WILDLAND FIRE MANAGEMENT PLAN

KERN NATIONAL WILDLIFE REFUGE COMPLEX

2001

SEPTEMBER 2001

WILDLAND FIRE MANAGEMENT PLAN

KERN NATIONAL WILDLIFE REFUGE COMPLEX

Prepared: _____ _____

Michael Ritter — Date
Deputy Refuge Manager
Kern NWRC

_____ _____

David A. Hardt — Date
Refuge Manager
Kern NWRC

Concurred: _____ _____

Pam Ensley — Date
Regional Fire Management Coordinator
Pacific Region, US Fish and Wildlife Service

Approved: _____ _____

Steve Thompson — Date
Acting Manager
California/ Nevada Operations, US Fish and Wildlife Service

TABLE OF CONTENTS

TABLE OF FIGURES

INTRODUCTION

The Kern National Wildlife Refuge Complex (NWRC) consists of two refuges: Kern and Pixley. This Fire Management Plan covers these two units. The complex is located in southern California's San Joaquin Valley and is part of the south district of the Central Valley ecoregion fire management zone. This valley lies between the coast range mountains to the west, and the Sierra Nevada range to the east. Presently the total acreage of the complex is 17,000 acres located in north western Kern County and southern Tulare County.

The Department of the Interior (DOI) fire management policy requires that all refuges with vegetation that can sustain fire must have a Fire Management Plan that details fire management guidelines for operational procedures and values to be protected/enhanced. The Fire Management Plan (FMP) for the Kern NWRC will provide guidance on preparedness, prescribed fire, wildland fire, and prevention. Values to be considered in the Fire Management Plan include protection of Refuge resources and neighboring private properties, effects of burning on refuge habitats/biota, and firefighter safety. Refuge resources include properties, structures, cultural resources, trust species including endangered, threatened, and species of special concern, and their associated habitats. The Fire Management Plan will be reviewed periodically to ensure that the fire program is conducted in accordance and evolves with the U.S. Fish and Wildlife Service (USFWS) mission and the Kern NWRC's goals and objectives.

When approved, this document will become the Kern National Wildlife Refuge Complex's Fire Management Plan. Major components include:

B updated policy for prescribed fires at the Kern National Wildife Refuge Complex (NWRC).

B implementation of Complex objectives identified in the 1984 Master Plan and Draft Comprehensive Conservation Plan.

B format changes under the direction of Fire Management Handbook (Release Date 6/1/00).

This plan is written to provide guidelines for appropriate suppression and prescribed fire programs at the Kern NWRC, which includes the Kern and Pixley National Wildlife Refuges. Prescribed fire may be used to reduce fuels, restore the natural processes and vitality of ecosystems, improve wildlife habitat, remove or reduce non-native species and noxious weeds and /or conduct research.

This Fire Management Plan addresses the use of prescribed fire to manage wetland vegetation in seasonal marshes and moist soil wetlands. Prescribed fire will not occur in upland habitats used by threatened and endangered species and therefore is not addressed in this plan.
Wildland fires that may threaten or occur in upland habitats will be contained/controlled from existing roads and levees. New firebreaks will not be created through upland habitat.

There are no year-round fire-funded personnel located at Kern NWRC. The Zone Fire Management Officer, located at San Luis NWRC, provides fire management oversight for the Complex. A seasonal engine crew based at Kern NWR is funded cooperatively through the Service and the Bureau of Land Management (BLM). Initial attack operations may be conducted in cooperation with the Lost Hills Fire Station, Kern County Fire Department, Tulare County Fire Department, and BLM -- Bakersfield.

COMPLIANCE WITH USFWS POLICY

Authority and guidance for implementing this plan are found in:

- < Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C.594): authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of timber.
- < Economy Act of June 30, 1932: authorizes contracts for services with other Federal agencies.
- < Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 U.S.C. 1856, 1856a and b): authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency lands in suppressing fires when no agreement exists.
- < Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 5121): authorizes Federal agencies to assist state and local governments during emergency or major disaster by direction of the President.
- < National Wildlife Refuge System Administrative Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd et seq.: defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas and waterfowl production areas. It also establishes a conservation mission for the Refuge System, defines guiding principles and directs the Secretary of the Interior to ensure that biological integrity and environmental health of the system are maintained and that growth of the system supports the mission.
- < Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C.2201): provides for reimbursement to state or local fire services for costs of firefighting on federal property.
- < Wildfire Suppression Assistance Act of 1989. (Pub.L. 100-428, as amended by Pub.L 101- 11, April 7, 1989).
- < Departmental Manual (Interior), Part 910 DM, Chapter 1, Wildfire Suppression Management (March 29, 1990): defines Department of Interior Fire Management Policies.
- < National Environmental Policy Act of 1969: regulations implementing the National Environmental Policy Act (NEPA) encourages the combination of environmental comments with other agency documents to reduce duplication and paperwork (40 CFR 1500.4(o) and 1506.4).
- < Clean Air Act (42 United State Code (USO) 7401 et seq.): requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of Wildland and prescribed fires managed for resource benefit.
- < Endangered Species Act of 1973.
- < Fed Fire Policy of 1995.

This plan meets NEPA / NHPA compliance and will be implemented in cooperation with the Endangered Species Act of 1973, as amended, under the section 7 programmatic review IS THIS A RELIC FROM THE SAN LUIS PLAN?, and will take appropriate action to identify and protect from adverse effects on any rare, threatened, or endangered species. The authority for funding (normal fire year programming) and all emergency fire accounts is found in the following authorities:

Section 102 of the General Provisions of the Department of Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.

P.L. 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990, established the funding mechanism for normal year expenditures of funds for fire management purposes.

31 US Code 665(E)(1)(B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

Authorities for procurement and administrative activities necessary to support wildland fire suppression missions are contained in the Interagency Fire Business Management Handbook.

FIRE MANAGEMENT OBJECTIVES

The following considerations were used to develop the Kern NWRC fire management goals and objectives, as outlined in the Refuge's Master Plan and Draft Comprehensive Conservation Plan. Appendix B contains a list of terminology definitions.

The overall goals of the Kern NWRC fire management program are:

- to ensure firefighter and public safety;
    - to maintain a suppression resources capable of initial attack;
- to reduce human-caused fires;
- to increase use of prescribed fire in seasonal marshes and moist soil wetlands.

Specific fire management objectives are:

- Suppress all wildland fires.
- Protect life and resources/property from wildland fires while considering resources at risk.
- Use prescribed fire, where appropriate, to reduce hazardous fuels, to restore and enhance wildlife habitat, and to control invasive weeds.
- Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions.
- Protect habitat for Endangered/Threatened species and species of concern.
- Educate the public regarding the role of fire within the Complex.

These fire management goals and objectives have been developed under the following assumptions:

- Prescribed fire may have positive effects on vegetation, wildlife and cultural resources when the appropriate burning conditions, techniques, and plant phenology are utilized.
- Uncontrolled wildland fire has the potential for negative impacts.
- Use of minimum impact suppression tactics (MIST) in the suppression and control of fire may minimize environmental damage.

DESCRIPTION OF COMPLEX

At present, Kern NWRC is in the process of preparing a Comprehensive Conservation Plan (planned for completion in 2002). Each Refuge in the Complex currently uses a Master Plan written in 1984 that identifies habitat needs including objectives which pertain to fire management. The primary objectives of the Complex are to:

- Provide feeding and resting habitat for migrating and wintering waterfowl and other water birds.
- Provide habitat and manage for endangered, threatened, or sensitive species of concern.
- Preserve a natural diversity and abundance of flora and fauna.
- Provide opportunities for understanding and appreciation of wildlife ecology, and the human role in the environment; and provide high-quality wildlife-dependent recreation and education.
- Provide an area for compatible, management-oriented research.
- Alleviate crop depredation.

The region is rural in nature with a very low population density. The valley is an extensive agricultural area that historically has been a major wintering area for waterfowl of the Pacific Flyway. The lands that surround the refuge are mostly irrigated agricultural farm fields.

KERN NWR DESCRIPTION

Kern National Wildlife Refuge was established on November 18, 1960 under the authority of the Migratory Bird Conservation Act and Migratory Hunting Stamp Act. The primary purpose was to "restore a segment of the waterfowl wintering habitat in the Southern San Joaquin Valley." The Refuge is located in the Southern San JoaquinValley, 19 miles west of the town of Delano. The Refuge comprises 10,618 acres located in Kern County (Figures1-2).

Most of the area surrounding the Refuge is flat and has been land-leveled and put into cropland for row crops, orchards, and vineyards. The remaining undeveloped land has minor ridges and swales and is used for grazing of livestock or managed as privately owned duck hunting clubs.

The Refuge consists of approximately 63 percent wetlands (moist soil and seasonal), 33 percent uplands, and 4 percent riparian wetland. Fuel and vegetation types characteristic of the Refuge are:

- Fuel Model 1: approximately 3,468 acres of uplands.
- Fuel Model 3: approximately 6,700 acres of wetlands.
- Fuel Model 9: approximately 450 acres of riparian wetland.

Public use occurs primarily from September to April and coincides with the Fall and Spring migrations of waterfowl and shorebirds. Non-consumptive public use is limited to the 6-mile Auto Tour route year-round. Water fowl hunting occurs on Wednesdays and Saturdays from October to January. A limited number of guided tours occur through out the year. Wildland fire may impact habitat which could limit or enhance hunting and wildlife viewing opportunities.

Figure 1: Vicinity Map

Figure 2: Kern NWR

PIXLEY NWR DESCRIPTION

Pixley National Wildlife Refuge was established in 1959 under provisions of the Bankhead-Jones Farm Tenant Act for land-conservation and land-utilization, the Endangered Species Act, and by Secretarial Order 2843 as a refuge for migratory birds and other waterfowl. Pixley National Wildlife Refuge is situated about 3 miles southwest of the town of Pixley in Tulare County. The refuge comprises 6,389 acres of which 755 acres is wetland and 5,634 acres of upland habitat (Figure 3).

Approximately 12 percent of the refuge's acreage consists of wetlands such as seasonally flooded marsh, and riparian habitat. The remainder of refuge acres consists of upland habitats. Fuel and vegetation types characteristic of the Refuge are:

1. Fuel Model 1: approximately 5,634 acres of uplands.
2. Fuel Model 3: approximately 755 acres of wetlands

Pixley NWR has very limited public use. A recently constructed observation platform and accompanying 1.5 mile self-guided interpretive trail are used infrequently from September to April. Wildland fire may impact habitat which could limit or enhance hunting and wildlife viewing opportunities.

CULTURAL RESOURCES

The Yokut Indians were the Native Americans who occupied the San Joaquin prior to European settlement in the mid-1800's. Evidence exists of Native American presence in this region at least 1900 years ago.

Several archeological sites have been identified in the Kern NWR (Figure 4). Most of these are midden scatters but at least one burial site has been recorded. No known archeological sites have been identified on the Pixley NWR. There are no known historic sites within the Complex.

The Comprehensive Conservation Plan identifies objectives and management strategies to protect all cultural and historic resources on Complex lands.

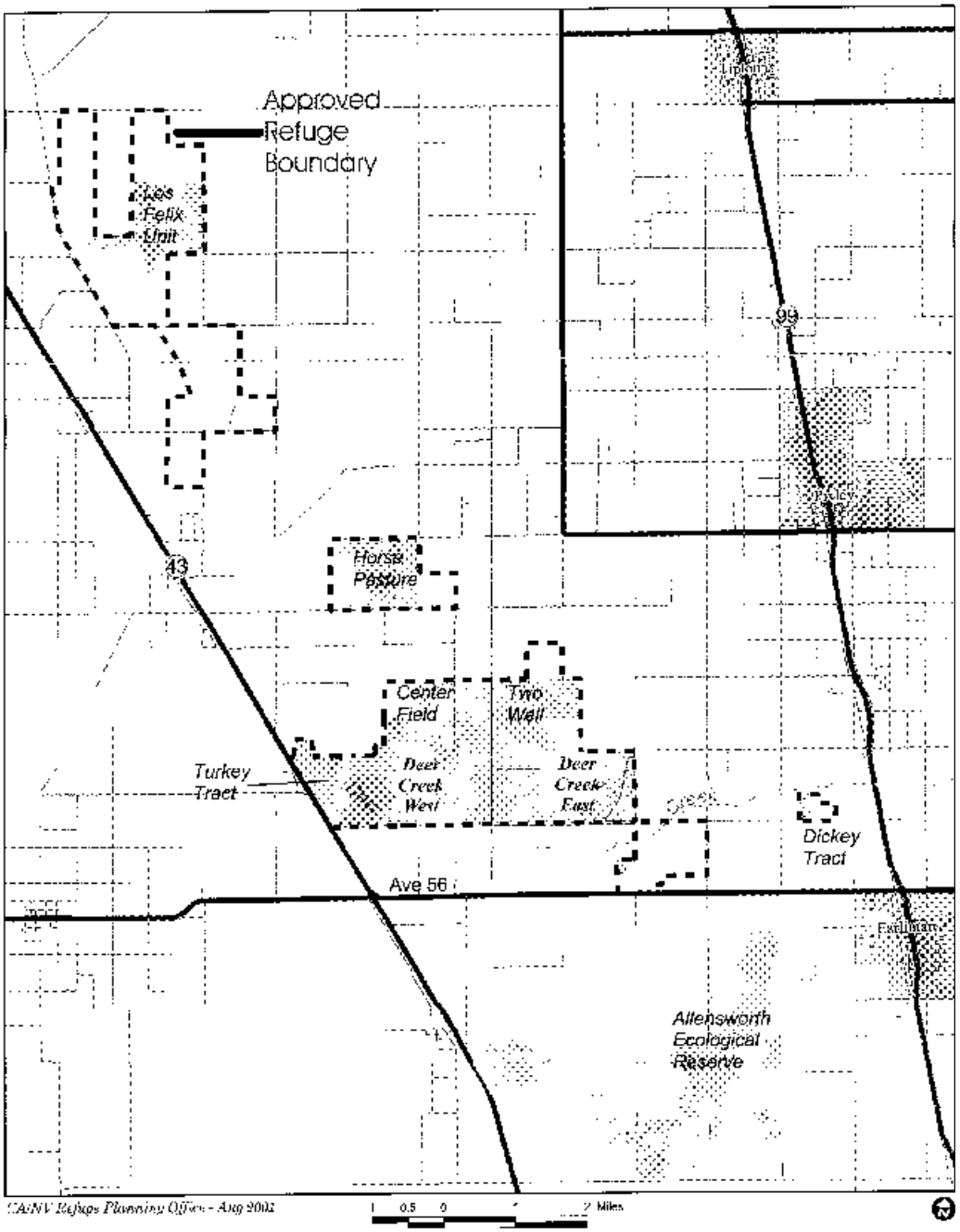
FISH AND WILDLIFE RESOURCES

The habitat provided by the Kern NWRC is critical to the welfare of a large number of bird, mammal, fish, herptofauna, and invertebrate species. Over 90 percent of the wetlands and 95 percent of the riparian habitat has been lost in the Central Valley of California. Nonetheless, over 60 percent of the waterfowl of the Pacific Flyway still winter in or migrate through the Central Valley. A large percentage of those birds utilize the Refuge Complex and the surrounding state and private lands each winter.

Avian groups that the Complex supports include waterfowl, waterbirds, shorebirds, wading birds, gulls, terns, and rails. Landbirds such as passerines, gamebirds, blackbirds, and raptors are also present at various times. The Complex supports a number of mammal, reptile, amphibian, and invertebrate species. Fish are present only intermittently on the Kern NWR when water is present in the wetlands. The only water at Pixley NWR comes from a deep well, therefore fish are absent.

An appended list contains wildlife species that have been documented at the Kern NWR Complex. An overview of wildlife use of the Complex follows.

Figure 3: Pixley NWR


Approved
Refuge
Boundary
Lee
Felix
Unit
99
43
Horse
Pasture
Center
Field
Two
Well
Deer
Creek
West
Deer
Creek
East
Turkey
Tract
Dickey
Tract
Ave 56
Allensworth
Ecological
Reserve
CANV Refuge Planning Office - Aug 2002
0.5
0
1
2 Miles

Avian Species
Over 200 species of birds have been recorded on the Complex. A list of all recorded species for the Complex is in Appendix C.

Waterfowl
Primary wildlife use in the wetland areas of the Complex is by wintering waterfowl. Wintering birds may be present from August through March. Peak mid-winter waterfowl populations on the Complex may exceed 100,000 ducks. If water is present, a small percentage of waterfowl may remain through the spring and early summer to nest. Common wintering ducks include the northern pintail, green-winged teal, cinnamon teal, mallard, American wigeon, gadwall, northern shoveler, redhead, canvasback, scaup, ringneck, bufflehead, and ruddy. Wintering geese that may be found on the Complex and number in the hundreds include the Canada goose, snow goose, Ross' goose, and white-fronted goose. Duck species that may remain and nest if water is available include the mallard, gadwall, cinnamon teal, pintail, redhead, and ruddy.

Shorebirds
Most shorebirds use the wetlands of the complex as a stopover for feeding and resting during their fall and spring migrations. Populations may peak in April when up to 20,000 birds use newly formed mudflats and shallow wetlands in the process of being drawn down. Some of the common species observed include western and least sandpipers, long-billed dowitcher, dunlin, greater yellowlegs, American avocet, black-necked stilt, long-billed curlew, whimbrel, common snipe, Wilson's phalarope, and black-bellied plover. The American avocet, black-necked stilt, and killdeer may remain to nest. The mountain plover sometimes uses the complex as part of its wintering range.

Wading/diving birds
Wading and diving birds typically use the Complex wetlands when water is available (September-April). The wetlands are used for foraging, cover, roosting, and nesting by many species. Great blue herons have maintained a small rookery (less than 50 nests) in the riparian area since 1998. Other species that use the Complex include great egrets, snowy egrets, cattle egrets, green-backed heron, black-crowned night heron, white-faced ibis (nesting in unit one since 1994), American bittern, least bittern, Virginia rail, sora rail, common moorhen, American coot, American white pelican, double-crested cormorant, pied-billed grebe, western grebe, eared grebe. From fall through spring, lesser sandhill cranes and small numbers of greater sandhill cranes forage and roost at the Pixley NWR.

Raptors
Raptor populations are higher during the winter when waterfowl numbers are high, thus providing a more substantial prey base. In winter raptors can be seen hunting from perches such as trees or flying low over the wetlands searching for prey. Raptors commonly seen in the winter include the red-tailed hawk, northern harrier, American kestrel, prairie falcon, black-shouldered kite, Cooper's hawk, sharp-shinned hawk, short-eared owl, ferruginous hawk, and rough-legged hawk. Other raptors that may be seen less frequently in the winter or during migration include the osprey, golden eagle, bald eagle, Swainson's hawk, red-shouldered hawk, merlin, and western screech owl. Raptors that may nest on the Complex include the black-shouldered kite, northern harrier, red-tailed hawk, American kestrel, common barn owl, great horned owl, and burrowing owl. Turkey vultures are occasionally seen in all seasons except winter.

Gamebirds
Pheasants and mourning doves can be found year-round. Pheasants are found in or near brushy cover and doves in the tree canopies. On rare occasions, small flock of California quail are sighted.

Gulls/terns
California and ring-billed gulls are common in the winter with immatures staying into the summer if water is available. Herring gulls are rarely seen in the winter. Caspian and Forster's terns are seen most frequently when habitat is available. Black terns are rarely seen, mostly during high water years.

Landbirds
The Refuge Complex provides habitat for a large number of both resident and migratory landbird species. Tri-colored blackbirds, redwinged blackbirds, and marsh wrens forage in uplands and wetlands, but nest in wetlands. Other species associated with wetlands that may nest here include the yellow-headed blackbird, Brewer's blackbird, brown-headed cowbird, cliff swallow, and barn swallow. Many of these species are year-round residents if habitat is available. Since the Complex dries up completely in mid-summer, many of these species use adjacent or nearby wet areas, canals and ditches. Species supported by wetland habitats that may breed here include Anna's hummingbird, horned lark, western meadowlark, American robin, northern mockingbird, loggerhead shrike, European starling, house sparrow, and sage sparrow. Other breeding species supported by these habitats that are not year-round residents include the western kingbird, Cassin's kingbird, cliff swallow, barn swallow, and northern oriole. Numerous other species have been recorded seasonally or as migrants that do not breed here but may use the riparian and upland habitats of the refuge complex.

Mammals
The refuge complex supports a variety of mammals year-round. Aquatic species include muskrats and an occasional beaver. The Buena Vista lake shrew has been found in riparian areas. Upland species include the coyote, San Joaquin kit fox, bobcat, long-tailed weasel, raccoon, spotted skunk, striped skunk, badger, black-tailed jack rabbit, and desert cottontail. Rodents found in the upland areas include the California ground squirrel, (old sightings) of the antelope ground squirrel, Botta's (valley) pocket gopher, Heermann's kangaroo rat, Tipton kangaroo rat, San Joaquin pocket mouse, deer mouse, western harvest mouse, California vole, house mouse, roof rat, and Norway rat. Opossums, a marsupial, are also present on the Complex. Mexican free-tailed bats are sometimes common in the spring in the shop area and the western mastiff bat has been confirmed on the complex.

Herptiles
Reptiles reside in upland and riparian areas of the complex and include the common garter snake, southwestern black-headed snake, California glossy snake, Pacific gopher snake, California (common) kingsnake, western long-nosed snake, coachwhip (San Joaquin whipsnake), and western (northern Pacific) rattlesnake. Lizards found on the complex include the blunt-nosed leopard lizard, western fenced lizard, California side-blotched lizard, western whiptail, and coast horned lizard. Occasionally a western pond turtle or a softshell turtle will be found in the complex. A Gilbert's skink was observed on the Pixley Refuge in June 2000. Amphibians present on the refuge include the bullfrog, Pacific treefrog, western (California) toad, and western (Pacific) spadefoot toad.

Fish
Fish cannot maintain viable populations on the Refuge Complex because the wetland units and canals are drained in the summer. Fish that come on the Kern NWR with delivered water primarily consist of carp, shad, catfish, striped bass, largemouth bass, and bullheads. As water in the units is drawn-off, the smaller fish fall prey to the birds and larger fish die due to lack of oxygen or lack of water.

Invertebrates
Invertebrates are an important food source for waterfowl, shorebirds, and other avian species in the wetland units of the Complex. There are at least seven species of midges on the Kern refuge. Other

common aquatic invertebrates include various species of flies, mosquitoes, dragonflies, damselflies, waterboatmen, beetles, clams, crayfish, and worms. Some of the more ephemeral ponds contain fairy shrimp. The uplands support numerous species of terrestrial insects. A partial list includes various species of butterflies, moths, grasshoppers, crickets, beetles, wasps, and flies among others.

THREATENED AND ENDANGERED SPECIES

The Kern NWR Complex contains three Federally listed threatened or endangered species: San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and blunt-nosed leopard lizard (*Gambelia sila*). All of these species are associated with upland habitats within the Complex.

The fire management program will be implemented in accordance with the Endangered Species Act of 1973 and will take appropriate action to identify and protect from adverse effects on any rare, threatened, or endangered species. A Section 7 was completed relevant to Threatened and Endangered Species in upland habitat (Appendix D).

VEGETATION

Kern National Wildlife Refuge Complex consists of 17,007 acres of marshes, uplands, and riparian areas. Because of the importance of Central Valley wetlands to Pacific Flyway waterfowl populations, marsh units receive the bulk of management actions and planning. The primary objective of this management is to provide a variety of successional stages and thus a diversity of plants in the marsh units.

Wetland units are divided into seasonal marshes and moist soil wetlands are outlined below.

$ Water is transported to seasonal marshes beginning in late August through October, and then is drained from late March to May. These wetlands are generally deeper than moist soil wetlands and shallower areas are dominated by hardstem bulrush, cattail, and alkali bulrush. Burhead is common in barrow ditches.

$ Water is transported to moist soil wetlands beginning in late August to October, and then is drained from late March to early May. Annual plants such as swamp timothy, sprangletop, and smartweed germinate on the exposed mudflats. Other plants common to seasonal wetlands include alkali and hardstem bulrush, cattail and several species of sedges.

Uplands on the Complex are dominated by introduced annual grasses including foxtail barley, brome, rye grass, rabbits foot, and soft chess. Some of the uplands also contain vernal pool areas. Dominant vernal pool plant species include alkali weed, cudweed, toad rush, mousetail, woolly marbles and annual grasses.

Riparian areas are typically dominated by willow and cottonwood and various grasses and shrubs.

SOILS AND TOPOGRAPHY

The Complex is located in the south central portion of the San Joaquin Valley. The area in and around the Kern NWR Complex is flat with minor ridges and swales in undeveloped areas. The historic Tulare Lake Basin lies within a few miles of the Kern NWR Complex. Within Basin there is dramatic relief as the upper limits of the drainage reach to some of the highest points in the continental United States. The foothills of both the coast range to the west and the Sierra Nevada range to the east start at about 600 feet msl. The relatively flat valley floor slopes fall gradually to the northwest, which is in accord with valley drainage. The highest point on the Kern NWR is 222 feet msl and the lowest elevation in 212 feet msl. The highest point on the Pixley NWR is 260 feet msl and the lowest point is 200 feet msl.

The soils on the Kern NWR are primarily Nahrub clay of Nahrub clay-Lethent silt loam moderately wet complex. Soils on the Pixley NWR consist primarily of Garces Complex: Garces clay loam and Garces fine sandy loam, and Lethent Complex: Lethent silt loam and Lethent silty clay loam or variations thereof.

WATER RESOURCES

Historically, in wet years, this portion of the southern San Joaquin Valley was a vast wetland. Since the construction of dams and water diversion structures, most of the area remains dry except for occasional floods or when the land is purposefully irrigated as part of agricultural practices or is flooded to create wildlife habitat.

Water on the Kern NWR is delivered from the California Aqueduct via the Goose Lake Canal that bisects the refuge into eastern and western halves. The delivery of water is coordinated through the local water district. The CVPIA will provide 25,000 acre feet of water annually when development of the refuge is complete. Water is moved through the refuge to seasonal and moist soil wetlands, and riparian habitat through manmade ditches, canals, and water control structures. Poso Creek terminates at the south-eastern corner of the refuge. In flood years, this creek carries flood water from snow melt in the Sierra Nevada Mountains to the refuge. Flooding occurs infrequently but may result in a significant amount of water entering the refuge.The Kern River Channel, located about 5 miles west of the Refuge is usually dry or has very little water.

Water for the wetlands of the Pixley NWR is provided by a deep well pump and then delivered underground to wetland units. Deer Creek, dry much of the time, carries flood water from the Sierra Nevada Mountains or is used as a water conveyance channel by the Pixley Irrigation District.

Fire may have short term impacts on the waterways and other surface water of the Kern and Pixley Refuges from the particulates produced (ash, dust, soil) and the resultant removal of cover vegetation. These effects would be of short duration and pose no major impact on the local waterways.

STRUCTURES AND FACILITIES

The Kern and Pixley NWR's have structures within the boundaries. These structures range from office buildings to houses. None of the structures are historic. At Kern NWR, structures are centralized around the Complex Headquarters (Figure 2). Only 3 structures are located at Pixley NWR, a storage structure, well, and interpretive sign. A complete list of structures within the Complex is located in the Appendix E.

Both refuges are bordered by private agricultural lands of mostly irrigated cropland and private duck-hunting clubs. Preventing the spread of wildland fire to/or from adjacent private lands provides for the safety of the general public and protection of private and public lands. Refuge maps with adjacent properties and owners are included in the Complex Fire Dispatch Plan (Appendix H).

CLIMATE

The climate is classified as Mediterranean, with wet and cool winters and hot and dry summers. Winter generally runs from mid-October through March. Rainfall is fairly well distributed through this time, occurring in steady but gentle two or three day storms. The annual average precipitation is 7 inches. Heavy fogs are common during the winter months, while thunderstorms, hail and snow are a rare occurrence. The mean annual temperature is 64.5EF with extremes of 118EF and 15EF. The south winds are the storm winds in the winter and the cooling winds in the summer. North winds are hot and dry and create the most hazardous wildland fire conditions.

WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

The period of high fire danger is from June through early November, based on information from BLM--Bakersfield District. Occasional fires have occurred from December thru May. Wildland fires have ranged from 0 to 45 acres, and prescribed fires range between 30 to 1000 acres. Most fires on the Complex have lasted no more than one burning period with containment usually being completed within a few hours of report.

Pre-settlement Fire History

These Refuges were primarily uplands prior to water management (i.e., the building of dams and canals) in the late-1800's. However, lightning fires were a periodic natural occurrence in the San Joaquin Valley grasslands, but are considered to be sporadic enough that no obvious fire-dependant plant community relationships have evolved.

Post Settlement Fire History

The recent fire history from 1980 is compiled from entries into the Shared Applications Computer System (SACS). Most wildland fires that occur each year are along roadways adjacent to Complex boundaries. Damage from these fires may have potential negative effects on resident or nesting wildlife, threatened and endangered species, and habitat depending on the time of year. Generally, damage is temporary and after one or two years, areas return to their original condition. The Kern NWRC wildland fire history is in Appendix F. The average acreage of wildland fires on the Complex is less than 5 acres/year.

Prescribed Fire History

Prescribed fire has been utilized since the 1980's as part of habitat management throughout the Complex. Fire is used based on its ability to produce desired habitat conditions to meet the specific needs of wildlife or reduce non-native plant species. Recent history of prescribed fire is listed in Appendix F and has averaged approximately one prescribed fire/year and 338 acres on Kern and 0.2 perscribe fires/year and 73 acres on Pixley.

RESPONSIBILITES

Principal members of theKern NWRC fire management organization are the Refuge Manager, Deputy Refuge Manager, Biologist, Zone Fire Management Officer, Lead Firefighter, and Seasonal and Collateral Duty Firefighters. Fire assignments are made on the basis of individual qualifications and position requirements.

Refuge Manager

- $ Responsible for the overall management of the Complex including the fire program.
- $ Ensure that Department, Service, and Complex policies are maintained and followed.
- $ Supervise the resource management activities of the Complex, working with the Complex Biologist in setting goals and objectives and selecting methods/actions to achieve them including prescribed fire.
- $ Review and approve prescribed burn plans for the Kern NWRC.

Deputy Refuge Manager

- $ Ensure that Department, Service, and Complex policies are maintained and followed.

- $ Supervise the resource management activities of the Complex, working with the Complex Biologist in setting goals and objectives and selecting methods/actions to achieve them including prescribed fire.
- $ Ensures that fire management objectives are incorporated into Complex management documents.
- $ Supervises and coordinates day-to-day operations of the fire crew.
- $ Review and recommend prescribed burn plans for approval.
- $ May serve as resource advisor for fire activities.
- $ Responsible for managing prescribed fire activities including coordinating annual prescribed fire program to meet management objectives.

Biologist

- $ Coordinates through Refuge Manager and Deputy Refuge Manger to provide biological input for the fire program with the FMO.
- $ Assists in design and implementation of fire effects monitoring, with FMO.

Zone Fire Management Officer

- $ Delegated the responsibility for coordination of the fire management program by the Refuge Manager.
- $ Prepares annual Fire Base budget request, tracks use of funding..
- $ Responsible for planning, coordinating, and directing Preparedness activities including:
- $ Fire training
- $ Physical fitness testing and Interagency Fire Qualification System and data entry.
- $ Coordinates with cooperative agencies. Revises agreements as necessary.
- $ Informs Complex staff of fire situation and potential.
- $ Maintains liaison with Regional Fire Management Coordinator and Cooperators.
- $ Annually updates the Fire Management Operations Plan, maintains fire records, and reviews completed DI-1202's for accuracy.
- $ Responsible for coordinating involvement with San Joaquin Valley Air Pollution Control District and Interagency Air and Smoke Council.
- $ what about prescribed fire responsibilities?

Lead Firefighter (Fire Operations)

- $ Leads the Complex Engine Crew
- $ Assists with planning, coordinating, and directing all Preparedness activities.
- $ Responsible for Fire cache and equipment inventory accountability, maintenance and operation.
- $ Assist with coordinating and directing suppression activities.
- $ Responsible for prescribed fire activities including:
- $ Ignition or holding leaders
- $ Monitors fire effects and other parameters as required.

Seasonal Firefighters and Collateral Duty Firefighters

- $ Maintain assigned fire equipment in ready state and use all safety gear assigned.
- $ Participate on fire assignments as firefighters (ignition, holding, and engine operation).

Incident Commander

Incident Commanders (of any level) use strategies and tactics as directed by the Complex Manager and WFSA where applicable to implement selected objectives on a particular incident. A specific Limited

Delegation of Authority (Appendix G) will be provided to each Incident Commander prior to assuming responsibility for an incident. Major duties of the Incident Commander are given in NWCG Fireline Handbook, including:

- Brief subordinates, direct their actions and provide work tools.
- Ensure that safety standards identified in the Fire Orders, the Watch Out Situations, and agency policies are followed at all times.
- Personally scout and communicate with others to be knowledgeable of fire conditions, fire weather, tactical progress, safety concerns and hazards, condition of personnel, and needs for additional resources.
- Order resources to implement the management objectives for the fire.
- Inform appropriate dispatch of current situation and expected needs.
- Coordinate mobilization and demobilization with dispatch and the Collateral FMO.
- Perform administrative duties; i.e., approving work hours, completing fire reports for command period, maintaining property accountability, providing or obtaining medical treatment, and evaluating performance of subordinates.
- Assure aviation safety is maintained to the highest standards.

INTERAGENCY OPERATIONS

Interagency contacts are established at the Federal, State, and local levels to provide the most efficient level of fire management operations. Agreements and Memorandum of Understandings (MOUs) should be established to foster guidelines for assistance from local cooperators. The MOU allows the responding agency to assume command of the incident until a representative of the Complex arrives to establish a unified command or assume responsibility for the incident if qualified. Depending on the time of year federal, state or local resources may perform initial attack for the refuges.

The Complex Dispatch Plan (Appendix H) contains the guidelines for a reported fire and the proper dispatching to effect a quick and orderly initial attack by the closest resources. Lost Hills Fire Department provides the closest resources to the Kern NWR and the Tulare County Fire Department provides the closest resources to the Pixley NWR. In addition, Kern County Fire Department and BLM–Bakersfield District may provide primary backup assistance to the Complex.

Agreements with the BLM and Tulare County have been established (Appendix I). An agreement between BLM and Kern County fire department provides for Kern county assistance on the Complex. Currently, no agreement exists between the Complex and Lost Hills Fire Department. However, negotiations will begin in the Fall of 2001.

On both refuges within the Complex, dialing 9-1-1 will provide the caller with direct tie-in to the fire department closest to the Refuge.

PROTECTION OF SENSITIVE RESOURCES

To protect the Refuges resources, mechanical line construction (dozers, discing) must be authorized by the Refuge Manager or their designate, unless human life and/or property are threatened. Sensitive areas, or areas containing threatened and endangered species, are designated in the Pre-Attack Plans located in each fire vehicle.

Prescribed burns will be conducted in wetlands (moist soil wetlands and seasonal marshes) only. Wetland habitat is not a preferred habitat for any of the listed species in the Complex.

In the event of wildland fires on the Complex, firebreaks, if required, will only be made on the tops of existing levee roads thereby minimizing any adverse affects fire containment activities would have on threatened and endangered species. As with any suppression operations, the Incident Commander has the authority to take any actions deemed necessary if fire threatens human life and/or property.

A Resource Advisor will be requested to an incident if sensitive resources are suspected to be in the area. In addition the Refuge Manager or their designate will also be assigned as the Agency Representative if outside firefighting resources are involved.

The Regional Archaeologist and/or his/her staff will work with fire staff, project leaders, and incident commanders to ensure that cultural resources are protected from fire and fire management activities. The "Request For Cultural Resource Compliance" form (RCRC, Appendix B) will be used to inform the Regional Archaeologist of impending prescribed fire activities, thereby meeting the regulations and directions governing the protection of cultural resources as outlined in Departmental Manual Part 519, National Historic Preservation Act (NHPA) of 1966, Code of Federal Regulations (36CFR800), the Archaeological Resources Protection Act of 1979, as amended, and the Archaeological and Historic Preservation Act of 1974. The NHPA Section 106 clearance will be followed for any fire management activity that may affect historic properties (cultural resources eligible to the National Register of Historic Places).

Impacts to archaeological resources by fire resources vary. The four basic sources of damage are (1) fire intensity, (2) duration of heat, (3) heat penetration into soil, and (4) suppression actions. Of the four, the most significant threat is from equipment during line construction for prescribed fires or wildfire holding actions (Anderson 1983).

The following actions will be taken to protect archaeological and cultural resources:

Wildland Fires

- $ Minimum impact fire suppression tactics will be used to the fullest extent possible.
- $ Resource Advisors will inform Fire Suppression personnel of any areas with cultural resources. The Resource advisor should contact the Regional Archaeologist and/or his/her staff for more detailed information.
- $ Foam will be limited in areas known to harbor surface artifacts.
- $ Mechanized equipment should not be used in areas of known cultural significance.
- $ The location of any sites discovered as the result of fire management activities will be reported to the Regional Archaeologist.
- $ Rehabilitation plans will address cultural resources impacts and will be submitted to the Regional Archaeologist using the RCRC.

Prescribed Fires

- $ The Refuge Fire staff will submit a completed RCRC to the Regional Archaeologist and/or his/her staff as soon as the burn area is identified (i.e., as soon as feasible).
- $ Upon receipt of the RCRC, the Regional Archaeologist and/or his/her staff will be responsible for consulting with the FMO and evaluating the potential for adverse impacts to cultural resources.
- $ When necessary, the Regional Archaeologist and/or his/her staff will coordinate with the State Historic Preservation Officer (SHPO). The SHPO has 30 days to respond. The Refuge will consider all SHPO recommendations.
- $ Mechanized equipment should not be used in areas of know cultural significance.

- The location of any sites discovered as the result of fire management activities will be reported to the Regional Archaeologist.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at the Kern NWRC. Program management includes: fire prevention, preparedness, emergency preparedness, fire behavior predictions, step-up staffing plan, fire detection, fire suppression, minimum impact suppression, minimum impact rehabilitation, and documentation.

All fires not classified as prescribed fires are wildland fires and will be appropriately suppressed in a prompt, safe, and cost-effective manner to produce fast, efficient action with minimum damage to resources using appropriate management strategies. All fire operations will be coordinated out of the Kern NWR. A mutual-aid program will be established for suppression operations on the Complex.

FIRE MANAGEMENT STRATEGIES

The following strategies will be employed to meet the fire management objectives:

- $ Suppress all wildland fires in a safe manner considering resources at risk.
- $ Minimum impact suppression tactics will be used.
- $ Conduct all fire management programs in a manner consistent with applicable laws, policies and regulations.
- $ Maintain an Initial Attack organization capable of suppressing wildland fires within the Complex. Initial Attack equipment and personnel shall maintain a minimum response time of one hour during the fire season.
- $ Establish and maintain Memorandum of Understandings with local, state and federal fire protection agencies to promote cooperative prevention, suppression, and prescribed fire activities. Provide assistance to local and federal cooperators under the "closest forces" concept in accordance with Service policy.
- $ Prepare and implement an effective fire prevention plan to minimize wildland fires, particularly those that may be started on Complex personnel performing their daily work during the fire season.

PREPAREDNESS

Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate response, as directed by the Fire Management Plan, can be carried out. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, dispatch (Initial attack, extended, and expanded), equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well-trained and equipped fire management organization to manage all fire situations within the Complex. Preparedness efforts are to be accomplished in the time frames outside the normal fire season dates. Fire prepardness planning is done on annual basis. This will ensure that all engines, fire cache, PPE, and training are identified and prepared for the fire season.

Historical Weather

The largest number of fires are in the summer season, which generally starts about June and runs through November, based on information from the BLM-- Bakersfield District. However, there is a potential for prescribed and wildland fires year-around. No historical data is available from a Complex NFDRS weather station. Roddy indicates that Carrizo weather station (#044914) should be used. He will help with this. Give him a call/ this can be done after the plan is signed.

Fire Prevention

An active fire prevention program will be conducted by employees in conjunction with other agencies to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of internal and external education regarding potential fire danger will be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs may be utilized to increase visitor and neighbor awareness of fire hazards. Trained employees need to relate to the public the beneficial effects of prescribed fires as opposed to unwanted human-caused fires, with emphasis on information, essential to understanding the potential severity of human-caused wildland fires and how to prevent them.

It is essential that employees be well informed about fire prevention and the objectives of the Complex's fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

During periods of extreme or prolonged fire danger emergency restrictions regarding Complex operations, or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators. Closures will be authorized by the Refuge Manager.

Staffing Priority Levels

Fire Danger calculations and adjectives are necessary on this refuge for communicating the fire danger and growth potential on a given day, and determining the precautions necessary when performing prescribed fire and field work. Staffing levels may also be used to augment the areas staffing levels with local cooperators such as the Bureau of Land Management and Lost Hills Fire Department.

The Central California Interagency Communications Center (CCICC) in Porterville calculates the BI and fire danger for NFDR area 525. Kern NWRC is within this fire danger rating area. The daily BI is obtained by either calling the CCICC at (559) 782-3120 ext. 701 or by listening to the daily fire weather forecasts on BLM standard frequency 1600 hours daily. Staffing levels are breakpoints in the historic level weather records from the Carrizo RAWS (WIMS ID #044916). These breakpoints are ranges in the BI with increasing fire danger. Staffing levels have been developed for the southern San Joaquin Valley region by the BLM Bakersfield District and are applicable for the Refuge. BI and NFDRS ratings are as follows: see the earlier note. Basically, need to be more explicit that we are following staffing guidelines of BLM, not calculating daily ourselves.

NFDRS	BI	Percentile
Very High	45	80th
Extreme	58	95th

During high visitor use, special events or fire activity there is a need to access the local fire weather. The San Joaquin Valley Fire Weather Office in Hanford CA is responsible for collecting and publishing the forecasted weather for the Central Valley. This forecast can be obtained by accessing their website at "http://www.fs.fed.us/r5/fire/south/fwx/index.html" or by calling CCICC.

The seasonal fire staff at Kern NWRC will use the NFDRS breakpoints to determine when staffing will be extended, repositioning of equipment and personnel on the Refuge, or in the local vicinity. A NFDRS rating of "extreme" would possibly require severity augmentation. All severity actions will follow FWS Fire Management Handbook direction which aids in providing guidance on when this type of action is warranted and the process for implementation.

Training

Departmental policy requires that all personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Kern NWRC will conform

strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Individual training needs will be identified in a training plan and will utilize Interagency training opportunities. Service policy sets training, qualification, and fitness standards for all fire positions. All fire personnel (full-time fire or collateral duty) will be provided with the training (classroom and on-the-job) required to meet Service fire position qualification standards for the positions they are expected to perform. All firefighters will be required to participate in an annual refresher to remain qualified. Refreshers will focus on local needs, fire shelter deployment, LCES, fire orders, and watch-out situations. On-the-job training is encouraged and will be conducted at the field level. Whenever appropriate, the use of fire qualification task books will be used to document fire experience of trainees. The FMO will coordinate fire training needs with those of other nearby refuges, cooperating agencies, and the RO/ CNO.

Personnel should be hired and prepared for the start of the fire season by June. All fire qualified employees are required to pass the mandatory fitness and training requirements prior to June or within two weeks of entering duty. Employees not meeting fitness and training requirements may assist in support capacities, but will not be permitted on the fireline. Personnel will not perform fire jobs they are not qualified for.

Engines are the primary initial attack resource on the Complex because of the predominance of areas with fine fuels and good vehicle access. All primary engines will be equipped with tools, firing devices, and water handling accessories. To ensure engine readiness all annual maintenance should be completed in the off season or at the latest by June. The Complex supports the development of individual Incident Command System (ICS) overhead personnel from among qualified and experienced Complex staff for assignment to overhead teams at the local, regional, and national level.

Supplies And Equipment

All dedicated fire equipment and supplies will located in the Fire Cache at the Kern NWR headquarters or assigned to individuals. The Lead Firefighter will be the cache manager. All equipment should be in a ready state and inventoried prior to the start of the fire season. The cache will be equipped for 3-5 persons. Equipment includes: hand tools, hose, fittings, personnel protective equipment, firing devices, ATVs.

All firefighters will be issued the required personal protective equipment to include: nomex pants and shirts, gloves, helmet and goggles, field harness with fire shelter, overnight pack, sleeping bag, headlamp and personal first aid kit.

Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel and equipment are made through the Sierra National Forest dispatch center.

DETECTION

There is currently no fire detection system other than personnel on site or visitor during normal work days. The Complex relies on neighbors, visitors, staff, and cooperators to detect and report fires. The Complex Fire Dispatch Plan (Appendix H) will be reviewed and updated annually. Copies will be kept at all Refuges, check stations and with local cooperators.

Initial attack of wildland fires at all refuges may be conducted by the Complex fire staff. Because of the geographic location of all the refuges many of the fires on the Complex are reported to 9-1-1 and the local

county dispatchers initiate suppression actions. For the Pixley NWR fires reported to 9-1-1 are dispatched through the Tulare County Fire Department while fires on the Kern NWR are dispatched through the Lost Hills Fire Station.

Fires on the Complex are reported to Complex staff and/or the Zone Fire Management Officer by the BLM–-Bakersfield Dispatch. The Complex will send a resource advisor to any suppression operations, as available.

The Fire Management Plan does not discriminate between human-caused and lightning caused fire. All wildland fires will be suppressed. However, detection shall include a determination of fire cause. Moreover, human-caused fires will require an investigation and report by law enforcement personnel. For serious human-caused fires, including those involving loss of life, a qualified arson investigator will be requested.

COMMUNICATIONS

Inter-Refuge: Cell phones and portable radios are the primary communications links while in the field. All fire fighters will have portable radios and supervisory fire fighters may also have cell phones. The Dispatch Plan (Appendix H) provides a list of phone numbers and radio frequencies. Radios will serve as the primary communication tool on fires, where available.

PRE-ATTACK PLAN

Pre-attack planning data will be reviewed annually by the fire staff. Pre-attack plans will include maps of each refuge, contact list (including phone numbers and radio frequencies), and maps of water sources. Pre-attack plans will be placed in each Engine, Fire Management Office, and at Complex Headquarters.

FIRE MANAGEMENT UNITS

Each of the refuges will be a separate Fire Management Unit (FMU) due to the distance between refuges. Suppression strategies, management restrictions, fuels, fire environment, and values art risk are similar for both Refuges.

Due to staff limitations, relatively small land management parcels, valuable resources, and values at risk on neighboring lands, this plan does not recommend wildland fire managed for resource benefit as an option for any of the units. Wildland fires will be suppressed using the appropriate suppression response. Prescribed fires will be used to reduce hazardous fuels and to meet resource management objectives.

Fire Effects on Vegetation

Burning removes accumulated residual fuels, thus reducing wildland fire potential. Fire itself could adversely affect the ecology of refuge grasslands and marshes by promoting pure stands of invader species. This would happen if conditions favored invader species (e.g., a hot fire during the growing season may destroy desired species). In mid August, before water is returned to the units, a wildland fire through dried wetlands may severely impact valuable waterfowl forage and endanger neighboring agricultural croplands.

Fire Effects on Wildlife

Generally, the direct impacts of fire on wildlife include disturbance, displacement, or injury/ mortality of individuals or groups of individuals, particularly slow moving and/or sedentary species and the eggs/young of ground nesting birds. Indirect impacts are more variable, depending on the species. The temporary alteration of habitat may reduce forage supplies and suitability of use for some species while increasing forage supply availability and suitability for use by other species. In general, the long term

results of fire on wildlife on upland habitats are positive due to the benefits of increased habitat quality and diversity. Fire within riparian corridors, although creating snags for cavity nesting species, would have an overall negative impact on species associated with that type of habitat for many years.

Threatened and endangered species may be impacted by a wildland fire in the uplands habitat. Any impacts to theses species from fire or fire suppression activities that are not covered in this FMP will require emergency Section 7 Consultations with Ecological Services of the Fish and Wildlife Service.

Fuel Types and Fire Behavior

The following behaviors are based on the average conditions found on the Complex in a normal fire season or mid-July averages for the 1400 hour weather. These averages include "maximum temp of 98 degrees F; 25% RH; mid-flame wind speed of 6 mph; and 4% average 1 hr (<1/4" diameter) dead fuel moisture. The slope is 0% to 2% and the rate of spread is for a head fire. The outputs are fromo BEHAVE - Fire Behavior Prediction Models based on the conditions above and for the major fuel models found within the Refuge Complex:

$ Fuel Model 1 - Upland, Vernal Pools, and Agricultural Cropland:
< Rate of Spread - 275 chains/hr (3.5 mph)
< Flame Length - 7.7 feet
$ Fuel Model 3 - Wetlands and Agricultural Cropland:
< Rate of Spread - 259 chains/hr (3.0 mph)
< Flame Length - 20.4 feet
$ Fuel Model 9 - Riparian Woodland:
< Rate of Spread - 22 chains/hr (0.2 mph)
< Flame Length - 4.8 feet

SUPPRESSION TACTICS

Wildland fires will be suppressed in a prompt, safe, and cost-effective manner to produce fast, efficient action with minimum damage to resources. Suppression involves a range of possible actions. All wildland fires will be suppressed.

Wildland fires should be contained using natural firebreaks, e.g. roads, levees, canals, etc. Heavy fire equipment should be kept on roads to prevent getting stuck. However, if the fire is heading towards private property or if any other situation exists that constitutes an immediate threat to human life or property, then immediate, total suppression efforts should be taken. Most Complex roads and canals should be maintained by mowing, grading, spraying, etc., to act as fire breaks in the event of a wildland fire.

There are no private inholdings or structures on lands owned and managed in the Kern Complex. Adjacent property surrounding the Refuge Complex is typically argriculture with dairy operations near the Pixley Refuge. Roads on private property adjacent to Complex lands are maintained by land owners and could serve as access routes to fires as well as fire breaks.

The majority of Service owned structures on the Complex are surrounded by a paved county road on one side and by refuge roads on the other three sides that are frequently used and seasonally maintained. These structures include the Complex compound (residences, headquarters, shop, equipment yard, etc.). Other structures include the research garage (wood and metal, Kern) and storage building (concrete block and metal, Pixley) and will be assessed for surrounding hazardous fuels. If needed, periodic maintenance will be conducted to remove any hazardous fuel build-up.

Priorities for protection include all Complex structures and could be accomplished using existing roads as access points and fire breaks as well as periodic hazardous fuel removal where needed.

There will be only one Incident Commander responsible to the Refuge Manager. The Incident Commander will designate all overhead positions on fires requiring extended attack. A sample Delegation of Authority is located in Appendix G.

Suppression Conditions
The Refuge Manager will ensure that a qualified Incident Commander is assigned for each fire occurring on the Complex. If a qualified IC is not available, one will be requested and a unified command will be established with a representative from the Complex.

The IC will be responsible for all aspects of the fire's management. The IC will select the appropriate suppression strategies and tactics. Minimum impact tactics will be used whenever possible. Unless threats to human life and/or property exist, dozers, plows, discs, or graders will not be used within the Complex boundaries without permission from the Refuge Manager or designate.

Mutual aid resources responding from local fire departments to Complex fires must meet federal fire qualifications as outlined in PMS 310-1 or National Fire Protection Association (NFPA) standards. The California State Fire Marshall's Office has issued standards for the State that meet or exceed PMS 310-1 standards. If true, state that the local and county Fd's meet state standards.

The IC will notify the Refuge Manager whenever it appears that a fire will exceed initial attack efforts, threaten Service/private lands, or when fire complexity will exceed the capabilities of command or operations. The Refuge Manager will be responsible for coordinating with the IC all extended attack actions including:

< completion and daily review of a WFSA (wildland fire situation analysis).
< assignment or ordering of appropriate resources.
< completion of Delegation of Authority if needed.

Wildland Fire Situation Analysis
For fires that cannot be contained in one burning period, a WFSA must be prepared. In the case of a wildland fire, the Refuge Manager, in conjunction with the FMO, will prepare the WFSA. Approval of the WFSA resides with the Refuge Manager. A sample WFSA is located in the Appendix J.

The purpose of the WFSA is to allow for a consideration of alternatives by which a fire may be controlled. Damages from the fire, suppression costs, safety, and the probable character of suppression actions are all important considerations.

Public safety will require coordination between all Complex staff and the IC. Notices should be posted to warn visitors, trails may be closed, traffic control will be necessary where smoke crosses roads, etc. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled. Every attempt will be made to utilize natural and constructed barriers, including changing fuel complexes, in the control of wildland fire. Rehabilitation efforts will concentrate on the damages done by suppression activities rather than on the burned area itself.

Aircraft Operations

Aircraft may be used in all phases of fire management operations. All aircraft must be Office of Aircraft Services (OAS) or Forest Service approved. An OAS Aviation Policy Department Manual will be provided by OAS.

Helicopters may be used for reconnaissance, aerial ignition, bucket drops and transportation of personnel and equipment. Natural helispots and parking lots are readily available in most cases. Clearing for new helispots should be avoided where possible. Improved helispots will be rehabilitated following the fire.

As in all fire management activities, safety is a primary consideration. Qualified aviation personnel will be assigned to all flight operations.

REHABILITATION AND RESTORATION

There are 2 types of fire rehabilitation, Suppression and Burn Area. Suppression rehabilitation is to restore and repair property and resources from direct suppression activity damage, i.e. cut fences, dozer lines, and campsites. Burn area rehabilitation and stabilization is to restore resources and property damaged or otherwise impacted from the fire, i.e. burned waterlines, denuded hill sides, etc.

In the event of a wildland fire, rehabilitation of fire suppression damage should be accomplished immediately. An appropriate time is within 7 days after the fire is controlled unless the regional fire coordinator grants an extension. Funding for suppression rehabilitation is from the specific fire cost account as established by the FMO. The Incident Commander as agreed to by the Project Leader or Refuge Manager will initiate suppression rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire. These actions may include:

Backfill control lines, scarify, and seed*.
Install water bars and construct drain dips on control lines to prevent erosion.
Restore natural ground contours, which were altered.
Remove all flagging, equipment and litter.
Completely restore camping areas and improved helispots.
Re-vegetation to restore sensitive impacted areas due to suppression actions*.

*If re-vegetation or seeding is necessary, only locally procured seeds of native plant species will be used.

A written suppression rehabilitation plan may be appropriate on larger incidents. Contractors or equipment may be hired to accomplish specialized work.

If Burned Area Emergency Stabilization and Rehabilitation is required to reduce the effects of a wildland fire, then the Refuge should request appropriate funding through the Burned Area Emergency Stabilization and Rehabilitation (ESR) fund. The Service representative at the National Interagency Fire Center administers the ESR fund. A rehabilitation and restoration survey, plan, and request must be prepared and submitted according to agency guidelines. Smaller incidents may only need simple plans prepared by refuge staff. Larger incidents with extensive rehabilitation efforts should employ a BAER Team. A BAER Team is composed of personnel who specialize in key disciplines of resource management and are experts in BAER Plan preparation. A formal request for a BAER Team should be made in consultation with the Incident Management Team as soon as it appears damage may be significant. Instructions for BAER Team mobilization can be found in the National Wildfire Coordinating Group mobilization guide. Delays in making a request may hinder funding approval and magnify the damage. Once a BAER Team is employed, the Project Leader or their representative should

provide guidance to the BAER team leader with expectations. The Project Leader, biologist, and FMO will review all BAER Plans. The final plan will be submitted to the Region for review prior to submission to the WO. Direction on BAER guidelines can be found in the Service Fire Management Handbook section 5.1.

REQUIRED REPORTING

The fire staff will complete all situation reports as soon as practical. The FMO and/or IC is responsible for ensuring completion of the DI-1202 Fire Report and Crew Time Reports for all personnel assigned to the fire, and return these documents to the Fire Program Clerk for entry into the DOI Computer (SACS). The FMO will ensure that all expenses and/or items lost on the fire are reported, that the timekeeper is advised of all fire time and premium pay to be charged to the fire and that expended supplies are replaced.

FIRE INVESTIGATION

Fire management personnel will attempt to locate and protect the probable point of origin and record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene and report findings to the fireline supervisor.

Prompt and efficient investigation of all suspicious fires will be carried out. However, fire management personnel should not question suspects or pursue the fire investigation unless they are currently law enforcement commission qualified. The Incident Commander, Refuge Manager, Deputy Refuge Manager, or Zone FMO may order a Fire Investigation.

PRESCRIBED FIRE ACTIVITIES

PRESCRIBED BURN PROGRAM OBJECTIVES

The Kern NWRC has been active with prescribed burning as part of the overall management of its resources. Prescribed fire has been an integral part of the resource management on the Complex since 1980. The prescribed fire activity is established and coordinated annually as part of the annual work plan between Refuge Managers, Biological staff, and Zone FMO. The planning allows for an annual target of 5-10% of the Complex's total acreage to be treated annually. The use of prescribed fire to remove excess vegetation in wetlands reduces the accumulation of dead fuels and creates open water and an emergent vegetation mosaic that provides for less intense fires and provides quality habitat desirable for many waterfowl, waterbird and other species.

Wetlands

Wetlands benefit by opening up overly dense stands of emergent vegetation or by managing tule. The results are found within the first year and are documented through the yearly bird use data.

Prescribed fire in wetlands removes accumulated vegetation, adds another environmental stress to the unwanted vegetation's rhizomes/root system and provides nutrients/minerals for desirable moist soil plants.

Cattle grazing may be incompatible with moist soil management on the Complex. Prescribed fire becomes even more important for use as a vegetation management tool in these settings since other methods are restricted. Fire is usually a better tool than grazing in wetland areas since it:

1. reduces woody, non-palatable, less nutritious, decadent plants more effectively than grazing.
2. produces ash deposits and increases pH and soil microbes in the ashbed postburn sites which cause a growth spurt in marsh plants and improves water quality.
3. promotes higher carbohydrates and protein contents in the new succulent growth.
4. Burning in winter and early springs produces earlier plant growth than spring season due to the black ash absorbing more heat than the surrounding area.
5. it can also be used in areas where it is difficult to control or accomplish grazing during the best time periods.

Prescribed fire in treated wetlands (i.e., mowed, disced) removes accumulated vegetation, adds another environmental stress to the unwanted vegetation's rhizomes/root systems and provides nutrients and mineral soil for desirable moist soil plants.

Uplands

Prescribed fires will not occur in uplands and wildland fires will be contained through the use of existing roads and levees.

Riparian Woodland

Little data exists as to the results of burning in these areas. However research is presently being conducted on the refuge or elsewhere? to see how these areas respond to burning under various conditions. Data from prescribed burns and wildland fires in Riparian zones show some impact to the areas. However, these areas start to recover within 1-2 years.

PRESCRIBED FIRE STRATEGIES

Specific management needs for the Complex as a whole and for specific areas will be determined annually. Specific burn objectives, firing methodology, and prescriptions will vary from year to year.

Burn plans will be updated to reflect any variations. The Refuge Manager will approve prescribed fire plans.

Prescribed fires involve the use of fire as a tool to achieve management objectives. Research burning may also be conducted when determined to be necessary for accomplishment of research project objectives. Actions included in the prescribed burn program include: the selection and prioritization of prescribed burns to be carried out during the year, prescribed burn plans, burn prescriptions, burn operations, documentation and reporting, and burn critiques.

Prescribed fire will be used, where appropriate, to reduce hazard fuel accumulation, restore native plant communities, enhance wildlife habitat, and to maintain cultural/historic scenes. All prescribed fire activity will comply with applicable Federal, state, and local air quality laws and regulations.

Fire is used to produce desired habitat conditions to meet the specific needs of the wildlife or reduce non-native plant species. Typical prescribed fire season begins in late-June when wetlands begin to dry out. Prescribed burning is conducted primarily to reduce marsh vegetation in seasonal wetlands so they may be rehabilitated prior to fall flood up.

Fire will reduce rank vegetation to allow discing, seeding, or other rehabilitation. A choked-up, non-productive marsh can be opened up for waterfowl food production.

1. Treatment Specifications
   a. Objective - Remove rank vegetation from marshes to produce soil, water, and vegetation benefits to improve habitat for waterfowl by creating open areas for feeding and access to loafing areas.
   b. Fire Behavior - Using Fuel Model 3, a slow backing fire with 2-3 foot flame lengths and/or higher intensity firing with 10-15 foot flame lengths should be used to consume the vegetation. Stable wind conditions and ample width fire breaks are essential to control in this fuel type.
   c. Environmental Conditions - Moisture of extinction for fuel model 3 is 23%. Air quality is determined by the San Joaquin Valley Air Pollution Control District.
2. Treatment Strategy
   a. Pre-burn Preparation - Area will be drawn down (de-watered) in the early-summer. Fire break of at least 20', double disced around burn.
   b. Ignition Technique - Backing fire to create secure flanks. Ring (circular) fires the perimeter and create center fire concurrently.
   c. Ignition Methods - Drip torch, Terra -Torch, helicopter with Plastic Sphere Dispenser.
   d. Firing Pattern - Begin backing fire along fire break. As fire progresses in the marsh, continue flanking fires along the fire breaks. Fire incendiary devices into the middle to create center fire. If there are dry slough channels void of flammable vegetation, personnel could light along the sides of channels to create center fire. Center fire could also be started with helicopter with Plastic Sphere Dispenser.
3. Pre-burn Monitoring will be accomplished by photo points, transects, and/or ocular reconnaissance of species composition and vigor.

PRESCRIBED FIRE PLANNING

The climate and air quality of the San Joaquin Valley as well as the diverse vegetation combined with habitat management objectives allows for prescribed burning to be conducted at any time of the year. However, most burning occurs from July through September.

The FMO will assign a burn boss of the appropriate level to implement the burn. The burn boss will follow all guidelines and procedures that are contained in the Prescribed Fire Plan.

Complex personnel will meet or exceed standard and qualification requirements as outlined in USFWS Fire Management Handbook and Interagency prescribed fire qualification (NWCG publication 310-1). The Refuge Manager shall delegate to the FMO or Burn Boss responsibility for ensuring that Refuge personnel maintain the qualifications necessary to implement the growing fire program.

When all prescription criteria are within the acceptable range, the Prescribed Burn Boss will select an ignition time based on current and predicted weather forecasts. A thorough briefing will be given by the Prescribed Burn Boss and specific assignments and placement of personnel will be discussed. An updated spot weather forecast will be obtained on the day of ignition and all prescription elements will be rechecked to determine if all elements are still within the approved ranges. If all prescription elements are met, a test fire will be ignited to determine on-site fire behavior conditions as affected by current weather. If conditions are not satisfactory, the test fire will be suppressed and the burn will be rescheduled. If conditions are satisfactory the burn will continue as planned.

A qualified Incident Commander Type III will be available within a one hour response REALLY? in the event of an escaped prescribed burn. If the prescribed burn escapes the predetermined burn area, all further ignition will be halted except as needed for suppression efforts. Suppression efforts will be initiated, as discussed in the pre-burn briefing. The FMO will be notified immediately of any control actions on a prescribed burn. If the burn exceeds the initial suppression efforts, the burn will be declared a wildland fire and suppressed using guidelines established in this plan. A WFSA will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local cooperating agencies via the servicing dispatch. A management overhead team may be requested to assume command of the fire.

ANNUAL ACTIVITIES

The FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary, personnel utilized, and fire effects.

Prescribed fire planning begins with annual work plan meetings held during February. Refuge Managers, Refuge Biologist and staff, and FMO discuss the year's project workload and discuss prescribed burn needs. The fire staff then determines if prescribed fire can be utilized to meet the treatment objectives requested by the biologist. If the FMO feels the treatment objectives can be met prescribed burn planning can begin. The first step will be for the requesting staff to complete a Central Valley Eco-Region Prescribed Fire Request Form (Appendix K). This form needs to be completed at least 2 months prior to an expected burn day. Providing the information on the form to the FMO allows for the review of the smoke management plan by the San Joaquin Valley Air Pollution Control Distsrict, interagency coordination to be conducted and adequate preparation of the burn.

Annual permits for agricultural burning must be obtained by January 1 of each year. The fee structure is currently being revised at this time. Permits for the Kern NWRC are obtained through:

San Joaquin Valley Unified Air Pollution Control District
2700 M Street, Suite 275
Bakersfield, CA 93301
661-326-6949

Prescribed Burn Plan

All prescribed fire projects will have a burn plan approved by the Refuge Manager. Each burn plan will be prepared using a systematic decision-making process. It will contain both measurable objectives and predetermined prescriptions and will be based on an approved environmental compliance document. Appropriate NEPA documentation (Appendix D) exists for this Fire Management Plan. Therefore, additional NEPA documentation will be necessary only for prescribed fire projects not meeting the criteria outlined in this Plan. Section7?

Prescribed Fire Burn Plans must include components such as a GO/ No-Go Checklist, contingency actions to be taken in the event the prescription is exceeded, and the need for alerting neighbors and appropriate public officials to the timing and the planning of the burn. A burn plan format meeting all required needs is located in Appendix L.

Individual prescribed burn plans will be the primary document used to record prescribed fire information. Burn plans document air quality requirements, personnel, costs, fire behavior, weather, fire summary and burn critique information. Prescribed burns will also be documented on DI-1202 forms and entered into the DOI Shared Application Computer System (SACS).

The Prescribed Burn Boss will conduct a field reconnaissance of the proposed burn location with the FMO, biologist, and/or Refuge Manager to discuss objectives, special concerns, and gather all necessary information to write the burn plan. After completing the reconnaissance, the Prescribed Burn Boss will write the prescribed burn plan.

All prescribed fires will have prescribed burn plans. The prescribed burn plan is a site specific action plan describing the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined. No burn will be ignited unless all prescriptions of the plan are met. Fires not within those parameters will be suppressed. Prescribed Burn Plans will follow the format contained in the Appendix L. Each burn plan will be reviewed by the Refuge Manager, Biologist, FMO, and Burn Boss. The Refuge Manager has the authority to approve the burn plan. The term “burn unit” refers to a specific tract of land to which a prescribed burn plan applies to.

Monitoring And Evaluation

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on Complex resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored after a fire. This information will be very useful in fine-tuning the prescribed burn program.

Monitoring may assist managers in documenting success in achieving overall resource objectives and limiting occurrence of undesired effects. Fire monitoring will be used to evaluate the degree to which specific burn objectives are accomplished. Wetland burns will be evaluated by documenting the response of desirable plant species (swamp timothy, smartweed, millet) used by waterfowl and by the reduction of cattail and roundstem. Upland burns will be evaluated by the species composition changes and response of the native grasses and forbs. Data on fire intensity and fire coverage over the area to be burned will be collected on all prescribed fires implemented.

Monitoring and evaluation are part of the prescribed fire process. Pre-burn evaluations use photo points or general photos, gross visual species composition and vigor and, if requested, plots. Burn day evaluations document temperature, relative humidity, windspeed, fine fuel moisture, rate of spread, flame length, smoke dispersal, objectives, and % scorch of woody species.

During prescribed burning, monitoring should include mapping, weather, site and fuel measurements and direct observation of fire characteristics such as flame length, rate of spread and fire intensity. Operational monitoring provides a check to insure that the fire remains in prescription and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

All fires may be monitored regardless of size. The FMO will establish specific fire information guidelines for each fire to update intelligence about the fire. Highest priority for monitoring will be assigned to large fires or fires which threaten to leave the Complex.

Required Reports
All prescribed burn forms will be completed as outlined by the Prescribed Burn Boss. A monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and after the burn. All records will be archived in the Complex's fire records for future use and reference.

The Prescribed Burn Boss will prepare a final report on the prescribed burn. Information will include a narrative of the burn operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

Prescribed Burn Critique
Prescribed fires will be critiqued by the burn boss and documented in the burn plan. The FMO and Refuge Manager will conduct a formal critique if:

< significant injury/accident.
< an escape prescribed fire occurs.
< Significant safety concerns are raised.
< smoke management problems occurs.

AIR QUALITY / SMOKE MANAGEMENT GUIDELINES

Visibility and clean air are primary natural resource values. The protection of these resources must be given full consideration in fire management planning and operations. In addition, smoke management can have serious health and safety effects which must be considered during the planning and approval process.

Smoke management is a concern in the Central Valley of California. When air quality is poor, no burn days are declared by the San Joaquin Valley Air Pollution Control District in Fresno. Wildlife habitat improvement burns are restricted to the hours of 10 a.m. to 5 p.m. and all fires are to be extinguished by sunset. Early morning and late afternoon fires tend to lay down and produce greater volumes of smoke that is prolonged due to more stable atmospheric conditions. If smoke on a public road is anticipated, the California Highway Patrol should be notified. Prior to a large burn (especially marsh/tule burns where a lot of black smoke will be produced), a public notice should be placed in local newspapers to avoid unnecessary public concern.

All prescribed burns must comply with the State of California Air Quality Regulations for Burning (CCR Title 17, Sub-chapter 2. “Smoke Management Guidelines for Agricultural and Prescribed Burning”), and local implementation plans. All burn projects are required to have an annual permit from the San Joaquin Valley Air Pollution Control District (Appendix K). Projects must be submitted for review of the smoke management plan portion of the burn plan to the District at least 30 days in advance of the proposed burn date.

The management of smoke will be incorporated into the planning of prescribed fires, and, to the extent possible, in the suppression of wildland fires. Sensitive areas will be identified and precautions will be taken to safeguard visitors and Complex neighbors. When burning is done adjacent to roads and highways, close attention will kept on wind conditions to prevent a driving hazard. There will be no hesitance to postpone a burn when the wind conditions are questionable.

FIRE RESEARCH

The effects of fire upon the Complex's plant and animal population needs to be better understood. Through applied research and careful application of fire, data collected can provide managers with a better understanding of the natural ecological effects of fire, and the information needed to refine prescriptions to meet resource objectives.

Fire behavior will be collected on all fires occurring on Complex lands, monitoring will comply with accepted scientific methods. These data, along with information gathered through research studies, will be used to improve the effectiveness of the fire management program.

PUBLIC SAFETY

Firefighter and public safety will always take precedence over property and resource protection during any fire management activity.

The greatest threat to public safety from Complex wildland fires or escaped prescribed burns is entrapment by extremely fast moving fire fronts or fingers. Of particular concern are hunters, visitors, or special use permitees who may be present in the area of the fire, and neighbors who initiate their own suppression actions without proper training, equipment, or communications.

Another concern is for fires which might escape from Complex lands and spread to inhabited private property. The IC is responsible for warning and evacuating the public from potentially dangerous wildland fires.

PUBLIC INFORMATION AND EDUCATION

Educating the public on the value of fire as a natural process is important to increasing public understanding and support for the fire management program. The Complex may use the most appropriate and effective means to explain the overall fire and smoke management program. This may include supplemental handouts, signing, personal contacts, auto tour routes, or media releases. When deemed necessary, interpretive presentations may address the fire management program and explain the role of fire in the environment.

The public information program may be developed as follows:

- Concepts of the prescribed burn program may be incorporated, as appropriate, in publications, brochures, and handouts.
- During periods when prescribed burns are ignited, handouts may be prepared and distributed to all visitors entering areas of fire activity.
- The fire management program may be incorporated into visitor contacts. Particular attention may be given when fires are conspicuous from roads or visitor use areas.
- News releases may be distributed to the media as appropriate.
- The public information outlets of neighboring and cooperating agencies and the regional office may be provided with all fire management information.
- The fire management program may be discussed in informal talks with all employees, volunteers, residents, and neighbors.

Prior to the lighting of any planned ignition, information may be made available to visitors, local residents, and/or the press about what is scheduled to happen and why. On-site information may be provided to alleviate visitor concern about the apparent destruction of resources by fire or the impairment of views due to temporary smoke. This information may include prescribed burn objectives and control techniques, current fire location and behavior, effects caused by the fire, impacts on private and public facilities and services, and restrictions and closures.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger.

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUES

Fire reviews will be documented and filed with the final fire report. The FMO will retain a copy for the Complex files.

ANNUAL FIRE SUMMARY REPORT

The FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary (prescribed burns and wildland fires), personnel utilized, and fire effects.

ANNUAL FIRE MANAGEMENT PLAN REVIEW

The Fire Management Plan will be reviewed annually. Necessary updates or changes will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Refuge Manager to determine if such alterations warrant a re-approval of the plan.

CONSULTATION AND COORDINATION

The following agencies, organizations and/or individuals were consulted in preparing this plan.

Jack Allen, Wildlife Biologist, Kern NWRC, Delano, CA

Roddy Baumann, Prescribed Fire Specialist, Pacific Region, USFWS, Portland, OR.

Richard Hadley, Assistant Refuge Supervisor, California/ Nevada Operations, Sacramento, CA.

Amanda McAdams, Fire Planner, Pacific Region, USFWS, Portland, OR.

Michael Ritter, Deputy Refuge Manager, Kern NWRC, Delano, CA

APPENDICES

APPENDIX A: DEFINITIONS

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director, Regional Director, Park Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

Appropriate Management Action. Specific actions taken to implement a management strategy.

Appropriate Management Response. Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Appropriate Management Strategy. A plan or direction selected by an agency administrator which guide wildland fire management actions intended to meet protection and fire use objectives.

Appropriate Suppression. Selecting and implementing a prudent suppression option to avoid unacceptable impacts and provide for cost-effective action.

Bureau. Bureaus, offices or services of the Department.

Class of Fire (as to size of wildland fires):
Class A - 3 acre or less.
Class B - more than 3 but less than 10 acres.
Class C - 10 acres to 100 acres.
Class D - 100 to 300 acres.
Class E - 300 to 1,000 acres.
Class F - 1,000 to 5,000 acres.
Class G - 5,000 acres or more.

Emergency Fire Rehabilitation/Burned Area Emergency Rehabilitation (EFR/BAER). Emergency actions taken during or after wildland fire to stabilize and prevent unacceptable resource degradation or to minimize threats to life or property resulting from the fire. The scope of EFR/BAER projects are unplanned and unpredictable requiring funding on short notice.

Energy Release Component (ERC) A number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effect on fuels. The ERC incorporates thousand hour dead fuel moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

Extended attack. A fire on which initial attack forces are reinforced by additional forces.

Fire Suppression Activity Damage. The damage to lands, resources and facilities directly attributable to the fire suppression effort or activities, including: dozer lines, camps and staging areas, facilities (fences, buildings, bridges, etc.), handlines, and roads.

Fire effects. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

Fire intensity. The amount of heat produced by a fire. Usually compared by reference to the length of the flames.

Fire management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use fire under prescribed conditions to achieve land and resource management objectives.

Fire Management Plan. A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

Fire prescription. A written direction for the use of fire to treat a specific piece of land, including limits and conditions of temperature, humidity, wind direction and speed, fuel moisture, soil moisture, etc., under which a fire will be allowed to burn, generally expressed as acceptable range of the various fire-related indices, and the limit of the area to be burned.

Fuels. Materials that are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

Fuel loadings. Amount of burnable fuel on a site, usually given as tons/acre.

Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, or to permit the spread of wildland fires across administrative boundaries except as authorized by agreement.

Initial Attack. An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Maintenance burn. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

Natural fire. A fire of natural origin, caused by lightning or volcanic activity.

NFDRS Fuel Model. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the US Forest Service and are general in nature rather than site specific.

NFFL Fuel Model. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by US Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

Prescription. Measurable criteria which guide selection of appropriate management response and actions. Prescription criteria may include safety, public health, environmental, geographic, administrative, social, or legal considerations.

Prescribed Fire. A fire ignited by agency personnel in accord with an approved plan and under prescribed conditions, designed to achieve measurable resource management objectives. Such a fire is designed to produce the intensities and rates of spread needed to achieve one or more planned benefits to natural resources as defined in objectives. Its purpose is to employ fire scientifically to realize maximize net benefits at minimum impact and acceptable cost. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition. NEPA requirements can be met at the land use or fire management planning level.

Preparedness. Actions taken seasonally in preparation to suppress wildland fires, consisting of hiring and training personnel, making ready vehicles, equipment, and facilities, acquiring supplies, and updating agreements and contracts.

Prevention Activities directed at reducing the number or the intensity of fires that occur, primarily by reducing the risk of human-caused fires.

Rehabilitation (1) Actions to limit the adverse effects of suppression on soils, watershed, or other values, or (2) actions to mitigate adverse effects of a wildland fire on the vegetation-soil complex, watershed, and other damages.

Suppression. A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Unplanned ignition. A natural fire that is permitted to burn under specific conditions, in certain locations, to achieve defined resource objectives.

Wildfire. An unwanted wildland fire.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA). A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria.

Wildland/urban interface fire A wildland fire that threatens or involves structures.

APPENDIX B: REQUEST FOR CULTURAL RESOURCE COMPLIANCE

REQUEST FOR CULTURAL RESOURCE COMPLIANCE

U.S. Fish and Wildlife Service, Region 1

Project Name:					**Program:** (Partners, Refuges, JITW, WSECP, etc.)	
State: CA, ID, HI, NV, OR, WA		**EcoRegion:** CBE, IPE,KCE, NCE			**FWS Unit:** **Org Code:**	
Project Location:	**County**	**Township**	**Range**	**Section**	**FWS Contact:** Name, Tel#, Address	
USGS Quad:					**Date of Request:**	
Total project acres/linear ft/m:		**APE Acres / linear ft/m (if different)**			**Proposed Project Start Date:**	

MAPS Attached	**Check below**		
Copy of portion of USGS Quad with project area marked clearly **(required)**			Project (sketch) map showing Area of Potential Effect with locations of specific ground altering activities **(required)**
Photocopy of aerial photo showing location **(if available)**			Any other project plans, photographs, or drawings that may help CRT in making determination **(if available)**

Directions to Project: (if not obvious)	
Description of Undertaking:	Describe proposed project and means to facilitate (e.g., provide funds to revegetate 1 mile of riparian habitat, restore 250 acres of seasonal wetlands, and construct a 5-acre permanent pond). How is the project designed (e.g., install 2 miles of fence and create approximately 25' of 3' high check dam)?

					Area of Potential Effects (APE):	Describe where disturbance of the ground will occur. What are the dimensions of the area to be disturbed? How deep will you excavate? How far apart are fenceposts? What method are you using to plant vegetation? Where will fill be obtained? Where will soil be dumped? What tools or equipment will be used? Are you replacing or repairing a structure? Will you be moving dirt in a relatively undisturbed area? Will the project reach below or beyond the limits of prior land disturbance? Differentiate between areas slated for earth movement vs. areas to be inundated only. Is the area to be inundated different from the area inundated today, in the recent past, or under natural conditions? Provide acres and/or linear ft/m for all elements of the project.
Environmental and Cultural Setting:	Briefly describe the environmental setting of the APE. **A)** What was the natural habitat prior to modifications, reclamation, agriculture, settlement? **B)** What is land-use history? When was it first settled, modified? How deep has it been cultivated, grazed, etc.? **C)** What is land use and habitat today? What natural agents (e.g., sedimentation, vegetation, inundation) or cultural agents (e.g., cultivation) might affect the ability to discover cultural resources? **D)** Do you (or does anybody else) know of cultural resources in or near the project area?					

BIRD LIST

Symbols
a - abundant
c - common
u - uncommon
o - occasional
r - rare
x - accidental
I - Introduced
* - species that nest on the Refuge

	Spring	Summer	Fall	Winter
GREBES				
Pied-billed Grebe*	c	c	c	c
Horned Grebe	x	-	x	r
Eared Grebe*	c	o	c	c
Western Grebe*	o	o	o	u
Clark's Grebe*	o	o	o	u
PELICANS & CORMORANTS				
American White Pelican	o	r	o	o
Double-crested Cormorant	u	o	u	u

BITTERNS, HERONS & EGRETS				
American Bittern*	u	r	u	o
Least Bittern	o	r	r	o
Great Blue Heron*	c	c	c	c
Great Egret	c	u	c	u
Little Blue Heron	-	-	-	-
Snowy Egret*	c	c	u	u
Cattle Egret*	u	u	u	u
Green Heron	u	u	u	u
Black-crowned Night-Heron*	c	c	c	c
VULTURES				
Turkey Vulture	o	o	o	r
IBIS & SPOONBILL				
White-faced Ibis*	c	c	u	o

	Spring	**Summer**	**Fall**	**Winter**

WATERFOWL				
Fulvous Whistling Duck	x	x	x	x
Tundra Swan	-	-	-	r
Greater White-fronted Goose	o	-	o	o
Snow Goose	o	-	o	o
Ross' Goose	-	-	r	r
Brant	x	-	-	x
Canada Goose	u	r	u	u
Wood Duck	u	-	u	u
Green-winged Teal*	c	c	a	a
Mallard*	c	c	a	a
Northern Pintail*	a	c	a	a
Blue-winged Teal*	o	o	o	o
Cinnamon Teal*	a	c	o	c
Northern Shoveler*	a	u	a	a
Gadwall*	a	c	a	a
Eurasian Wigeon	-	-	-	x
American Wigeon*	a	o	a	a
Canvasback*	o	r	0	o
Redhead*	u	o	u	u
Ring-necked Duck*	u	r	u	c
Greater Scaup	x	-	x	x
Lesser Scaup	-	o	o	o
Common Goldeneye	r	-	r	r
Barrow's Goldeneye	-	-	-	x
Bufflehead	u	-	u	u
Hooded Merganser	-	-	r	r
Common Merganser	o	-	o	o
Red-breasted Merganser	x	-	-	-
Ruddy Duck*	c	c	c	c
OSPREY, KITES, EAGLES & HAWKS				
Osprey	r	-	r	r
White-tailed Kite*	c	c	c	o
Bald Eagle	-	-	-	r
Northern Harrier*	a	c	a	a
Sharp-shinned Hawk	c	c	c	c
Cooper's Hawk	u	u	u	u
Red-shouldered Hawk	r	-	r	r
Swainson's Hawk	r	-	r	-
Red-tailed Hawk*	c	u	a	a
Ferruginous Hawk	o	-	o	o
Rough-legged Hawk	r	-	r	r
Golden Eagle	o	r	o	o
FALCONS				
American Kestrel*	c	c	c	c
Merlin	r	-	r	r
Peregrine Falcon	o	o	o	o
Prairie Falcon	o	o	o	o

	Spring	**Summer**	**Fall**	**Winter**
GALLINACEOUS BIRDS				
Ring-necked Pheasent (I)*	a	a	a	a
California Quail	r	r	r	r
RAILS				
Virginia Rail*	u	u	u	u
Sora Rail*	o	u	c	c
Common Moorhen*	a	r	c	c
American Coot*	u	o	a	a

CRANES				
Sandhill Crane	r	-	r	r
PLOVERS				
Black-bellied Plover	u	-	u	o
Snowy Plover	o	-	-	-
Semipalmated Plover	o	-	o	o
Killdeer*	a	a	a	a
Mountain Plover	o	-	u	u
STILTS & AVOCETS				
Black-necked Stilt*	a	a	c	c
American Avocet*	a	a	a	r
SHOREBIRDS				
Greater Yellowlegs	c	-	c	c
Lesser Yellowlegs	o	-	o	o
Solitary Sandpiper	r	-	-	-
Willet	o	-	o	o
Wandering Tattler	-	-	x	-
Spotted Sandpiper	u	-	o	o
Whimbrel	o	-	o	-
Long-billed Curlew	u	o	u	c
Marbled Godwit	o	-	o	-
Ruddy Turnstone	r	-	-	-
Red Knot	-	r	r	-
Semipalmated Sandpiper	x	-	-	-
Western Sandpiper	a	o	a	o
Least Sandpiper	c	o	a	c
Pectoral Sandpiper	-	-	o	-
Sharp-tailed Sandpiper	x	-	-	-
Dunlin	c	-	u	o
Short-billed Dowitcher	u	o	u	o
Long-billed Dowitcher	a	c	a	a
Stilt Sandpiper	x	-	r	-
SNIPE				
Common Snipe	c	o	c	c
PHALAROPES				
Wilson's Phalarope	u	o	u	-
Red-necked Phalarope	u	-	u	-
	Spring	**Summer**	**Fall**	**Winter**
GULLS & TERNS				
Bonaparte's Gull	o	o	-	-
Ring-billed Gull	o	c	c	c
California Gull	c	o	o	c
Herring Gull	r	r	r	r
Caspian Tern*	o	o	o	o
Forster's Tern	c	c	u	u
Least Tern	-	x	-	-
Black Tern	r	r	-	-
Common Tern	-	-	r	-
DOVES				
Rock Dove (I)	o	o	o	o
Mourning dove*	c	a	a	a
CUCKOOS				
Greater Roadrunner	c	c	c	c

OWLS				
Barn Owl*	c	c	c	c
Western Screech-Owl	o	o	o	o
Great Horned Owl*	u	u	u	u
Burrowing Owl*	c	c	c	c
Short-eared Owl*	u	u	o	o
Long-eared Owl*	-	o	-	-
GOATSUCKERS				
Lesser Nighthawk	c	c	o	-
Common Poorwill	-	u	-	-
SWIFTS				
Vaux's Swift	o	-	o	-
HUMMINGBIRDS				
Black-chinned Hunningbird	u	c	u	-
Costa's Hunningbird	-	-	-	r
Anna's Hunningbird*	c	c	c	c
Rufous Hummingbird	o	-	o	-
KINGFISHERS				
Belted Kingfisher	u	-	u	u
WOODPECKERS				
Acorn Woodpecker	o	o	o	-
Nuttal's Woodpecker	o	-	o	o
Downy Woodpecker	-	-	u	u
Northern Flicker	c	o	c	c
	Spring	**Summer**	**Fall**	**Winter**
FLYCATCHERS				
Olive-sided Flycatcher	o	o	-	-
Wester Wood-Pewee	c	-	u	-
Willow Flycatcher	-	o	-	-
Hammand's Flycatcher	u	-	o	-
Dusky Flycatcher	o	-	-	-
Gray Flycatcher	r	-	r	-
Pacific Slope Flycatcher	u	-	u	-
Black Phoebe	u	u	c	c
Say's Phoebe	u	o	u	u
Vermilion Flycatcher	x	-	x	x
Ash-throated Flycatcher	u	-	u	-
Western Kingbird*	c	c	c	-
LARKS				
Horned Lark*	c	c	c	c
SWALLOWS				
Tree Swallow	c	u	a	o
Violet-green Swallow	u	-	u	-
Northern Rough-winged Swallow	u	-	u	-
Bank Swallow	o	o	-	-
Cliff Swallow*	a	a	o	-
Barn Swallow*	c	c	u	-
JAYS, MAGPIES & CROWS				
Clark's Nutcracker	-	-	x	-
American Crow	o	o	o	o
Common Raven*	c	c	c	c

WRENS				
Rock Wren	-	-	r	r
Bewick's Wren	-	-	o	o
House Wren	o	-	o	o
Marsh Wren	a	a	a	a
KINGLETS, BLUEBIRDS & THRUSHES				
Golden-crowned Kinglet	-	-	o	o
Ruby-crowned Kinglet	u	-	u	u
Blue-gray Gnatcatcher	-	-	o	-
Western Bluebird	-	-	o	o
Swainson's Thrush	o	-	-	-
Hermit Thrush	u	-	u	u
American Robin	u	-	u	u
Varied Thrush	o	-	o	o
MOCKINGBIRDS & THRASHERS				
Northern Mockingbird*	u	u	u	u
Sage Thrasher	o	-	o	o
California Thrasher	o	o	o	o
WAGTAILS & PIPITS				
American Pipit	u	-	c	c
	Spring	**Summer**	**Fall**	**Winter**
WAXWINGS				
Bohemian Waxwing	-	-	-	x
Cedar Waxwing	u	-	u	o
SHRIKES				
Loggerhead Shrike	a	a	c	c
VIREOS				
Cassin's Vireo	u	-	u	-
Warbling Vireo	u	-	u	-
WARBLERS				
Orange-crowned Warbler	u	-	u	-
Nashville Warbler	o	-	o	-
Yellow Warbler	c	-	c	c
Yellow-rumped Warbler	c	-	c	-
Black-throated Gray Warbler	u	-	u	-
Townsend's Warbler	o	-	-	-
Hermit Warbler	o	-	-	-
MacGillivray's Warbler	u	-	u	-
Common Yellowthroat	c	u	u	u
Wilson's Warbler	c	-	u	-
TANAGERS				
Western Tanager	u	u	u	-
GROSBEAKS & BUNTINGS				
Black-headed Grosbeak	c	u	u	-
Blue Grosbeak	u	u	o	-

TOWHEES & SPARROWS				
Spotted Towhee	u	-	u	u
Chipping Sparrow	u	-	u	-
Vesper Sparrow	u	-	u	u
Lark Sparrow	u	-	u	u
Sage Sparrow	u	u	u	u
Savannah Sparrow	c	-	c	a
Lark Bunting	-	-	x	-
Fox Sparrow	u	-	u	u
Song Sparrow	c	c	c	c
Swamp Sparrow	-	-	-	-
Lincoln's Sparrow	u	-	c	c
Golden-crowned Sparrow	u	-	u	r
White-throated Sparrow	c	-	a	a
Dark-eyed Junco	o	-	c	c
	Spring	**Summer**	**Fall**	**Winter**
BLACKBIRDS, MEADOWLARKS & ORIOLES				
Red-winged Blackbird*	a	a	a	a
Tricolored Blackbird*	a	a	a	a
Western Meadowlark*	a	a	a	a
Yellow-headed Blackbird*	a	a	c	o
Brewer's Blackbird*	a	c	a	a
Great-tailed Grackle*	c	c	c	c
Brown-headed Cowbird*	c	c	u	u
Hooded Oriole	o	-	-	-
Bullock's Oriole	c	c	r	-
FINCHES				
House Finch	c	c	c	c
Pine Siskin	r	-	r	o
Lesser Goldfinch	u	-	u	u
American Goldfinch	u	-	u	u
WEAVER FINCHES				
House Sparrow (I)*	c	c	c	c

MAMMALS

c = confirmed sighting

Virginia opossum (c)	*Didelphis virginiana*
San Joaquin kit fox (c)	*Vulpes macrotis mutica*
Coyote (c)	*Canis latrans*
Raccoon (c)	*Procyon lotor*
Long-tailed weasel (c)	*Mustela frenata*
Badger (c)	*Taxidea taxus*
Western spotted skunk (c)	*Spilogale gracilis*
Striped skunk (c)	*Mephitis mephitis*
Bobcat (c)	*Felis rufus*
San Joaquin antelope squirrel	*Ammospermophilus nelsoni*
Botta's pocket gopher (c)	*Thomomys bottae*

San Joaquin pocket mouse (c)	*Perognathus inornatus*
San Joaquin kangaroo rat (c)	*Dipodomys nitratoides*
Heerman's kangaroo rat (c)	*Dipodomys hermanni*
Southern grasshopper mouse	*Onychomys torridus*
Deer mouse (c)	*Peromyscus maniculatus*
House mouse (c)	*Mus musculus*
Western harvest mouse (c)	*Reithrodontomys megalotis*
California Vole (c)	*Microtus californicus*
Broad-banded mole	*Scapanuslatimanus*
Ornate shrew (c)	*Sorex ornatus*
Muskrat (c)	*Ondatra zibethicus*
Beaver	*Castor canadensis*
Black rat (c)	*Rattus rattus*
Norway rat (c)	*Rattus norvegicus*
Desert cottontail (c)	*Sylvilagus audubonii*
Black-tailed jackrabbit (c)	*Lepus californicus*
Western small-footed myotis	*Myotis ciliolabrum*
California Myotis	*Myotis californicus*
Yuma Myotis	*Myotis yumanensis*
Silver-haired bat	*Lasionycteris nocyivagans*
Western pipistrelle	*Pipistrellus hesperus*
Big brown bat	*Eptesicus fuscus*
Hoary bat	*Lasiurus cinereus*
Western red bat	*Lasiurus blossevillii*
Townsend's Western Big-eared bat	*Corynorhinus townsendii*
Pallid bat	*Antrozous pallidus*
Mexican free-tailed bat (c)	*Tadarida brasiliensis*
Western mastiff bat	*Eumops perotis*

Reptiles and Amphibians

Iguanidae - Iguanids

Blunt-nosed leopard lizard - *(Gambelia silus)* - Listed as endangered.
Western fence lizard - *(Sceloporus occidentalis)* - Hypothetical, no known records, but on old refuge list.
California side-blotched lizard - *(Uta stansburiana)*
Coast horned lizard - *(Phrynosoma coronatum frontale)*

Telidae - Whiptails

Western (California) whiptail - *(Cnemidophorus tigris mundus)*

Colubridae - Colubrid snakes

Coachwhip (San Joaquin whipsnake) - (*Masticophis flagellum ruddocki)* - Hypothethical, no known records, but on old refuge list. Identified in areas around refuge.
Pacific gopher snake - *(Pituophis melanoleucus catenifer)*
California (common) kingsnake - *(Lampropeltis getulus californiae)*
Western long-nosed snake - *(Rhinocheilus leconteei lecontei)*
California glossy snake - *(Arizona elegans occidentalis)*
Southwestern black-headed snake - *(Tantilla hobartsmithi)*
Common garter snake *(Thamnophis sirtalis)*

Viperidae - Vipers
Western (northern Pacific) rattlesnake - *(Crotalus viridis oreganus)*

Ranidae - True frogs
Bullfrog - *(Rana catesbeiana)*

Hylidae - Treefrogs
Pacific treefrog - *(Pseudacris regilla)*

Bufonidae - True toads
Western (California) toad - *(Bufo boreas halophilus)*

Pelobatidae - Spadefoot toads
Western (Pacific) spadefoot - *(Scaphiopus hammondi)*

Testudinidae - Turtles
Western pond turtle - *(Clemmys marmorata)* - Pond turtles in this area are believed to be intergrades between *C.m. marmorata* and *C.m. pallida*. (Kern NWR only)

APPENDIX D: COMPLIANCE DOCUMENTS

APPENDIX E: STRUCTURES AND FACILITIES

KERN NWR

Structure

Headquarters (wood)

Maintenance Compound (Metal buildings, Unleaded and Diesel AST's, Concrete Oil storage building)

Bunkhouse and detached garage (wood)

Residence 63 (wood)

Residence 64 (wood)

Duck Hospital (metal)

Hunter Check Station (metal)

Research Garage (wood)

Rom-Tex restroom (2) (brick)

PIXLEY

Structure

Storage Shed (Concrete)

Deep well

Interpretive trail with signs (wood and metal) and observation platform (wood)

APPENDIX F: FIRE HISTORY

Kern NWR Fires (1994-2001)

	Wildland Fire		Prescribed Fire	
Year	**# Fires**	**# Acres**	**# Fires**	**# Acres**
1994	2	268	1	230
1995	0	0	1	400
1996	1	2	0	0
1997	0	0	3	548

1998	2	118	0	0
1999	0	0	1	850
2000	0	0	0	0
2001	0	0	0	0

Pixley NWR Fires (1994-2001)

	Wildland Fire		**Prescribed Fire**	
Year	**# Fires**	**# Acres**	**# Fires**	**# Acres**

1992	4	643	0	0
1993	3	1436	0	0
1994	0	0	0	0
1995	1	0.2	0	0
1996	0	0	1	100
1997	1	1	0	0

1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	1	45

APPENDIX G: DELEGATION OF AUTHORITY

Delegation of Authority

Name of Incident Commander is assigned as Incident Commander of the ***Name of Incident***, Kern National Wildlife Refuge Complex for the US Fish and Wildlife, effective ***Time and Date.***

The Incident Commander has full authority and responsibility for managing the fire suppression activities within the framework of the law and Fish and Wildlife Service policy and direction as provided by this office. Refuge Habitat Management Guidelines and/or other appropriate documents will be provided by the Resource Advisor.

Names of Resources Advisors and contact Information are assigned as Resource Advisors. They or the Refuge Manager will be consulted in situations where natural resource decisions or trade offs are involved unless life safety issues require immediate attention and those actions will be documented.

Specific direction and fire suppression priorities for the ***Name of Incident*** are as follows, and are in priority order:

1. Provide for firefighter and public safety.

2. Use of minimal impact techniques should be employed to reduce habitat damage. Use natural barriers and roads if possible for burnout operations.

3. Use of dozers or tractors requires approval of the Refuge Manager of their designate (resource advisors) prior to implementation.

Include other Standards or conditions as needed.

Turn Back Standards

1. All ***Name of Incident*** contracts, agreements, bills, medical problems, equipment repairs, and fire cache re-supply shall be closed out prior to team being released.

2. Road or levee damage during suppression efforts will be repaired prior to the teams departure.

3.Fire perimeter mopped-up ***Specify*** and all lines checked for heat and integrity.

4. Rehabilitation Plan will be completed in Coordination with the Refuge Biologists and resource Advisors.

5. Fire perimeter mapped by GPS and loaded into the Refuges GIS Database.

6. Tort claims reviewed by Refuge Manager or their designee.

The Deputy Refuge Manager or Fire Management Officer will represent the Refuge Manager on any occasion where Refuge Manager is not immediately available.

Refuge Manager, _____ Kern National Wildlife Refuge Complex, ***Date and Time***.

APPENDIX H: DISPATCH PLAN

KERN NWR COMPLEX
2001 FIRE DISPATCH PLAN

I Report of a Detected Fire

1. When a wildfire or smoke is reported on any station, the employee should obtain all necessary information. Begin phone log to record radio messages. Information to obtain from reporting party:

    1. Name, address and phone number or location of reporter
    Location of fire
    Size of fire
    Current suppression action (i.e. running, smoldering, creeping)
    IMPORTANT: **Best access or route to fire**
    Approximate weather at fire site (i.e. wind strength and direction)
    2. Notify FMO , Fire Crew Supervisor **AND** Refuge Manager
    3. Notify Refuge Law Enforcement Officer, if available

2. Check map to determine whose jurisdiction and responsibility the fire falls under. Be aware whether the day has been declared an "agricultural burn day." You may have spotted a controlled burn.

    1. If the fire is well **OUTSIDE** the boundary of the refuge property and is not threatening refuge lands:

    CONTACT: Lost Hills Fire Department (Kern NWR) or
    Alpaugh Fire Station (Pixley NWR) by calling 911

    2. If the fire is **WITHIN** the boundary of the refuge property OR if the fire is outside refuge property but is threatening refuge lands:

    Contact: FMO or Fire Crew Supervisor AND Refuge Manager whose refuge the fire is burning on or is threatening.

    NOTIFY Lost Hills Fire Department (Kern NWR) or
    Alpaugh Fire Station (Pixley NWR by dialing 911. Inform them we are attempting to determine if there is a fire on the refuge and "we are checking it out at this time." Describe the most direct route thru refuge to gain access to the fire.

PHONE NUMBERS

KERN NWR COMPLEX HEADQUARTERS (661) 725-2767

(contact in order listed below)

David Hardt, Complex Manager home 661-758-8359
Michael Ritter, Complex Deputy Manager home 661-725-8785
Roger Wong, Refuge Fire Management Officer .. . home 209-827-4390
weekends 510-832-5648
cell 209-704-4508

Regional Fire Personnel

Pam Emsley, Regional Fire Coordinator. . . . 503-231-6175
Andy Anderson, Regional Fire Management Officer. . . 503-231-6174

Kern County Fire Numbers

Lost Hills Fire Station 661-797-2308
Delano Fire Station 661-725-1000

Tulare County Fire Numbers

Alpaugh Fire Station 209-949-8343

Burn Permit Approval

San Joaquin Valley Air Pollution Control District 800-349-9401

Radio Frequencies

Channel	**Repeater**	**Transmit**	**Receive**
1	Parkridge	166.975	166.375

2	Breckenridge	167.075	166.4875
3	Forgotten	171.750	171.750
4	Car/Car	166.375	166.375
5	Car/Car Fire	166.4875	166.4875

APPENDIX I: COOPERATIVE AGREEMENTS

APPENDIX J: WFSA

3. Jurisdiction: **US Fish and Wildlife Service**	4. Geographic Area: **Southern California Operations**
5. Unit: National Wildlife Refuge	6. WFSA Number of .
7. Fire Name:	8. Incident Number:
9. Accounting Code:	
10. Date/Time prepared / / @ : .	
11. Attachments	
-Complexity Analysis X -Risk Assessment/Analysis X Probability of success Consequences of Failure -Maps -Decision Tree -Fire Behavior Projections X -Calculations of Resource Requirements -Other	

OBJECTIVES AND CONSTRAINTS

$Objectives (Must be specific and measurable) These objectives must be considered in the development of alternatives in III, below. Suppression objectives must relate to the Unit resource management objectives.

$ Safety (These must receive the highest priority)
  -Public
  -Firefighter

$ Economic (May include closure, which could impact the public through transportation, communication and resource values)

$ Environmental (e.g. management objectives for wildlife habitat, water quality, etc.)

$ Social (May include local attitudes towards fire that might affect decisions on the fire)

$ Other (e.g. legal or administrative constraints needing consideration such as fire encroaching onto other jurisdictions)

$Constraints (e.g. environmentally and culturally sensitive areas, irreparable damage to resources, and economic constraints)

ALTERNATIVES

	A.	B.	C.
Wildland Fire Strategy	e.g. Allow fire to play a natural role	e.g. Aggressive attack	
Narrative			
Resources Needed Hand Crews Engines Dozers Air Tankers Helicopters			
Final Size			
Est. Contain/ Control Date			
Costs			
Risk Assessment -Probability of success -Consequence of failure			
Complexity			
Attach maps for each alternative			

EVALUATION OF ALTERNATIVES

	A.	B.	C.
Evaluation Process			
Safety Firefighter Aviation Public			
Sum of safety values			
Economic Forage Improvements Recreation Water Wildlife Other			
Sum of economic values			
Environmental Air Visual Fuels T&E Species Other			
Sum of environmental values			
Social Employment Public Concern Cultural Other			
Sum of social values			
Other			
Sum of other values			
TOTAL			

ANALYSIS SUMMARY

	A.	B.	C.
Compliance with Objectives Safety Economic Environmental Social Other			
Pertinent Data Final fire size Complexity Suppression cost Resource values Probability of success			
External/Internal Influences			

VI. DECISION

The Selected Alternative is: .

Rationale:

Agency Administrator's Signature Date/Time

VII. DAILY REVIEW

			PREPAREDNESS LEVEL	INCIDENT PRIORITY	RESOURCE AVAILABILITY	WEATHER FORECAST	FIRE BEHAVIOR PREDICTIONS	WFSA VALID
Date	Time	By						

VIII. FINAL REVIEW

The elements of the selective alternative were met on:

Date Time:

By:
Agency Administrator

APPENDIX K: AIR QUALITY

APPENDIX L: BURN PLAN FORMAT

Prescribed Fire Plan
Kern National Wildlife Refuge Complex

Approved By: _____ Date:
Refuge Manager

Prepared By: _____ Date:
Prescribed Fire Specialist / Burn Boss (circle one)

Reviewed By: _____ Date:
Fire Management Officer

Reviewed By: _____ Date:
Refuge Manager

Reviewed By: _____ Date:
Refuge Biologist

Reviewed By: _____ Date:
Burn Boss
(If not preparer of fire plan)

The approved Prescribed Fire Plan constitutes the authority to burn, pending approval of Section 7 Consultations, Environmental Assessments, or other required documents. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Prescribed burning conditions established in the plan are firm limits. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported, but personnel will be held accountable for actions taken which are not in compliance with the approved plan.
Refuge:

Name of Area:

Acres To Be Burned:

Legal Description:
State: California **County:**
Latitude: Longitude:
Township: Range: Sections:
Quad Map: USGS - CA **Series:** 7.5" **Scale:** 1:24000

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review?
YES / NO (Programmatic section 7 is in place for this activity)

Prescribed Fire Burn Boss/Specialist participated in the development of this plan? **YES / NO**

(Included: Refuge map showing the location of the burn on Fish and Wildlife Service land.)

I. GENERAL DESCRIPTION OF BURN UNIT

Physical Features and Vegetation Cover Types (Species, height, density, etc.):
Elevation: Slope: 0-2% **Aspect:** Flat
Unit Description:
Vegetation:

Primary Resource Goals of Unit: (Be specific. These are management goals):

Objectives of Fire (Be specific. These are different than management goals)**and Acceptable Range of Results:** (Area burned vs. unburned, scorch height, percent kill of a species, range of litter removed)
General Objectives:
1) Provide for Firefighter and Public Safety.
2) Minimize smoke impacts
Resource Objectives and Ranges:
1) Reduce or consume 1 hr fuels(grass); 60 - 100%

II. PRE-BURN MONITORING

Vegetation Type Acres % FBPS Fuel Model

Total

Habitat Conditions: (Identify with transect numbers if more than one in burn unit.)

Type of Transects:

Photo Documentation (Add enough spaces here to put a pre-burn photo showing the habitat condition or problem you are using fire to change/correct. A photo along your transect may reflect your transect data.):

III. PLANNING AND ACTIONS

Complexity Analysis Results:(see attached complexity sheet)

Prescribed Fire Organization: (See Section VII, Crew and Equipment Assignments. All personnel and their assignments must be listed. All personnel must be qualified for the positions they will fill.)

Site preparation:

Who: **Time:**
Fire crew 1-2 weeks prior to burn
What to be done:

Weather information required:
Instrument Location and Elevation (s): On site (wx kit)

Data Collected and Sampling Period: Temp, RH, Wind Speed and direction(mid flame). On site will be 1 day prior to burn.

Forecasts: Weather forecasts(general) will be monitored 2 - 3 days prior to burning. A general (for Low complexity burns only)or spot weather forecast will be requested for the day of the burn or as needed.

Safety considerations and Protection of sensitive features:
(Adjacent lands, visitors, facilities, terrain, etc., and needed actions. Include buffer and safety zones. Be specific, indicate on a burn unit map. Map should be a USGS quadrangle if possible, so ridges, washes, water, trails, etc. can be identified.)

General: Unit is flat and has no major hazards.
Special Constraints and Considerations (Should be discussed with Burn Boss):
Special Safety Precautions Needing Attention:(Aerial ignition, aircraft, ignition from boat, etc.):
Public safety: The area is in a closed part of the refuge.
Safety Zones and Escape Routes: All areas will be identified in the pre-fire briefing.
Medical Facility: Minor injuries will be handled at the scene. Major injuries - call 911 from cell phone (burn Boss). At least 1 First aid trained person will be on scene**.**
Adjacent Lands:
Facilities:
Endangered, Threatened, or Listed Species:
PROTECTION ACTIONS:
Sensitive or Species of Concern:
PROTECTION ACTIONS:
Archeological, Historical, or Cultural Areas:
PROTECTION ACTIONS:

COMMUNICATION:

Communication and Coordination on the Burn (Who will have radios, frequencies to be used, who will coordinate various activities.):
All crews will have at least 1 radio or be teamed with a person with a radio. Tactical channels will be used. Cell phone will be on site and with the Burn Boss or Deputy

Media Contacts (Radio stations, newspaper, etc., list with telephone numbers): Burning is a common activity in the Kern NWR area so no media contacts are needed. Adjacent land owners and neighbors will be notified prior to the burn. Burn

information is available by request(in person or by phone) from the Kern National Wildlife Refuge Complex Headquarters:
Kern National Wildlife Refuge Complex
P.O. Box 670
Delano, CA 93216
Phone:(661) 7250-2767 Fax:(661) 725-6041
Hrs: Mon - Fri 7:00 am to 3:30 pm

(see Contact list)

IV. IGNITION, BURNING AND CONTROL

Scheduling: Approx. Date(s):
Duration: days

Acceptable Range

FBPS Fuel Model 1	MIN	MAX	OPT
Temperature (degrees F)			
Relative Humidity (%)			
20' Wind Speed (mph)			
MF Wind Speed (mph) Gusts			
Wind Direction			
Cloud Cover (%)			
ENVIRONMENTAL CONDITIONS			
1 hr. Fuel Moisture			
10 hr. FM			
100 hr. FM			
Woody Live Fuel Moisture			
Herb. Live Fuel Moisture			
FIRE BEHAVIOR			

Rate of Spread (mph): Head fire Backing fire			
Flame Length(feet) Head fire Backing fire			

Cumulative effects of weather and drought on fire behavior: None
Ignition Technique: (Explain and include on map of burn unit. Use of aerial ignition must be identified in this plan. Last minute changes to use aircraft will not be allowed and will be considered a major change to the plan. This will require a resubmission):

Other: (If portions of the burn unit must be burned under conditions slightly different than stated above, i.e., a different wind direction to keep smoke off of a highway or off of the neighbors wash, detail here.)

Prescription monitoring: (Discuss monitoring procedure and frequency to determine if conditions for the burn are within prescription)

V. SMOKE MANAGEMENT

Make any Smoke Management Plan an attachment.

Permits required:(who, when)

Burn will be conducted on a declared "burn day" or as planned under a favorable 48 and 24 hour smoke forecast from the San Joaquin Valley Air Pollution Control District. A call will be placed at 08:30 am the day of the burn to for Burn Day status and to register the acres for the day.

Total Emissions Estimate(Tons/# of acres): FOFEM Generated

PM 10:
PM 2.5:
CO:
Total:

Distance and Direction from Smoke Sensitive Area(s):

Visibility Hazard(s) (Roads, airports, etc.):

Actions to Reduce Visibility Hazard(s):

Residual Smoke Problems: 100% mop-up of the unit after ignition and burn down is completed. No more than 24 hours for any smoke in unit.

Necessary Transport Wind Direction, Speed and Mixing Height: (Explain how this information will be obtained and used)

VI. FUNDING AND PERSONNEL

Activity Code: 11610-9263

Est Costs: (See Attached)

VII. BURN-DAY ACTIVITIES

Public/Media Contacts on Burn Day: (List with telephone numbers):

Crew & Equipment Assignments: (List all personnel, equipment needed, and assignments. The following is not an all-inclusive list for what you may need.)

Crew Briefing Points: Area / unit overview, burn objectives, safety including escape and safety zones, weather, fire behavior, crew assignments, firing pattern and timing, holding concerns, communication, and contingency actions and responsibilities.

Firing Procedures: (Methods, how, where, who, and sequence. Go over what was submitted in Section IV and any changes needed for the present conditions. Attach ignition sequencing map if necessary)

Personnel Escape Plan:

Special Safety Requirements:

Go-No-Go Checklist:(see Attached)

Holding Actions: (crew placement, duties)

Critical Control Problems:

Water Refill Points:

Contingency Plan:(Are there crews standing by to initial attack or will people doing other jobs be called upon to do initial attack, who must be called in case of an escape, what radio frequencies will be used, etc.).
In the event of an escape or conditions become unfavorable(smoke, weather, fire behavior, and/or objectives not being achieved)the Burn Boss will declare the fire out of prescription or escaped(which ever is the situation)and will assume IC of the fire(until relieved by a higher rated IC). All new burning will stop unless needed to contain the RX or escaped fire. The holding

crew will begin attacking the escape and the ignition crew will hold and work the RX fire until the RX fire is contained or is deemed as no threat.

If the fire exceeds the capability of the crews on hand a call will be placed for assistance from local resources through the Sierra National Forest Dispatch. The contingency plan will be outlined in the briefing with procedures for activation of the contingency plan. A list of the available resources will be posted with the Sierra NF Dispatch which will be the ordering point for the incident. If the fire exceeds the capability of the crews on hand a call will be placed for assistance from local resources (Merced County Fire Department and Sierra NF) through the Sierra National Forest Dispatch. The contingency plan will be outlined in the briefing with procedures for activation of the contingency plan. Sierra NF dispatch will be the ordering point for the incident. If the escape fire exceeds more than 12 hours, a Wildland Fire Situation Analysis(WFSA) will be completed for the incident.

Minimum required on - site contingency resources and response times:
1- Tractor w/ disk and driver
1- Tractor w/ mower and driver

Minimum required off - site contingency resources and response times:
1- Type III IC - 1 hr
1- Engine (Merced County FD) - ½ -1 hr
1- Helicopter (1-2 hr CWN or SNF)

Mop Up and Patrol: Mop-up will be 100% due to the fuel load. Smoldering heavy fuels will be extinguished. The area will be patrolled by at least 1 crew through the evening and the following days as needed.

Rehabilitation Needs:

Special Problems:

Kern National Wildlife Refuge Complex

GO-NO-GO CHECKLIST

Unit

Answer Yes or No to the following:

___ Do you have an APPROVED fire plan?

___ Are ALL fire prescriptions elements met?

___ Are ALL smoke management prescriptions met?

___ Are ALL permits and clearances obtained?

___ Has an area spot weather forecast been OBTAINED and is it FAVORABLE?

___ Are ALL required personnel in the prescribed fire plan on-site?

___ Have ALL personnel been briefed on the prescribed fire plan requirements?

___ Have ALL personnel been briefed on safety hazards, escape routes, and safety zones?

___ Has the contingency planning process adequately considered FUELS ADJACENT TO and in REASONABLE PROXIMITY to the burn unit?

___ Has the availability of ALL contingency resources been checked, and are they available?

___ Are the ON-SITE holding forces adequate for containment under the expected conditions?

___ Have ALL the required notifications been made?

___ Is ALL of the required equipment in place and in working order?

___ In YOUR OPINION, can the prescribed fire meet the planned objectives, be carried out according to the approved plan?

We certify that we have reviewed the burn objectives, we are in agreement that the Prescribed Fire Complexity Analysis is correct, and that ALL of the questions above were answered "YES"?

Refuge Manager Date Burn Boss Date

VIII. CRITIQUE OF BURN

Were burn objectives within acceptable range of results? (Refer to Section I):

What would be done differently to obtain results or get better results?

Was there any deviation from plan? If so, why?

Problems and general comments:

IX. POST-BURN MONITORING

Date:_____ Refuge Burn Number:

Length of Time after Burn:

Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

Other:

X. FOLLOW-UP EVALUATION

Date: _____ Refuge Burn Number:

Length of Time after Burn:
Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

APPENDIX M: EQUIPMENT INVENTORY

Equipment Inventory
Kern National Wildlife Refuge Complex

Engines

Engines:	Type:	Year:	Make/ Model:	Pump Type:	Foam: Y/N	Condition/Remarks:
E-3149	6	1993	Ford F350	BB-4	Y	Fair; 47K miles; 11K GVW
Water Truck	n/a	1979	International	Auxilary	N	Poor; limited fire use; for refuge manintenance

Portable Pumps and Chain Saws

Equipment Type:	Make/Model:	Year:	Condition/Remarks:
Chainsaw	Stihl/034	1992	Good
Pump	Honda	1999	Good

Weather Station

RAWS	FTS-11	1994	Currently inoperative; needs GOES update; not transmitting to WIMS

Facility

Fire Engine Garage	Pre-fabricated	2000	Funded thru MMS
Bunk House	Pre-fabricated	2000	Funded thru MMS; 4 bedroom