

U.S. Fish and Wildlife Service Final Coordination Act Report



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Mr. Robert J. Whiting
Chief, Environmental Resources Section
Management and Evaluation Branch
St. Paul District, Corps of Engineers
Army Corps of Engineers Centre
190 Fifth Street East
St. Paul, Minnesota 55101-1638

OCT 08 1998

Dear Mr. Whiting:

As agreed to in our November 5, 1997, Scope of Work, the U.S. Fish and Wildlife Service (Service) has prepared the enclosed Final Fish and Wildlife Coordination Act Report for the Corps of Engineers' flood control study of the Red River of the North at Grand Forks, North Dakota, and East Grand Forks, Minnesota. The report provides a description of the existing resources in the project area; identifies problems, needs, and management objectives for the area's biological resources; provides input into the development of the project design; and makes recommendations to preserve, restore, or enhance environmental resources.

The Service has coordinated with the States of North Dakota and Minnesota in the preparation of this final report. Further, we have incorporated your comments into this final document.

In accordance with the consultation requirements of section 7 of the Endangered Species Act of 1973, as amended, we concur with your determination that the proposed flood abatement project for Grand Forks, North Dakota, is not likely to adversely affect federally-listed threatened and endangered species in the project area. This precludes further action as required under section 7 for the project. However, if new information becomes available that indicates listed species may be affected, consultation must be reinitiated with this office.

If you have questions, please contact either Bill Pearson of the Bismarck, North Dakota, Field Office at (701) 250-4401 or Paul Burke of the Twin Cities, Minnesota, Field Office at (612) 725-3548 x205.

Sincerely,

Lynn M. Lewis
Lynn M. Lewis
Field Office Supervisor



**Grand Forks, ND and East Grand Forks, MN
Long Term Flood Abatement Project**

Introduction

This Fish and Wildlife Coordination Act Report has been written to accompany the Corps of Engineers' (Corps) flood control study on the Red River of the North at Grand Forks, North Dakota, and East Grand Forks, Minnesota. The report provides a description of the existing resources in the project area, identifies problems, needs, and management objectives for the area's biological resources, provides input into the development of the project design, and makes recommendations to preserve, restore, or enhance environmental resources. It is prepared under the authority of and in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e), and in accordance with the provisions of the Endangered Species Act (16 U.S.C. 1531 et seq.).

The Corps has prepared a General Reevaluation Report and Environmental Impact Statement for the proposed construction of flood protection features along the Red River of the North at Grand Forks, North Dakota, and East Grand Forks, Minnesota. The Corps has previously prepared a Reconnaissance Report for the Grand Forks project, which included a Planning Aid Letter from the Fish and Wildlife Service (Service) dated February 25, 1991. The Corps also prepared a Supplement to the Final Environmental Impact Statement (EIS) for East Grand Forks, which included a Service Fish and Wildlife Coordination Act Report dated March 7, 1984. The Grand Forks reconnaissance study has been discontinued. The East Grand Forks study will be reevaluated and will include flood protection for Grand Forks. The General Reevaluation Report will confirm tentative recommendations of the reconnaissance report with appropriate economic, environmental, engineering, and design information.

Description of the Study Area

The Red River of the North is a part of the Hudson Bay drainage system which drains parts of North Dakota, South Dakota, and Minnesota, in the United States, and parts of Manitoba and Saskatchewan in Canada. The Red River, formed by the confluence of the Ottertail and Bois de Sioux Rivers at the twin cities of Breckenridge, Minnesota, and Wahpeton, North Dakota, has a total drainage area in the United States of 39,200 square miles, of which 20,820 square miles are in North Dakota (including the non-contributing Devils Lake Basin) (Figure 1). The Red River Valley is not a river valley but a lacustrine plain - the bottom of an extinct glacial lake. In recent geologic times, the Red River region was covered by a large continental ice sheet. Retreating glaciers left a massive meltwater lake known as Lake Agassiz. The present day Red River Valley formed the bottom of the lake. The Red River flows north into Canada across the floor of the glacial lake bed for 394 river miles, forming the North Dakota-Minnesota boundary. The lake bed is nearly flat, with an average slope of about 0.4 feet per mile. The river has a high sediment load of silts and clays, which results in the muddy character of the Red River.

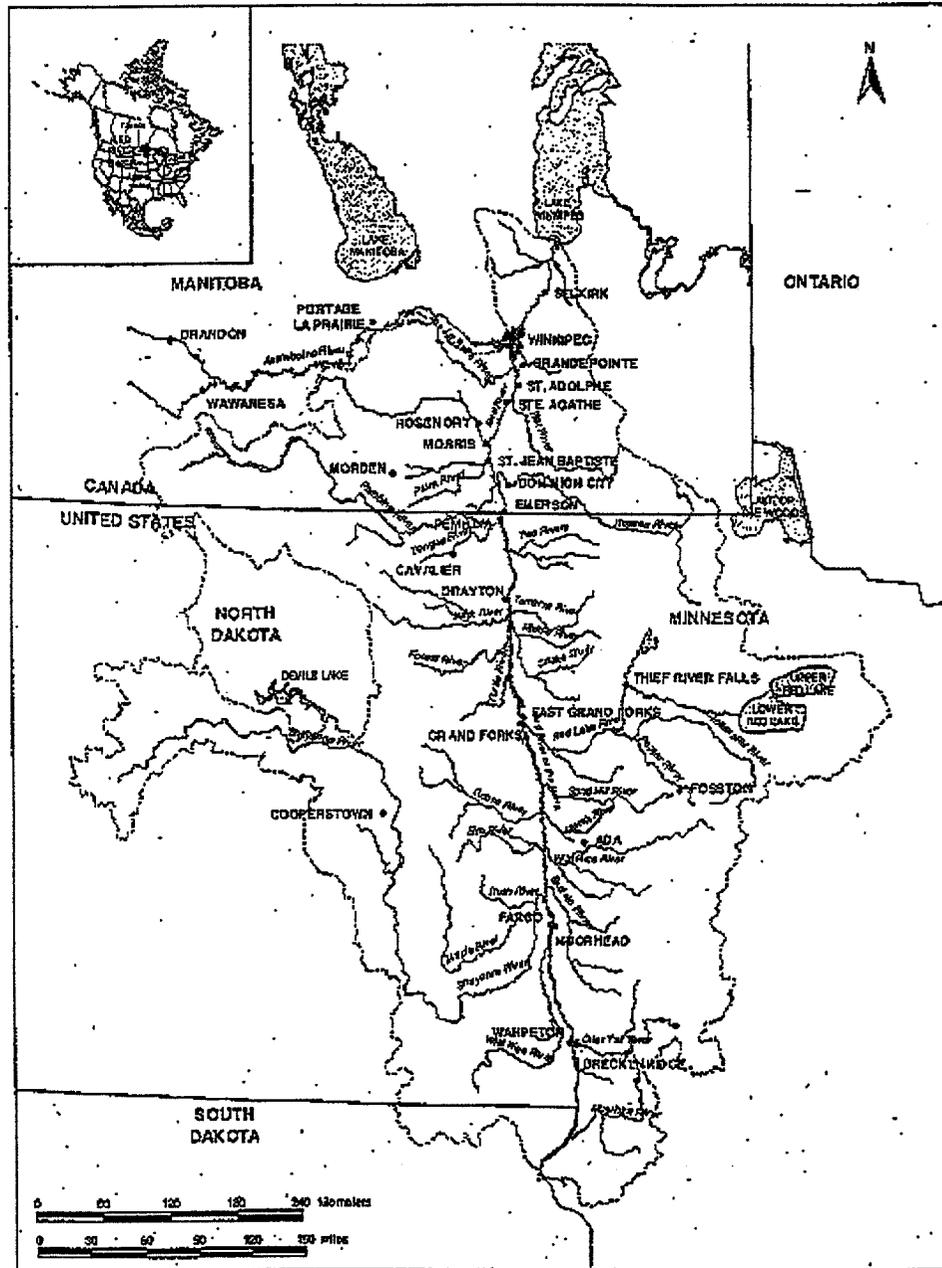


Figure 1. Red River of the North drainage basin in the U.S. and Canada.

Additionally, the river is characterized by a low gradient and high sinuosity. The river has carved a channel 20-50 feet deep through which water flows northward. The North Dakota portion of the Lake Agassiz Plain is approximately 35 miles wide. Flows in the Red River vary greatly depending on winter snow accumulation and precipitation. Destructive floods may occur during April and May from snowmelt runoff augmented by rainfall. Because of the mild gradient of the Red River (average of one-half foot per mile), floodwaters inundate wide areas and move slowly. As a result, flooding may persist for several weeks.

The Red Lake River flows westward from Upper and Lower Red Lakes in northern Minnesota approximately 100 miles to its confluence with the Red River at East Grand Forks, Minnesota. The area drained by the Red Lake River watershed is 1,133 square miles. Land use in this area is approximately 1 percent urban, 1 percent forest, and 98 percent cropland.

The cities of Grand Forks and East Grand Forks are important agricultural service centers for rural Grand Forks County, North Dakota, and Polk County, Minnesota, respectively. The agribusinesses located in the two cities process products from much of the Red River Valley. Grand Forks (pop. 52,500) is the second largest city in eastern North Dakota. East Grand Forks, Minnesota (pop. 9,000) is primarily a residential community with close economic ties to Grand Forks.

Project Description

The initial Corps flood control project had two alternatives that were evaluated. The Locally Preferred Plan (LPP), identified by the non-Federal Sponsor for full evaluation, was a split-flow diversion and levee combination plan. It consisted of an in-town levee system and a large diversion channel located on a North Dakota alignment. This plan was dropped due to a cost/benefit ratio of 0.40, which does not meet the criteria of a National Economic Development (NED) Plan. Federal and Corps planning procedures require the formulation of an NED plan. This NED plan is an optimized plan that provides the greatest net benefits and has a benefit-to-cost ratio of at least 1.0. After detailed economic optimization was completed in January 1998, the NED plan was determined to be the 210-year plan (0.47% exceedency frequency plan), which is also referred to locally as the 1997 flood plan or the levees only plan. This plan was determined to be economically feasible with a benefit-to-cost ratio of 1.13 and the largest net benefit of the plans evaluated.

The Corps' flood protection plan (Corps of Engineers 1998) will protect Grand Forks, North Dakota, and East Grand Forks, Minnesota, from floods of a magnitude equal to the 1997 flood (54.4 feet). The flood protection plan will be accomplished through the erection of a system of set-back levees protecting the cities. The levees will extend along the banks of the Red and Red Lake Rivers and either tie into high ground, or completely encircle the cities. Because of the unstable nature of the soil along the river banks, the levees must be set back from the rivers, on stable ground. High plasticity glacio-lacustrine clays deposited in glacial Lake Agassiz cause

most of the soil stability problems in the Red River Valley. The majority of the land along the alignments of the levees is residential, commercial, or industrial. The amount of agricultural land is limited and natural areas are scarce.

The Corps' flood protection plan includes the concept of a greenway (Figure 2) to be located on the floodplains of the Red River and Red Lake River between the cities of Grand Forks, North Dakota, and East Grand Forks, Minnesota. In addition to offsetting the adverse effects on habitat caused by construction, the inclusion of a greenway provides the opportunity for restoration and development of native habitats including upland, wetland, and riparian types. Habitat restoration of former human use areas (residential, commercial, industrial, and agricultural) would provide direct benefit to native species and indirect benefits to riverine habitat. The greenway will be located between the proposed levee alignments and encompass approximately 2,000 acres of the floodplain between the two cities. The greenway concept provides the residents of the cities a unique opportunity to help shape the redevelopment of their cities by incorporating a "green" (natural) element into those areas most ravaged by the recent flooding. The area designated as greenway must first and foremost act as a floodway, moving water through the cities as efficiently as possible. With this in mind, the greenway provides an opportunity to create an environmentally friendly, low maintenance area with a trail system, few structures or high maintenance areas, floodplain restoration, and natural open areas.

The design of the greenway includes three primary areas of influence: Cultural, Recreation, and Environmental (Figure 2). These areas fit naturally into the present structure of the cities and overlap to some extent. An extensive trail system would run the length of the project on both sides of the river and be linked by three pedestrian bridges spanning the Red River. The trail concept also provides for city-to-city connection and multiple neighborhood accesses.

Major Grand Forks, North Dakota, Area Features include:

- 408 acres of fee title lands and 264 acres of temporary easements of real estate acquisition for unimproved and city owned properties (acreage does not include improved properties)
- 206 single family homes (some are historically significant), 24 apartments, 11 condominiums, 6 businesses, RDO Food water plant, and portions of the Grand Forks city water plant
- 7.2 miles of in-town levees (ranging from 8 to 22 feet in height and having a 10-foot-wide levee top with 1 vertical on 3 horizontal side slopes)
- 1.0 miles of in-town road raise levees
- 1.8 miles of tieback levees
- 2.3 miles of road raise tieback levees
- 1.1 miles of floodwalls
- 0.5 miles of mechanically stabilized earth wall/levee
- 7 road raises that cross levee alignment
- 1 road earth closure
- 2 railroad stoplog closure structures

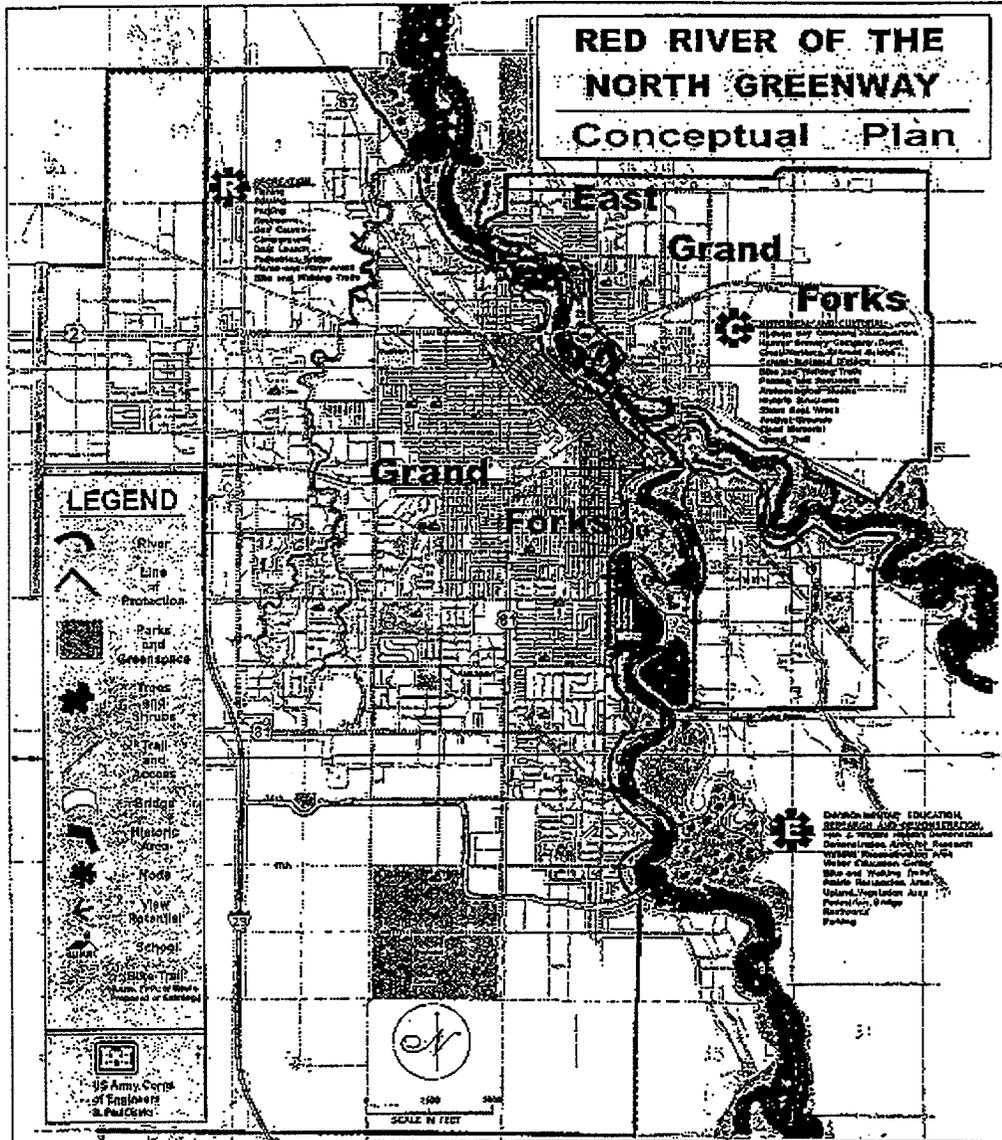


Figure 2. U.S. Army Corps of Engineers' Grand Forks/East Grand Forks Greenway conceptual plan.

- 0.6 miles of new streets
- 9 pump stations
- 22 gated outlets
- 4.0 miles of new English Coulee diversion channel (ranging from 5 to 12 feet in depth and having a 30- to 60-foot bottom width with 1 vertical on 5 horizontal side slopes)
- 4.5 miles of existing English Coulee diversion channel modifications (widening bottom width to 80 feet grading 1 vertical on 5 horizontal side slopes and replacing existing drop structures near outlet to the Red River)

Major East Grand Forks (North), Minnesota, Area Features include:

- 177 acres of fee title and 49 acres of temporary easement real estate acquisition for unimproved and city owned properties (acreage does not include improved properties)
- 16 single family homes and 60 apartments
- 10 businesses
- 10.1 miles of levees (ranging from 7.5 to 23 feet in height and having a 10-foot top width with 1 vertical on 3 horizontal side slopes)
- 1.2 miles of road raise levees
- 0.2 miles of floodwalls
- 0.1 mile MSE wall/levee
- 11 road raises which cross the levee alignment
- 6 road stoplog closure structures
- 2 railroad closure structures
- 5 pump stations.
- 9 gated outlets

Major East Grand Forks (Point Area/South) Area Features include:

- 153 acres of fee title and 37 acres of temporary easement real estate acquisition for unimproved and city owned properties (acreage does not include improved properties)
- 30 single family homes
- 6.0 miles of levees (ranging from 9.5 to 21 feet in height and having a 10-foot top width with 1 vertical on 3 horizontal side slopes)
- 0.8 miles of floodwalls
- 8 road raises which cross the levee alignment
- 2 road stoplog closure structures
- 0.2 miles of new streets
- 2 pump stations
- 10 gated outlets
- 1.2 miles of new Hartsville Coulee diversion channel (ranging from 18 feet to 20 feet in depth and having a 10 foot bottom width with 1 vertical on 7 horizontal side slopes)
- 3 drop structures near outlet to the Red River

Fish and Wildlife Resources Without the Project

Wildlife

The habitats supporting fish and wildlife resources in the project area, along the Red and Red Lake Rivers, have been substantially altered through residential, commercial, industrial, and agricultural development. However, the remaining remnant habitat areas provide several important functions. Shelterbelts and riparian woodlands provide benefits to wildlife, such as; denning and nesting sites, food, escape and winter cover, and travel lanes for many wildlife species (Table 1). Mammals, including red and gray squirrels, chipmunk, cottontail rabbit, striped skunk, red fox, raccoon, and white-tailed deer are commonly found in the area. Common bird species (Table 2) include brown thrasher, American kestrel, yellow warbler, crow, robin, downy and hairy woodpeckers, flycatchers, black-capped chickadee, and warblers. Passerine birds use shelterbelts and riparian forest habitat along the river corridor as migrational routes. Species which have adapted to man's activities on the river include the house wren, robin, chipping and house sparrows, grackle, and purple martin. Waterfowl habitat along the rivers is minimal because of the lack of oxbows and marshes along the river channel and aquatic plants are virtually nonexistent due to the river's high turbidity. Wood ducks are the most common breeding waterfowl species in the area, with Canada geese, mallards, and hooded mergansers also making use of the riparian floodplain areas during migrational periods. The Red and Red Lake Rivers also serve as a rest area for migrating shorebirds, waterfowl, birds of prey, and other bird species.

Aquatic

The Red River is classified by North Dakota Game and Fish Department as a Class I, highest-valued fishery resource, supporting a good population of sport fish as well as forage species (Table 3). The Red River and its tributaries provide migrational avenues, spawning habitat, and nursery areas for forage fish and sport fish, including channel catfish, northern pike, walleye, sauger, rock bass, yellow perch, bullhead and crappie. The river receives a heavy amount of sport fishing due to its proximity to large population centers. The Red River and the Red Lake River are classified by the Minnesota Department of Natural Resources as warmwater gamefish (Class II) streams. The Red Lake River also supports good population of sport fish such as northern pike, walleye, channel catfish, rock bass, and bullhead.

There are 13 species of freshwater mussels (Table 4) inhabiting the Red River and its tributaries (Cvancara 1974). Mussels are found in a variety of habitats such as; pools or sluggish streams with a mud, sand, or fine gravel bottom; ponds, lakes, and sluggish mud-bottomed pool of creeks and rivers; lakes and small to medium-sized streams in mud, sand, or gravel; small creeks and the headwaters of larger streams in mud and sand; medium to large rivers and reservoirs with a mud, sand, or gravel bottom; and medium to large rivers in riffles or raceways in gravel or firm sand. Freshwater mussels are sensitive to environmental degradation and are, therefore, useful

Table 1. Mammal species commonly found along the Red and Red Lake Rivers.

Mammals - Common Name	Scientific Name
Beaver	<i>Castor canadensis</i>
Eastern chipmunk	<i>Tamias striatus</i>
Cottontail rabbit	<i>Sylvilagus floridanus</i>
Coyote	<i>Canis latrans</i>
Fox squirrel	<i>Sciurus niger</i>
Grey squirrel	<i>Sciurus carolinensis</i>
Jackrabbit	<i>Lepus townsendi</i>
Mink	<i>Mustela vison</i>
Moose	<i>Alces alces</i>
Muskrat	<i>Ondatra zibethica</i>
Raccoon	<i>Procyon lotor</i>
Red fox	<i>Vulpes vulpes</i>
Red squirrel	<i>Tamiasciurus hudsonicus</i>
Striped Skunk	<i>Mephitis mephitis</i>
Long-tailed weasel	<i>Mustela frenata</i>
White-tailed deer	<i>Odocoileus virginianus</i>

Table 2. Bird species commonly found along the Red and Red Lake Rivers.

Birds - Common Name	Scientific Name
American kestrel	<i>Falco sparverius</i>
American Robin	<i>Turdus migratorius</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Black-capped chickadee	<i>Parus atricapillus</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Canada goose	<i>Branta canadensis</i>
Chipping sparrow	<i>Spizella passerina</i>
Common crow	<i>Corvus brachyrhynchos</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Downy woodpecker	<i>Dendrocopos pubescens</i>
Grackle	<i>Quiscalus quiscula</i>
Great horned owl	<i>Bubo virginianus</i>
Greater prairie chicken	<i>Tympanuchus cupido</i>
Grey partridge	<i>Perdix perdix</i>
Hairy woodpecker	<i>Dendrocopoc villosus</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
House wren	<i>Troglodytes brunneicollis</i>
House sparrow	<i>Passer domesticus</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida asiatica</i>
Northern Harrier	<i>Circus cyaneus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pheasant	<i>Phasianus colchicus</i>
Piping plover	<i>Charadrius melodus</i>
Purple martin	<i>Progne subis</i>
Red-tail hawk	<i>Buteo jamaicensis</i>
Sharptail grouse	<i>Pedioecetes phasianellus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Wild turkey	<i>Meleagris gallopavo</i>
Wood duck	<i>Aix sponsa</i>
Yellow warbler	<i>Dendrocia petechia</i>

Table 3. Fish species commonly found in the Red River and its tributaries.

Fish - Common Name	Scientific name
Rock bass	<i>Ambloplites rupestris</i>
Black bullhead	<i>Ameiurus melas</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
White sucker	<i>Catostomus commersoni</i>
Brook stickleback	<i>Culaea inconstans</i>
Carp	<i>Cyprinus carpio</i>
Northern pike	<i>Esox lucius</i>
Iowa darter	<i>Etheosoma exile</i>
Johnny darter	<i>Etheosoma nigrum</i>
Channel catfish	<i>Ictalurus punctatus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Orange spotted sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth bass	<i>Micropterus salmoides</i>
White bass	<i>Morone chrysops</i>
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>
Golden shiner	<i>Notemigonus chrysoleucas</i>
Yellow perch	<i>Perca flavescens</i>
Trout-perch	<i>Percopsis omiscomaycus</i>
Bluntnose minnow	<i>Pimephales notatus</i>
Fathead minnow	<i>Pimephales promelas</i>
White crappie	<i>Pomoxis annularis</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blacknose dace	<i>Rhinichthys atratulus</i>
Longnose dace	<i>Rhinichthys cataractae</i>
Creek chub	<i>Semotilus atromaculatus</i>
Sauger	<i>Stizostedion canadense</i>
Walleye	<i>Stizostedion vitreum</i>

indicator species for assessing changes in water quality.

Wetland and Riparian

The Red and Red Lake Rivers are characterized by the National Wetland Inventory (NWI) as riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH). There are occasional exposed river bars which have been typed as riverine, lower perennial, unconsolidated shore, temporarily or seasonally flooded (R2USA, and R2USC, respectively). The River floodplain, the area bordering the river subject to flooding, supports a limited number of temporarily or seasonally flooded wetlands (PEMA, and PEMC, respectively). Floodplain wetlands typically exist in old river scars and oxbows.

Riparian habitats are defined as the zone of vegetation influenced by the hydrology of streams and rivers. Riparian vegetation exhibits a higher degree of hardiness than that located in adjacent areas, and as such, represents a transitional zone between wetland and upland environments. Riparian corridors along intermittent streams and tributaries to the Red and Red Lake Rivers provide valuable, but limited, habitat for fish and wildlife. Marsh habitat within riparian corridors often provide quality waterfowl habitat. Riparian areas along the river corridors are important not only as habitat for fish and wildlife, but also for flood control, streambank stabilization, and to improve water quality.

During high precipitation or runoff events, riparian corridors slow the rate of surface water runoff or overland flow. The dense, thick vegetation of a healthy, unaltered riparian corridor, and its deep humus layer of soil act as retardants, holding back and slowing runoff. Cottonwood, ash, and elm with their deep roots, and willow, dogwood, and buck brush with shallow, dense roots effectively hold the soil in place and deflect water to reduce streambank erosion. Riparian areas can improve water quality by acting as filters to remove chemical compounds, toxic substances, sediments, and trash as the water moves slowly through the system.

Vegetation

Most of the original prairie which once stretched beyond the river corridor has been replaced by farmland. Dominant tree species along the Red and Red Lake Rivers include American elm, box elder, cottonwood, green ash, basswood, bur oak and hackberry. The ribbons of wooded vegetation along these rivers are important because of their location, scarcity, and the habitat they provide for many species of wildlife, especially passerine birds. In addition, riparian zones function as important migration and travel corridors for birds and mammals (Tables 1 and 2), as well as provide an important ecotone or "edge" with adjacent areas (e.g., agricultural lands, aquatic habitats). Common understory species in riparian areas include willow, gooseberry, hawthorn, Juneberry, and buck brush. Species such as Solomon's seal, nodding trillium, asters, wood nettle, violets, Canada anemone, hawksbeard, bedstraw, and columbine are common in the herb layer. Riparian vegetation also provides shading along the stream bank moderating daily water temperature fluctuations. Fallen trees in the river provide spawning areas, create eddies,

Table 4. Freshwater mussels commonly found in the Red River and its tributaries.

Mussels - Common Name	Scientific Name
White heelsplitter	<i>Lasmigona complanata</i>
Giant floater	<i>Anodonta grandis</i>
Fatmucket	<i>Lampsilis siliquoides</i>
Cylindrical papershell	<i>Anodontoides ferussacianus</i>
Wabash pigtoe	<i>Fusconia flava</i>
Three-ridge	<i>Amblema costata</i>
Mapleleaf	<i>Quadrula quadrula</i>
Creek heelsplitter	<i>Lasmigona compressa</i>
Fluted-shell	<i>Lasmigona costata</i>
Squawfoot	<i>Strophitus rugosus</i>
Pink heelsplitter	<i>Proptera alata</i>
Black sandshell	<i>Ligumia recta latissima</i>
Pocketbook	<i>Lampsilis ventricosa</i>

and scour holes which are used by the fisheries resource.

Endangered, Threatened, and Rare Species and Habitats

In accordance with Section 7 of the Endangered Species Act, the following federally-listed endangered or threatened species may be present in the project's area of influence: bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and gray wolf (*Canis lupus*). These species often utilize water courses and river valleys as migration routes and temporary feeding sites. The Red River and its tributaries are a primary north/south migration route across eastern North Dakota and western Minnesota. No federally-listed endangered or threatened fish species occur in the river.

The Corps, or its delegated agent, is required to evaluate whether the proposed action may affect endangered or threatened species. If it is determined the proposed action "may affect" listed species, the Corps shall request formal section 7 consultation with this office. If the evaluation results in a "no effect" situation on the listed species, further consultation is not necessary.

The North Dakota Parks and Recreation Department, Natural Heritage Inventory, compiles and maintains a database documenting the statewide status and location of rare flora and fauna, ecological communities, and unique geological features. There are 2 vertebrate, 1 invertebrate, and 2 plant species of concern on the North Dakota side of the project area (Table 5).

The Minnesota Department of Natural Resources compiles and maintains a similar database for Minnesota. There is one vertebrate and one ecological community found in the Minnesota database (Table 6).

Fish and Wildlife Resources with the Project

Wildlife

The construction of levees in the project area should not cause significant negative impacts to the wildlife resources in the project area. The addition of the greenway concept into the plan has the potential to restore wildlife habitat. Removal of residential housing from the river floodplain will open the area for occupation by various wildlife species. The removal of structures will lessen the potential demand for additional flood control projects, further impacting area natural resources. Migrating passerine birds will also find resting and feeding areas within the greenway.

Table 5. North Dakota Natural Heritage Inventory of ecologically significant species identified in the project area.

Common Name	Scientific Name	State Rank	Location
Vertebrate			
Rosyface Shiner	<i>Notropis rubellus</i>	S3	
Mourning Warbler	<i>Oporornis philadelphia</i>	S4	
Invertebrate			
Black Sandshell mussel	<i>Ligumia recta</i>	S4	
Vascular plant			
Dutchman's Breeches	<i>Dicentra cucullaria</i>	S1	
Purple Cinquefoil	<i>Potentilla palustris</i>	S2	

North Dakota State Ranks (See appendix for complete list of Natural Heritage Inventory ranks)

S1= Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres), or because of some factor of its biology making it especially vulnerable to extirpation from the state. [Critically endangered in state.]

S2= Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of other factors demonstrably making it very vulnerable to extirpation from the state. [Endangered in the state.]

S3= Rare in state (on the order of 20+ occurrences). [Threatened in the state.]

S4= Apparently secure in state.

Table 6. Minnesota Natural Heritage Inventory of ecologically significant species or features identified in the project area.

Common Name	Scientific Name	State Status	Location
Vertebrate			
Lake Sturgeon	<i>Acipenser fulvescens</i>	Special concern	
Feature			
Colonial Waterbird Nesting Site			

Aquatic

The project, once constructed, should have little or no adverse affect on aquatic habitat and/or aquatic resources of the Red River or the Red Lake River in the project area. However, any increased velocity of flood flows within the river channels created by the new levees may increase streambank erosion along the banks of these rivers where they flow through the cities. Non-structural methods should be used to counter any increase in erosion due to increased water velocity whenever possible, and if structural methods must be used they should be kept to a minimum.

Wetlands and Riparian

If the few remaining wetlands within the floodplain of the project area are preserved or enhanced to the extent possible, the project as proposed should not have significant adverse wetland impacts. During construction of the levee system, the opportunity exists to create new wetlands in borrow areas and within the floodplain, increasing the wetland habitat over what presently exists. The water quality of the Red and Red Lake Rivers within the greenway area may experience a temporary reduction in water quality during construction. However, if appropriate construction practices are followed, there should not be a permanent decrease in water quality due to the project. Reduced erosion, with expansion of riparian vegetation and environmentally sensitive development, is another positive aspect of greenway development.

Vegetation

If the existing trees and shrubs, including those in reclaimed residential areas, are retained to the extent possible and the area is allowed to revert to a natural floodplain condition, an enhanced riparian woodland habitat would be reestablished within the floodplain. Planting of native trees and shrubs on project lands on the riverward side of the new levee will result in a net gain of riparian woodland vegetation over what would be anticipated to exist without the project. Maintenance and protection of a buffer strip within the lower and more vulnerable portion of the floodplain, in addition to its wildlife and recreational values, will also control streambank erosion and reduce the amount of sediment, nutrients and other pollutants entering these waterways. If these vegetative areas are allowed to grow naturally and managed for sustainability, they will provide quality habitat into the future for many species of wildlife.

Economic Evaluation

Non-consumptive Recreation

The Red River is a significant recreational resource for the State of North Dakota (North Dakota Parks and Recreation Department 1997). The river receives a substantial level of recreational use and supports a wide variety of recreational activities. According to North Dakota Parks and Recreation Department (1987), canoeing on the Red River is generally fair, but the river is rated higher prior to the month of July. Bird watching and wildlife viewing are an important part of the many non-consumptive recreational activities that contribute to the economy of North Dakota and Minnesota, and more specifically the Grand Forks and East Grand Forks urban area. The Red River corridor and natural areas within the limits of the two cities currently provide habitat for numerous resident and migratory birds, and a variety of animals which provide the public with opportunities for wildlife observation. Public participation in these recreational activities has a net positive effect for local economies. Grand Forks/East Grand Forks citizens and visitors alike purchase equipment and supplies, food, lodging, gas, and services at local businesses while engaging in various non-consumptive recreational activities. The greenway plan offers the potential opportunity for economic development directly related to greenway operation (equipment rental, camping and facility user fees, concessions, and tours).

Hunting and Fishing

North Dakota has a long tradition of hunting and fishing as a recreational pastime. Although no hunting is allowed within or adjacent to the Grand Forks city limits, white-tailed deer, waterfowl, upland birds, and small game are sought by hunters in the area surrounding Grand Forks/East Grand Forks. The Red River receives heavy fishing pressure due to its proximity to major population centers in eastern North Dakota and western Minnesota.

Municipal and Industrial

The city of Grand Forks obtains its raw water for municipal use from the Red River. Although highly turbid and of seasonally poor water quality, this river is extremely important to the economy of the Red River Valley. Various industries utilize the river, and it provides an primary water source for commerce in the valley. The Red Lake River is the municipal water supply source for the city of East Grand Forks. Although there may be temporary impacts to water quality during project construction, due to the reliance of Grand Forks and East Grand Forks on water from the Red and Red Lake Rivers, water quality in the project area must be maintained.

Discussion/Mitigation/Enhancement

Based on the information provided and field review of the project area, the Fish and Wildlife Service (Service) does not anticipate significant adverse impacts to fish or wildlife resources or their habitats with the construction of flood protection levees or the greenway area. The Service has determined that the proposed flood abatement project is not likely to adversely affect federally-listed threatened and endangered species and is in compliance with the Endangered Species Act. Therefore no further action under Section 7 of the Act is required. The greenway concept (Figure 2), in conjunction with flood protection features, has the potential to enhance wildlife habitat values in the Grand Forks/East Grand Forks area.

Incorporation of a greenway into the flood protection project is an opportunity to protect and/or enhance ecologically important and increasingly rare native vegetation and wildlife resources in the Grand Forks/East Grand Forks urban area. Tallgrass prairie, historically the predominant ecosystem in the Greater Grand Forks area, is now one of the most endangered ecosystems in North America (Samson and Knopf 1996). Establishment of a tallgrass prairie preserve in the project area will give people the chance to experience a rare and significant type of northern Great Plains habitat.

The greenway concept also has great potential for ecological education focused on riparian, riverine, and watershed ecosystems. Informational and educational displays within the greenway area explaining unique and interesting features of the river and riparian corridor will give visitors an appreciation for the value of a natural area directly adjacent to the urban center of Greater Grand Forks. The greenway's close proximity to local schools will give environmental education classes opportunities for field trips to study native plants and animals in their natural environment.

There are a number of scenarios for utilization of a greenway, including a park, rest area, natural area, or urban national wildlife refuge (NWR). Public comments at the greenway workshop held in Grand Forks, North Dakota, on March 11-12, 1998, indicated that the public's highest priority for the greenway is to enhance, protect, and restore the environment. The option that received the most public support was creation of a wildlife refuge and/or wildlife sanctuary.

The Service has just recently completed project planning and is moving into the implementation phase of the Northern Tallgrass Prairie Habitat Preservation Area (TGHPA) project. Through this project, the Service hopes to protect up to 70,000 acres of tallgrass prairie habitat in Minnesota and Iowa. The TGHPA may provide one opportunity for the Service to become involved in the greenway through the protection of tallgrass prairie habitat.

In addition, a separate NWR could be established that could permanently protect a substantial portion of the natural area located between the flood protection features. If a refuge were to be established and funding secured, the Service could take over management and long-term

operation and maintenance of the facility. The Service is available to help public organizations and city, State, and Federal agencies with our technical expertise and support for greenway design and development. The Service's outreach capabilities can also produce strong support for an environmental educational program highlighting an urban NWR in the Grand Forks/East Grand Forks greenway.

Holistic upper basin water management is a critical component in any comprehensive flood management plan for the Red River Valley. Major basins that will require long-term water management include the Sheyenne, Maple, Wild Rice, Elm, and Goose Rivers in North Dakota, and Lake Traverse, Bois de Sioux, Otter Tail, Buffalo, Wild Rice, and Red Lake Rivers in Minnesota (Figure 3). One of the goals for this project should be to reduce flood water crests and the related property and natural resource damage. To accomplish this goal, water must be held back temporarily and runoff from the watershed slowed before it reaches Grand Forks/East Grand Forks.

Planning efforts in the basin are looking at ways to lessen peak flows in the river. Peak flows can be reduced through water management practices such as restoring drained wetlands, enhancing existing wetlands, creating new wetlands, protecting riparian buffer zones, and creating grassed waterways. Agricultural practices and programs such as no till and minimum till, the waterbank program, Wetland Reserve Program, and root-zone water storage on Conservation Reserve Program grasslands can also help reduce flood peaks.

Minnesota has established the Red River Basin Flood Damage Reduction Work Group to look at this issue in a mediated forum. The Corps and Service can play important roles in this work group.

The Energy and Environmental Research Center (EERC) in Grand Forks is promoting the "waffle" plan. The Waffle plan would use flat areas sectioned off into farmland by existing roads and culverts that act like ridges, much like a waffle, to hold back water during peak flood periods and releasing the water after the flood danger has passed. Our evaluation has shown that although basin-wide plans may have benefits, they would not have sufficient capacity to provide relief from large magnitude floods, and thus would not be a substitute for the proposed plan.

The Service has a wetland development project at Kelly's Slough northeast of Grand Forks, North Dakota. This project will store floodwater that otherwise would enter the Red River, increasing flood flows. Kelly's Slough will also be an important area of wetland habitat attracting waterfowl and other species.

The Service also manages wetlands within the Red River Basin through Wetland Management Districts (i.e., Devil's Lake, Arrowhead, Valley City, Tewaukon, Detroit Lakes, Morris, Fergus Falls) and NWRs (i.e., J. Clark Salyer, Agassiz, Tamarac, Hamden Slough). The wetlands in these lands help to regulate runoff by collecting water from the surrounding uplands (Figure 4 and Figure 5).

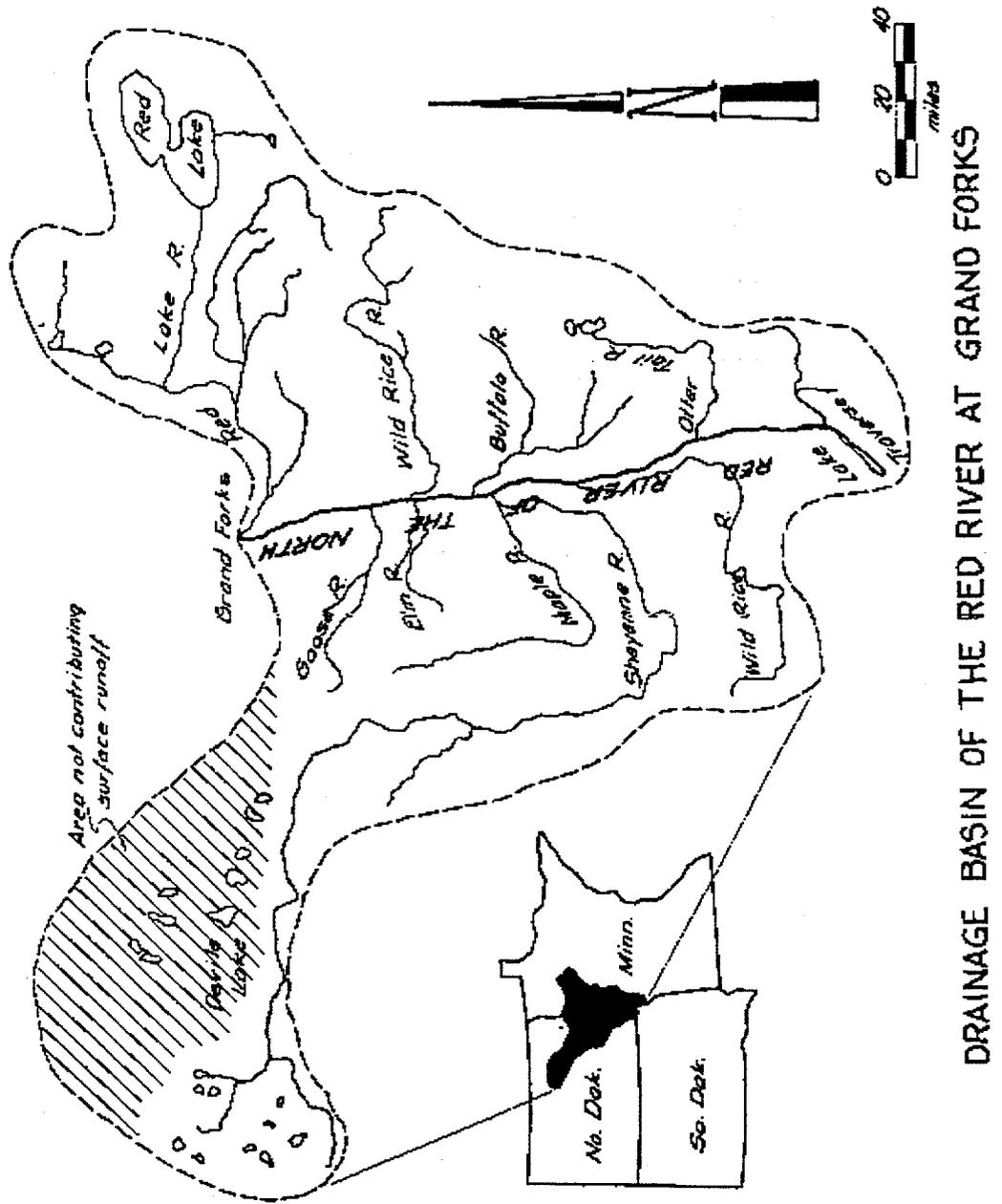


Figure 3. Red River of the North drainage basin above Grand Forks/East Grand Forks.

Recommendations

1. Remove and properly dispose of all man-made structures such as buildings, roads, sidewalks and utilities within the greenway area.
2. Control streambank erosion caused by floodwater confined between levees using non-structural methods (e.g., vegetation, levee design, land use) where possible. If structural erosion control (e.g., rip-rap, gabion) is used, it should be the minimum required to do the job.
3. Wetlands created as part of the project should have gently sloping sides and wetland vegetation (e.g., cattail, bulrush) should be allowed to reclaim the site.
4. Follow appropriate construction practices and safety regulations (including a spill prevention plan) to minimize erosion and prevent environmental contamination during project construction.
5. Restrict development within the floodplain to environmentally sensitive projects that are thoroughly reviewed by the appropriate agencies for environmental impacts and regulated to protect natural resources.
6. Preserve the existing trees and shrubs, to the extent possible, when removing man-made structures.
7. Restore and revegetate disturbed areas with native plants. Coordinate with state and Federal agencies such as National Resource Conservation Service or the Fish and Wildlife Service to develop a native plant species list.
8. Maintain and protect a vegetative buffer strip within the lower and more vulnerable portion of the floodplain.
9. Allow vegetation to grow naturally where possible, with little or no human manipulation such as mowing or pruning. Periodic burning may be permitted to maintain native vegetation.
10. Maintain the water quality of the Red and Red Lake Rivers in the project area. Coordinate with State Health Departments and the Environmental Protection Agency to insure water quality is in compliance with state and Federal standards.
11. Provide for environmental education opportunities for local schools and public organizations as well as visitors to the Grand Forks/East Grand Forks Greenway.
12. Develop a holistic water management strategy for the watershed above the project area that includes structural and non-structural features to help reduce peak flows during flood events.
13. Create a tallgrass prairie preserve in the project area if suitable land is available and the habitat values are compatible with greenway development.
14. Replace unavoidable losses of trees and shrubs with native trees on a 2:1 basis.
15. Replace wetland losses by restoring equal or greater acreage of similar wetland habitat.
16. Design operation and maintenance plans for the greenway that encourage conservation of fish and wildlife resources.

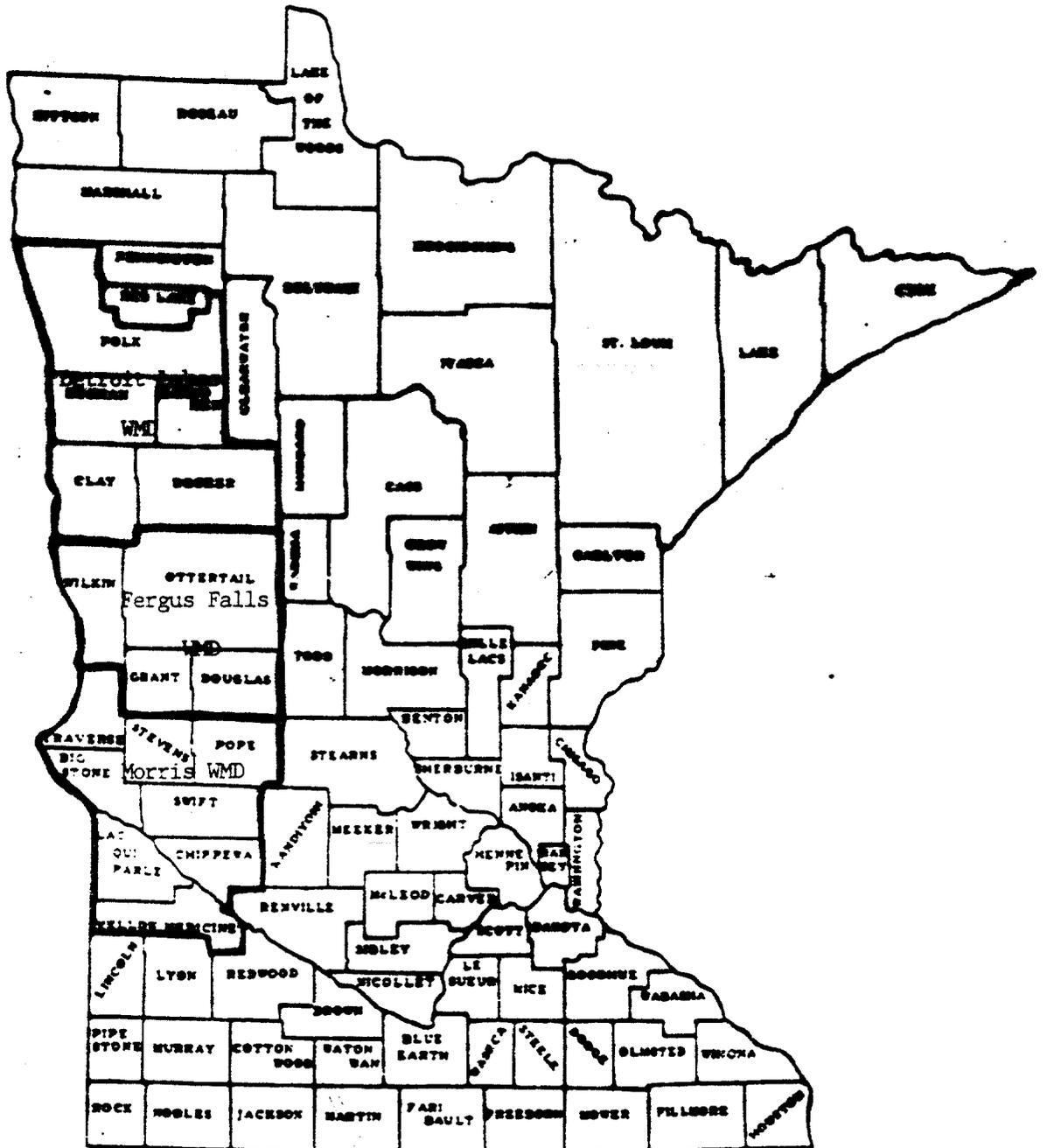


Figure 5. Minnesota Wetland Management Districts

17. Provide upland nesting habitat for waterfowl and other species on the levee alignment right-of-way by planting appropriate native vegetation and allowing natural growth.
18. Improve waterfowl nesting habitat by installing nesting boxes (especially wood duck nesting boxes in remaining riparian areas), creating wetlands, and providing nesting cover.

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FEDERAL THREATENED AND ENDANGERED SPECIES FOUND IN
GRAND FORKS COUNTY, NORTH DAKOTA

ENDANGERED SPECIES

Birds

Peregrine falcon (Falco peregrinus): Migrates spring and fall statewide but primarily along the major river courses. Historic nesting has been recorded in the Badlands.

Mammals

Gray wolf (Canis lupus): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

THREATENED SPECIES

Birds

Bald eagle (Haliaeetus leucocephalus): Migrates spring and fall statewide but primarily along the major river courses. It concentrates along the Missouri River during winter and is known to nest in the floodplain forest.