

CCPs provide long term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

Kern and Pixley National Wildlife Refuges

Comprehensive Conservation Plan

Prepared by:
U.S. Fish and Wildlife Service
Region 1

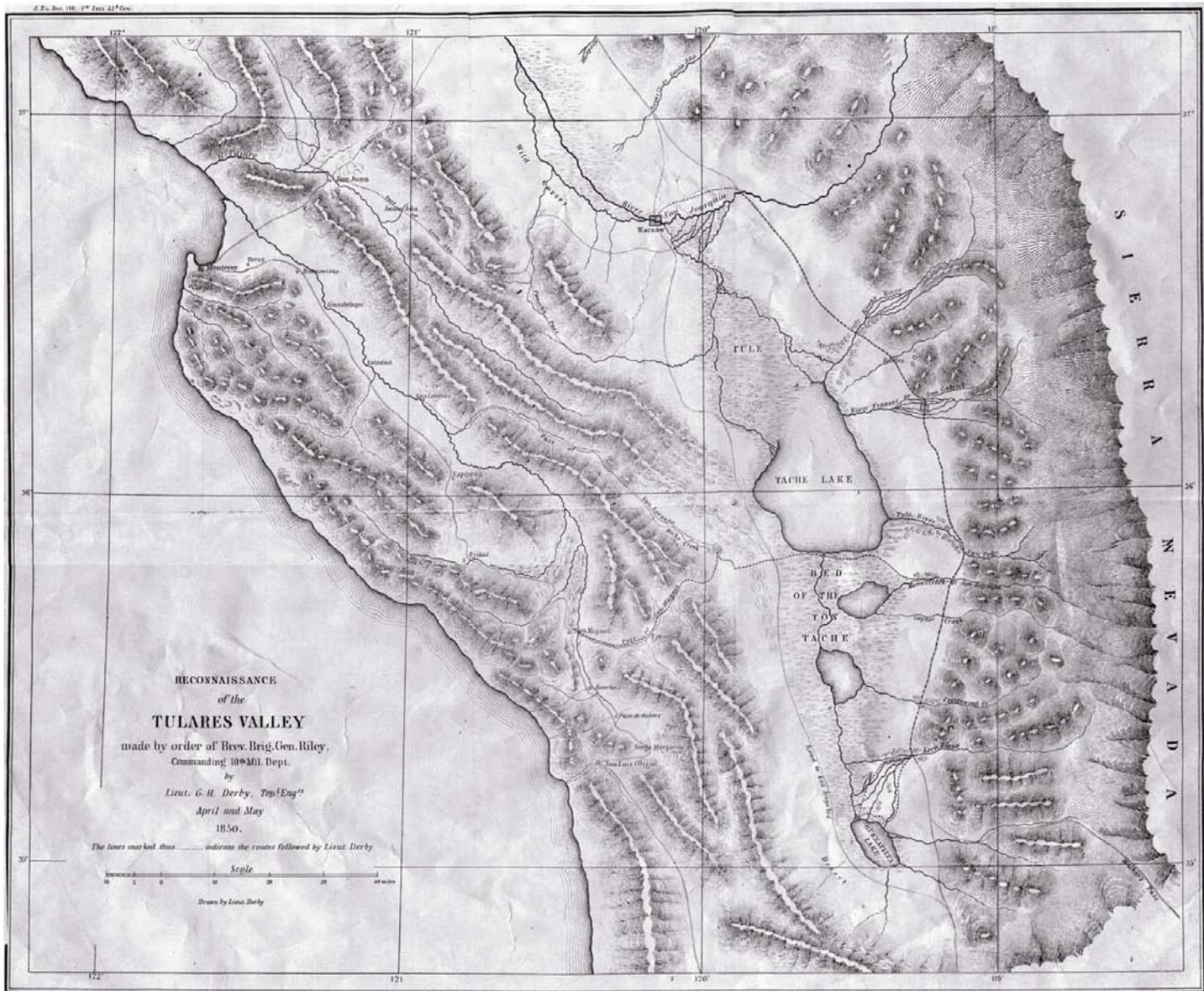
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Date: 9/30/2004

Implementation of this Comprehensive Conservation Plan and alternative management actions/programs have been assessed consistent with the requirements of the National Environmental Policy Act (42 USC 4321 et seq.).



Map of the Southern San Joaquin Valley. Lieutenant G.H. Derby, 1850.

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Introduction

Kern and Pixley Refuges are part of a network of 15 national wildlife refuges and wildlife management areas in California's Central Valley and San Francisco Bay region that provide wintering habitat for migratory waterfowl and other waterbirds in the Pacific Flyway. The Refuges are located in the southern end of California's San Joaquin Valley (Figure 1), also known as the Tulare Basin. Kern Refuge is about 19 miles west of Delano in northern Kern County. The Refuge consists of a single 10,618-acre unit. It is surrounded by privately owned non-native grassland used for pasture or agriculture and privately owned wetlands managed as duck clubs. Pixley Refuge is located approximately 19 miles south of the city of Tulare in southwestern Tulare County. It consists of 11 units ranging in size from 40 to 900 acres, surrounded by agricultural croplands and pasture.

National Wildlife Refuge System

Established in 1903 by President Theodore Roosevelt, the 95-million-acre Refuge System now includes over 540 National Wildlife Refuges, thousands of small wetlands, and other special management areas in 50 states and several territories. Most National Wildlife Refuges are strategically located along the major bird migration corridors, ensuring that ducks, geese, and songbirds have rest stops on their annual migrations. Many refuges were established to protect threatened or endangered species or key sensitive habitats, such as wetlands or offshore nesting seabird colonies.

Our Vision for the Refuges

Kern Refuge

Kern Refuge is representative of a once extensive complex of native wetlands and uplands and is currently the largest wetland complex managed for wildlife in the southern San Joaquin Valley. With a secure water supply, Kern Refuge will provide reliable, high-quality wetland habitat to meet the needs of wintering and migrating waterfowl and

Refuge System Mission:

"... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans"



U.S. Fish & Wildlife Service Photo

*Waterfowl at Kern
Refuge*

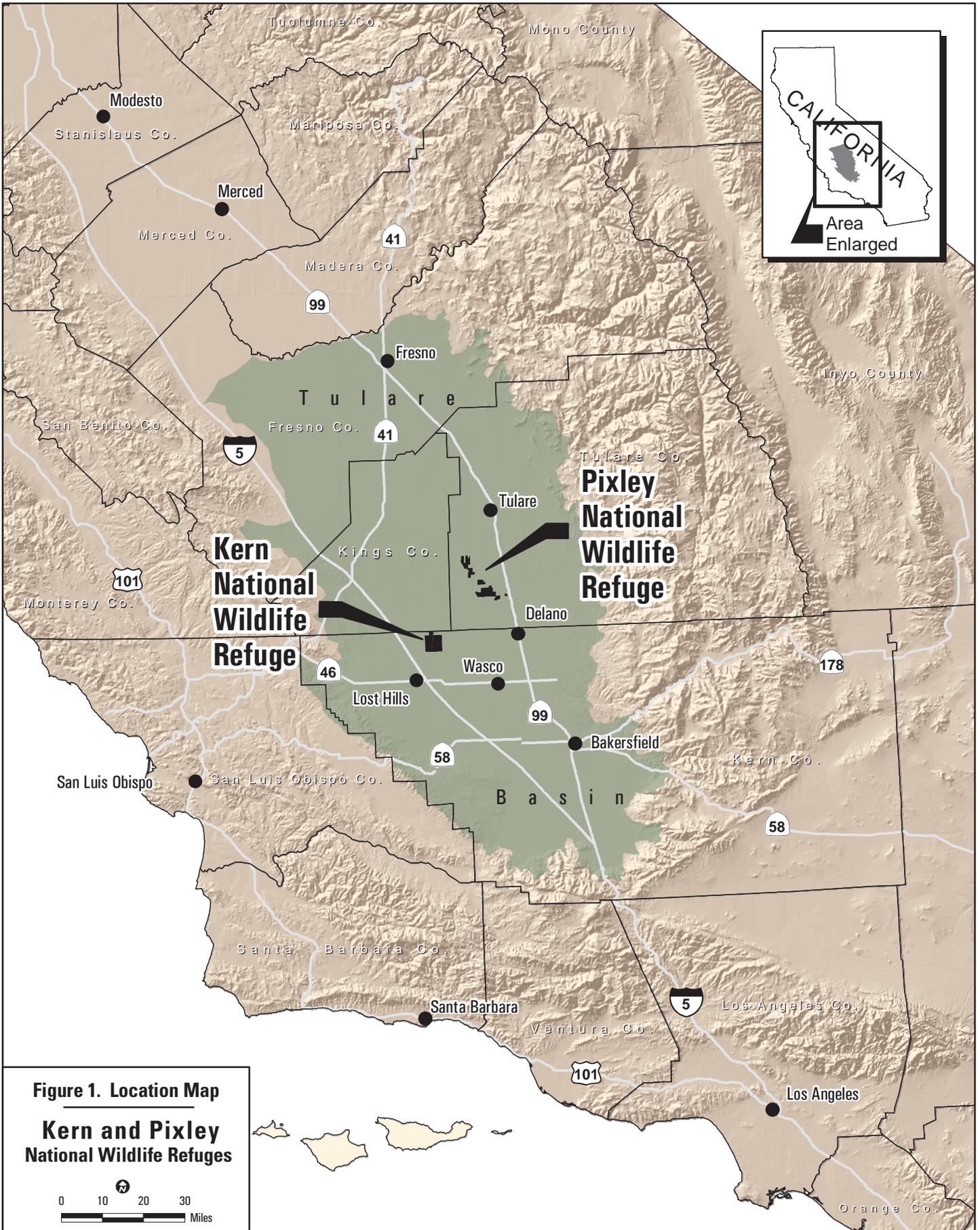


Figure 1. Location Map
Kern and Pixley
National Wildlife Refuges

0 10 20 30
Miles

waterbirds. The Refuge's riparian corridors and seasonal wetlands will support a rich diversity of migratory songbirds, colonial nesting species, and raptors. Remnant valley-floor uplands will be preserved and restored for native plant and animal species. These uplands will support populations of threatened and endangered species including the blunt-nosed leopard lizard, Tipton kangaroo rat, San Joaquin kit fox, and Buena Vista Lake shrew. To meet the demands of the rapidly growing population of the southern San Joaquin Valley and accommodate more than 50,000 visitors annually, the Refuge will provide opportunities for high-quality wildlife-dependent visitor services, including hunting, wildlife observation, environmental education, and interpretation. These visitor services opportunities will increase the public's understanding of and appreciation for wildlife and the importance of conserving their habitat.

Pixley Refuge

Pixley Refuge represents one of the few remaining examples of the grasslands, vernal pools, and playas that once bordered the historic Tulare Lake. Management of these diverse natural communities will focus on providing high-quality habitat for threatened and endangered species including the blunt-nosed leopard lizard, Tipton kangaroo rat, San Joaquin kit fox, and vernal pool fairy shrimp. Natural lands between the Refuges will be protected through conservation easements, partnerships, and willing-seller acquisition to provide linkage areas for these species. Managed wetlands and adjacent grasslands will provide high-quality habitat for wintering and migratory waterfowl and waterbirds, including sandhill cranes. Restored riparian corridors will support a rich diversity of migratory songbirds and raptors. Pixley Refuge will provide unique opportunities for compatible wildlife-dependent visitor services which will increase the public's understanding of and appreciation for wildlife and the importance of conserving wildlife habitat.

Background

Kern Refuge was established in 1958 under the authority of the Migratory Bird Conservation Act for use “. . . as an inviolate sanctuary, or for any other management purpose, for migratory birds” (16 U.S.C. § 715d). Between 1960 and 1963, the Service purchased 10,616 acres under this authority from various landowners. In 2004, a 631-acre tract of upland habitat was donated to the Service under the authority of the Endangered Species Act of 1973. According to the memorandum of agreement which stipulated the terms of the donation, the land is “to be managed as part of the Kern NWR, for the preservation, conservation, and management for the benefit of listed threatened and endangered species.”

Pixley Refuge was established in 1959 to provide wintering habitat for migratory birds and protect habitat for the endangered blunt-nosed leopard lizard. The authorities and corresponding purposes for which Pixley Refuge was established are: 1) the Bankhead-Jones Farm Tenant Act “. . . a land-conservation and land-utilization program . . .” 7 U.S.C. § 1011; 2) Secretarial Order 2843, dated Nov. 17, 1959 “. . . for migratory birds and other wildlife . . .”; and 3) the Endangered Species Act of 1973 “. . . to conserve (A) fish or wildlife which are listed as endangered species

Tipton Kangaroo Rat



U.S. Fish & Wildlife Service Photo.

or threatened species . . . or (B) plants . . .” 16 U.S.C. § 1534. Since 1959, the Service has acquired approximately 6,385 acres within the 10,300-acre approved boundary.

Issues

Issues, concerns, and opportunities were identified through discussions with planning team members, key contacts, and the public scoping process, which began with two public workshops in August 1999. Oral and written comments were received at the meetings. The following issues, concerns, and opportunities are a compilation of information developed by the Service throughout the planning process.

General

- Coordinate CCP with other conservation efforts in the region.
- Keep Kern Refuge in its current condition.
- Maintain or increase water allocations.

Wildlife and Habitat Management

- Replace chain link fencing with larger mesh to avoid a possible choking hazard to kit foxes.
- Emphasize management of tricolored blackbirds.
- Continue cattle grazing as a management tool on refuge uplands.
- Control vegetation in Unit 1 to provide more open water habitat.
- Ensure that vegetation management practices in the marsh are sensitive to migratory birds that use vegetation in the spring and summer.
- Reintroduce large native mammals, such as tule elk.
- Offer incentives to adjacent landowners to grow wildlife-friendly crops.
- Update the status and distribution information for all the natural resources on the Refuges.

Visitor services

- Build more public restrooms at Kern Refuge.
- Ensure Service staff is on the Refuge at all times to prevent vandalism.

- Construct more parking at Kern and Pixley Refuges.
- Note that hunting and trapping are not compatible with the Refuge purposes.
- Plan more youth-hunt days.
- Increase the hunting area at Kern Refuge
- Eliminate hunting in some units.
- Rotate the open and closed units throughout the season.
- Open Pixley Refuge to hunting.
- Keep existing hunter reservation system.
- Modify hunt reservation system.
- Offer three types of hunting passes: hunting from blinds, free roaming, and hunting from dikes.
- Accommodate more hunters on hunt days.
- Add Sunday as a hunt day.
- Allow hunters to start a half-hour or an hour earlier than currently.
- Maintain current 25-shell limit.
- Increase enforcement of hunting regulations.
- Prohibit motion decoys.
- Adopt a limit of two adult hunters per blind.
- Establish a birder's board outside the Refuge Complex office.
- Establish a second tour route at Kern Refuge that could be used by non-hunters on hunt days.
- Develop a signed nature trail and viewing platform at Pixley Refuge.
- Address the liability issues of concurrent public use public of areas where permittee livestock may interact with visitor services, such as birdwatching.

Outreach/Environmental Education

- Produce an educational video about the Refuges and involve area schools.
- Conduct a publicity campaign highlighting Refuge Complex restoration efforts and the resulting benefits.
- Place a Watchable Wildlife sign on Highway 99 to direct visitors to Pixley Refuge.

Acquisition

- Expand the Refuges to provide protected corridors between the Refuges and other conservation areas in the San Joaquin Valley.
- Acquire lands at the boundaries of Kern Refuge to secure feeding habitat for tricolored blackbirds.
- Acquire the remaining private lands within the Pixley Refuge approved boundary.

Vegetation

Kern Refuge

Kern Refuge supports a variety of wetland and upland vegetation over the 11,249 acres managed for waterfowl and endangered species. Eight plant communities have been identified, including grassland, seasonal marsh, alkali playa, grassland/alkali playa, moist soil wetland, riparian, valley sink scrub, and salt cedar. The salt cedar plant community covers approximately 1,600 acres and is in former wetland and grassland habitat types. Wetland habitat covers approximately 5,300 acres and includes 3,800 acres of seasonal marsh, 1,200 acres of moist soil wetlands, and 215 acres of riparian habitat. An additional 1,200 acres of moist soil wetlands

are being restored. The grassland plant community covers about 2,900 acres on the west side of the Refuge. The west side of Kern Refuge also supports about 500 acres of grassland/alkali playa complex. The valley sink scrub plant community covers about 950 acres primarily on the west side, but small patches occur in higher areas in seasonal wetlands on the east side.

Pixley Refuge

Eight major types of land cover are found within the Pixley Refuge approved boundary: grassland, alkali playa, northern claypan vernal pool, valley saltbush scrub, riparian, Great Valley willow scrub, intensively managed moist soil units, and agricultural croplands. About 74 percent (7,347 acres) of the lands within the approved boundary are annual grassland. Of the wetland plant communities, managed moist soil communities cover the greatest area (755 acres). Riparian vegetation covers about 15 acres in a narrow band along Deer Creek on the southern border of the Pixley Refuge. The alkali playa community covers about 39 acres. Another 1,300 acres of grassland contains numerous alkali playas which were too small to map. Vernal pools are found only on the Two Well Tract and Big Deer Creek Unit and total about 36 acres. Valley saltbush scrub covers about 246 acres in the area just east of the managed wetland units. About 1,058 acres of private land within the approved Pixley Refuge acquisition boundary are actively farmed to provide feed for several dairies adjacent to the Refuge. Dairies now occupy about 704 acres within the approved boundary.

Wildlife

The variety of unique habitats at the Refuges support a diversity of wildlife species. More than 359 species of birds, mammals, amphibians, and reptiles have been documented on the Refuges. Some 15 special-status wildlife species are known or believed to use the Refuges.

Birds.

Kern Refuge. A total of 214 bird species have been sighted on Kern Refuge. Fifty-nine different species have nested on the Refuge. Species recorded on the Refuge wetlands include waterbirds, such as northern pintails, green-winged teal, and northern shoveler, which account for the largest number of ducks wintering on the Refuge. Other species also use Kern Refuge, including mallards, American wigeon, gadwall, cinnamon teal, canvasbacks, redheads, lesser scaups, ring-necked ducks, buffleheads, ruddy ducks, Canada geese, white-fronted geese, white pelicans, double-crested cormorants, belted kingfishers, egrets, herons, American and least bitterns, grebes, rails, gulls, terns, plovers, black-necked stilts, American avocets, greater yellowlegs, western and least sandpipers, dunlins, and long-billed dowitchers. Red-winged, tricolored, and Brewer's blackbirds use the marshes.

Birds of prey, such as red-tailed hawks, northern harriers, Swainson's hawks, golden eagles, peregrine falcons, kestrels, barn owls, burrowing owls, and great-horned owls, have been observed on Kern Refuge.



Dave Menke photo.

Northern pintail

Kern Refuge's upland habitats support a variety of birds, including ring-necked pheasants, mourning doves, and turkey vultures, hummingbirds, swallows, horned larks, flycatchers, crows, ravens, and sparrows.

In the spring and fall a variety of neotropical migratory birds can be found in the riparian areas of the Kern Refuge. Some of the species include common yellowthroats, western tanagers, warblers, vireos, kinglets, thrushes, and cedar waxwings.

Pixley Refuge. One hundred nine species of birds have been documented using Pixley Refuge, including some of the same species that use Kern Refuge. Since Pixley Refuge consists primarily of the grassland plant community, it is largely grassland bird species that nest on the Refuge. The moist soil wetlands provide habitat for migrating and wintering birds. Sandhill cranes are the most prominent species that roost on Pixley Refuge wetlands. Cranes begin arriving in September and numbers may peak at up to 6,000 birds in January.

In the fall and winter, the wetlands also support many of the same dabbling ducks found at Kern Refuge. In the past five years, green-winged teal, northern shovelers, and mallards have been the three most abundant ducks counted during mid-winter aerial surveys. Other wintering waterfowl species abundant on the Refuge include gadwalls, wigeons, and northern pintails.

Pixley Refuge also provides wintering habitat for white-faced ibis. In recent years, more than 2,000 white-faced ibis have been counted in a single day roosting in the wetlands. Wintering and migrating shorebirds also use the Refuge. Some of the more common shorebirds include black-necked stilts, yellowlegs, American avocets, killdeer, long-billed dowitchers, and western and least sandpipers. Occasionally marbled godwits and Wilson's phalaropes are observed. In the uplands, long-billed curlews are frequently sighted in the winter; mountain plovers are a rare occurrence. Waterbirds using the Refuge include American coots, pied-billed grebes, various species of gulls, as well as wading birds, such as great blue herons, black-crowned night herons, great and snowy

egrets, and American bitterns. Birds of prey occur on the Refuge, including red-tailed hawks, northern harriers, American kestrels, burrowing owls, barn owls, and occasional sightings of great horned owls, prairie falcons, peregrine falcons, black-shouldered kites, turkey vultures, and Cooper's hawks. Other common birds include mourning doves, western meadow larks, horned larks, loggerhead shrikes, and various species of sparrows and blackbirds.

Mammals

Kern Refuge. A total of 27 species of mammals have been sighted on Kern Refuge. Some of the mammals found on the Refuge include desert cottontails, black-tailed jackrabbits, coyotes, kit foxes, bobcats, opossums, raccoons, muskrats, beavers, badgers, long-tailed weasels, striped and western spotted skunks, California voles, Heermann's kangaroo rats, Tipton kangaroo rats, deer mice, western harvest mice, San Joaquin pocket mice, Botta's pocket gophers, house mice, roof rats, endangered Buena Vista Lake shrews, California ground squirrels, and San Joaquin antelope ground squirrels. The Refuge is home to at least two flying mammals, the Mexican free-tailed bat and the western mastiff bat.

Pixley Refuge. At least 16 species of mammals use Pixley Refuge as habitat. Of the 16 mammals known to inhabit Pixley Refuge, five are carnivores, such as coyotes, endangered San Joaquin kit foxes, badgers, striped skunks, and long-tailed weasels. Other species present include black-tailed jackrabbits, Audubon cottontails (desert cottontail), California ground squirrels (Beechey ground squirrel), Botta's pocket gophers (valley pocket gopher), endangered Tipton kangaroo rats, Heermann's kangaroo rats, deer mice, western harvest mice, house mice, and muskrats, on rare occasions in the water delivery canals.

Reptiles and Amphibians

Kern Refuge. Kern Refuge is home to 12 species of reptiles and 4 species of amphibians. The four species of lizards that inhabit Kern Refuge are the endangered blunt-nosed leopard lizard, coast horned lizard, California side-blotched lizard, and Western (California) whiptail. Seven species of snakes have been recorded using the Refuge. One species, the western (northern Pacific) rattlesnake, is venomous. The remaining species include Pacific gopher snakes, California (common) kingsnakes, western long-nosed snakes, California glossy snakes, southwestern black-headed snakes, and common garter snakes. The amphibians found on Kern Refuge include the Pacific treefrog, bullfrog, western toad, and western spadefoot toad.

Pixley Refuge. Pixley Refuge provides habitat for 13 species of reptiles and amphibians. The four species of lizards inhabiting Pixley Refuge are the endangered blunt-nosed lizard, coast horned lizard, California side-blotched lizard, and western (California) whiptail. The five species of snakes present on the Refuge include Pacific gopher snakes, California (common) kingsnakes, western long-nosed snakes, southwestern black-headed snakes, and one poisonous species, the western (northern Pacific) rattlesnake. The four species of amphibians that inhabit Pixley Refuge are the Pacific treefrog, western (California) toad, western (Pacific) spadefoot toad, and bullfrog.

Federally Listed Species

The following section provides information on Federally-listed species that may exist or are known to exist on Kern or Pixley Refuges.

San Joaquin Kit Fox

The San Joaquin kit fox (*Vulpes macroti nutica*) is a small fox with relatively large ears and a long, bushy, black-tipped tail. They are endemic to the Valley and surrounding foothills and a few interior coast range watersheds. The San Joaquin kit fox is listed as a Federal and State endangered species. This species is commonly associated with valley sink scrub, valley saltbush scrub, and annual grassland. Kit foxes also exist in some highly modified landscapes, including petroleum fields, urban areas, and areas adjacent to agricultural fields. The primary threats to the survival of this species are loss and degradation of habitat by agricultural and industrial development and urbanization.



U.S. Fish & Wildlife Service Photo.

San Joaquin Kit Fox

Population numbers are low on Kern Refuge with only seven kit foxes sighted during night spotlight surveys conducted from 1996 through 2000. Fifteen kit foxes were sighted on Pixley Refuge during this same time. Resident or denning kit foxes have not been confirmed on Kern Refuge. Kit fox den sites were confirmed on Pixley Refuge prior to the wet winters of the mid-1990s when their prey population numbers crashed. Denning has not been confirmed since that time. Dead kit foxes are occasionally found dead on the roads near both Refuges.

Tipton Kangaroo Rat

The Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) is a small, buff-colored rodent endemic to the southern Valley. This species is listed as a Federal and State endangered species. Tipton kangaroo rats inhabit arid-land communities, such as iodine bush shrubland, valley saltbush scrub, and annual grassland on the floor of the Tulare Basin in level or nearly level terrain. Their habitat is typically characterized by one or more species of sparsely scattered woody shrubs and a ground cover of mostly introduced annual grasses and forbs. In the past, the primary reason for the Tipton kangaroo rat's decline was habitat loss due to

agricultural conversion. Today, the greatest threats to this species are habitat destruction or modification from industrial and agriculturally-related development, cultivation, buildup of heavy thatch by nonnative annual grasses, and urbanization. Flooding also poses a threat to this species (Service 1998).

Pixley Refuge provides some of the best remaining habitat for Tipton kangaroo rats. The Endangered Species Recovery Program has been studying the population ecology of Tipton kangaroo rats at Pixley Refuge since 1992. Surveys are conducted on a grid in the Deer Creek East Unit twice a year. Few or no animals have been trapped in recent years. Population numbers crashed on Pixley Refuge and other areas of the southern Valley in the mid-1990s when the areas were flooded two consecutive winters. Tipton kangaroo rats historically occurred in the upland communities on the west side of Kern Refuge. All of the west side was flooded in 1983 and partially flooded in the mid-1990s. In limited, small mammal live-trapping surveys conducted in 1992, 1993, 1994, and 1998, few Tipton kangaroo rats were captured on the west side or near Unit 8 on the east side.

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard (*Gambelia sila*) is a large lizard from the iguana family with a long tail, long powerful hind limbs, and a short, blunt snout. It is endemic to the Valley. The blunt-nosed leopard lizard is listed as a Federal and State endangered species. They are found in open, sparsely vegetated areas of low relief in the Valley and the surrounding foothills. In the Valley, this species is most commonly associated with nonnative grassland and valley sink scrub communities. Valley needlegrass grassland and alkali playa also provide habitat for this species. In the foothills, the blunt-nosed leopard lizard is found in saltbush scrub, upper Sonoran subshrub scrub, and serpentine bunchgrass. They generally use small rodent burrows for shelter from predators and temperature extremes.



US Fish and Wildlife Service Photo.

Blunt-Nosed Leopard Lizard

The primary threats to blunt-nosed leopard lizards are habitat disturbance, destruction, and fragmentation. These threats come from a variety of sources, including development and operation of oil and gas facilities, overgrazing, pesticide use, and on and off road vehicle use in or near blunt-nosed leopard lizard habitat.

On Pixley Refuge, researchers have found densities of blunt-nosed leopard lizards ranging from 0.1 to 4.2 per acre. Biologists from the Endangered Species Recovery Program of California State University, Stanislaus have been monitoring population numbers in the Deer Creek East Unit of Pixley Refuge from 1993 to the present. Population numbers experienced a drastic decline in the mid-nineties when there were successive years of high amounts of rainfall. On Pixley Refuge, lizard populations appeared to be greater in the year 2000 monitoring season than they had been in recent years. On Kern Refuge, blunt-nosed leopard lizard surveys of limited scope were conducted on the west side in 1996 and 1998, with no blunt-nosed leopard lizards observed. The most recent sighting was one lizard on the east side of Kern Refuge in 1994. Four sightings occurred in 1993, three lizards on the east side and one in the San Joaquin Desert Research Natural Area (RNA) on the west side.

Buena Vista Lake Shrew

The Buena Vista Lake shrew (*Sorex ornatus relictus*) is a mouse-sized mammal with a long snout and tiny bead-like eyes. The fur on its upper body is blackish-brown and the lower body is smoke gray. Its tail is bicolored and relatively short. Buena Vista Lake shrews were likely historically distributed throughout the Tulare Basin. This species is a Federally listed endangered species and a State species of special concern. Buena Vista Lake shrews prefer moist habitats with an abundant layer of leaf litter. Plants typically found in their habitat include Fremont cottonwood, willows, glasswort, alkali heath, wild rye grass, and Baltic rush. Loss and fragmentation of habitat are the primary reasons for the Buena Vista Lake shrew's historical decline and are the current threats to its survival. As a result, this species faces a high risk of extinction from catastrophic events, such as floods and drought.

Three Buena Vista Lake shrews were found on the Kern Refuge in 1992 and 1994. Two Buena Vista Lake shrews were live-trapped and released at the capture site in 1998 in the riparian area of Kern Refuge. In 1999, Endangered Species Recovery Program biologists captured and released five Buena Vista Lake shrews at the capture site along a remnant slough in the moist-soil units of Kern Refuge. In 2000, a limited survey resulted in no captures of Buena Vista Lake shrews on Pixley Refuge on the southern boundary near Deer Creek. Pixley Refuge has little potential habitat for shrews.

Visitor Services

The wetlands at Kern Refuge provide numerous opportunities for outdoor recreation, including hunting, wildlife observation, photography, and environmental education. Over the past three years, Kern Refuge has annually averaged about 6,000 visitors. Until recently, the only visitor services on Pixley Refuge were guided public talks and tours.

Pixley Refuge has averaged about 230 visitors per year over the last three years.

Refuge Access

Kern Refuge's entrance is located at the intersection of Garces Highway and Corcoran Road. The entrance is about 14 miles from Interstate 5 via State Highway 46 and Corcoran Road, and 19 miles west of State Highway 99 via Garces Highway. Kern Refuge has a small paved parking lot at the headquarters with space for about eight vehicles and a larger gravel parking lot at the nearby hunter check station with space for up to 75 vehicles. Three gravel parking lots with space for 20 to 30 vehicles each are located along the five-mile gravel auto tour route.

Pixley Refuge is located about 6.7 miles from Highway 99 via Avenue 56 and Road 88. The entrance to Pixley Refuge's parking lot is located off Road 88, about one mile north of Avenue 56. The gravel parking lot has space for about 12 vehicles.

Hunting

Waterfowl hunting has occurred on Kern Refuge since the early 1960s and is administered by CDFG through a cooperative agreement. Kern Refuge is the only public hunt area in the southern Valley. An average of 1,800 visitors per year hunt on the Refuge. From 1995 to 2002, the number of hunters at Kern Refuge has more than doubled from 1,236 to 2,830. Hunters account for about 39 percent of the Refuge's visitors. Currently, Kern Refuge has 11 hunting blinds spaced across 479 acres. Two of the blinds are wheelchair-accessible. Kern Refuge also provides up to 1,867 acres of free roam hunt area. The maximum hunter density in this area is one hunter per 20 acres, for a total capacity of 93 hunters.

The duck-hunting season generally runs from late October or early November to mid-January. At Kern Refuge, hunt days are Wednesdays and Saturdays, from a half hour before sunrise to sunset. Hunter success at Kern Refuge is consistently higher than the State average. Over a 7-year period from 1995 to 2002, hunters at Kern Refuge averaged 2.7 ducks per visit while, the State average over the same period was 1.7 ducks per hunter visit. Hunting is not permitted on Pixley Refuge.

Wildlife Observation, Interpretation and Environmental Education

About 1,500 visitors participate in wildlife observation and 2,000 visitors participate in interpretation activities on Kern Refuge each year. The Refuge offers wildlife observation and photography opportunities along a five-mile self-guided auto tour route. Foot access is also allowed on established dike roads. The auto tour route is open year-round during daylight hours, except during the waterfowl hunting season. During this period, the Refuge is closed to the nonhunting public on hunt days (Wednesdays and Saturdays). During the peak waterfowl migration, and wintering period (September 15 through February 15), visitor services are limited to the self-guided auto tour route, until 1,000 acres of wetlands are flooded. Once this initial sanctuary is established, 45 percent of the remaining wetland units are opened to foot travel as they are flooded.

Over the last three years, an average of about 445 visitors per year participate in staff or volunteer conducted talks, tours, and demonstrations at Kern Refuge. Approximately 340 students per year participate in Refuge-related environmental education, conducted by Refuge staff or volunteers either on or off Refuge.

In 2000, Pixley Refuge staff and Tulare County Audubon Society volunteers constructed a parking lot and a 1.5-mile interpretive walking trail and observation platform on the wetland unit at the Refuge. The trail guides visitors through 13 interpretive stops, and includes six interpretive panels and an observation platform overlooking the east end of the managed wetland unit. The majority of the use occurs on the trail from fall to spring, coinciding with bird migrations and waterfowl and waterbird use of the wetland habitat.

Current Management

Kern Refuge

A Master Plan developed in 1986 guides current management of the Kern Refuge. Management efforts are focused on creating and maintaining quality wetland habitat for migratory birds with an emphasis on waterfowl and water birds; protecting threatened and endangered species and enhancing their habitats; and providing quality wildlife-dependant recreational opportunities.

Creating and maintaining wetland habitat have been a major emphasis since the inception of the Refuge due to the absence of naturally occurring marsh habitat in the southern valley. The Refuge follows water management regimes involving specific water draw down dates, spring irrigations, and fall flood-up periods to produce quality habitat within the wetlands of the Refuge. Non-native grasslands are managed for use by several threatened and endangered species through implementation of a closely monitored cattle-grazing program. Control of non-native, invasive plant species, such as salt cedar, is ongoing to improve both wetland and upland habitats.

Public uses, such as wildlife observation, photography and waterfowl hunting, have long been available on limited areas of the Refuge and are compatible with the purposes for which the Refuge was established.

Periodic wildlife surveys within various habitat types are conducted to monitor population trends of waterfowl, birds of prey, shorebirds and other resident and migratory species. Surveys are periodically conducted to determine the presence or absence of threatened and endangered species, such as the San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat.

Pixley Refuge

As is the case with Kern, a Master Plan developed in 1986 guides management of Pixley Refuge. Annual grasslands comprise over 74 percent of the area within the approved refuge boundary; consequently, it is a primary concern to manage the grasslands to threatened and endangered species. A closely monitored cattle grazing is the primary management tool for reducing the grass cover and providing more open habitat suitable to the endangered blunt-nosed leopard lizard and Tipton

kangaroo rat. Although very limited in scope, the Refuge has created and maintains seasonal wetlands on approximately 300 acres of impoundments in the southwestern portion of the Refuge adjacent to the Deer Creek channel. These moist soil units are maintained during the fall and winter for the benefit of waterbirds including ducks, geese, sandhill cranes, and other wading birds and shorebirds. Although foraging habitat for cranes on the Refuge is limited, use of Refuge ponds as roosting areas is generally increasing on an annual basis.

Refuge Goals

Goals are descriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but do not define measurable units. Goals translate refuge purposes into management direction. Following are the goals developed for Kern and Pixley Refuges.

Kern Refuge

- Provide high quality wintering and migratory habitat for migratory birds in the southern San Joaquin Valley, with an emphasis on waterfowl and waterbirds.
- Protect, preserve, and restore alkali sink scrub, saltbush scrub, iodine bush scrub and grassland habitats in the southern San Joaquin Valley to contribute to the recovery plan goals for the San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton's kangaroo rat.
- Restore and maintain a representative example of Tulare Basin grassland, riparian, and sink scrub habitats on Kern Refuge.
- Provide visitors with wildlife-dependant recreation, interpretation, and education opportunities which foster an appreciation and understanding of Kern Refuge's unique wildlife, plant communities, and cultural resources.

Pixley Refuge

- Protect, restore, and manage alkali sink scrub, saltbush scrub, iodine bush scrub and grassland habitats in the southern San Joaquin Valley to contribute to the recovery plan goals for the San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton's kangaroo rat.
- Restore and maintain a representative example of Tulare Basin grassland and riparian habitat on Pixley Refuge.
- Provide high quality wintering and migratory habitat for migratory birds in the southern San Joaquin Valley, with an emphasis on waterfowl, sandhill cranes, and other waterbirds.
- Provide visitors with wildlife-dependant recreation, interpretation, and education opportunities which foster an appreciation and understanding of Pixley Refuge's unique wildlife and plant communities.

Future Management Direction

Following is a description of the future management direction for each Refuge, organized by goal topic. Figures 2 and 3, respectively, show the proposed habitat management and visitor services plans for Kern Refuge. Figure 4 shows the proposed habitat management and visitor services plans for Pixley Refuge.

Prepare Grassland Management Plan, Eradicate 90 percent of Salt Cedar in 10 Years, and Expand Surveys and Monitoring for Special Status Species

Expand Aerial Waterfowl Surveys and Ground Surveys for Shorebirds, other Waterbirds and Raptors

Rehabilitate Seasonal Marsh (1,100 acres)

Strengthen Levees around Unit 14

Complete Moist Soil Rehabilitation (1,200 acres)

Eradicate 90 percent of Salt Cedar from Seasonal Marsh within 5 Years

Restore Valley Sink Scrub (440 acres)

Plant Riparian Vegetation (15 acres)

Eradicate 90 percent of Salt Cedar from Riparian Habitat within 10 Years

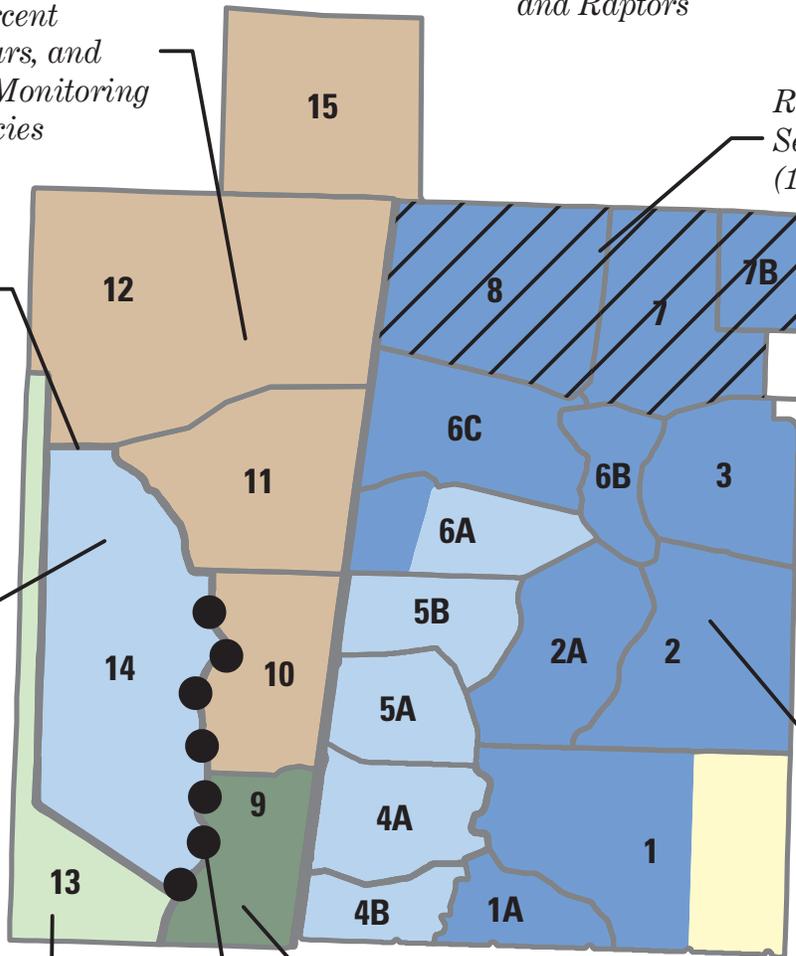


Figure 2. Proposed Habitat Management

Kern National Wildlife Refuge



- | | | | |
|---|---------------------------|---|----------------|
|  | Units to be Rehabilitated |  | Moist Soil |
|  | Saltbush Scrub |  | Riparian |
|  | Grassland/Scrub/Playa |  | Seasonal Marsh |
|  | Riparian Expansion |  | Summer Water |

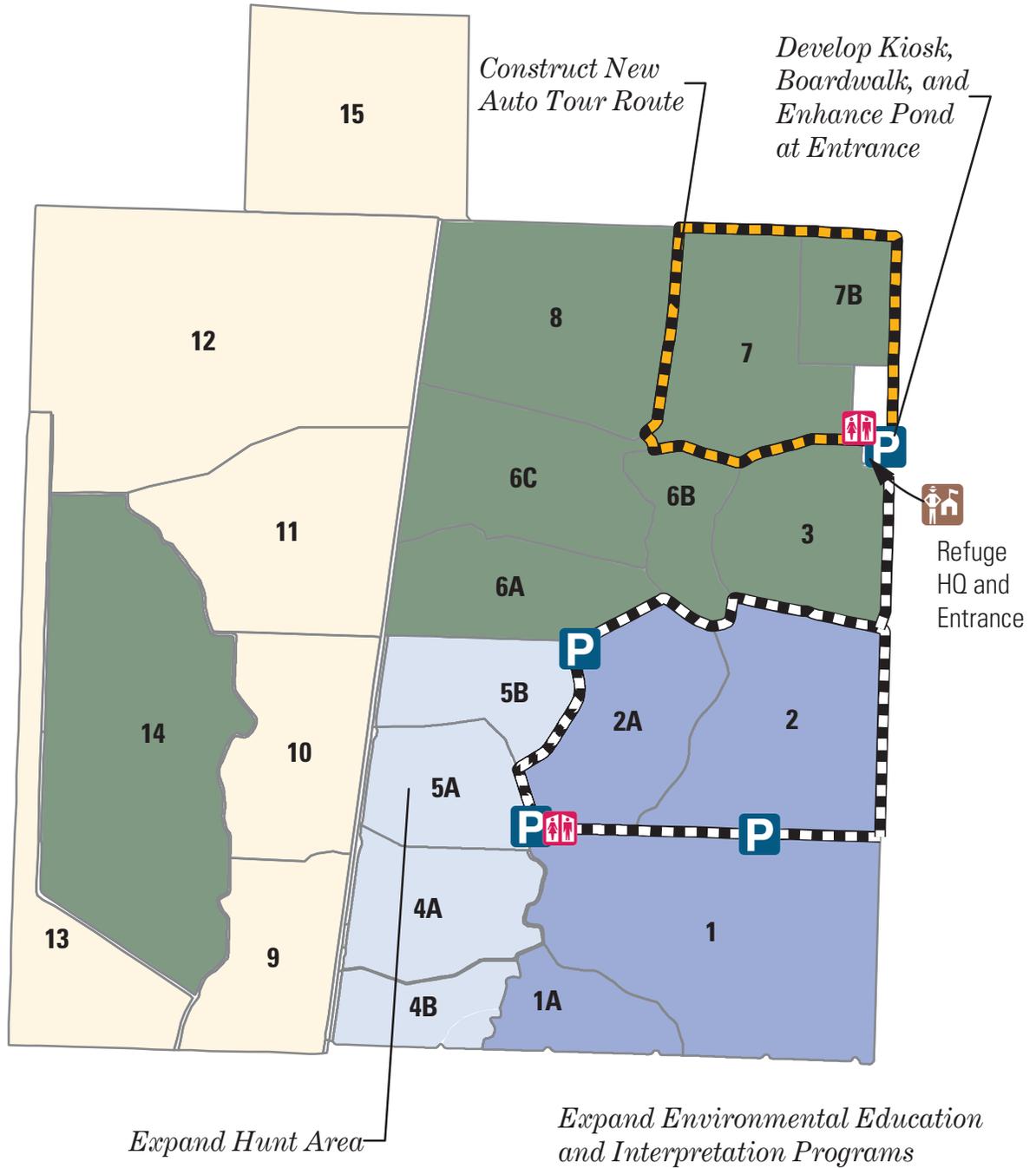


Figure 3. Proposed Visitor Services Plan

Kern National Wildlife Refuge



- | | | | |
|---|--------------------------|---|-------------------|
|  | Restrooms | Closed Areas | |
|  | Parking Lots |  | Uplands |
|  | Hunting Blinds |  | Wetland Sanctuary |
|  | New Auto Tour Route | Hunt Areas | |
|  | Existing Auto Tour Route |  | Blinds |
| | |  | Free Roam |

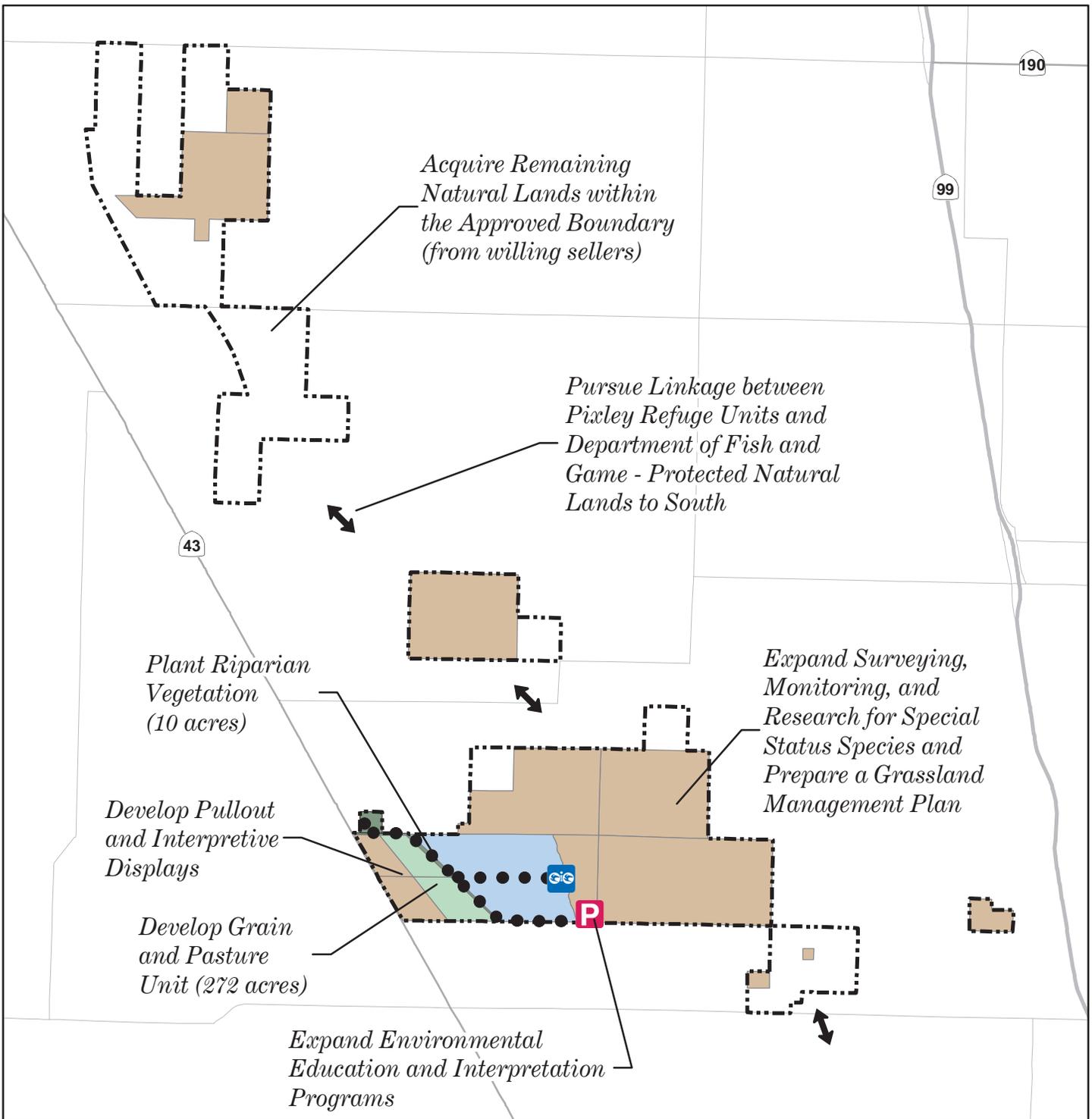


Figure 4. Proposed Habitat Management and Visitor Services Plan

Pixley National Wildlife Refuge



- Grain
- Grassland
- Moist Soil Wetlands
- Riparian
- Approved Refuge Boundary
- Riparian Expansion
- Existing Observation Platform
- Existing Parking Lot

CA/NV Refuge Planning Office - Sept. 2004

*Prescribed Burn in
Seasonal Marsh Unit*



U.S. Fish & Wildlife Service Photo.

Kern Refuge

Under the selected plan, the Refuge focus will be to provide wintering habitat for migratory birds and contribute to the recovery of targeted special status species. Management programs for migratory waterfowl, colonial nesting birds, threatened and endangered species, riparian communities, and native uplands will be expanded and improved. In addition, opportunities for hunting, wildlife observation, photography, environmental education, and interpretation will be improved and expanded from the present conditions. Staffing and funding will need to increase to accommodate the changes.

Migratory Birds. Under the selected plan, the Service will continue existing management of moist soil and seasonal marsh units. Wetland units will be flooded up in August and draw down will begin in March. Moist soils units will be irrigated once or twice in April and May to assist in the germination of waterfowl food plants. Each year 25 percent of the moist soil and seasonal marsh units will be burned, disked, or mowed. In Addition, the Service will rehabilitate Units 7, 7b, and 8 (1,330 acres) to improve habitat conditions and water management efficiency. This will involve rehabilitating interior levees, eradicating salt cedar from the units using mechanical control, and installing new water control structures. The Service will also eradicate 90 percent of the salt cedar occurring in the other seasonal marsh units within five years, using flooding and mechanical removal that could involve digging, mowing, and disking.

To provide sanctuary for wintering birds and other wildlife, the existing flexible closed zone will be maintained as follows: the first 1,000 acres of wetlands to be flooded are closed to public use; as the remaining wetlands are flooded, 45 percent are open and 55 percent are closed. After Unit 14 is completely developed, the area of permanent sanctuary will total 3,504 acres. The Service will continue to maintain water through most of the summer in the eastern portion of Unit 1 to provide nesting habitat for tricolor blackbirds, white-faced ibis, and other colonial nesting birds.

The Service will expand its surveying program to include monthly waterfowl surveys of the southern San Joaquin Valley from September to March, and biweekly ground surveys of shorebirds, waterbirds, and raptors from September to June).

The Service will also complete a land protection plan that explores protection and enhancement of Tulare Basin wetlands and associated uplands.

Threatened and Endangered Species. Under the selected plan, the Service will continue to use cattle grazing in the 2,377-acre upland area to control the accumulation of thatch and provide suitable habitat for the blunt-nosed leopard lizard and Tipton kangaroo rat. Plant cover will be periodically monitored using average residual dry matter calculations, and cattle stocking rates will be adjusted accordingly. The Service will also develop and implement a grassland management plan that will explore various options (different grazing regimes, etc.) for managing plant cover and improving habitat conditions for the blunt nosed leopard lizard and Tipton kangaroo rat. The Refuge will seek approval to prepare a land protection plan that explores opportunities to work with Federal, State, local agencies and landowners to establish linkages between Kern Refuge and other natural lands to the south and east (including Pixley Refuge).

Riparian and Saltbush Scrub Habitat. The Service will continue to maintain 450 acres of existing riparian habitat in Unit 9 by periodically flooding it in fall, winter, and early spring and irrigating it monthly during the summer. In addition, the Service will plant and maintain 15 acres of new riparian habitat along the deliver canal that forms the eastern boundary of Unit 14 in conjunction with the ongoing moist soil rehabilitation. Herbicides (imazapyr and glyphosate) will be used to treat salt cedar through foliar spray or cut stump application with a goal of removing 90 percent within 10 years. In addition, the Service will restore 400 acres of valley sink scrub in Unit 13.

Visitor Services. Visitor services will be improved and expanded under the selected plan. For example, hunting opportunities will be increased by opening an additional 540 acres (Units 5a and 5b) to hunting and constructing nine new hunting blinds. Other major new visitor services projects under this alternative include: developing new interpretive signs and displays and a new refuge brochure; enhancing the pond at the refuge entrance and constructing a new kiosk and boardwalk; constructing a new 4.3-mile tour route (open every day); and constructing two new photo blinds. In addition, if funding becomes available, the Service will hire a full time outdoor recreation planner and a full time law enforcement officer.

Pixley Refuge

Under the selected plan, the focus of Pixley Refuge will remain the same: contribute to the recovery of targeted special status species and provide wintering habitat for migratory birds. The selected plan will improve and expand management programs for threatened and endangered species, migratory birds, and riparian communities.

Threatened and Endangered Species. The Service will continue to use grazing to improve habitat conditions for the Tipton kangaroo rat and blunt-nosed leopard lizard. In addition, the Service will prepare a grassland management plan and conduct habitat management research to better define the habitat needs of these species. The Service will also substantially expand its surveying, monitoring, and research programs for special status species and prepare a comprehensive surveying and monitoring plan. The Service will pursue acquisition of remaining natural lands within the approved boundary from willing sellers.

Migratory Birds. The Service will continue existing management of moist soil units (755 acres) to maximize production of waterfowl food plants. Units will be flooded up in August and draw down will begin in March. Moist soils units will be irrigated once or twice in April and May to assist in the germination of waterfowl food plants. Each year 25 percent of the units will be burned, disked, or mowed. In addition, a 272-acre grain unit will be developed on the Turkey Tract to provide foraging habitat for sandhill cranes and geese. Aerial surveys for waterfowl and ground surveys of shorebirds, waterbirds, and birds of prey will be expanded under the selected plan.

Riparian and Saltbush Scrub Habitat. A grassland management plan will be prepared. Approximately 10 acres of riparian vegetation will be planted on the north levee and along the service ditch that supplies water to the wetland units.

Visitor Services. Under the selected plan, the environmental education program at Pixley Refuge will be expanded. A visitor services plan will be developed and implemented and a full time outdoor recreation planner will be hired (shared with Kern Refuge). The Service will also seek to establish new partnerships with educational institutions and local organizations for environmental education on the Refuge. In addition, new educational materials will be developed. A new wildlife viewing area and interpretive displays will also be constructed on the Turkey Tract adjacent to State Highway 43. The displays will focus on sandhill crane ecology and wildlife friendly farming.

Plan Implementation

The implementation phase for this CCP began when the FONSI was signed on September, 30, 2004. During the next 15 years, the objectives and strategies presented in this CCP will be realized; the CCP will serve as the primary reference document for all Refuge Complex planning, operations, and management until it is formally revised. The Service will implement the final CCP with assistance from existing and new partner agencies, and organizations and the public.

Many activities called projects in the text below are needed to realize the management strategies discussed in this CCP. Every effort will be made to implement these projects by the deadlines established here. However, the timing of implementation of the management activities proposed in this document is contingent upon a variety of factors, including funding, staffing, completion of detailed step-down management plans, compliance with other Federal laws and regulations, partnerships, and the results of monitoring and evaluation.

Funding and Staffing

To implement the selected plan and to achieve the objectives and goals of this CCP, the Service will need additional funding and staff. Full implementation of all of the projects proposed in this CCP will require the Service to increase Kern Refuge Complex's current annual operations budget by 43 percent to approximately \$820,000.

When the selected plan is completely implemented, full staffing for both Kern and Pixley Refuges will include the following positions.

- Project leader
- Deputy project leader
- Wildlife biologist
- Private lands biologist
- Administrative support assistant
- Office automation clerk
- Refuge operations specialist
- Three engineering equipment operators
- Maintenance worker
- Outdoor recreation planner
- Law Enforcement Officer
- Biological Science Technician

Step-Down Management Plans

Some projects or types of projects require more in-depth planning than the CCP process is designed to provide. For these projects, the Service prepares step-down management plans. In essence, step-down management plans provide the additional planning details necessary to implement management strategies identified in a CCP. Kern and Pixley Refuges currently have a number of step-down plans already completed. These include plans for fire management (Appendix K), disease prevention and control, and pest management. This CCP proposes several new step-down plans that are identified below along with their target date for completion.

- Land Protection Plan – Wetlands (2005)
- Grassland Management Plan (2006)
- Land Protection Plan – Upland Linkages and Threatened and Endangered Species Habitat¹ (2008)
- Visitor Services Plan (2009)
- Comprehensive Inventory and Monitoring Plan (2018)
- Poso Creek Flood Water Management Plan (2018)

Partnership Opportunities

A number of partners play an important role in helping the Service achieve its goals and objectives for Kern and Pixley Refuges. The Service will continue to rely on these and other partners in the future to help implement this CCP and provide input for future CCP updates. This CCP identifies many projects that provide new opportunities for existing or new partners. There is great potential for more public participation and assistance in the management and interpretation of the Refuges. The Service welcomes and encourages more public participation in the Refuges.

¹ Subject to the approval of the Director of the Fish and Wildlife Service

Adaptive Management

This CCP provides for adaptive management of Kern and Pixley Refuges. Adaptive management is a flexible approach to long-term management of biotic resources that is directed by the results of ongoing monitoring activities and new data. Management techniques, objectives, and strategies are regularly evaluated in light of monitoring results, new scientific understanding, and other new information. These periodic evaluations are used to adapt management objectives and techniques to better achieve the Refuge's goals. Monitoring is an essential component of adaptive management in general, and of this CCP. Specific monitoring strategies have been integrated into the goals and objectives described in this CCP whenever possible.

Plan Amendment and Revision

CCPs are meant to evolve with each individual refuge unit, and the Improvement Act specifically requires formal revision and updating of CCPs at least every 15 years. The formal revision process will follow the same steps as the CCP process (see Figure 3). In the meantime, the Service will review and update this CCP periodically (at least as often as every five years) based on the results of the adaptive management program. This CCP will also be informally reviewed by Refuge staff while preparing annual work plans and updating the Refuge database. It may also be reviewed during routine inspections or programmatic evaluations. Results of any or all of these reviews may indicate a need to modify the plan. The goals described in this CCP will not change until they are re-evaluated as part of the formal CCP revision process. The objectives and strategies, however, may be revised to address changing circumstances or take advantage of increased knowledge of the resources on the Refuge. If changes are required, the level of public involvement and associated NEPA documentation will be determined by the Project Leader in accordance with Service policy.