2 The Refuges

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The North Dakota refuges provide environmental education opportunities for school children.

This chapter describes the establishment, special values, purposes, vision, goals, and planning issues for the refuges.

2.1 Establishment, Acquisition, and Management History

The 12 national wildlife refuges are located throughout the state of North Dakota. All 12 refuges are managed toward a common primary purpose to provide habitat and breeding ground for migrating waterfowl, shorebirds, and other wildlife. The refuges were established under several different authorities:

- Audubon National Wildlife Refuge was established under the authority of the Fish and Wildlife Coordination Act.
- Under executive order, President Theodore Roosevelt established 2 of the 12 refuges as preserves and breeding grounds for native birds: Chase Lake and Stump Lake national wildlife refuges.
- Under executive order, President Franklin D. Roosevelt established 8 of the 12 refuges as breeding grounds for migratory birds and other wildlife: Kellys Slough, Lake Ilo, Lake Nettie, Lake Zahl, McLean, Shell Lake, Stewart Lake, and White Lake national wildlife refuges.
- Lake Alice National Wildlife Refuge was established under the authority of the Migratory Bird Conservation Act.

A brief description of each refuge follows; maps for each refuge (figures 6–17) follow the description of White Lake National Wildlife Refuge.

Audubon National Wildlife Refuge

Established as Snake Creek National Wildlife Refuge in 1955 under the Fish and Wildlife Coordination Act, the refuge provides habitat for a wide variety of wildlife. Developed to compensate for habitat lost when Garrison Dam flooded Missouri River bottomlands, the refuge was renamed in 1967 in honor of John James Audubon. A 19th century naturalist and wildlife artist,

Audubon spent the summer of 1843 in what is now northwestern North Dakota collecting and painting wildlife of the northern plains.

The Service manages the Audubon National Wildlife Refuge (figure 6); the U.S. Army Corps of Engineers owns the land. The refuge is in McLean County in west-central North Dakota; its headquarters are in Coleharbor, North Dakota, from where it is administered as part of the Audubon National Wildlife Refuge Complex.

Much of the 14,739-acre refuge is comprised of Lake Audubon (10,421 acres). The refuge is an important feeding and resting area for waterfowl migrating in the Central Flyway. More than 3,000 acres of grassland are habitat for upland wildlife of all sizes including Baird's and Le Conte's sparrows, sharp-tailed grouse, fox, coyote, and white-tailed deer. The refuge also has cropland and several large-tree plantings. The 370 acres of wetland provide habitat for shorebirds, gulls, terns, rails, and cranes. Almost 100 islands dot Lake Audubon—enough for 450 acres of giant Canada goose and duck-nesting habitat.

Visitor activities include a 7.5-mile interpretive auto tour route for exploring (1) the area's history, (2) agriculture's role in benefiting wildlife, (3) wetlands and native prairie, and (4) the refuge's contribution in restoration of the giant Canada goose—a bird once on the verge of extinction on North Dakota's prairies. A 1-mile interpretive hiking trail offers a first-hand look at prairie and wetlands. The Service allows fishing during winter and hunters have opportunities for upland birds and deer during special seasons.

Chase Lake National Wildlife Refuge

Large numbers of American white pelicans nested at Chase Lake in 1863 when General Sibley was active in the area. In 1872, the Northern Pacific Railroad reached Jamestown, North Dakota, and brought a flood of settlers to the area. Market hunting and indiscriminate killing had drastic effects on wildlife populations before the establishment of laws protecting wildlife. In 1905, local resident H.H. McCumber reported about 500 pelicans were left on the lake. By the time the government investigated the area, only 50 pelicans remained. On August 28, 1908, President Theodore Roosevelt established Chase Lake National Wildlife Refuge as a "reserve and breeding area for native birds," making it one of the oldest refuges in the country.

Found in south-central North Dakota, the 4,440-acre refuge is in Stutsman County and has its headquarters in Woodworth, North Dakota (see figure 7). The refuge is part of the Arrowwood National Wildlife Refuge Complex.

The refuge and surrounding area provide breeding and resting habitat for more than 293 bird species, including the largest breeding colony of American white pelicans in North America. The American Bird Conservancy has designated Chase Lake National Wildlife Refuge as one of America's top 100 "Globally Important Bird Areas." The refuge includes Chase Lake, along with native prairie, dense nesting cover, and an amazing density of wetlands. Most of this land has not been altered since Euro-American settlement times. Thus, Chase Lake National Wildlife Refuge was also designated as Chase Lake Wilderness in 1975. This is one of only two refuges in North Dakota with designated wildernesses.

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Chase Lake National Wildlife Refuge and the surrounding area support North America's largest breeding colony of the American white pelican.

The refuge offers opportunities for hunting and wildlife observation.

Kellys Slough National Wildlife Refuge

In 1936, President Franklin D. Roosevelt established Kellys Slough National Wildlife Refuge "as a refuge and breeding ground for migratory birds and other wildlife." The refuge was established to develop and manage a system of wetlands and grasslands that is unique to the Red River Valley of North Dakota.

The 1,270-acre refuge (figure 8) is in Grand Forks County in northeastern North Dakota; its headquarters are in Devils Lake, North Dakota, from where it is administered as part of the Devils Lake Wetland Management District Complex.

The refuge contains an intermittent stream that flows into the Turtle River, a tributary of the Red River. Since the 1960s, the Service has been purchasing lands around the original refuge with federal Duck Stamp money and developing these into waterfowl production areas. In 1991, the Service, with the help of Ducks Unlimited, began constructing several dikes and water control structures with funding from two North American Waterfowl Management Plan grants. Recent and future land purchases are aimed at acquiring land needed to develop more managed pools for waterfowl on the refuge.

Kellys Slough National Wildlife Refuge supports a diversity of wetland and grassland wildlife, while providing for wildlife-dependent recreation including environmental education and interpretation. The Service does not allow hunting or fishing at the refuge.

Although waterfowl production areas are open to public hunting and other wildlife-dependent recreational use by regulation, several of these areas within and surrounding the original refuge were formally closed to the public through administrative procedures and published in 50 CFR 32.53 (see figure 8). Several other waterfowl production areas near the refuge remain open to public hunting and other recreational activities (see figure 8).

Lake Alice National Wildlife Refuge

Lake Alice National Wildlife Refuge (figure 9) was established in 1935 under the Migratory Bird Conservation Act as a sanctuary for migratory birds. The 11,500-acre refuge is a major waterfowl concentration point during spring and fall migrations, as well as a significant breeding area for wetland wildlife.

The 12,096-acre refuge is in Ramsey County in northeastern North Dakota; its headquarters are in Devils Lake, North Dakota, from where it is administered as part of the Devils Lake Wetland Management District Complex.

The relatively flat landscape of the area is intertwined with wetlands and marshes. Often called "prairie potholes," these wetlands were created by large continental glaciers during the last ice age and provide excellent habitat for a variety of wetland wildlife. Tens of thousands of snow geese, Canada geese, sandhill cranes, and ducks use the lake and surrounding lands each year. Most of the area within the refuge was farmed at one time, so very little native prairie remains. A mixture of grasses and legumes have been planted throughout most of the refuge to provide cover for a variety of ground-nesting birds, as well as winter cover and food for many species of resident wildlife.

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Northern pintail is a common duck at the refuges.

The refuge provides many photography and wildlife-viewing opportunities, an auto tour, and hiking trails and serves as an outdoor classroom for local schools. The Service allows hunting, but no fishing, at Lake Alice National Wildlife Refuge.

Lake Ilo National Wildlife Refuge

Newspaper accounts in the early 1930s indicate Dunn County citizens envisioned creating a lake to enrich their lives. Circumstances became reality in 1936 when a dam was constructed near the confluence of Spring and Murphy creeks. The federal government built the dam as a water conservation project through the Works Progress Administration during the Depression years. Several hundred local citizens were hired during dam construction in 1936 and 1937. The new dam created the Lake Ilo, the first major lake in western North Dakota.

In 1939, Franklin D. Roosevelt signed the executive order establishing Lake Ilo National Wildlife Refuge (figure 10) as a breeding ground for migratory birds and other wildlife. Other refuge purposes include fish- and wildlife-oriented recreation, environmental education, interpretation, conservation of endangered species, and protection of cultural and natural resources.

The 4,033-acre refuge is in Dunn County and has its headquarters in Coleharbor, North Dakota, where it is administered as part of the Audubon National Wildlife Refuge Complex.

Over the years, the Service developed wetlands, shelterbelts, and grassland habitats that created an oasis for both migratory birds and resident wildlife. Lake Ilo covers 1,240 acres with a maximum depth of 15 feet. Refuge uplands, amounting to 2,650 acres, are comprised of native prairie, introduced grasses, cropland, and tree plantings. Refuge management is directed at preserving native plants and animals and creating as much species diversity as possible.

The refuge is unique for its archeological sites dating back 11,000 years. The refuge offers fishing opportunities, but hunting is not allowed.

Lake Nettie National Wildlife Refuge

President Franklin D. Roosevelt established Lake Nettie National Wildlife Refuge (figure 11) in 1935 as an easement refuge, where there now are fee-title lands and conservation easements. The Service purchased easements on privately owned land and maintains them as breeding grounds for migratory birds and other wildlife.

Located 5 miles east of Lake Audubon in west-central North Dakota, the 3,055-acre refuge is in McLean County and has its headquarters in Coleharbor, North Dakota, from where it is administered as part of the Audubon National Wildlife Refuge Complex.

Half of the refuge is made up of diverse wetlands. The wetlands are influenced by the water flows of Turtle Creek and agricultural drainage. Uplands, with both native and introduced grass species, make up the other half of Lake Nettie National Wildlife Refuge. In 1962, the Service was authorized to acquire easement lands from private landowners for the purpose of wetland protection, water management, and waterfowl and other wildlife management. In 1966, the Migratory Bird Commission approved acquisition of additional acreage within the meander line of Lake Nettie. In 1997, the Service bought additional acreage under the Garrison Diversion Unit Reformulation Act of 1986. This act required mitigation for Service lands flooded at Audubon National Wildlife Refuge.

The refuge offers opportunities for hunting white-tailed deer. The Service does not allow fishing.

Lake Zahl National Wildlife Refuge

Lake Zahl National Wildlife Refuge (figure 12) was established on June 15, 1939 as a "breeding ground for migratory birds and other wildlife."

The 3,823-acre refuge is in Williams County in northwestern North Dakota; its headquarters are in Crosby, North Dakota, from where it is administered by the Crosby Wetland Management District.

Encompassing 3,219 acres in fee title and 604 acres in easements, the refuge includes two large wetland pools totaling 1,226 acres and 350 acres of seasonal wetlands. A dam constructed by the Civilian Conservation Crops in the 1940s maintains the two pools; Ducks Unlimited repaired and upgraded the dam in the 1990s. The wetlands are used by all species of prairie waterfowl, as well as Wilson's phalarope; ring-billed and California gulls; and common, Forster's, and black terns. Lake Zahl was one of the original release sites for the giant Canada goose reintroduction program. Refuge wetlands are important feeding and resting areas for waterfowl migrating in the Central Flyway. Ten artificial islands constructed by Ducks Unlimited provide secure nesting habitat for waterfowl.

Upland habitat includes more than 1,200 acres of native prairie grassland, plus 400 acres of areas seeded with tame grass. The grasslands provide for a wide variety of songbirds including Le Conte's sparrow, Baird's sparrow, Sprague's pipit, Nelson's sharp-tailed sparrow, and chestnut-collared longspur. The uplands are also home to red fox, gray coyote, white-tailed deer, sharp-tailed grouse, and ring-necked pheasant. In an attempt to curtail winter depredation in the area, 50 acres of cropland provide feed for a large, overwintering population of white-tailed deer.

Visitors use Lake Zahl National Wildlife Refuge for bird watching and hunting. Lake Zahl is open annually for hunting white-tailed deer and upland game birds. The Service does not allow fishing at the refuge.

McLean National Wildlife Refuge

Originally established as Lake Susie Migratory Waterfowl Refuge by Franklin D. Roosevelt in 1939, the refuge changed its name to McLean National Wildlife Refuge with the same purpose of protecting breeding grounds for migratory birds and other wildlife.

© Bob Gress

Grasslands across the refuges are habitat to many songbirds including the Sprague's pipit.

The 760-acre refuge (figure 13) is in McLean County in western North Dakota; its headquarters are in Coleharbor, North Dakota, from where it is administered as part of the Audubon National Wildlife Refuge Complex. This refuge has fee-title lands and conservation easements.

The refuge includes acreage owned by the North Dakota State Land Department as an easement. A dam built in the 1930s and reconstructed in 2003 creates the large wetland that is locally known as "Lake Susie" and provides excellent wetland habitat for migratory birds.

The Service does not allow hunting or fishing at the refuge.

Shell Lake National Wildlife Refuge

President Franklin D. Roosevelt established Shell Lake National Wildlife Refuge (figure 14) on June 12, 1939, as a refuge for breeding migratory birds and other wildlife.

Found in northwestern North Dakota, the 1,835-acre refuge is in Mountrail County; its headquarters are in

Kenmare, North Dakota, from where it is administered as part of the Lostwood Wetland Management District Complex. This refuge has fee-title lands and conservation easements.

The refuge comprises 785 acres in fee-title and 1,050 acres in easements. The refuge includes Shell Lake, a 450-acre area of open water and wetland that provides excellent habitat for all species of prairie waterfowl, as well as Wilson's phalarope; ring-billed and California gulls; and common, Forster's, and black terns. In many years, especially in the fall, Shell Lake is the only wetland in the immediate area that provides a critical resting area for migratory waterfowl.

Uplands, comprised of native prairie and introduced grasses, provide for a wide variety of breeding songbirds including Le Conte's sparrow, Baird's sparrow, Sprague's pipit, Nelson's sharp-tailed sparrow, and chestnut-collared longspur. Other common wildlife species are red fox, coyote, white-tailed deer, sharp-tailed grouse, and ring-necked pheasant.

Public use is restricted to protect the integrity of Shell Lake National Wildlife Refuge as a sanctuary for breeding and migratory birds. However, opportunities for wildlife viewing of large concentrations of migratory waterfowl exist from adjacent public roads. The Service does not allow hunting or fishing at the refuge.

Stewart Lake National Wildlife Refuge

By executive order in 1941, President Franklin D. Roosevelt established Stewart Lake National Wildlife Refuge (figure 15) as a breeding ground for migratory birds and other wildlife.

The 2,230-acre refuge is in Slope County in southwestern North Dakota; its headquarters are in Coleharbor, North Dakota, from where it is administered as part of the Audubon National Wildlife Refuge Complex. This refuge has fee-title lands and conservation easements.

The centerpiece of the refuge is a 197-acre impoundment constructed in 1936. This impoundment wetland serves as breeding, brooding, and migration habitat for migratory birds and other wildlife. Large wetlands are not typical in western North Dakota and Stewart Lake serves as an oasis in a generally well-drained landscape. The uplands surrounding the impoundment are characterized by short- to midgrass prairie and planted wildlife cover.

The Service does not allow hunting or fishing at Stewart Lake National Wildlife Refuge.

Stump Lake National Wildlife Refuge

By executive order in 1905, President Theodore Roosevelt established Stump Lake National Wildlife Refuge (figure 16), the third national wildlife refuge in the nation and the first in North Dakota. Roosevelt established the refuge as a preserve and breeding ground for native birds; the refuge originally consisted of four small islands. Historically, Stump Lake was a nationally significant staging area for canvasbacks and tundra swans due to the uniquely large beds of sago pondweed.

Found in eastern North Dakota, the 27-acre refuge is in Nelson County; its headquarters are in Devils Lake, North Dakota, from where it is administered as part of the Devils Lake Wetland Management District Complex. This refuge has fee-title lands.

At the time of refuge establishment in 1905, the elevation of Stump Lake was 1,411.75 feet at mean sea level (msl). In 1990, the elevation of the lake was approximately 1,400 feet msl. In 1993, the levels of Stump Lake and adjacent Devils Lake began rising. By 2005, the original refuge islands were completely inundated. Stump and Devils lakes equalized at 1,447 feet msl in 2007, effectively placing the highest elevation of the original islands under 15 feet of water.

The Service has closed this refuge to the public.

White Lake National Wildlife Refuge

By executive order in 1941, President Franklin D. Roosevelt established White Lake National Wildlife Refuge (figure 17) as a breeding ground for migratory birds and other wildlife.

The 1,040-acre refuge is in Slope County in southwestern North Dakota, 4 miles east of Amidon. Refuge headquarters are in Coleharbor, North Dakota, from where it is administered as part of the Audubon National Wildlife Refuge Complex. This refuge has fee-title lands.

Development of the refuge began in 1936 as a cooperative venture between the Bureau of Biological Survey and the Works Projects Administration: a dam, primary spillway, and emergency spillway were constructed and a 190-acre impoundment wetland was created. This wetland serves as valuable wildlife habitat in a landscape that is generally well drained and contains few natural wetlands. Refuge uplands are characterized by short- to midgrass prairie.

The Service has closed this refuge to the public.

Location Maps

Figures 6–17 are maps of each refuge and show the refuges' boundaries and ownership.

Refuge Summary

Table 2 provides a summary of acreages of protected habitat managed by each refuge.

Table 2. Land Information for the 12 Refuges, North Dakota.

National Wildlife Refuge	*Reserved From Public Domain*	*Fee-title Acres From Other Agencies*	*Gift Acres*	*Purchase Fee-title Acres*	*Easement Acres*	*Total Acres*
Audubon	0	14,739.19	0	0	0	14,739.19
Chase Lake	0	0	0	4,449.47	0	4,449.47
Kellys Slough	0	680.00	0	0	589.50	1,269.50
Lake Alice	0	160.00	2.18	8,349.86	3,583.50	12,095.54
Lake Ilo	0	0	10.71	3,186.50	835.91	4,033.12
Lake Nettie	0	0	0	2,420.60	634.30	3,054.90
Lake Zahl	40.00	0	0	3,178.98	604.21	3,823.19
McLean	0	0	0	344.00	416.00	760.00
Shell Lake	0	0	0	785.20	1,049.90	1,835.10
Stewart Lake	0	0	3.99	636.01	1,590.40	2,230.40
Stump Lake	27.39	0	0	0	0	27.39
White Lake	0	0	0	1,040.00	0	1,040.00

Source: "2006 Annual Report of Lands Under Control of the Service."

2.2 Special Values

Early in the planning process, the planning team and public identified the outstanding qualities of the 12 refuges. Refuge qualities are the characteristics and features of each refuge that makes it special, valuable for wildlife, and worthy of refuge status. It was important to identify the special values of each refuge to recognize its worth and to ensure that the special values of the refuges are preserved, protected, and enhanced through the planning process. Refuge qualities can be unique biological values, as well as something as simple as, "a quiet place to see a variety of birds and enjoy nature."

The following summarizes the qualities that make the refuges unique and valued:

- The refuges provide critical spring breeding grounds and staging areas for millions of migratory birds that gather from Mexico and South America.

John and Karen Hollingsworth/USFWS

Several thousand sandhill cranes stage in the refuges each spring and fall.

- The refuges are comprised of and provide protection to two ecosystems: tall- and mixed-grass prairie with an abundance of permanent and seasonal wetlands.
- Wildlife is abundant and highly visible because of varied habitat types and relatively low disturbance levels.
- Visitors can still find wide-open spaces that remain relatively undisturbed.
- Refuges provide for high-quality environmental education.

2.3 Purposes

For this CCP process, the Service combined the 12 national wildlife refuges for evaluation as a group and program. The purposes and management capabilities and challenges are similar for all 12 refuges. The refuges were established under several authorities to provide breeding grounds for migratory birds and other wildlife.

The Migratory Bird Hunting Stamp Act of March 16, 1934, and the Migratory Bird Conservation Act of February 18, 1929, have been used to increase the acreage of the refuges for migratory bird habitat protection:

- The Migratory Bird Hunting Stamp Act provides for the conservation, protection, and propagation of native species of fish and wildlife, including migratory birds threatened with extinction.
- The Migratory Bird Conservation Act provides for meeting the obligations of the United States under a migratory bird treaty with Great Britain by the following:

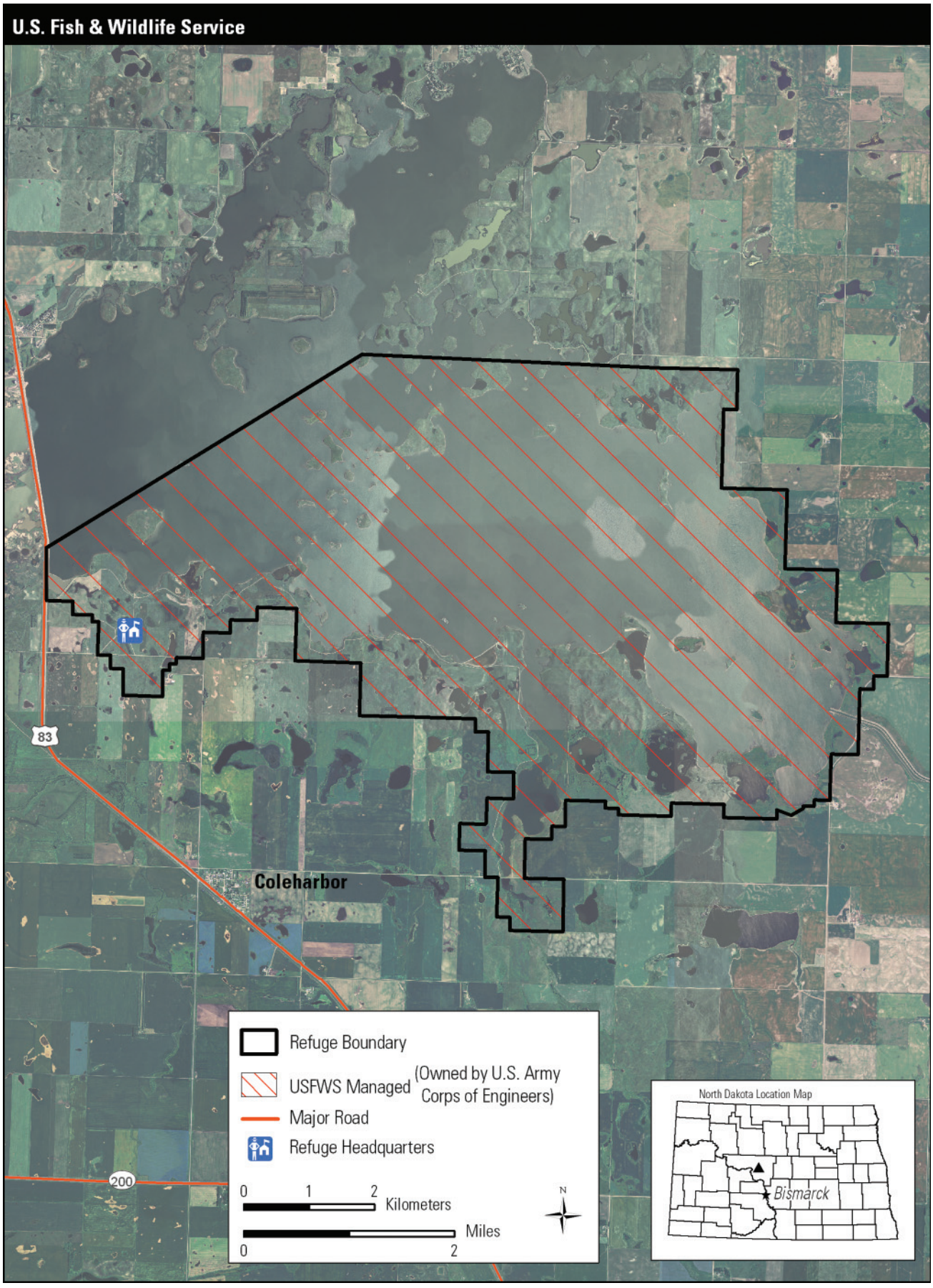

Figure 6. Map of Audubon National Wildlife Refuge, North Dakota.

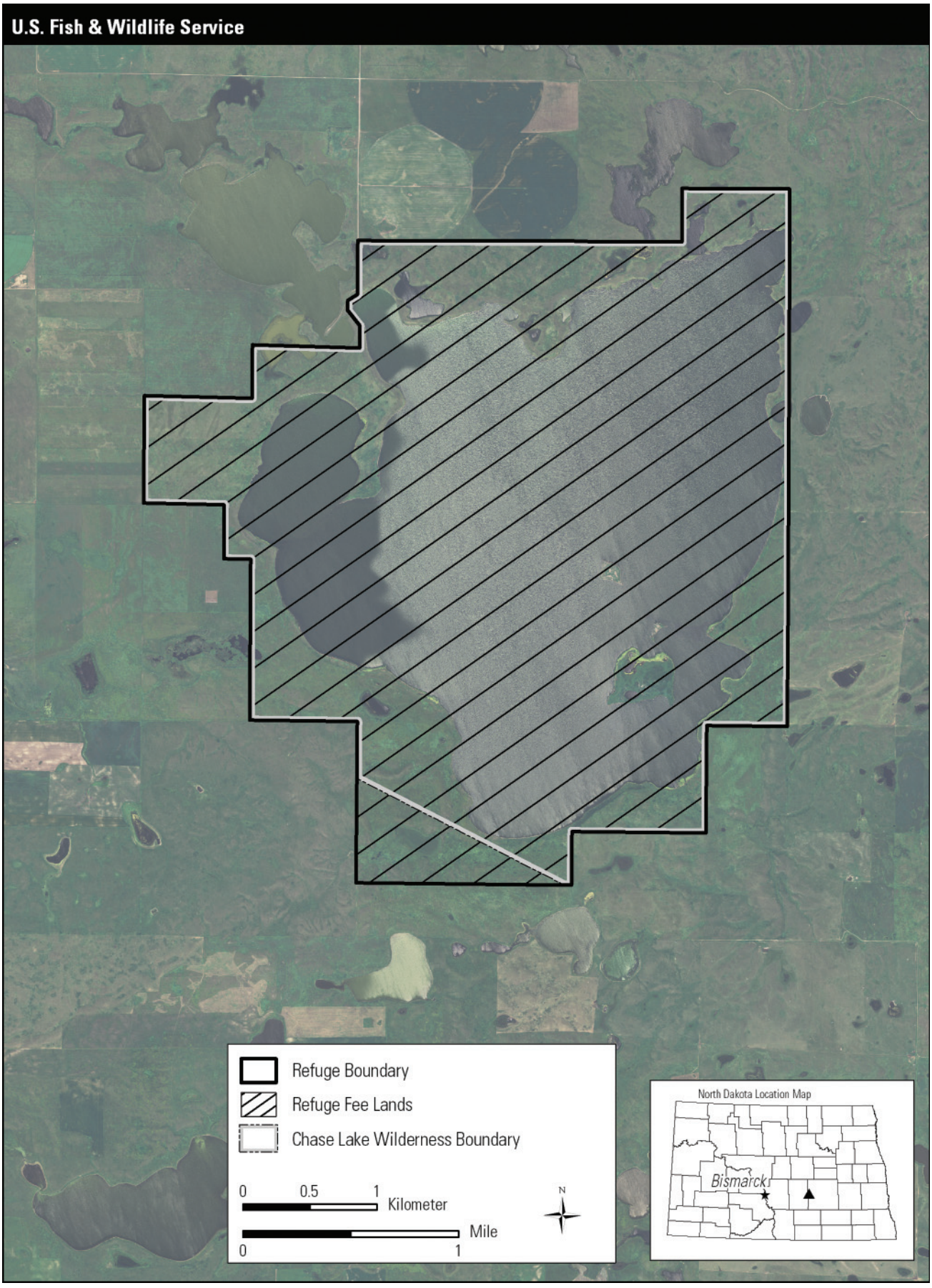

Figure 7. Map of Chase Lake National Wildlife Refuge, North Dakota.

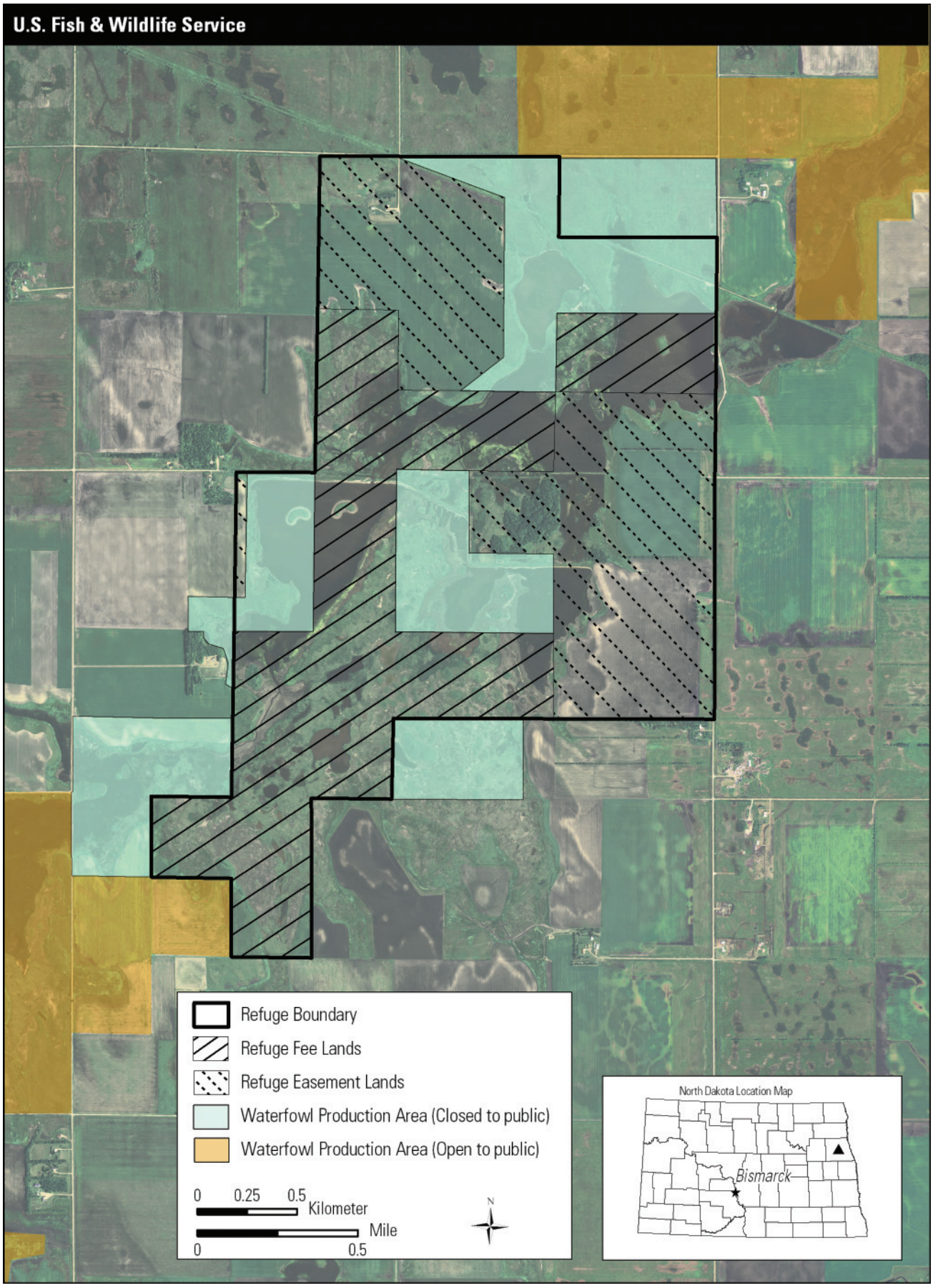

Figure 8. Map of Kellys Slough National Wildlife Refuge, North Dakota.

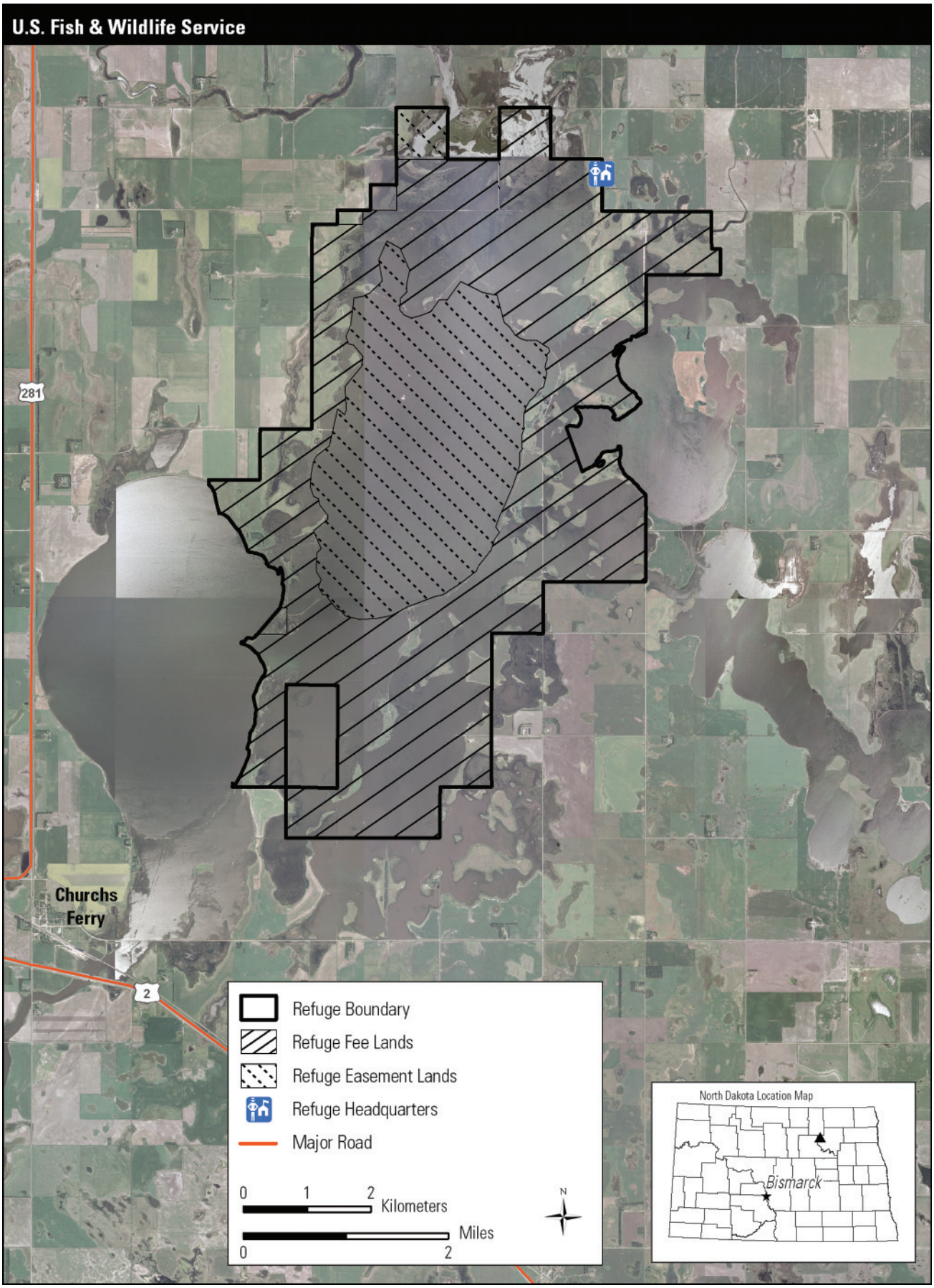

Figure 9. Map of Lake Alice National Wildlife Refuge, North Dakota.

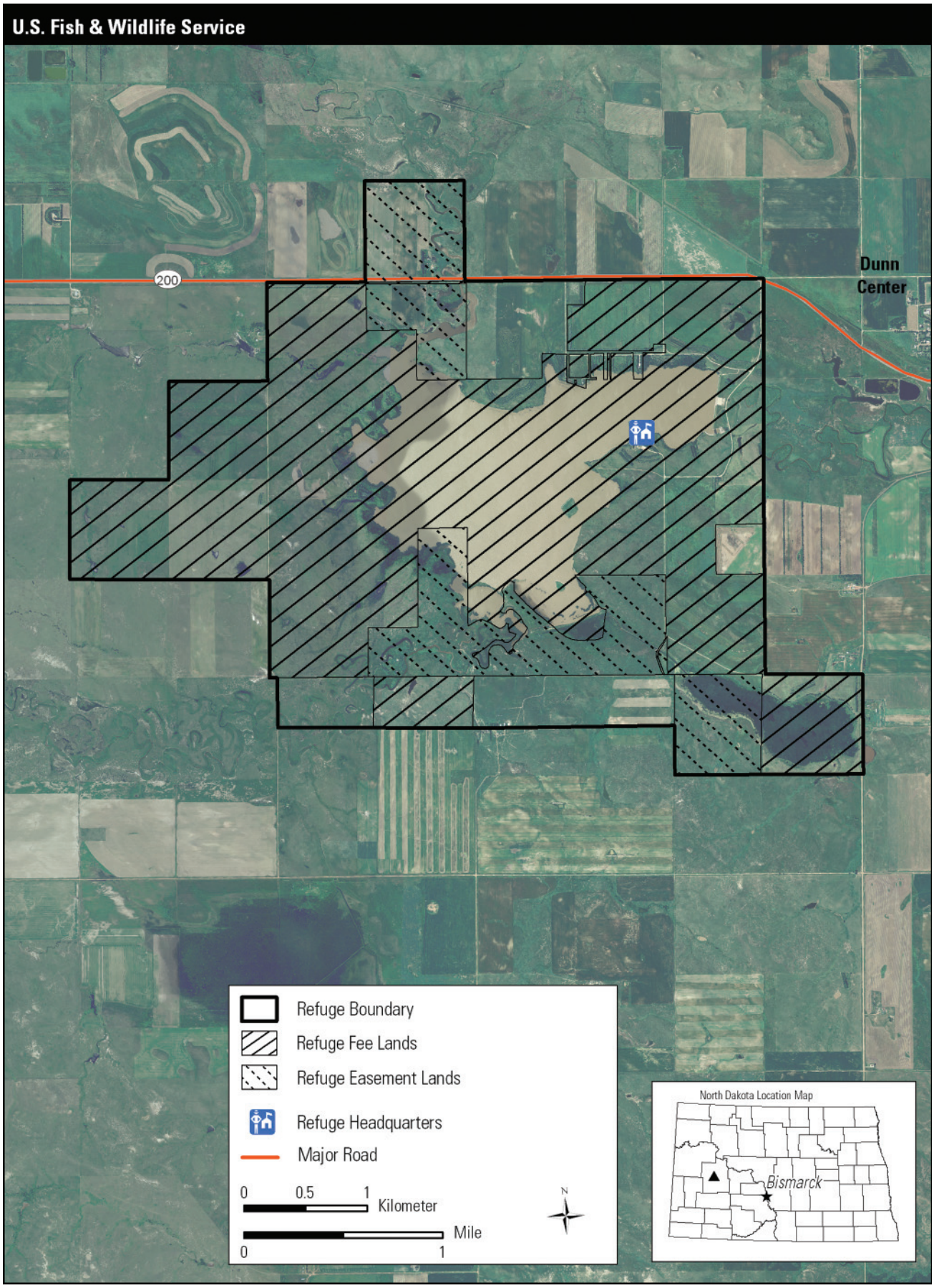

Figure 10. Map of Lake Ilo National Wildlife Refuge, North Dakota.

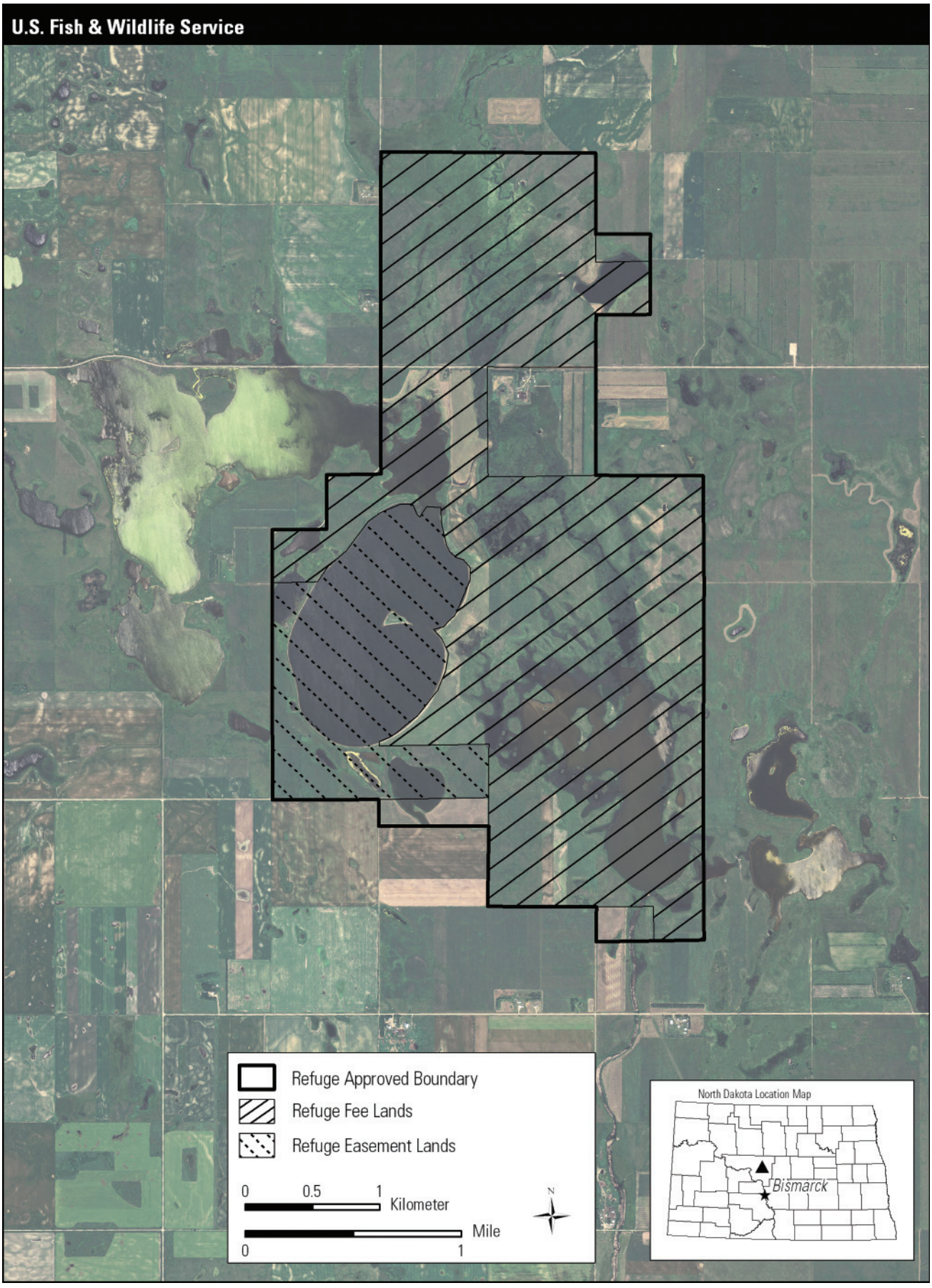

Figure 11. Map of Lake Nettie National Wildlife Refuge, North Dakota.

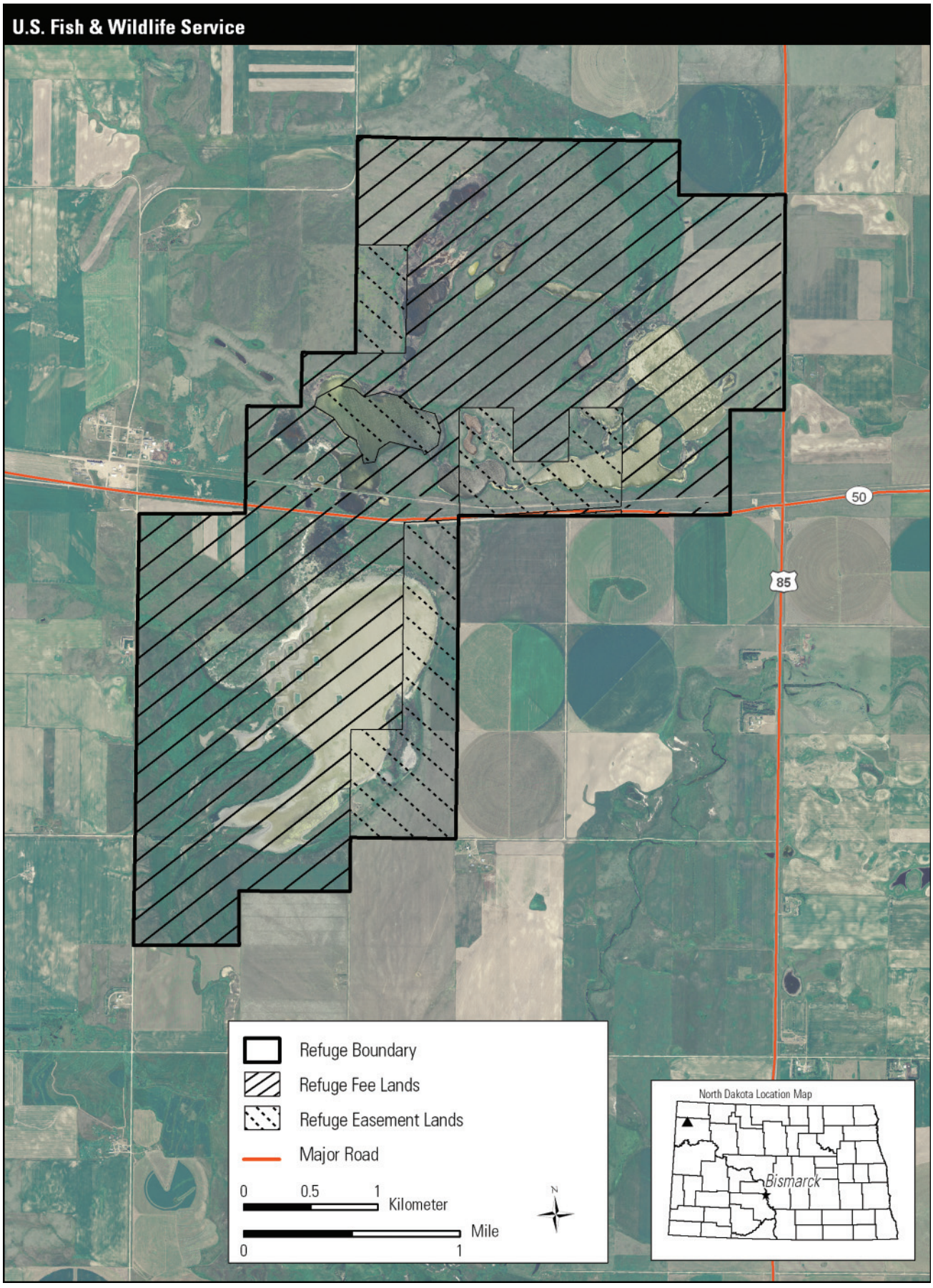

Figure 12. Map of Lake Zahl National Wildlife Refuge, North Dakota.

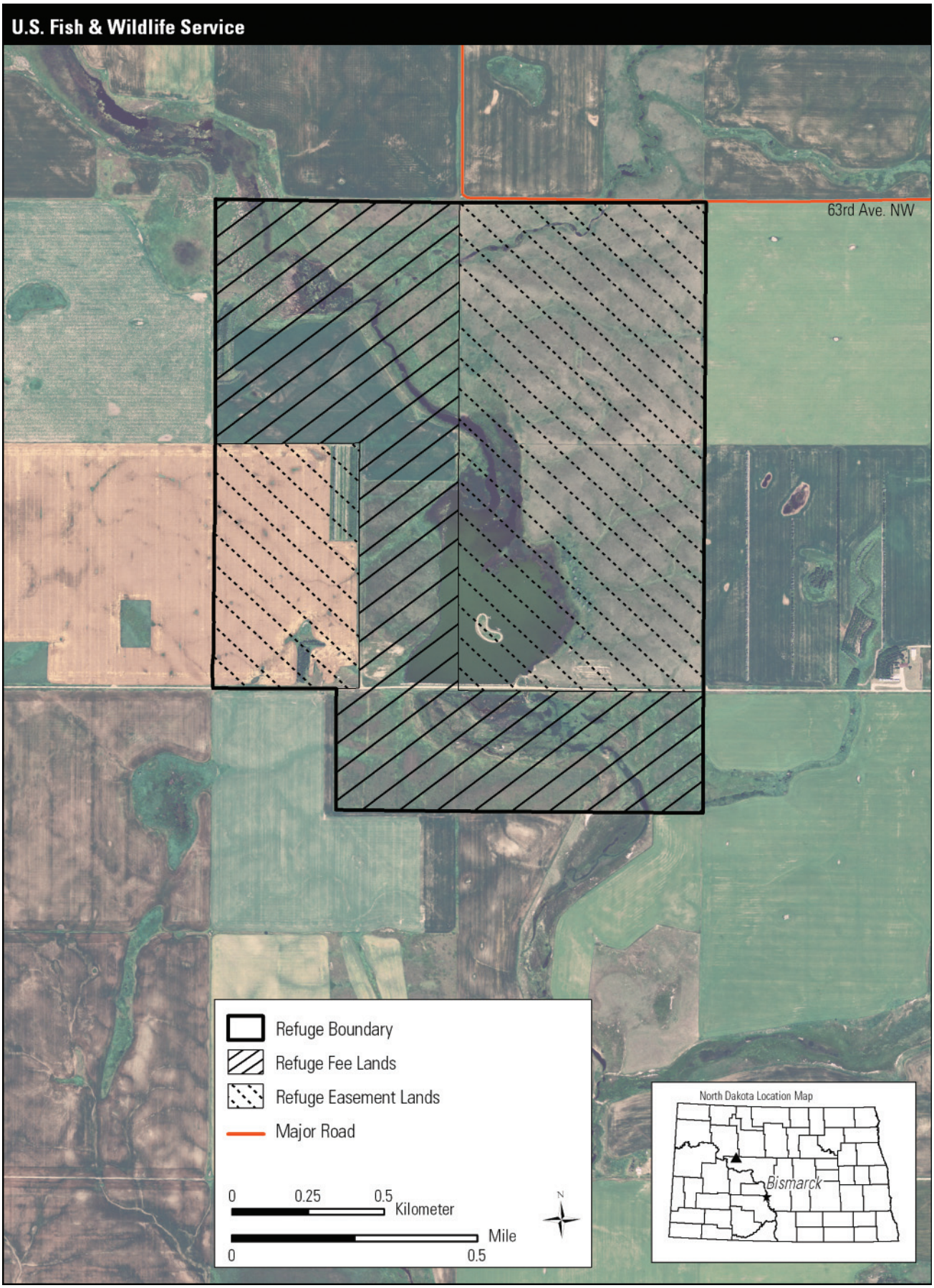

Figure 13. Map of McLean National Wildlife Refuge, North Dakota.

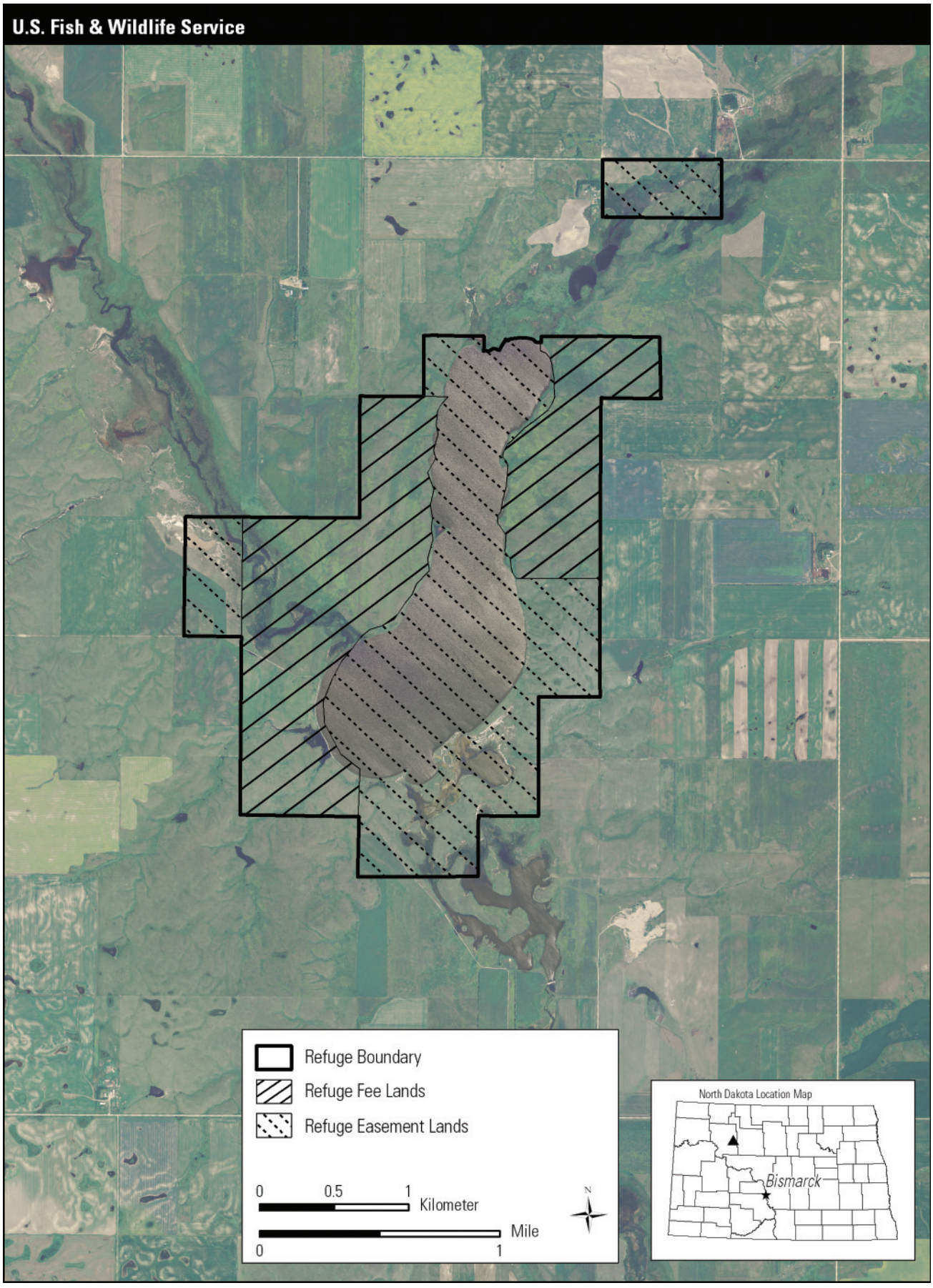

Figure 14. Map of Shell Lake National Wildlife Refuge, North Dakota.

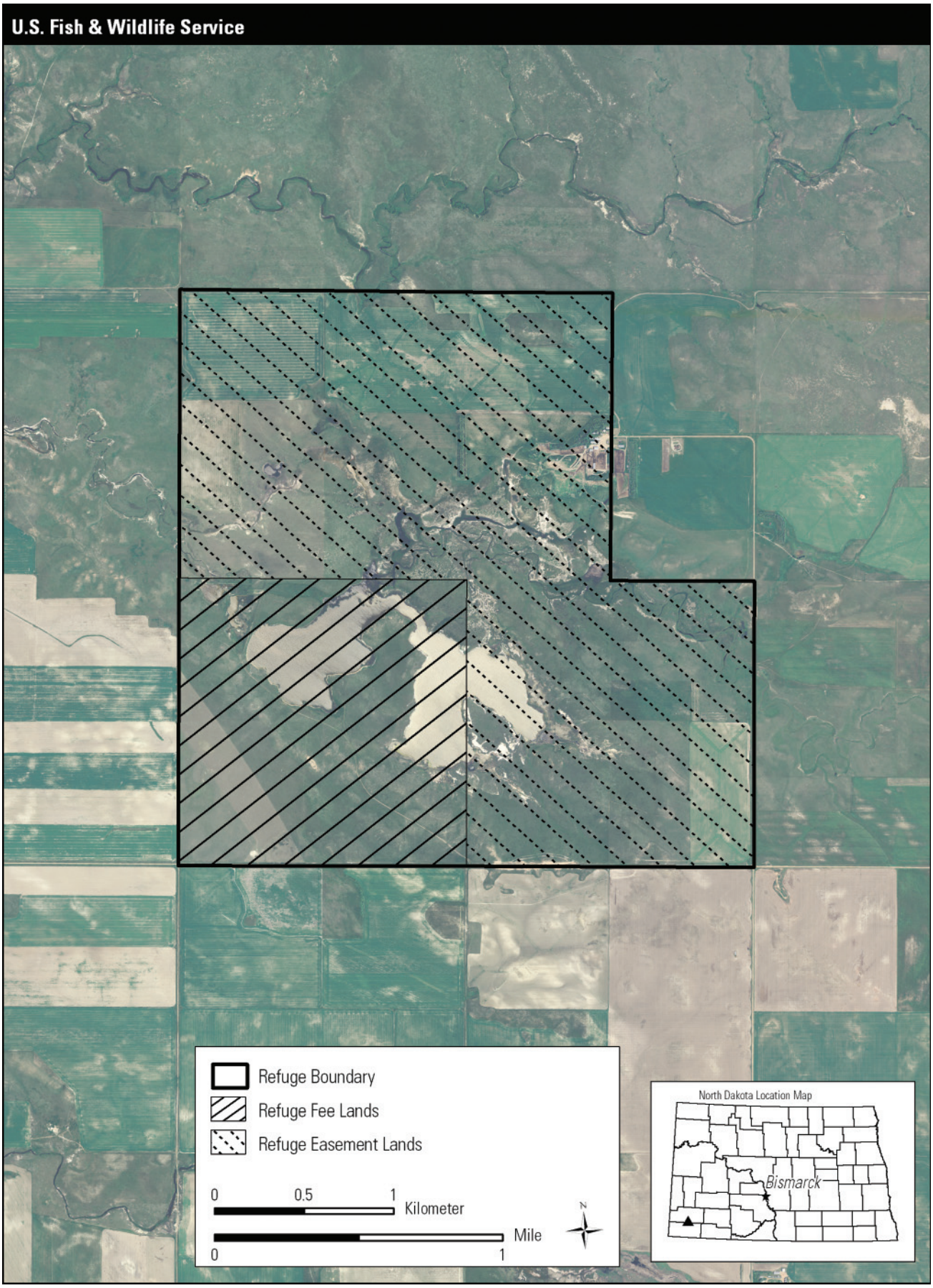

Figure 15. Map of Stewart Lake National Wildlife Refuge, North Dakota.

Figure 16. Map of Stump Lake National Wildlife Refuge, North Dakota.

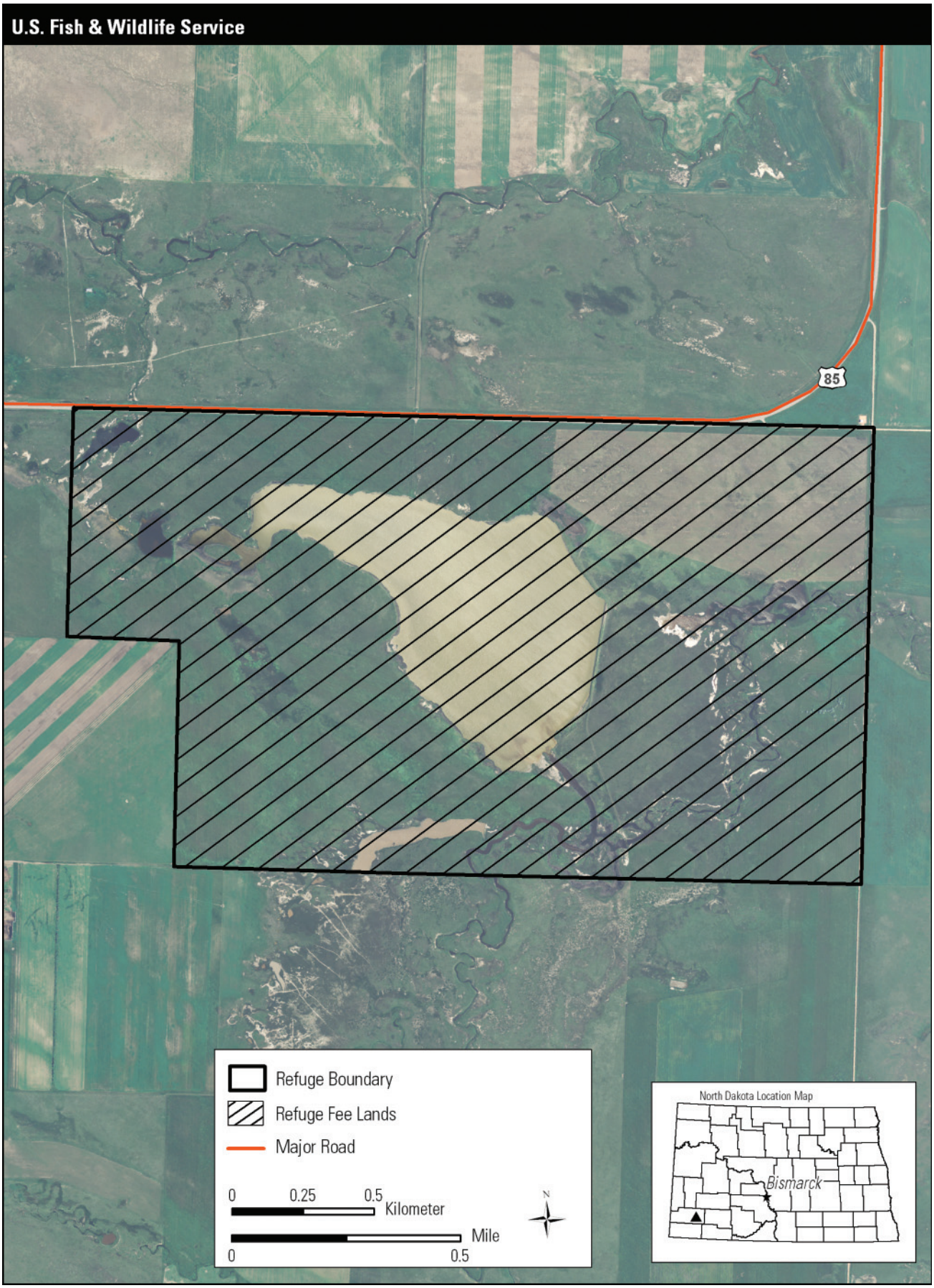

Figure 17. Map of White Lake National Wildlife Refuge, North Dakota.

- lessening the dangers threatening migratory game birds from drainage and other causes
- acquisition of areas of land and water for the adequate protection of migratory birds
- authorizing appropriations for the establishment of such areas, their maintenance and improvement, and for other purposes

In addition, Audubon and Lake Nettie national wildlife refuges increased their area for migratory bird habitat protection through the Garrison Diversion Unit Reformulation Act of 1986. This act required mitigation for Service lands flooded as a result of the construction of the Garrison Dam and Audubon Lake.

2.4 Vision

At the beginning of the planning process, the Service developed a vision for the refuges. The vision describes the focus of refuge management, including what would be different in the future, and is the essence of what the Service is trying to accomplish by the end of the 15-year CCP period. The vision for the refuges follows.

This collection of unique and diverse refuges encompasses a broad range of North Dakota habitat types and landscapes.

These refuges provide vital resting and breeding habitat for waterfowl, other migratory birds, and resident fish and wildlife species.

Visitors to these prairie refuges experience wide-open spaces, skies filled with migratory birds, places to learn, and welcome solitude.

The responsible management of these special places requires adequate funding, dedicated personnel, and successful partnerships.

Achievement of this vision ensures that the American people retain a legacy of wildlife and prairie habitats for future generations.

2.5 Goals

The Service developed five goals for the refuges based on the Improvement Act and information developed during planning. The goals direct work toward achieving the vision and purposes of the refuges and outline approaches for managing refuge resources.

Habitat and Wildlife Goal

Conserve, restore, and enhance the ecological diversity of grasslands and wetlands of the North Dakota prairie to support healthy populations of ducks and geese, other migratory birds, native species, and other wildlife.

Monitoring and Research Goal

Use science, monitoring, and applied research to advance the understanding of natural resources and management within the North Dakota national wildlife refuges.

Cultural Resources Goal

Identify and evaluate cultural resources that are on Service-owned lands or are affected by Service undertakings. Protect resources determined to be significant and, when appropriate, interpret resources to connect staff, visitors, and communities to the area's past.

Visitor Services Goal

Provide visitors with opportunities to enjoy wildlife-dependent recreation where compatible and expand their knowledge and appreciation of the prairie landscape and the National Wildlife Refuge System.

Partnerships Goal

A diverse network of partners join with the North Dakota national wildlife refuges to support research, accomplish habitat conservation, and foster awareness and appreciation of the prairie landscape.

Operations Goal

Efficiently employ staff, partnerships, and volunteers and secure funding in support of the Refuge System's mission.

2.6 Planning Issues

Several key issues were identified following the analysis of comments collected from Service staff and the public and a review of the requirements of the Improvement Act and the NEPA. Substantive comments (those that could be addressed within the authority and management capabilities of the

Service) were considered during the formulation of the alternatives for future management. These key issues are summarized below.

Wetland and Upland Habitat

All of the refuges have a primary purpose to provide optimal habitat conditions for the needs of a suite of waterfowl, shorebirds and other migratory birds, and, to a lesser extent native, resident wildlife. Wetland and upland habitats need to be protected and enhanced through management to achieve goals and objectives. Habitat protection needs to be evaluated through a priority system so that different means of protection, through either fee title or easement, can be evaluated.

Invasive Species

The refuges include uplands, which were previously farmed. Farmed uplands have since been restored to mixes of tame and native grasses and are interspersed with native uplands, the bulk of which have the native vegetation character but are compromised by invading species. The primary invasive plants are leafy spurge, Canada thistle, and absinth wormwood. Kentucky bluegrass and smooth brome are primary invasive grass species. These nonnative grasses and forbs, and potentially invasive native woody species, substantially diminish the quality and suitability of upland habitat for many native wildlife species. Western snowberry and silverberry are native shrubs that have greatly expanded their coverage in some areas where natural regimes of fire and grazing have been altered.

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Canada thistle is one of the primary invasive plants at the refuges.

Energy Development

While the Service works to minimize the negative effects of energy development, the demand for energy is an increasing factor in habitat quality and preservation at the refuges. The production of biofuels, coal, oil, gas, and wind energy has the potential to impact effectiveness of many refuge programs. The Service supports research that helps to understand the effects on wildlife of such energy projects as wind towers and conversion of grassland to cropland to support production of ethanol. It is a high priority for the Service to work in partnership with conservation and agricultural groups to support conservation programs such as the following: federal Farm Bill legislation, NDGF projects, water quality and watershed projects, and private conservation efforts.

The physical structure of wind power turbines has unknown effects on birds. Through studies and analysis, the Service is currently evaluating wind towers to determine their effect on wildlife. In addition, it is unknown if wind power would affect the potential for future habitat protection through conservation easements.

The Service needs to evaluate oil and gas development. Effects on some refuges—including salt-water contamination, filling of wetlands, and road development—have increased as increasing exploration takes place in North Dakota.

Prairie Conversion

The loss of native prairie is occurring at an alarming rate. Prairie is being converted for corn production to produce ethanol, which also has additional needs for irrigation water. An active role by the agricultural community, in partnership with conservation groups, would need to be taken to protect the federal Farm Bill and its conservation provisions, such as the Conservation Reserve Program and "Swampbuster" and "Sod Saver" provisions in the Farm Bill.

Wildlife Management

Priority species, predators, and wildlife disease are issues for the refuges.

Priority Species

The piper plover is a federally listed, threatened, shorebird. Breeding piping plovers occur in small numbers on numerous alkali wetlands in the northwestern part of the state. Endangered whooping cranes can be observed in refuge marshes. Chase Lake National Wildlife Refuge is home to the largest population of breeding American white pelican in North America. The primary issues related to these and other priority species center on the following: (1) monitoring populations; (2) monitoring habitat use; (3) identifying, securing, and maintaining essential habitat; and (4) developing habitat conditions in areas

with potential for these species and that would promote increased recruitment or population protection to secure and increase their populations.

Predator Management

Several species including red fox, coyote, striped skunk, Franklin's ground squirrel, mink, badger, and raccoon are found at higher than historical levels due to modifications of habitat and other factors. These species can adversely affect—primarily by predation on nests of grassland-nesting bird species—waterfowl and other migratory bird populations and reduce the likelihood of reaching wildlife population goals and objectives. The woody vegetation has a negative influence on grassland songbirds because it provides habitat for predators and attracts forest-edge bird species that may displace grassland species.

Wildlife Disease

The refuges administer migratory bird programs and have the lead role in addressing wildlife and, in particular, bird disease issues. National wildlife refuges in North Dakota have a history of botulism outbreaks. Success in combating botulism occurs at the expense of other resources. There is the ongoing issue of striking a balance between providing optimal habitats, maintaining other refuge programs, and managing botulism.

Monitoring and Research

Monitoring habitat and wildlife populations is an essential element in achieving the primary goals and objectives of the refuges. Basic data about recruitment, mortality, and habitat use for a representative group of species must be collected and analyzed on a regular basis to make appropriate decisions that affect the habitats these species depend on. The use of the refuges as a research field station could make valuable strides in development of new directions in management and expansion of the knowledge of field biologists.

Visitor Services

The Service allows hunting only at Audubon, Chase Lake, Lake Alice, Lake Nettie, and Lake Zahl national wildlife refuges. Fishing is allowed only at Audubon and Lake Ilo national wildlife refuges. Wildlife observation, photography, environmental education, and interpretation are wildlife-dependent recreational uses at 10 of the refuges, with the exception of White Lake and Stump Lake national wildlife refuges, which are closed to all public use. A growing demand for public recreation in North Dakota and the nation makes the six wildlife-dependent recreational uses, as specified in the National Wildlife Refuge System Improvement Act, a primary issue of interest. Some of the commenting public would like to see more opportunities to participate in these activities.

Operations

Funding and staff are not sufficient to fulfill the purposes and meet the goals of the refuges. Identification of priorities and direction of resources efficiently will always be an issue for the refuges. Refuge staffs need to identify and describe unfunded needs to be able to compete effectively for additional money from within the Service and from partners and other sources. Refuge facilities need to be evaluated and upgraded.