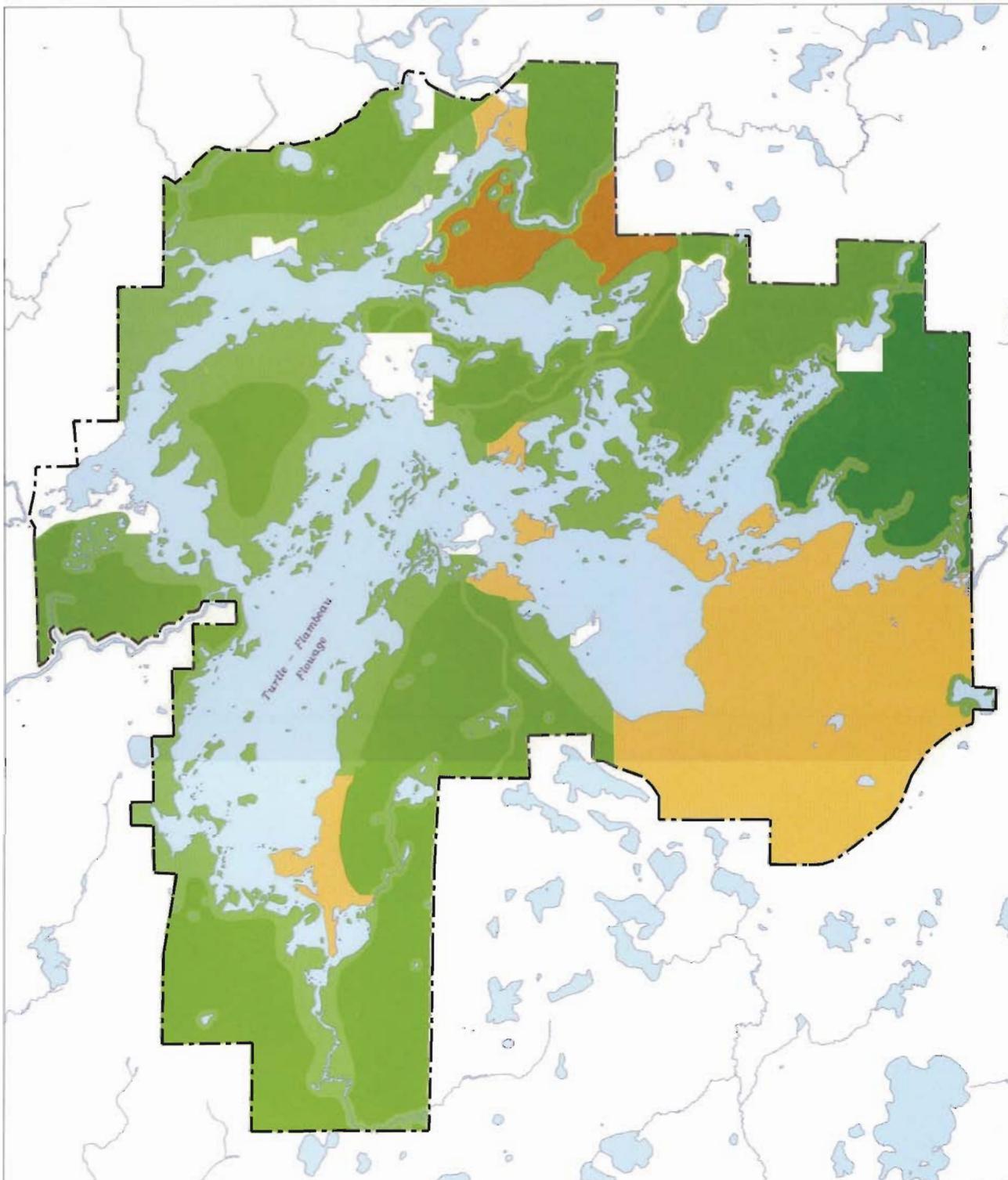
**Percent Vegetation within Project Boundary**



Scale 1:75,000



Figure 5



### Turtle - Flambeau Flowage: Land Classification

- Resource Protection Areas:
- Wild
  - Habitat Preservation
  - Natural
  - Scenic
- Resource Development Area:
- Demonstration Management
- Open Water
- Project Boundary

Percent Land Classification within Project Boundary

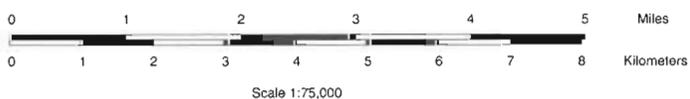
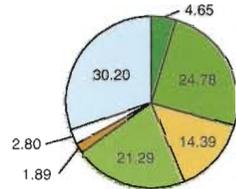
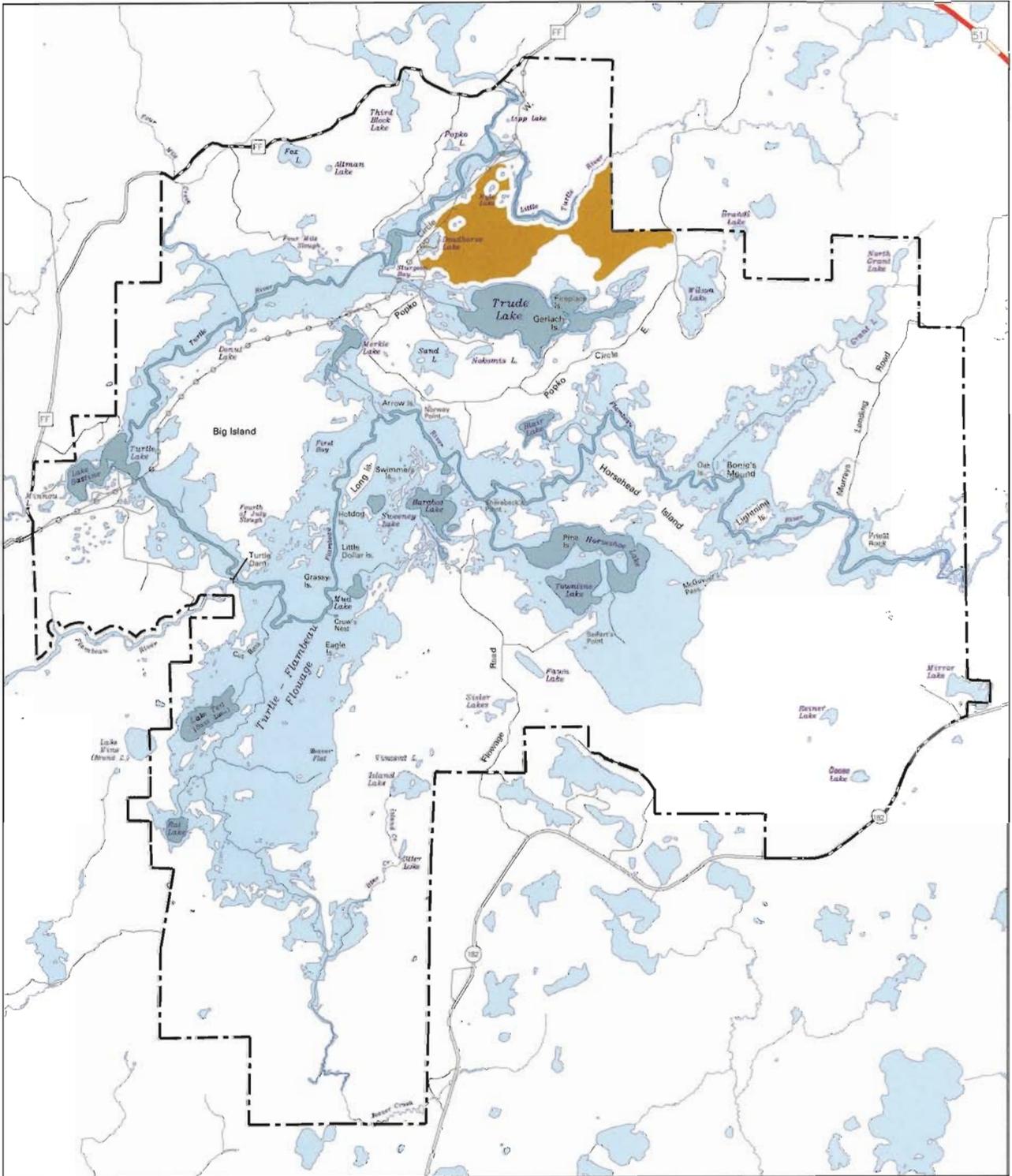


Figure 6



### Turtle - Flambeau Flowage: Administrative

-  Township Road
-  County and State Highway
-  U.S. Highway
-  Powerline
-  Open Water
-  Original River Channel and Lakes
-  Deadhorse Lake Ruffed Grouse Demonstration Area
-  Project Boundary

