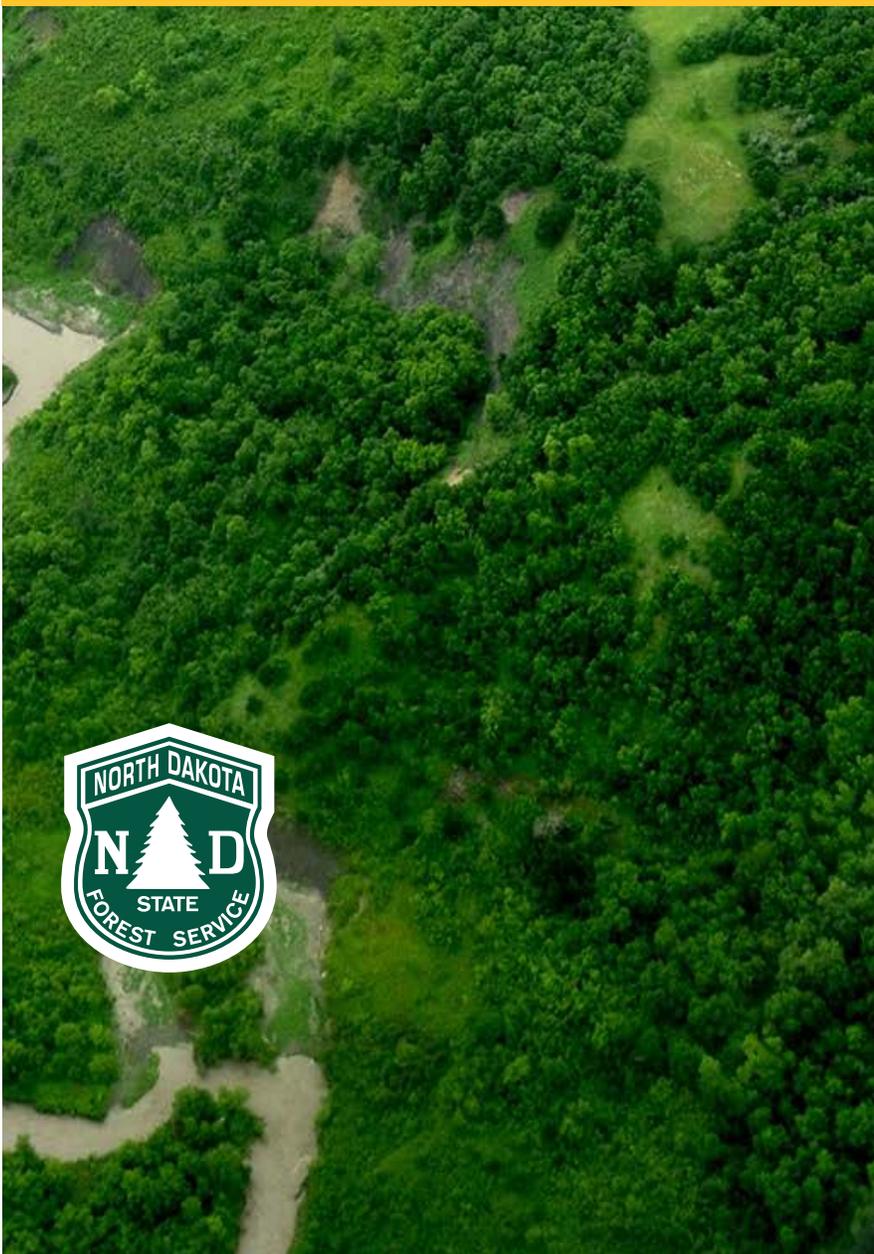
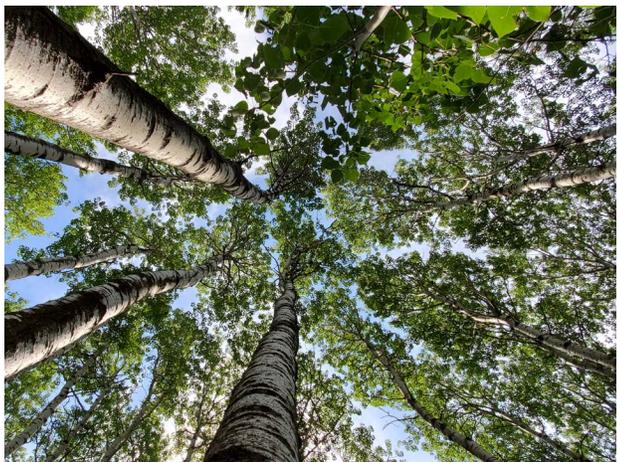




North Dakota Forest Service State Forest Assessment and Management Plan

Prepared by: **Michael Kangas** and **Mitch Thompson**



Executive Summary

The “*State Forest Assessment and Management Plan*” serves as a strategic document intended to focus resources most effectively on lands the North Dakota Forest Service administers. The document chronicles the most up-to-date information on the state forests system and describes pertinent needs and emerging trends. The plan was compiled utilizing a data-driven approach supported by geographic information system (GIS) technology and geospatial analysis.

The document outlines: 1) an assessment of the state forestlands, recreational infrastructure and program activities, and 2) a description of management goals and needs.

Goals and trends will change in the years and decades to come as a consequence of our ever-changing societal and natural resource needs. As a result, the State Forests Program commits to reviewing and updating this document at 10-year intervals to assure that management goals are balanced with societal demands.

Table of Contents

Section I. Introduction	3
Section II. State Forest Assessment	4
Section III. Management Goals and Needs	13
Section IV. Summary	16
Literature Cited	16
Appendix A	17
Appendix B	18

Section I. Introduction

Forests are found throughout North Dakota and represent approximately 1.3 percent (815,000 acres) of the state's total land area. Both eastern deciduous forest types and western coniferous forest types are found in North Dakota (Figure 1).

Despite their limited acreage, forests are important resources in North Dakota. The state's forestland provides wildlife habitat, recreational opportunities and wood products; stabilizes river banks; filters water runoff from adjacent agricultural lands; serves as seed sources for conservation tree production; and increases the botanical diversity of the state. The scarcity of North Dakota's forestland warrants that the resource be managed sustainably.

In the 1960s and 1970s, the North Dakota Forest Service (NDFS) began a forestland acquisition program utilizing the Land and Water Conservation Fund. The objective of these acquisitions was to ensure native forestland in North Dakota would be protected and not subject to land use changes. These acquired properties were designated as State Forests to provide recreational opportunities such as camping, horseback riding, biking, fishing, hunting, cross country skiing, and snowmobiling.

To date, the NDFS State Forests Program manages five state forests encompassing 13,945



Figure 1. Forestland in North Dakota

acres. The primary goal of the State Forest Program is to *practice sound land stewardship to enhance the forest, grassland and wetland ecosystems found on the state forests.*

The **state forests** consist of woody plant communities interspersed with open grassland, wetlands and small lakes. The varied plant communities provide excellent habitat for wildlife and numerous opportunities for outdoor recreation.

The agency has developed four campgrounds, four picnic sites, over 40 miles of maintained trails, fishing access to three lakes and canoe access to three major rivers to enhance the public use of state forests. In addition, the state forests provide the general public with the opportunity to collect common berries and harvest firewood, as well as observe native wildlife, active forest management and plant communities.

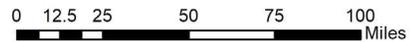
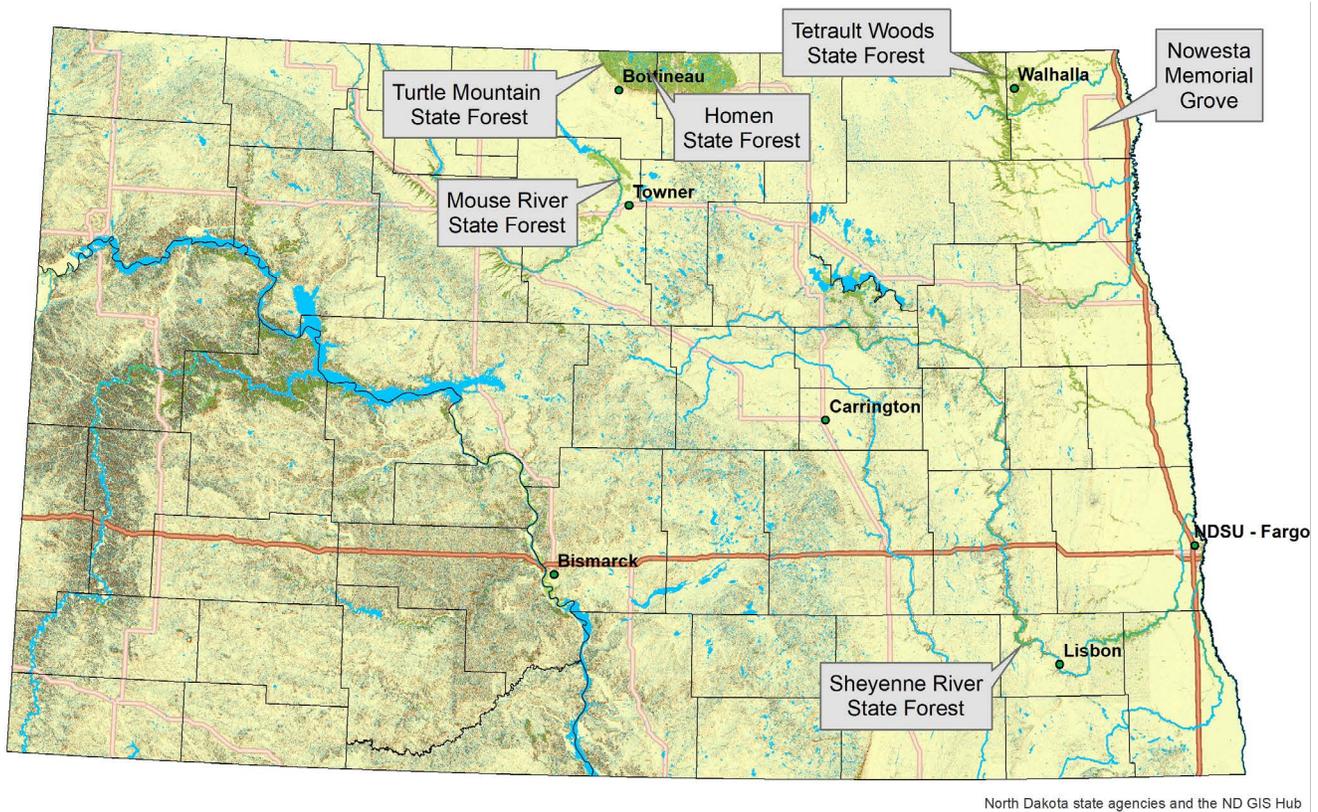
To ensure that resources are being used effectively, assessing existing state forest conditions and identifying goals and priority areas is essential. This document is intended to:

- Provide an assessment of the state forests the NDFS manages
- Identify surface management goals and needs

Section II. State Forest Assessment

The state forests system is distributed across North Dakota and represents four forested areas of the state (Figure 2): the Turtle Mountain State Forest and Homen State Forest in the Turtle Mountain forest tract; The Tetrault Woods State Forest in the Pembina Gorge forest tract; The Mouse River State Forest in the Mouse River Sand Hills forest tract; and the Sheyenne River State Forest in the Sheyenne River Valley forest tract. The North Dakota Forest Service also manages a 12-acre tree claim near Drayton, N.D., in addition to the state forests.

Figure 2. Location of state forests managed by the North Dakota Forest Service



Forests and Cover Types of the State Forest System

The state forests system consists of numerous parcels. These parcels exist as a mosaic of forests, woodlands, lakes, ponds, rivers, meadows and pastureland (Table 1). Seventy-two percent (10,178 acres) of the total land area of the state forest system is classified as forest. Predominant trees and shrubs found in the state forests include: bur oak (*Quercus macrocarpa*), green ash (*Fraxinus pennsylvanica*), quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), paper birch (*Betula papyrifera*), basswood (*Tilia americana*), American elm (*Ulmus americana*), box elder (*Acer negundo*), American hazelnut (*Corylus americana*), beaked hazelnut (*Corylus cornuta*), black currant (*Ribes americanum*), Missouri gooseberry (*Ribes missouriense*), juneberry (*Amelachier alnifolia*), hawthorn (*Crataegus roundifolia*), prickly rose (*Rosa acicularis*), pin cherry (*Prunus pennsylvanica*) and chokecherry (*Prunus virginiana*). Common forbs found in the state forests include: false lily-of-the valley (*Maianthemum canadense*), early meadowrue (*Thalictrum venulosum*), yellow avens (*Geum strictum*), pink wood violet (*Viola rugulosa*), wild sarsaparilla (*Aralia nudicaulis*), dwarf cornel (*Cornus canadensis*) pink wintergreen (*Pyrola asarifolia*) and arrowleaf aster (*Aster sagittifolius*).



A stand of quaking aspen in the Homen State Forest

Prairie and pastureland account for 2,202 acres (15.8 percent) of these lands. Species are widely variable, contingent on site conditions. South-facing slopes tend to have more abundant native warm-season grasses such as sideoats gramma and big bluestem. Forbs and native wildflowers on these sites include wood lily, yellow lady slipper, prairie smoke, groundplum milkvetch and purple cone flower. Smooth brome and Kentucky bluegrass have become naturalized on many of the grassland areas on the state forest system. A more thorough study of the grassland acres on the state forest should be completed to identify range conditions, species distribution and management needs.

Wetlands, including lakes, sloughs and streams, constitute a notable portion of the state forests system, encompassing 1,565 acres. Delineation of this estimate reveals 671 acres of lakes, 876 acres of emergent wetlands, and 18 acres of river.

The following sections provide a brief overview of resources found in each state forest, including forest resources and associated cover, recreational facilities and infrastructure, and sensitive areas.

Table 1. Summary of State Forest Surface Cover.

State Forest	Acres	Lake, Wetland, or River Acres (%)	Forested Acres (%)	Prairie/Meadow/Pasture Acres (%)
Turtle Mountain	7,787	781 (10.1%)	6,136 (78.2%)	870 (11.2%)
Homen	4,740	749 (15.8%)	3,207 (67.7%)	784 (16.5%)
Mouse River	357	7 (19.6%)	199 (55.7%)	151 (42.3%)
Tetrault Woods	551	19 (3.4%)	336 (60.9%)	196 (35.6%)
Sheyenne River	498	9 (1.8%)	292 (58.6%)	197 (39.6%)
Nowesta	12	0	8 (66%)	4 (34%)
Totals	13,945	1,565 (11.2%)	10,178 (72.9%)	2,202 (15.8%)

Turtle Mountain State Forest

The Turtle Mountain State Forest (Figure 3) is on the western edge of the Turtle Mountain plateau in Bottineau County. The Turtle Mountain plateau rises 600 to 800 feet above the surrounding prairie/wetland landscape. The rolling topography and extra 10 inches of precipitation per year support deciduous forest cover of bur oak, quaking aspen, balsam poplar, green ash, paper birch, box elder, sumac, serviceberry and snowberry. The soil is rather erodible and poorly suited for farming, although some occurs. Native woodland clearings have made way for pastureland. Hundreds of large, deep ponds and lakes are present throughout.

The Turtle Mountain State Forest encompasses 7,787 acres on six parcels. This forest one of the largest continuous blocks of forestland found anywhere in the Turtle Mountain area and the state, encompassing 5,751 acres. Forest inventory surveys reveal that these forested parcels are comprised of Bur Oak (44%), Quaking aspen (31%), and Green Ash (19%). The forest understory is predominantly hazel (87%) with small amounts of choke cherry (3%).

Primary uses include hunting, hiking, camping, cross-country skiing, snowshoeing, fishing, horseback riding and wildlife viewing. The Turtle Mountain State Forest has three developed recreational areas (Hahn's Bay, Strawberry Lake, Twisted Oaks). To date, the forest has 27.1 miles of trails. The Turtle Mountain State Forest boasts the Mystical Horizons scenic overlook.



Fall colors on display in the Turtle Mountain State Forest

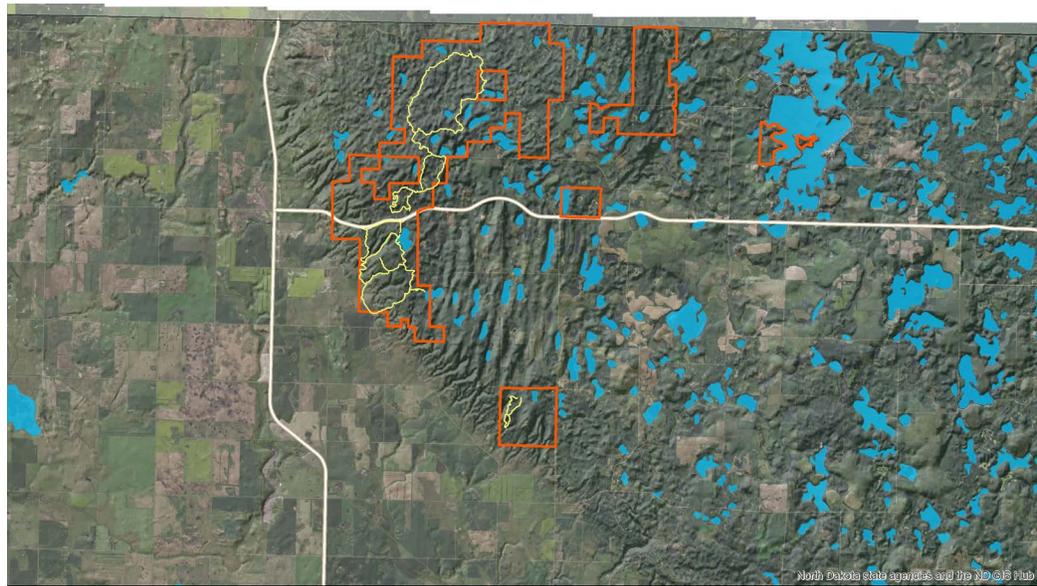


Figure 3. Parcels of the Turtle Mountain State Forest

Homen State Forest

The largest tract of the Homen State Forest (Figure 4) is five miles east of Lake Metigoshe in the Turtle Mountains of Bottineau and Rolette counties. The Homen State Forest consists of 13 parcels encompassing 4,420 acres. Aspen, birch, oak and green ash represent the dominant tree species. Forest inventory surveys reveal these that forested parcels are comprised of Quaking aspen (64%), Bur oak (14%) and Green Ash (16%). The forest understory is predominantly hazel (80%) with small amounts of choke cherry (5%).

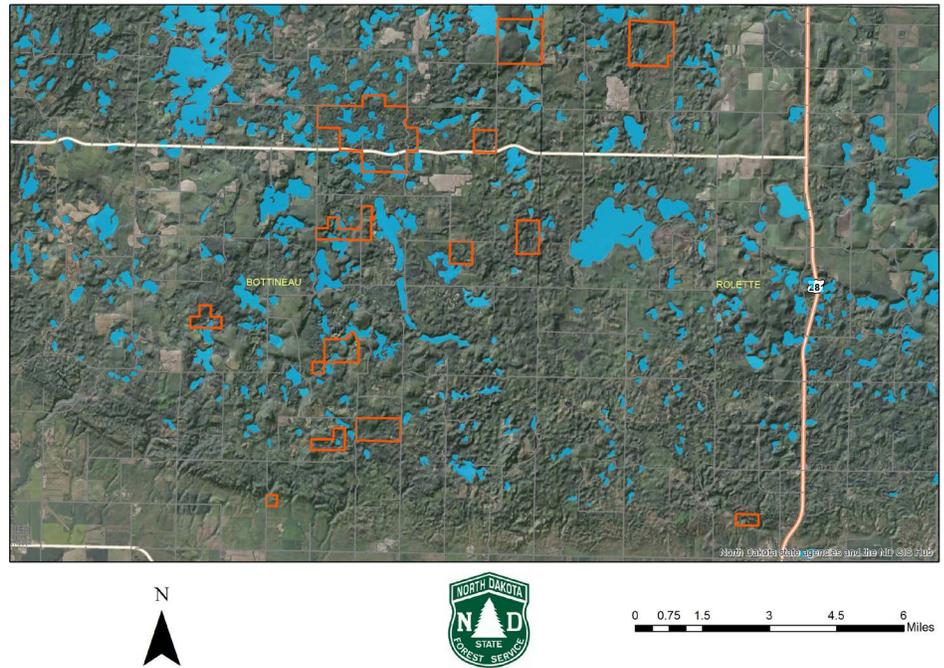


Figure 4. Parcels of the Homen State Forest

Two developed recreational areas are found on the state forest in addition to 4.5 miles of hiking trails and three miles of snowmobile trails. Primary uses include hunting, hiking, camping, cross-country skiing, snowshoeing, fishing, horseback riding and wildlife viewing.

Mouse River

The Mouse River State Forest (Figure 5) is north of Towner in McHenry County and encompasses 357 acres on two parcels. Mixed hardwoods of ash, oak, elm and box elder are dominant of the southern parcel. The northern parcel has sandier soils and supports primarily aspen. This state forest does not have developed recreational areas. Hunting is the primary use of the forest. The north unit has 1.5 miles of access trails. The south unit has one mile of walking trails.

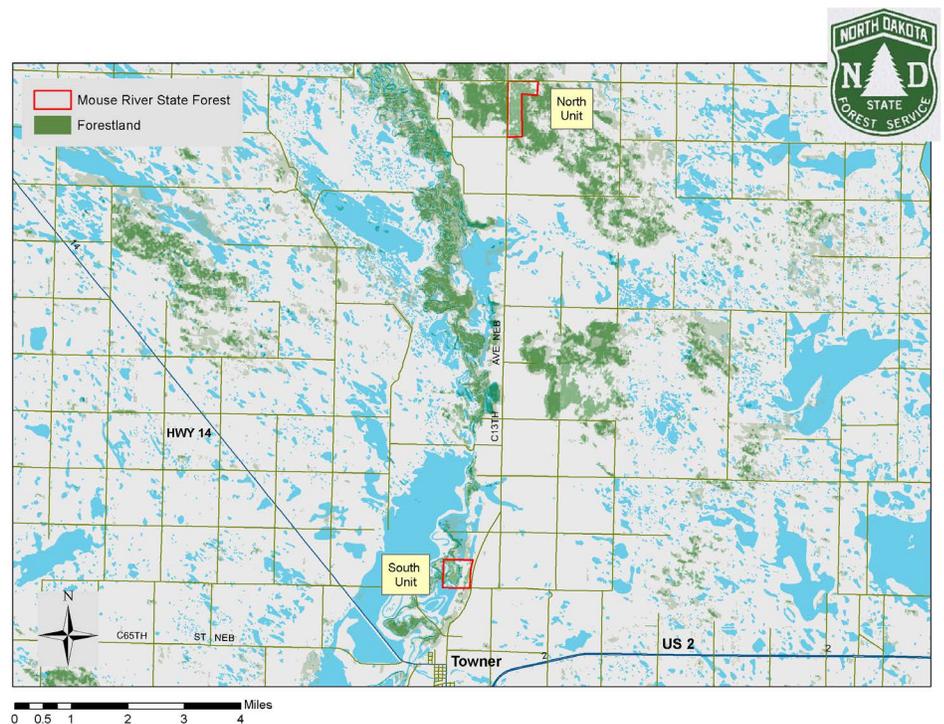


Figure 5. Mouse River State Forest

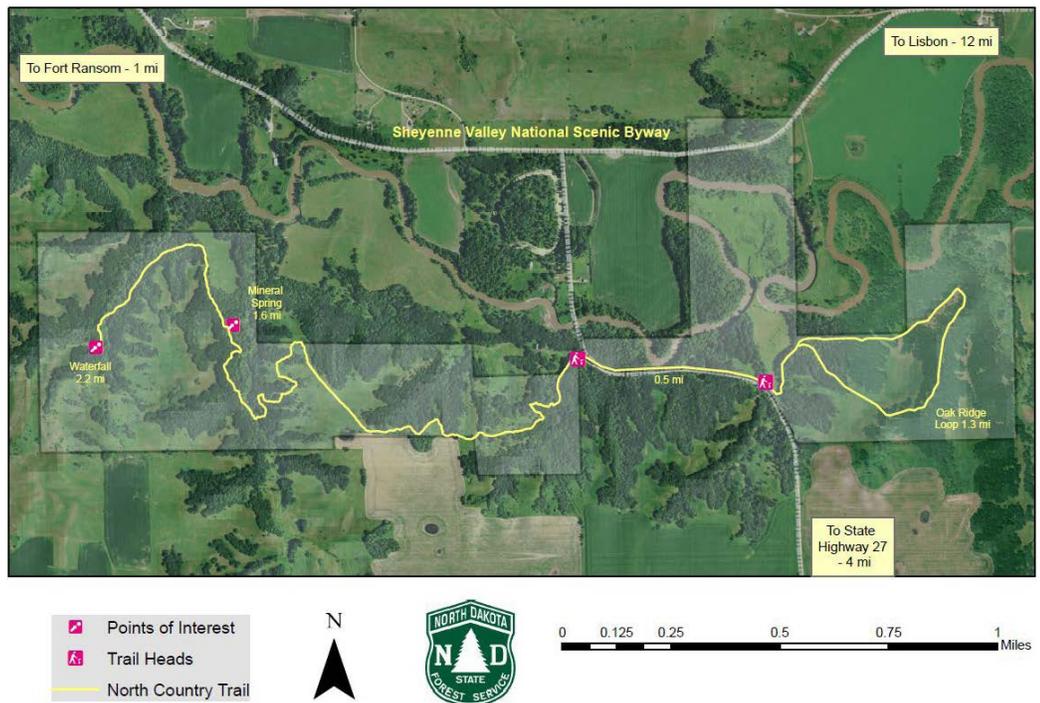
Sheyenne River State Forest

The Sheyenne River State Forest (Figure 6) is nine miles northwest of Lisbon in Ransom County. This 498-acre parcel is composed of ash, oak, elm, basswood, cottonwood and hackberry along the river bottoms and oak, basswood and aspen along hillsides. Primary uses include hunting, hiking, primitive camping, cross-country skiing, snowshoeing, fishing, horseback riding, canoeing and wildlife viewing. Forest inventories of this unit reveal that the forest is comprised of Bur oak (58%), Green ash (19%), Ironwood (11%), Box elder (5%), and basswood (3%). The understory is comprised of snowberry and chokecherry.



A view along the North Country Trail on the Sheyenne River State Forest

The state forest possesses 3.8 miles of trails. The Sheyenne River State Forest contains the state's only waterfall; it is along the North Country Trail. A mineral spring and backcountry campsite can be found along the trail as well.



Cartographer: Michael Kangas, ND Forest Service
Source: NDGIS Hub

Figure 6. Sheyenne River State Forest

Tetrault Woods

Tetrault Woods State Forest (Figure 7) is south of Walhalla in Pembina and Cavalier counties. The 551-acre tract consists of aspen and oak on the hillsides and mixed hardwoods along the river bottoms. The state forest has a scenic overlook and 1.5 miles of hiking/snowmobile trails. Primary uses include hunting, hiking and snowmobiling.



Overlooking the Pembina River at the Tetrault Woods State Forest Scenic Overlook

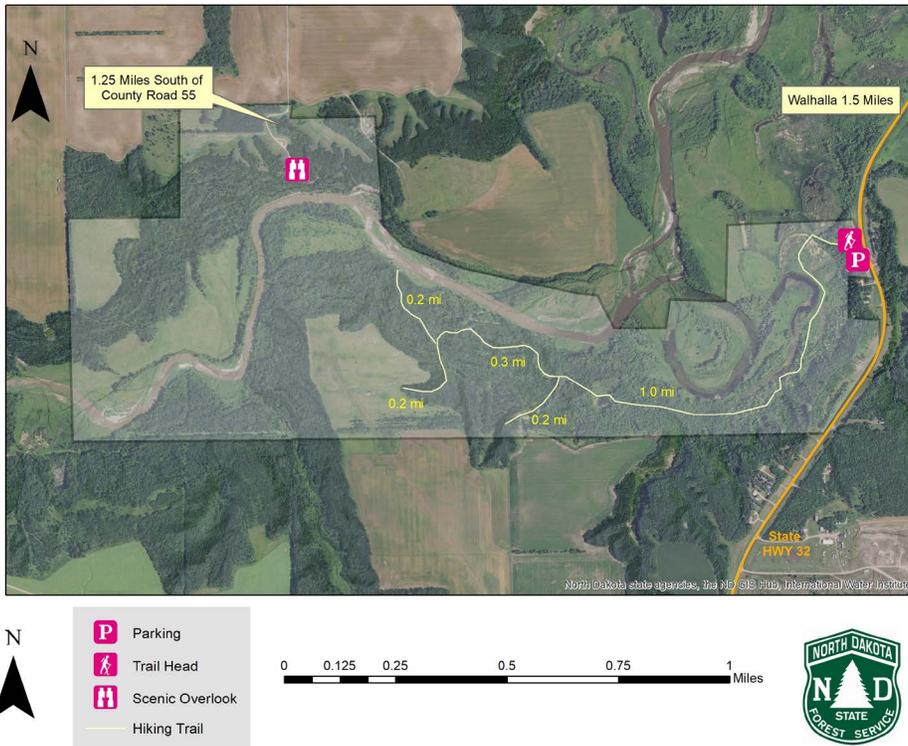


Figure 7. Tetrault Woods State Forest

Nowesta Memorial Tree Grove

Nowesta is a 12-acre tract that was granted to the North Dakota Forest Service, is located 8 miles east of St Thomas in Pembina County. The grove of trees was planted in 1881 by pioneers who founded the community of Nowesta. The grove is the only remaining sign of the community. Facilities include a small gravel parking lot, a dedication plaque and an information sign

Forest Conditions

Nearly 27 percent of North Dakota's timberland is classified as the aspen/birch forest type and is the predominant forest type in the state forest system. The majority of this forest type is in the Turtle Mountains and represents the state's largest concentration of forestland.

A significant portion of this aspen resource is characterized as having low productivity and high levels of stem decay, and episodes of large stem mortality. These stand characteristics are associated with over mature stands. In the absence of stand-replacing disturbances to encourage vigorous aspen regeneration, aspen stands age and deteriorate through time and eventually may succeed hazel shrub land.

In addition to the senescence of the aspen resource, many areas in the Turtle Mountains have been converted to pastureland. The acreage of the aspen forest type decreased from 98,297 acres in 1980 to 87,699 acres in 1995 (U.S. Forest Service Forest Inventory and Analysis data). This conversion may be driven in part by reduced productivity and vigor of the stands coupled with a lack of harvesting opportunities for private landowners. As a result, some private landowners are inclined to clear low-production forests and use the land for agricultural purposes that generate marginal economic benefits.

The NDFS has an obligation to manage its aspen resource in a sustainable manner, given the successional and societal pressures on the forests of the Turtle Mountains. Timber stand improvement (TSI) treatments aimed at regenerating aging aspen stands have been administered in the past. Since the 1990s, the NDFS has been able to regenerate some aspen stands by bulldozing small tracts (usually less than 10 acres). Bulldozing has been the most cost-effective means to regenerate aspen. Based on



A forestry brush cutter is used to clear old decadent aspen; giving way to lush regrowth

GIS analyses, approximately 136 acres of aspen have been treated between 1990 the early 2000's. This acreage is significant but only represents 1.5 percent of the total forestland in the Turtle Mountain and Homen state forests.

The State Forests program began a program in 2013 to facilitate aspen regeneration treatments. Forest stand inventories were conducted between 2013 and 2017 as a means to evaluate forest conditions and prioritize areas that would most benefit for treatments. Through a cooperative agreement with the ND Game and Fish Department, the NDFS was able to purchase a forestry brush cutter that can be attached to a skid steer loader to implement aspen regeneration treatments. Since 2017, and additional 45 acres have been treated on NDFS lands. The program plans to continue to implement 5 to 10 acre treatments of high priority stands annually.

Wildlife Habitat in the State Forest System

Upland and bottomland deciduous forests are important habitat to numerous species of wildlife. Characteristic wildlife species associated with upland forests include game animals such as white-tailed deer, moose, elk, wild turkeys and ruffed grouse. The state forests provide excellent bird watching opportunities because numerous avian species are found in North Dakota's forests. Birds associated with upland forests include migratory songbirds, cavity-nesting birds, birds of prey and waterfowl. Furbearers such as coyote, red fox, gray fox, raccoon, American marten, ermine, long-tailed weasel, least weasel and bobcat are associated with upland deciduous habitats.

The North Dakota Comprehensive Wildlife Conservation Strategy, developed by the North Dakota Game and Fish Department, represents a strategy for preserving the state's fish and wildlife resources for the foreseeable future. The plan is habitat-based rather than species-based. One of the identified landscape components is upland



Big game are inhabitants of North Dakota's State Forests

deciduous forests. Within this habitat classification, several conservation priority species are identified, including golden eagle, bald eagle, Swainson's hawk, black-billed cuckoo, red-headed woodpecker, arctic shrew, pygmy shrew, small-footed myotis, long-eared myotis, long-legged myotis and redbelly snake. Sustaining North Dakota's forest resources is critical to the protection of these species.

A complete list of wildlife associated with upland forests according to the North Dakota Game and Fish Department can be found in Appendix A.

Recreation in the State Forest System

Major recreational uses of the state forests include fishing, camping, hiking, hunting, horseback riding, snowmobiling and cross-country skiing. Recreational use management of state forestland is a major priority of the NDFS. To accommodate these users, the NDFS maintains significant infrastructure, including 41 miles of trails, four campgrounds, one equestrian campground, two day-use areas, three boat ramps, two fishing piers, two scenic overlooks and two primitive campsites (Table 2). Appendix B provides legal descriptions of all recreational infrastructure and easements for the state forest system.

Table 2. Summary of State Forest Recreational Infrastructure.

State Forest	Campgrounds	Trail Miles	Recreation Area	Boat Ramp	Fishing Pier	Scenic Overlook
Turtle Mountain	3 + 1 primitive campsite	27.1	1	2	2	1
Homen	1	6.7	1	1	0	0
Mouse River	0	2.5	0	0	0	0
Tetrault Woods	0	1.5	0	0	0	1
Sheyenne River	1 primitive campsite	3.8	0	0	0	0

Non-recreational Forest Uses

Non-recreational uses of state forests include firewood collecting, agricultural leases and tree seed orchards. Firewood collection is allowed in the Turtle Mountain and Homen state forests. Agricultural leases include haying and grazing leases issued to local citizens. To date, 965 acres are under lease. Several seed orchards and conifer tree plantings have been established in state forests in past decades. Such plantings are used for seed collection by the Towner State Nursery and also serve as important evaluation sites for seed sources of conservation tree species.

Invasive Tree Pests and Noxious Weeds

Invasive tree pests and noxious weeds are major threats to North Dakota's natural resources. The state forests program spends a considerable amount of time and effort on surveying for these threats and mitigating their impact.

The most prominent invasive tree pests include the gypsy moth (*Lymantria dispar*) and emerald ash borer (*Agrilus planipennis*). The state forest system has two attributes that make the system vulnerable to gypsy moth: campgrounds that may attract out-of-state visitors and vast acreages of aspen, oak, and ash forest, host species the gypsy moth and emerald ash borefr. Preventing the establishment of these pests is of primary importance. In the past State Forests Staff participated in pest detection surveys and currently post firewood alerts in campgrounds and stay abreast of new invasive pest-related information.

Mapping and controlling noxious weeds remain as a major effort that state forest staff coordinate each year. State law requires landowners to be responsible for noxious weed control on their properties (*NDDA Century Code, Title 63, Ch. 63-01.1, Noxious Weed Control*). Noxious weeds in North Dakota include absinth wormwood, Canada thistle, diffuse knapweed, leafy spurge, musk thistle, purple loosestrife, Russian knapweed, spotted knapweed, yellow toadflax, dalmatian toadflax and saltcedar. Leafy spurge, spotted knapweed and Canada thistle represent the noxious weeds of highest priority on state forestlands. Management of these plants requires surveillance and chemical and biological control.

The state forest program has demonstrated success in reducing the impacts of noxious weeds. Through investments in equipment, GIS technology and training, the program has seen an overall reduction in noxious weed acres. Continued vigilance and investments are necessary to maintain this trend.

Section III. Management Goals and Needs

Goal 1. Manage and sustain biological resources in the NDFS state forests system

1a. Woodlot Management

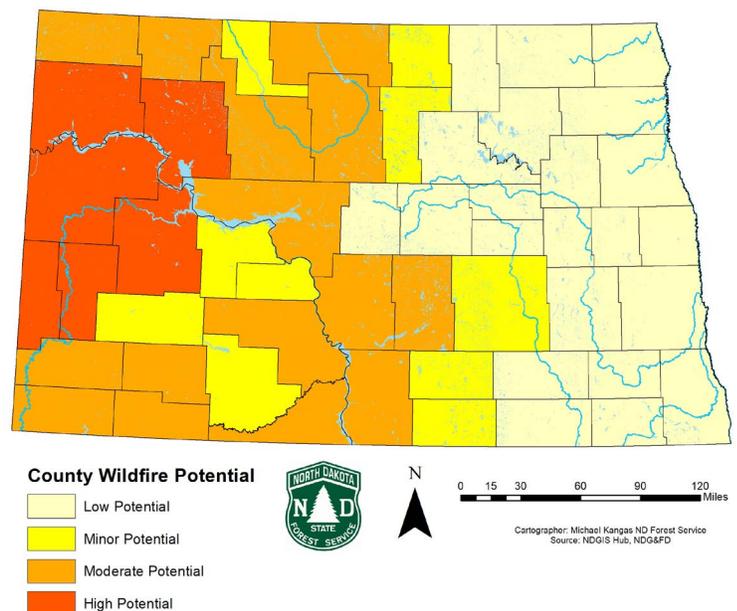
A very small percentage of forestland in the state forest system has undergone timber stand improvement (TSI) treatments. A more even distribution of age class structure has important implications for wildlife habitat, forest conservation, and resilience to forest threats. Therefore, implementing TSI treatments is an important priority for the state forest program. Improving the age class distribution of the state forest system requires: 1) Forest inventories should continue to be conducted to determine the percentage of predominately aspen forest and determine the stand age class of those stands to prioritize areas in greatest need of treatment. Coordination with other NDFS programs such as forest health and stewardship may serve as the most effective means to leverage resources to carry out an inventory project. Following the completion of an inventory, treatments goals (acreage by state forest) can be established on a reasonable timeline. 2) Upon completion of an inventory and identification of priority stands, state forest personnel must engage state and private partners and existing fiber markets must be assessed. Treatments are unlikely to derive revenue for the state forest program; however, if projects can be completed at no or minimal cost, the benefits of harvesting may be justified to achieve conservation goals. 3) Guidelines must be established so that, if possible, TSI treatments are completed in a sensible manner that does not have adverse impacts on soils, water or other natural resources. 4) Demonstration areas should be established in areas where TSI treatments have been conducted successfully. Such demonstration areas may help promote similar conservation practices in adjacent North Dakota forest tracts such as the Turtle Mountains, Pembina Gorge and Sheyenne River Valley.

1b. Mitigation of Wildfire

The Turtle Mountain, Homen and Mouse River state forests are in counties identified as having moderate wildfire risk, according to the North Dakota Forest Action Plan (Figure 8).

An updated fuel inventory would be of great value to assess wild fire potential and vegetative fire break needs on the state forest system. Firebreaks are a widely used practice that has been shown to slow the spread of wildfire. A firebreak (also called a fire road, fire line or fuel break) is a gap in vegetation or other combustible material that acts as a barrier to slow or stop the progress of a bush fire or wildfire. Fire breaks can slow the spread of wildfire and reduce the ultimate size of wildfires, and may serve as a logging road, thereby providing access to forestry products such as timber and biomass fuel.

Figure 8. Wildfire risk by county (Courtesy North Dakota Forest Action Plan)



1c. Fence and Boundary Maintenance

The state forests system has 108 miles of boundaries. Properly marked and surveyed boundaries are important for a variety of reasons, including reducing the encroachment of neighboring landowners, reducing potential trespassing by people using the state forests for recreation, reducing unintended harvesting of wood from state forestland thought to be private land, reducing property disputes and identifying easement needs. Boundary markings need to be re-established on all parcels of the state forest system because signs deteriorate through time. An estimated 3.7 miles of fencing needs exist on the state forest system, according to the NDFS Facility Master Plan (2020).

1d. Grassland Management

Keeping areas as close to their natural condition as possible is a goal of the state forests program. The state forest system contains significant acreages of land that were historically grasslands/meadows. Controlling noxious weeds, haying, and grazing are the primary approaches to maintaining these areas as grassland. Noxious weed control entails mapping, surveillance and spraying. Haying and grazing also are used as management tools to maintain grassland communities on the state forest system. The use of prescribed fire is a potential tool for maintaining grassland as well, but it must be coordinated with numerous fire-management partners to ensure the practice is implemented safely.

1e. Mitigation of Oil and Gas Development

Oil and gas development has fluctuated in North Dakota. The NDFS does not actively seek such development on NDFS lands because mineral development can affect recreational opportunities and natural resources adversely. Despite these preferences, the NDFS has limitations in its role in mineral development as a surface owner. The agency must be able to weigh the rights of those with mineral leases with protecting the natural resources of the state forest system. The state forester, in consultation with the State Land Department and NDSU general counsel, has established specifications for reclamation and mitigation to surface occupancy by mineral development entities. The NDFS will reinvest any revenues derived from such activities toward recreation and mitigation.

Goal 2. Provide North Dakota residents and visitors with a high-quality outdoor recreational experience

2a. Campground and Day Use Management and Maintenance

A significant amount of infrastructure is associated with campgrounds and day-use areas. Infrastructure such as vault toilets, gates, campsite structures (picnic tables, fire rings), campground roads, wells, boat ramps, fishing piers and numerous buildings must be maintained to serve intended needs and address safety purposes. Such infrastructure components are included in the NDFS facility master plan, which identifies needs and prioritizes deferred maintenance and extraordinary repair projects on a biennial basis.

2b. Trail Maintenance and Monitoring

In addition to campground and day-use areas, the NDFS maintains an extensive trail system. Two primary needs for this system are maintenance (annual inspection and clearing of trails and bridges) and monitoring (enforcement of state forest rules to mitigate inappropriate behaviors on state forest trails). These two goals have been difficult to achieve due to limited personnel and funding. Furthermore, the NDFS has limited statutory enforcement authority. Development of new trails is evaluated periodically. Trail development must consider long term deferred maintenance costs, staffing availability, and balancing recreational development with conserving undeveloped natural areas.

Goal 3. Mitigation of forest threats: Invasive tree pests and weeds

Preventing the establishment of invasive tree pests and noxious weeds is critical to maintaining the ecological integrity of these resources. A significant amount of effort is directed toward the surveillance and eradication of such exotic species.

3a. Invasive Tree Pests

The emerald ash borer and European gypsy moth represent two invasive pests of high priority. The lands managed by the NDFS have an abundance of host trees for these pests. No populations of either pest are known to date in North Dakota. Experts believe that in time, these pests will become established in the state. Detection surveys are conducted in conjunction with the North Dakota Department of Agriculture on state forestlands every year. State forest staff will continue to promote educational information aimed at reducing pest introduction.

3b. Noxious Weed Mapping and Treatment

Reducing the acres of noxious weeds through surveillance and treatment is a primary goal of the state forest program. Staff will continue weed mapping, treatment activities, and training. These already have shown that they reduce noxious weed acreage significantly on NDFS-managed lands.



Section IV. Summary

The North Dakota Forest Service is proud to manage these lands for the public. We see great value in providing recreational opportunities and managing wildlife habitat on these lands.

The “*State Forest Assessment and Management Plan*” serves as a strategic document intended to focus resources most effectively on lands the North Dakota Forest Service administers.

Management goals and needs are derived from an assessment of the state forests conditions, recreational infrastructure, program activities, and available resources.

Goals and trends will continue to evolve in the years to come as a consequence of our ever-changing societal and natural resource demands. As a result, the State Forests Program commits to reviewing and updating this document at 10-year intervals to assure that management goals remain balanced with societal demands.

Literature Cited:

- Hagen, Sandra K., Patrick T. Isakson and Steve R. Dyke. 2005. *North Dakota Comprehensive Wildlife Conservation Strategy*. North Dakota Game and Fish Department. Bismarck, N.D. 454 pp.
- Harniss, R.O. 1981. *Ecological Succession in Aspen and its Consequences on Multiple Use Values*. In: DeByle, N.V., editor. Symposium proceedings, Situation management of two intermountain species: aspen and coyotes. Aspen. Logan, Utah: Utah State University. Volume 1, pp 31-39.
- Haugen, David E., Michael Kangas, Susan J. Crocker, Charles H. Perry, Christopher W. Woodall,; Brett J. Butler, Barry Wilson and Dan J. Kaisershot. 2009. *North Dakota's Forests 2005*. Resource Bulletin NRS-31. Newtown Square, Pa.: U.S. Department of Agriculture, Forest Service, Northern Research Station. 82 p.
- Kangas, M. 2007. *North Dakota Forest Health Report 2005 – 2006*. Bottineau, N.D.: North Dakota Forest Service. 16 p.
- North Dakota Forest Service, 2020. *North Dakota Forest Resources and Forest Action Plan*. 916 E. Interstate Ave St 4. Bismarck, N.D. 51 p.
- North Dakota Parks and Recreation Department. 2005. *Master plan for trail development in the Turtle Mountains and Pembina gorge areas*. Bismarck, N.D. 85 p.
- Oduor, P., and L. Kotchman. 2007. *North Dakota Spatial Analysis Project. 2007*. Bottineau, N.D.: North Dakota Forest Service. 127p.
- Perala, D.A. 1990. Quaking aspen. In: Burns, Russell M., and Barbara H. Honkala, technical coordinators. 1990. *Silvics of North America: 1. Conifers, 2. Hardwoods*. Agriculture Handbook 654. Washington, D.C., U.S.

Appendix A.

Wildlife associated with upland deciduous forests (2001. North Dakota Comprehensive Wildlife Conservation Strategy. North Dakota Game and Fish Department)

Birds: turkey vulture, sharp-shinned hawk, Cooper's hawk, broad-winged hawk (Turtle Mountains), red-tailed hawk, American kestrel, merlin, ruffed grouse, wild turkey, mourning dove, great horned owl, Eastern screech owl, long-eared owl, common nighthawk, ruby-throated hummingbird, yellow-bellied sapsucker, downy woodpecker, hairy woodpecker, yellow-shafted flicker, Western wood pewee, Eastern wood pewee, yellow-bellied flycatcher, willow flycatcher, least flycatcher, great crested flycatcher, purple martin, tree swallow, blue jay, black-billed magpie, common crow, black-capped chickadee, white-breasted nuthatch, brown creeper, house wren, golden-crowned kinglet, ruby-crowned kinglet, Eastern bluebird, veery, wood thrush, American robin, gray catbird, brown thrasher, cedar waxwing, yellow-throated vireo, warbling vireo, Philadelphia vireo, red-eyed vireo, yellow warbler, chestnut-sided warbler, yellow-rumped warbler, American redstart, black-and-white warbler, ovenbird, Northern waterthrush, mourning warbler, common yellowthroat, migratory warblers, scarlet tanager, rose-breasted grosbeak, black-headed grosbeak, lazuli bunting, indigo bunting, spotted towhee, Eastern towhee, chipping sparrow, lark sparrow, clay-colored sparrow, song sparrow, common grackle, brown-headed cowbird, orchard oriole, Bullock's oriole, Baltimore oriole, pine siskin, American goldfinch, evening grosbeak

Mammals: little brown bat, silver-haired bat, big brown bat, Eastern red bat, hoary bat, Eastern cottontail, woodchuck, Eastern chipmunk, gray squirrel, fox squirrel, Northern flying squirrel, beaver, white-footed mouse, Southern red-backed vole, meadow vole, meadow jumping mouse, Western jumping mouse, porcupine, coyote, red fox, gray fox, raccoon, American marten, ermine, long-tailed weasel, least weasel, bobcat, elk, mule deer, white-tailed deer

Reptiles and Amphibians: American toad, gray tree frog, wood frog, common garter snake, plains garter snake



Appendix B.

Recreational infrastructure and easements by legal description

State Forest	County	Legal Description	Recreational Infrastructure Present
Turtle Mountain	Bottineau	N1/2, Sec 16, T163N R76W	Mystic Horizons Scenic Overlook, Twisted Oaks Campground, hiking trails
Turtle Mountain	Bottineau	SE1/4, Sec 16, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	NE1/4, Sec 21, T163N R76W	Sensitive site - unmarked grave, hiking trails
Turtle Mountain	Bottineau	N1/2 SE1/4, Sec 21, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	Sec 22, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	W1/2, Sec 15, T163N R76W	Strawberry Lake Campground, hiking trails
Turtle Mountain	Bottineau	Sec 10, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	Sec 3, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	Sec 34, T164N R76W	Hiking trails
Turtle Mountain	Bottineau	Sec 35, T164N R76W	Dalen Campsite, rare plant location - Ostrich fern
Turtle Mountain	Bottineau	Sec 2, T163N R76W	Hiking trails
Turtle Mountain	Bottineau	Sec 36, T163N R76W	Utility easement
Turtle Mountain	Bottineau	N1/2 Sec 5, T163N R75W	Utility easement
Turtle Mountain	Bottineau	SE 1/4, Sec 3, T163N R75W	Hahn's Bay Recreational Area, utility easement, hiking trails
Homen	Bottineau	SE 1/4, Sec 35 T163N R75W	Utility easement
Homen	Bottineau	SW1/4 NW1/4 Sec 21, T163N R74W	Sensitive ecological area - peatland, utility easement, fishing and boating access
Homen	Bottineau	S1/2 S1/2 Sec 20, T163N R74W	Conservation seed orchard
Homen	Bottineau	Sec 36, T164N R74W	Utility easement, hiking trails
Homen	Bottineau	N1/2, Sec 16, T163N R74W	Pelican Sandy Recreational Area, hiking trails
Homen	Bottineau	Sec 9, T163N R74W	Conservation seed orchard, hiking trails
Homen	Bottineau	N1/2 S1/2, Sec 17, T162N R74W	Rare plant location - yellow lady slipper
Mouse River	McHenry	w1/2, sec 20, T158N R75W	Hiking trails
Tetrault Woods	Cavalier	se1/4 ne1/4, sec 36, T163N R57W	Pipeline easement
Tetrault Woods	Pembina	w1/2, sec 31, T163N R56W	Waterfall, pipeline and scenic overlook easements
Sheyenne River	Ransom	s1/2 sec 18, T135N R57W	Hiking trail, waterfall
Sheyenne River	Ransom	s1/2 sec 17, T135N R57W	Hiking trail
Sheyenne River	Ransom	sw1/4 sec 16, T135N R57W	Hiking trail



NDSU

Partial funding for this report is made available through support from the USDA Forest Service State and Private Forestry Program.

Any inquiries about the North Dakota Forest Service insect trapping or the Forest Health Program in general can be directed to Lezlee.Johnson@ndsu.edu or (701) 231-5138. This publication is available in alternative formats by calling (701) 231-5138.

All materials in this publication may be reproduced only with the consent of the author and/or the agencies represented.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD).

USDA is an equal employment opportunity provider and employer.

North Dakota State University and U.S. Department of Agriculture cooperating. NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.