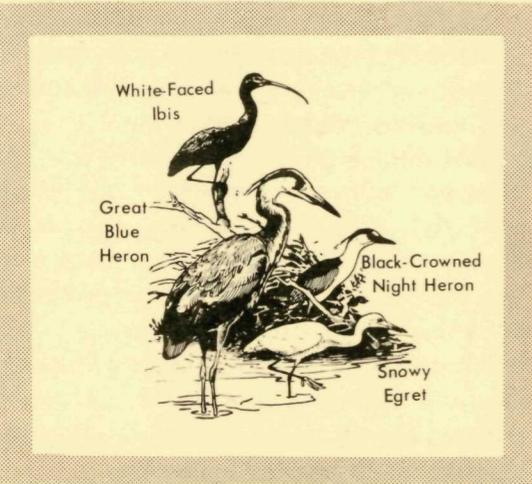


as herons, egrets, bitterns, yellowlegs, black-necked stilts, soras, Virginia rails, avocets, and sandpipers.

To the east, toward the bluffs, a plug dike holds seepage water from the main impoundments. Occasionally during the summer months, when this water is very still and warm, it will turn a beautiful shade of pink. This is due to the overabundance of a species of algae which thrives on the combination of environmental factors present.

Parts of the surrounding area are open to hunting, subject to federal and state regulations.



#7 Notice the mat of vegetation covering the bottom of the impoundment. Most of this is musk grass (*Chara spp.*). Some species of this plant are highly favored by ducks as a food source. Musk grass also provides food and cover for bass, channel catfish, carp, and many other fishes.

If you look closely, you will also see schools of small fish feeding along the edge. These are mosquito fish (*Gambusia spp.*). Because they eat small

organisms from the surface of the water they are frequently used in mosquito control. They are also an important bait and forage fish.



Channel Catfish



#8 Waterfowl are a beautiful and necessary part of our wildlife heritage, but they can be a problem to farmers. Thus, the refuge grows 200 acres of irrigated crops to help keep the birds away from private farmlands. Winter barley, millet, and grain sorghum are the principal crops grown.

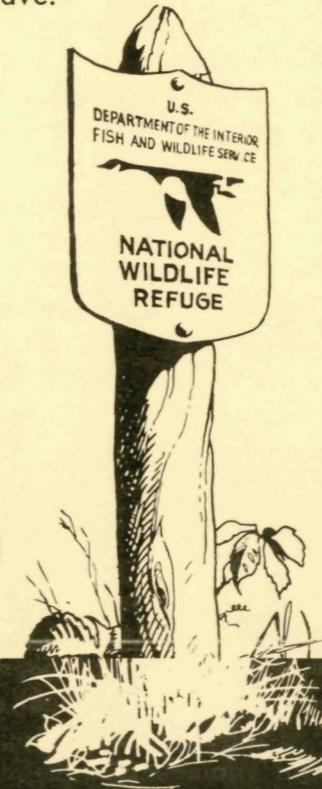
Refuge personnel use the same methods of farming as do commercial growers, except that waterfowl and cranes do the harvesting, with a little help from mule deer, pheasants, quail, rabbits and other animals.

#9 Salt cedar, a predominant plant on refuge lowlands, was first noticed growing along the Pecos River in 1915. Since then, it has spread over many sections of southeastern New Mexico. This plant's root system grows to great depths seeking adequate water supplies.

Due to its water requirements, salt cedar has been the object of an extensive control program by the Bureau of Reclamation during the past several years. On the refuge, strips of salt cedar are left uncleared. These strips, interspersed with cleared areas provide improved wildlife habitat.

Thickets of salt cedar provide good nesting habitat, especially for doves, and protective cover for deer, small mammals, and various birds. This plant can be valuable for windbreaks, to help control erosion, and to shade streams, thereby improving fish habitat.

This completes your tour of Bitter Lake National Wildlife Refuge. We hope you have enjoyed it and will return many times. You are welcome to stay until closing time, or you can return to refuge headquarters by driving west across the Impoundment #3 dike. Refuge personnel will be happy to answer any questions you may have.



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE

# Self-Guiding Tour



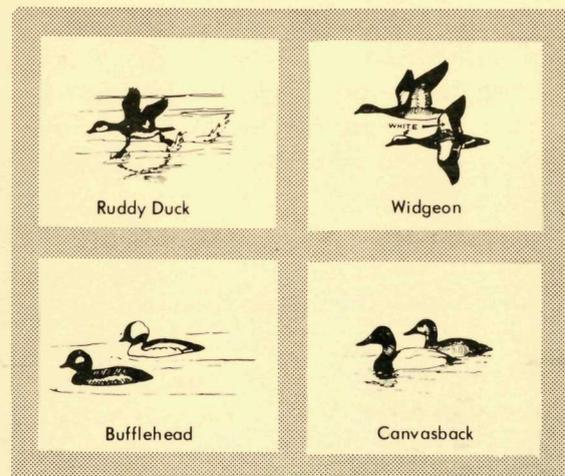
## WELCOME TO BITTER LAKE NATIONAL WILDLIFE REFUGE!

This self-guiding tour has been designed to help you enjoy and become acquainted more quickly with Bitter Lake Refuge. Please drive slowly so that you can observe closely the interesting plants and elusive wildlife along the roadside. You may find a pair of binoculars very helpful.

The tour begins south of refuge headquarters and continues on a round trip of about nine miles. Numbered markers identify each stop along the route and correspond to the numbered paragraphs in this leaflet. Most of the markers are located on short turnoffs from the main road. The turnoffs are indicated by small arrows.

A bird list and a general information leaflet are available at refuge headquarters.

#1 The display pen contains many of the waterfowl that commonly use this refuge. Signs on the pen identify the birds. Further information on each species is provided in the display case.



On each side of the path you will notice small plots containing many of the plants present on the refuge.

#2 The refuge is made up of two separate land units: the north tract, which contains the Salt Creek Wilderness Area; and the south tract, which you are viewing now. This south tract contains 11,000 acres of river bottomland, grasslands, and man-made water areas.

The water areas are especially important wildlife habitats on this refuge. They are a source of food, water, and protection for migrating and nesting waterfowl and other birds associated with water and marsh, as well as habitat for many species of fish.

These very shallow lakes receive water from artesian springs and were formed by construction of a series of dikes which allow for water level manipulation.

#3 The land west of the road exhibits what is known as a mixed shrub-grass community. It provides habitat for a wide variety of animals, including quail, rabbits, weasels, prairie dogs, kangaroo rats, snakes, and many others.

The dominant plants you see here are alkali sacaton grass and fourwing saltbush. Sacaton grass is not a preferred range grass for livestock but its seeds are important to ground feeding birds. It also retards erosion. Saltbush seeds, stems, and foliage are eaten by many forms of wildlife, including mule deer and antelope. Both of these plants provide protective cover to upland game.

#4 The period from September through January is the best for observing large numbers of waterfowl on this refuge. Impoundment #7 is the largest and deep-

est lake and receives the greatest waterfowl use: it is possible to see as many as 40,000 ducks and geese on it at one time.



CENTRAL FLYWAY

Impoundment #6 at times is used by up to 40,000 sandhill cranes plus as many as 75,000 ducks and geese.

It is important to note that the refuge exists not only for migratory waterfowl and public use but also for

protection of the entire ecological community: the mammals, birds, fish, insects, reptiles, and plants, and the soil, water, and air that support them.

#5 At the end of this erosion control dike you will see a waterfowl trap which is used during refuge banding operations. The banding done here, part of a continuing nationwide effort, provides basic waterfowl population information. This information is used for setting hunting seasons and bag limits and for determining nesting success and range of migration of individual species.

#6 This stop is a good place to get out and stretch your legs. South of you lies a large marshy area containing bulrushes, cattails, and other wetland vegetation. This is a highly productive area for feeding, nesting, and protective cover, not only for waterfowl but also for a great variety of wading and shore birds such

