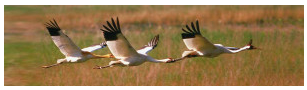


Whooping Crane Stopover Habitats on Benbrook Lake, Texas

U.S. Army Corps of Engineers, Fort Worth District

Friends of the Wild Whoopers (FOTWW) and the U.S Army Corps of Engineers (COE) have agreed on a joint project to evaluate "stopover habitats" on COE lakes within the six state Whooping Crane migration corridor (TX, OK, KS, NE, SD and ND). FOTWW will evaluate the lakes and make habitat improvement/management recommendations where needed.

FOTWW Wildlife Biologist Chester McConnell visited Benbrook Lake on September 12, 2017 to assess potential "stopover habitats" for Whooping Cranes.

Martin Underwood, USACE - Environmental Stewardship (CESWF) made arrangements for our visit. After discussing the natural resource objectives for Benbrook Lake, Mr.Underwood guided us on a tour of the lake property to examine the most likely places that would provide Whooping Crane "stopover habitats". FOTWW appreciates Mr. Underwood for making preparations for an interesting, productive and enjoyable visit.

There is only one wild self-sustaining population of Whooping Cranes remaining on earth. This population nests in Wood Buffalo National Park, Canada during spring and summer. After their chicks fledge, they migrate 2,500 miles through 6 states in the midsection of our nation to Aransas National Wildlife Refuge on the Texas coast where they spend the winter (see map below). Destruction of nesting habitat and killing the birds for food decimated the population during the 1800's and early 1900's. Coupled with this is the loss of approximately15 million wetland acres in the 7 state migration corridor. In 1943 there were only 16 Whoopers remaining. With protection and habitat management the population has slowly increased to an estimated 431 in 2016.

Two adults and a fledgling Whooping Crane.

Today, however Whooping Cranes are facing more threats to their habitats. During their migration they must stop 15 to 20 times to rest and feed. Secure stopover habitats are needed throughout the migration corridor approximately every 50 miles. And more secure wintering habitats are needed along the Texas coast near the Aransas National Wildlife Refuge. Currently about half of the population winters off the Aransas National Wildlife Refuge where they are not as safe. Continuous

development along the coast is taking a serious toll on habitat.

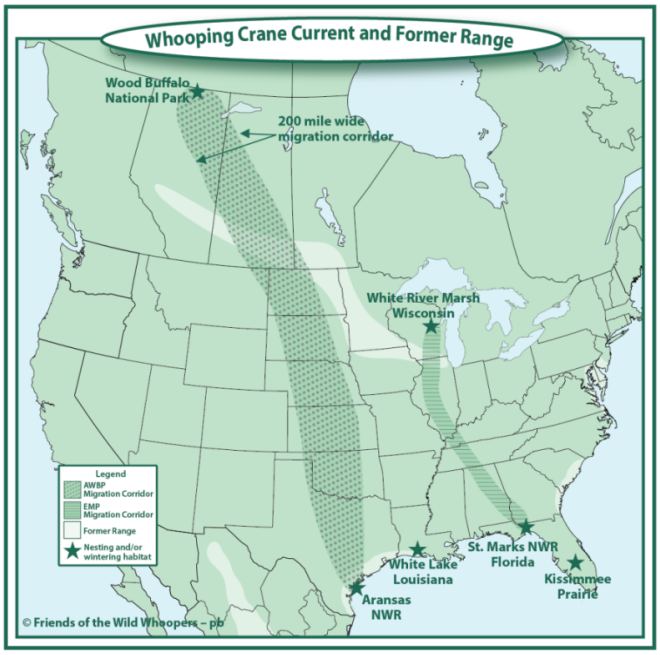
During migration Whooping Cranes often stop over on private lands, wildlife areas, lakes and some military bases. However, many private lands are being more intensively managed and face various forms of development. And some wetlands are becoming dryer due to global warming. Friends of the Wild Whoopers (FOTWW) contends that lands and waters on COE and military bases within the migration corridor can provide much needed relief. Some of these lands can be developed and/or managed to provide more stopover habitats for endangered Whooping Cranes. Importantly, habitats for the cranes also benefit many other species of wildlife and fish. Likewise Whooping Cranes are compatible with other wildlife species using the same habitats.

The most expensive part of establishing or improving habitat is land cost. If projects can be accomplished on government lands and Indian Reservations, the cost would be relatively minimal. Importantly any habitat projects deemed to be incompatible with the mission of the agencies involved would not be considered.

FOTWW and the COE have now entered into a joint venture that allows FOTWW to make habitat assessment of lands under COE jurisdiction. We first need to determine if any suitable areas could be managed, or appropriately developed, to provide stopover habitats for Whooping Cranes. The next step would be to work to encourage appropriate management. We are aware that some Corps lakes are currently used by Whoopers and we would like that to continue and increase.

FOTWW has completed habitat evaluations on 32 military facilities and 8 Indian Reservations within the wild Whooping Crane migration corridor. Some of these had suitable stopover wetland habitats while other areas could be enhanced with minor work. Now we have begun making habitat evaluations and management recommendations on COE lakes.

Whoopers make two 2,500 mile migrations each year. They migrate to and from their winter habitats on the Texas coast to their nesting habitats in northern Canada (see migration map below).

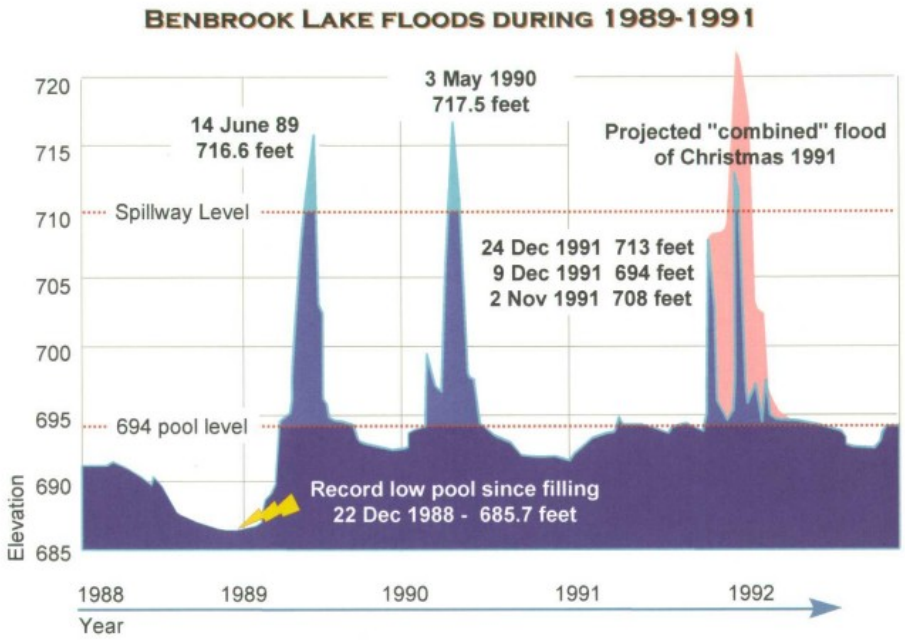


During our review of COE documents we discovered the following interesting and relevant facts about Benbrook Lake. The fluctuations of water levels may affect management for Whooping Cranes and other wildlife. Significant flooding on the Trinity River during May 1908, April 1922 and September 1936, was a primary cause for the Corps of Engineers flood control projects in North Texas development. Benbrook Dam and Lake were built by the Galveston District of the Corps of Engineers. Flooding in May of 1949 claimed eleven lives in Fort Worth and cost $11 million to local businesses, as construction for the dam was beginning. During a spring 1957 flood, the new lake and the downtown floodway prevented $9.3 million in damages, almost recouping the original construction costs of the lake.

A record low water level occurred in late 1988, as a decade-long drought dropped the lake to 685.7 feet, over eight feet below normal. But the drought ended with heavy rainfall in the spring of 1989, and over the next eleven months the lake reached record high levels on two occasions. Construction on the lake began in May 1947, and deliberate impoundment was begun in September 1952. The cost to build the lake was $14.5 million.

At the normal, or conservation pool, level of 694 feet above sea level, the lake covers 3,770 surface acres. This would increase to 7,630 acres if the lake ever reaches the nominal maximum flood pool elevation of 724, which is also the overall spillway elevation at the top of the dam. These floods closed all the parks and recreation areas on Benbrook Lake for almost all of those two years, heavily damaging the facilities and shoreline, but saving hundreds of millions of dollars in Fort Worth downstream of the dam.

The Tarrant Regional Water District in 1992 gained the lake's water rights and now provides water supply to the cities of Benbrook, Fort Worth and Weatherford. Changes in municipal water usage practices have lowered summer lake levels since1999. Although there have been saving on water bills, this brought Benbrook Lake to record low summer pool levels, and has had great impacts on recreation.



There are recorded observations of Whooping Cranes on Benbrook Lake. Based on information from a recent U.S. Geological Survey study, 58 radio-tagged Whooping Cranes provided data on 2,158 stopover sites over 10 migrations and 5 years (2010-14). Several of these additional stopover sites were also in the general vicinity of Benbrook Lake. Whoopers normally migrate over or near Benbrook Lake during (April (northward migration) and fall during October – November (southward migration). Whoopers normally stopover to rest late in the afternoon and depart early the following morning primarily when lake personnel are off duty.

Benbrook Lake also allows a number of other uses of the land and waters including fishing, hunting, birding, camping and other types of recreational activities. Outdoor recreational activities may be pursued by the general public.

While occasionally challenging, all military installations must abide by a number of laws and regulations to help protect and manage wildlife.

In accordance with the Endangered Species Act (ESA) of 1973, as amended, the COE must assist in recovery of all listed threatened and endangered (T&E) species and their habitats under the COE's land management authority. Also, the Migratory Bird Treaty Act (16 U.S.C.703-712) requires protection of shared migratory bird resources with four other nations. Importantly, the Sikes Act Improvement Act of 1977 (16 U.S.C.670 requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on lands used for military mission activities. Based on FOTWW observations COE personnel are using all these legal authorities to properly manage lands in a manner beneficial to many species of wildlife including Whooping Cranes.

COE lakes within the 7 state migration corridor may become even more important to Whooping Cranes in the near future because of their locations and quality of "stopover habitats". Benbrook Lake and others that are located in the mid-section of the Whooping Crane migration corridor. As the crane population increases the migration corridor may expand in width. Any Whooping Cranes that may stopover on during their fall migration still have over 400 miles remaining to fly to their winter home on Aransas National Wildlife Refuge on the Texas Gulf coast. And if they stopover while migrating north to their nesting area on Wood Buffalo National Park, Canada, they have over 1,900 miles more to fly. Appendix A contains a map identifying hundreds of places in the migration corridor that a sample group of 58 Whooping Cranes have stopped over during a five year radio telemetry study.

Some of the "stopover habitat" around Benbrook Lake are currently in excellent condition to serve as secure Whooping Crane stopover habitats. However some of the potential will not be useful because they are too close to developed areas and trees grow close to the lake shore. Still, several such areas have potential and can easily and inexpensively be developed into stopover habitat. Open landscapes near most "stopover habitats" allow Whooping Cranes to easily locate the ponds and provides ready observation of any predator threats (see photos below). The scarcity of tall bushes and trees close to habitats provide easily accessible flight approach corridors for Whooping Cranes entering the area.

FOTWW selected 15 photographs taken during our visit to use as examples to feature characteristics desired for "stopover habitat". See the map on page 7 for locations. Photos of the ponds are on pages 8 through 14.

Stopping over for the night.

"Whooping Crane "Stopover Habitats" on Lakes, Ponds and Wetlands"

Friends of the Wild Whoopers
www.friendsofthewildwhoopers.org

Whooping Cranes are America's symbol of conservation. They are the largest bird in North America standing 5 feet tall with a wing span of 7 feet. They are an endangered species and need your help. These amazing birds migrate 2,500 miles two times each year between their Canadian nesting grounds and their winter habitat on the Texas coast. During their long migrations they must stopover to rest about 10 to 20 times. Mostly they stopover on lakes, natural wetlands and small ponds on private farms just to rest overnight. Over the years many thousands of stopover areas have been destroyed for other needs. If you own or manage land, would you share a small amount with Whooping Cranes? Like humans on a long trip they just need a small place to briefly stop, feed and then continue their journey. Importantly, Whoopers are compatible with other wildlife and briefly share their habitats. Ensuring that sufficient areas with the proper conditions as stopover sites are available is important for the survival of the species. Proactive techniques implemented by conservation interest can help reduce potential morality that occurs during migration. *Whooping Cranes and other wildlife need lakes, wetlands and small ponds with the following features:*

Features of Whooping Crane stopover lakes/ponds/wetlands include:

Lakes/small ponds/wetlands from 0.3 acres and larger in size
Lakes/ponds/wetlands with some shallow areas 5 to 10 inches deep for roosting sites
Flight glide path clear of obstructions for Whooping Cranes to land near roosting sites
No thick bushes or trees in or near landing site
Gradual or gentle slopes into lakes/ponds where water is shallow
Little or no emergent or submerged vegetation in lake at roost areas
Extensive horizontal visibility from roost site so predators can be detected
300 or more yards from human development or disturbance such as power lines

Excellent roost site for Whooping Cranes. Number “1” points out the glide path for Whooping Cranes landing on lake shore. The site is clear of obstructions and provides a gradual slope into the shallow water. Horizontal visibility around the roost site is good. Number “2” points out the shallow water from 5 to 10 inches deep in roost area. Whoopers can feed on aquatic animal in the lake and insects and grains in nearby fields.

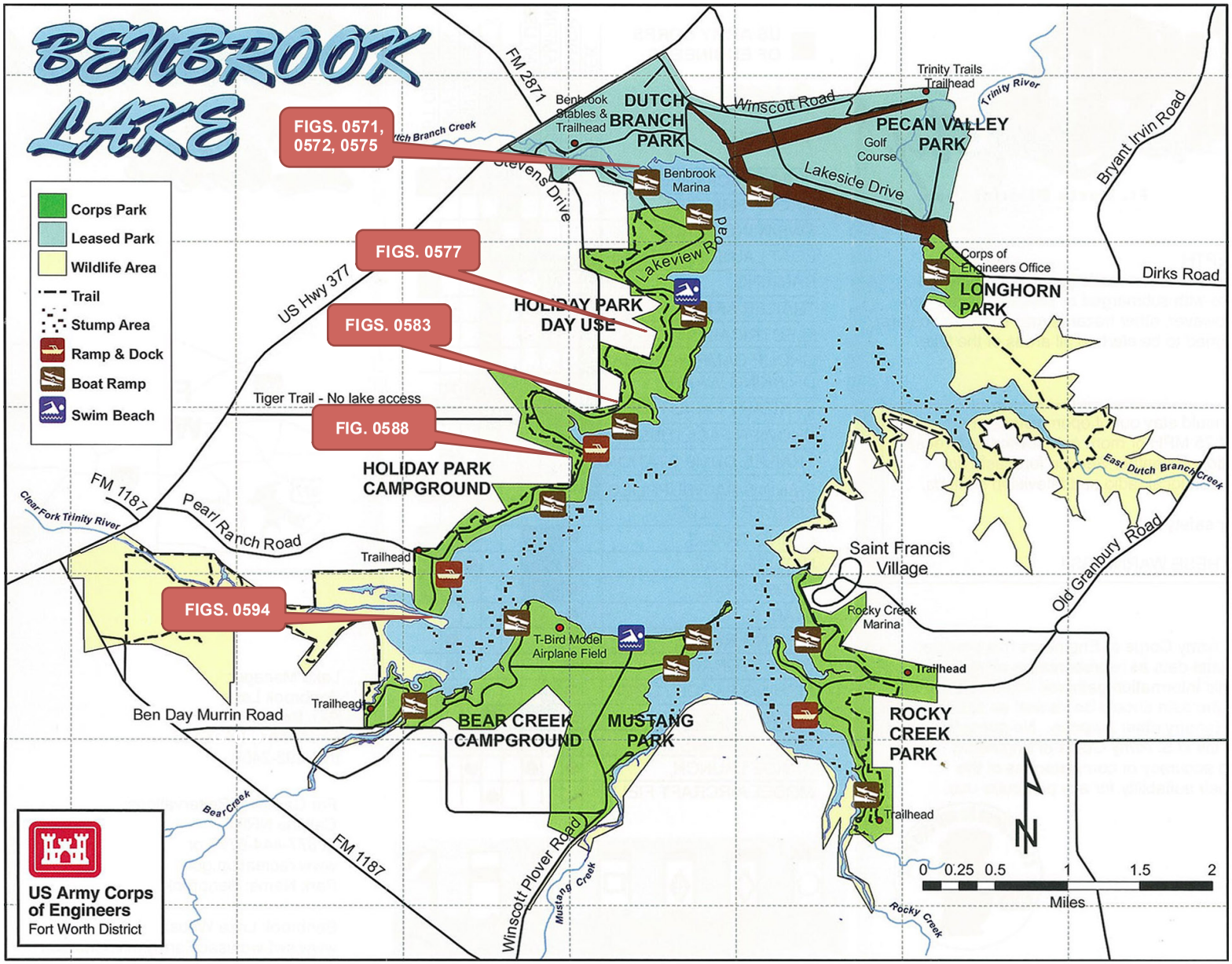

BENBROOK LAKE
FIGS. 0571, 0572, 0575
FIGS. 0577
FIGS. 0583
FIG. 0588
FIGS. 0594
Corps Park
Leased Park
Wildlife Area
Trail
Stump Area
Ramp & Dock
Boat Ramp
Swim Beach
FM 2871
Benbrook Stables & Trailhead
DUTCH BRANCH PARK
Winscott Road
Trinity Trails Trailhead
Trinity River
PECAN VALLEY PARK
Golf Course
Lakeside Drive
Bryant Irvin Road
Stevens Drive
Benbrook Marina
Lakeview Road
US Hwy 377
HOLIDAY PARK DAY USE
Corps of Engineers Office
Dirks Road
LONGHORN PARK
Tiger Trail - No lake access
HOLIDAY PARK CAMPGROUND
East Dutch Branch Creek
FM 1187
Clear Fork Trinity River
Pearl Ranch Road
Trailhead
Saint Francis Village
Old Granbury Road
Rocky Creek Marina
T-Bird Model Airplane Field
Trailhead
Ben Day Murrin Road
Trailhead
BEAR CREEK CAMPGROUND
MUSTANG PARK
ROCKY CREEK PARK
Trailhead
Bear Creek
FM 1187
Winscott Plover Road
Mustang Creek
Rocky Creek
US Army Corps of Engineers
Fort Worth District
N
0 0.25 0.5 1 1.5 2
Miles

Figure 1. (Photo no. IMG_0571.JPG) This photo on shoreline of north Holiday Park Day Use area is an excellent example of a “stopover habitat” for Whooping Cranes. The shore area is free of tall thick vegetation which allows the cranes to see predators. It also provides a flight guide path for approaching Whoopers to land on shore. The shore’s gradual slope allows the birds to wade into the shallow water (2” inches to 10” depths) to roost.

Figure 2. (Photo no. IMG_0572.JPG) This photo of a shallow water area (2” to 10” depth) along the shore line of north Holiday Park Day Use area is an excellent example of a “stopover habitat” for Whooping Cranes to use as a roost. The shore’s gradual slope into the shallow water provides a good roost site for the cranes. Farther along the shore there are other potential roost sites.

Figure 3. (Photo no. IMG_0575JPG) This third photo on shoreline of north Holiday Park Day Use area is another good example of a “stopover habitat” for Whooping Cranes. The shore area is free of tall thick vegetation which allows the cranes to see predators. The water is shallow (2” to 10” depth) and the shore’s gradual slope allows the birds to wade into the shallow water to roost. The site in the background is also a good roost area but needs some bushes cleared on the shore. Thick bushes and tall grass may hide predators that could injure or kill Whooping Cranes.

Figure 4. (Photo no. IMG__0577 JPG) This photo on Holiday Park Day Use area is a closer view of the lake in Figure 3. The shore is free of tall, thick vegetation and shallow water (2" to 4" depth) is just off shore. The shore's gradual slope into the shallow water provides a good roost site for the cranes. Farther along the shore there are other potential roost sites that could easily be improved with cutting of bushes on the shore.

Figure 5. (Photo IMG_0583JPG). Holiday Park Campground. This photo shows an area that Whooping Cranes will not use as a roost site. The trees are thick and tall on the shore. If this site were needed, lake managers could cut the trees near the shore to a distance about 50 feet back. Currently, however, Benbrook Lake has ample sites that may serve as roosting areas for Whooping Cranes.

Figure 6. (Photo No. 0588 IMG_0588JPG) Holiday Park Campground. Whooping Cranes can safely walk across the open area at bottom of photo and be able to detect any predators in the vicinity. Then they can walk down the gentle shore slope into the shallow water. Here they can remain relatively safe and roost in their “stopover Habitat.

Figure 7. (Photo No. IMG_0594.JPG) Holiday Park Campground area. This photo includes a open flight glide path and landing area. Once on the ground Whooping Cranes can detect any predators in the area. Then they can walk down gentle slopes into the shallow water area (2” to 10” depth). This is an excellent example of a “stopover habitat” for Whooping Cranes to use as a roost site. Farther along the shore there are other potential roost sites.

FOTWW was pleased to have the opportunity to visit Benbrook Lake. The majority of the lake and land area has good fish and wildlife habitat and some outstanding Whooping Crane "stopover habitats". Very little management is needed to make several areas more suitable for the cranes. We urge COE personnel to continue management and maintenance of these important stopover habitats to satisfy the needs for Whooping Cranes and many other species of wildlife.

COE managers should focus on areas with suitable roosting characteristics and safer landscapes. Such areas should not be near power lines. They should be as far from roads and human activities that may disturb the birds as practical. And there should be extensive horizontal visibility from the roost sites.

We sincerely appreciate the interest and cooperation of COE officials. Importantly, I also appreciate the assistance of FOTWW Vice-President Pamela Bates in preparing this report.

Friends of the Wild Whoopers Chester A. McConnell

Chester McConnell, President

Appendix A:

By Aaron T. Pearse,1 David A. Brandt,1 Wade C. Harrell,2 Kristine L. Metzger,3 David M. Baasch ,4 and Trevor J. Hefley5

Abstract: Whooping cranes (*Grus americana*) of the Aransas-Wood Buffalo population migrate twice each year through the Great Plains in North America. Recovery activities for this endangered species include providing adequate places to stop and rest during migration, which are generally referred to as stopover sites. To assist in recovery efforts, initial estimates of stopover site use intensity are presented, which provide opportunity to identify areas across the migration range used more intensively by whooping cranes. We used location data acquired from 58 unique individuals fitted with platform transmitting terminals that collected global position system locations. Radio-tagged birds provided 2,158 stopover sites over 10 migrations and 5 years (2010–14). Using a grid-based approach, we identified 1,095 20-square-kilometer grid cells that contained stopover sites. We categorized occupied grid cells based on density of stopover sites and the amount of time cranes spent in the area. This assessment resulted in four categories of stopover site use: unoccupied, low intensity, core intensity, and extended-use core intensity. Although provisional, this evaluation of stopover site use intensity offers the U.S. Fish and Wildlife Service and partners a tool to identify landscapes that may be of greater conservation significance to migrating whooping cranes. Initially, the tool will be used by the U.S. Fish and Wildlife Service and other interested parties in evaluating the Great Plains Wind Energy Habitat Conservation Plan.

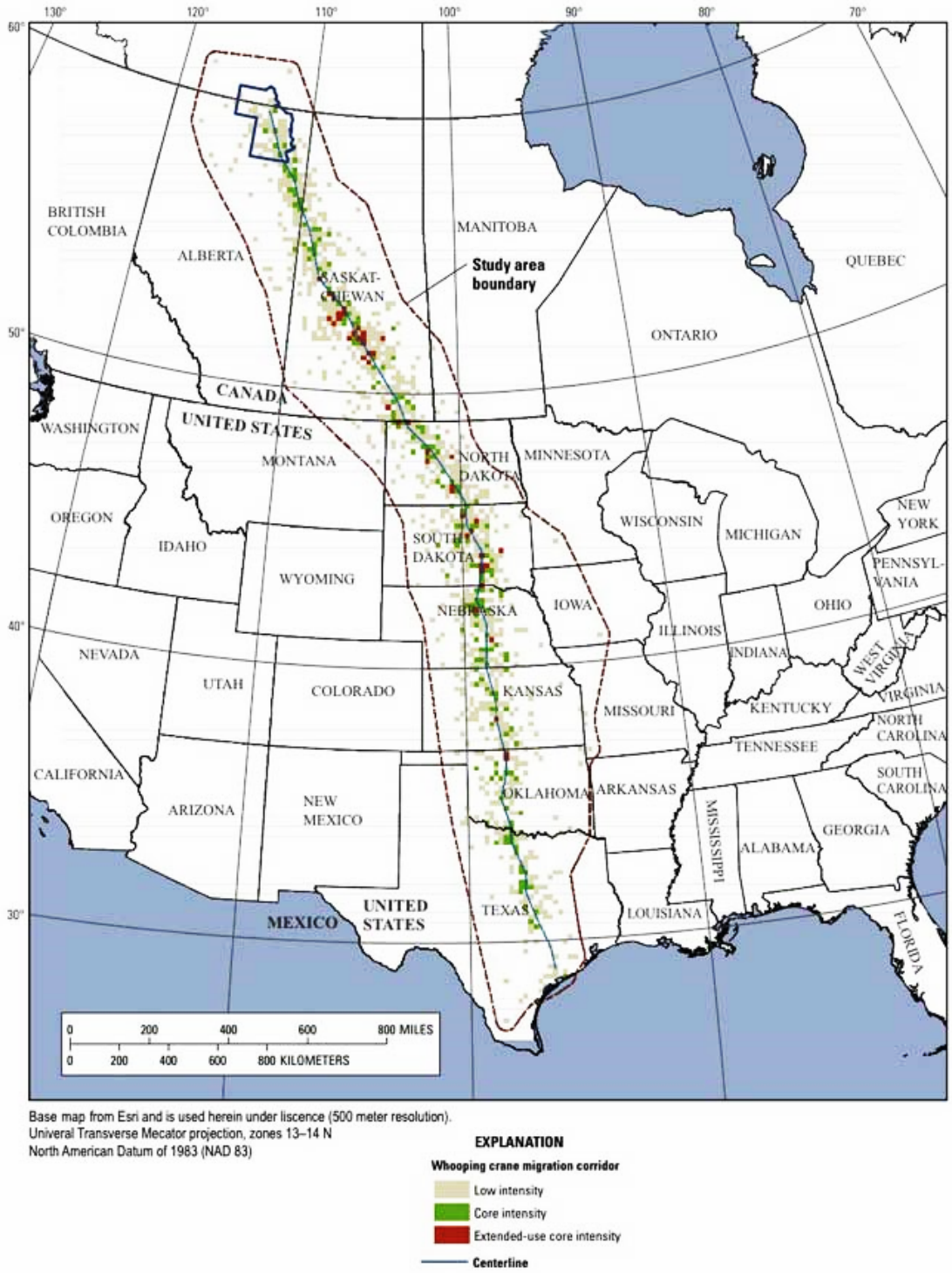


Figure 5. Areas within the migration corridor of whooping cranes identified with varying levels of stopover site use intensity (category definitions shown in table 1).