WILDLAND FIRE MANAGEMENT PLAN

ELLICOTT SLOUGH NATIONAL WILDLIFE REFUGE

2002

MARCH 2002

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INTRODUCTION

The Ellicott Slough National Wildlife Refuge (Refuge) and State Ecological Reserve (Reserve) lie within the California Coastal Chaparral Forest and Shrub Province described by Bailey (1995). Fire is common in this province, usually set by lightning during the summer dry season, and thus native vegetation is adapted to periodic occurrence of fire (Bailey 1995). The history of fire at the Refuge, however, is not documented or well known.

The 201-acre Refuge was established in 1975 to protect the endangered Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)(SCLTS). Ellicott Slough NWR is adjacent to the state-owned Ellicott Slough Ecological Reserve. The Refuge and Reserve are jointly managed by the Service and the California Department of Fish and Game (CDFG) through a Memorandum of Understanding (MOU). The California Department of Fish and Game (CDFG) owns the Ellicott SCLTS breeding pond and surrounding riparian area, and the Service owns the upland habitat surrounding Ellicott pond and the Calabasas Pond Unit (Figure 1).

The Fire Management Plan (FMP) for Ellicott Slough National Wildlife Refuge will help achieve resource management objectives of reducing fuel accumulations to decrease the potential for large wildland fires. The Department of the Interior policy requires that all refuges with vegetation that can sustain fire must have a Fire Management Plan that details fire management policies, the use of prescribed fire for attaining resource management objectives, and fire program operational procedures. In the past, prescribed burns were used to eliminate slash piles created by mechanical removal of non-native eucalyptus and pampas grass. At this time, no prescribed fires are planned. Fuel accumulations of eucalyptus and pampas grass slash piles will be reduced through mechanical means. Should additional prescribed fire activities be planned in the future, this document will be amended and reviewed accordingly.

This plan is written as an operational guide for managing the refuge's wildland fire program. It defines levels of protection needed to ensure safety, protect facilities and resources, and restore and perpetuate natural processes, given current understanding of the complex relationships in natural ecosystems. It is written to comply with a service-wide requirement that refuges with burnable vegetation develop a fire management plan (620 DM 1). This plan complies with NEPA and NHPA (Appendix C).

The FMP outlines procedures for wildland fire suppression. The fire plan furthers the mission of the Refuge by providing increased protection for Refuge resources. Increasing coordination and preparedness to suppress wildland fires will help to ensure quick responses to fires which have the potential to be devastating to Refuge resources,

There is no dedicated fire staff at Ellicott Slough NWR or the San Francisco Bay NWRC. All wildland fires will be suppressed by local cooperating agencies with the oversight of the Project Leader and Zone Fire Management Officer (FMO).

Figure 1

COMPLIANCE WITH USFWS POLICY

The Refuge and Reserve were established in 1975 under the authority of the Endangered Species Act to preserve and protect the endangered Santa Cruz long-toed salamander. The Refuge and Reserve provide both important breeding and estivation habitat for the SCLTS. Breeding habitat consists of 2 ephemeral ponds and adjacent willow habitat. The upland areas are characterized by grasses, native shrubs, oaks, non-native species such as eucalyptus and pampas grass, and restoration areas where non-native vegetation has been removed and is being restored with native grasses, shrubs, and oaks. The Refuge and Reserve additionally support a variety of flora and fauna, including the threatened California Red-legged frog (*Rana aurora draytonii*), and the California tiger salamander (*Ambystoma tigrinum californiense*), a federal species of special concern.

The objectives of the Refuge are to protect habitat for the SCLTS, which includes maintaining the native coastal prairie habitat. Several operational plans are used by the Refuge to meet these objectives, including the Recovery Plan for the SCLTS, Preliminary Refuge Restoration Plan, multiple internal Section 7 endangered species consultations, and two environmental assessments for the Refuge. The plans that currently apply to Fire Management include the Internal Section 7 Modification on #1-8-98-F/C-26, approved amendment to include mechanical methods for slash pile removal (Appendix D).

The FMP meets the objectives of the Refuge's operational plans by addressing protection of important habitat for the SCLTS from unplanned wildfire.

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 620 DM, Chapter 1, Wildland Fire Management: General Policy and Procedures (April 10, 1998): defines Department of Interior fire management policies.
- Service Manual, Part 621, Fire Management (February 7, 2000): defines U.S. Fish and Wildlife Service 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.
- U.S. Fish & Wildlife Service Fire Management Handbook.

FIRE MANAGEMENT OBJECTIVES

All wildland will be appropriately suppressed.

The Fire Management Objectives for this Refuge are:

1. Give firefighter and public safety top priority. All Fire Management activities will reflect this commitment.

2. Actively suppress and prevent the occurrence of wildland fire that could seriously jeopardize populations of endangered species, private property, or public safety.

3. Protect important local resources and private lands from fire.

DESCRIPTION OF REFUGE

The 201-acre Refuge is located near the city of Watsonville, Santa Cruz County, California. It includes the 31-acre Calabasas Pond Unit which is located approximately 3 miles from the main Refuge parcel (Figure 1). The Watsonville area has a Mediterranean climate with approximately 32 inches of annual rainfall occurring predominantly between November and March. Cloudiness and fog are commonly encountered during the dry summer season. The mean temperatures are approximately 44 and 69 degrees F for winter and summer, respectively. Elevation varies from 120 to 180 feet between Ellicott Pond and the top of the adjoining hills.

The Refuge and Reserve are closed to the public due to the sensitive nature of the habitat. The Refuge is located in Santa Cruz County approximately four miles north of the City of Watsonville. The population of Watsonville was 31,099 in 1990 (City of Santa Cruz Public Library, pers. comm.). Located 12 miles to the northwest of the Refuge, the City of Santa Cruz is the largest municipality in the area with a population of 49,040 in 1990 (City of Santa Cruz Public Library, pers. comm.)(Figure 2).

CULTURAL RESOURCES

Under Federal ownership, archaeological and historical resources within the Refuge receive protection under Federal laws mandating the management of cultural resources, including, but not limited to, the Archaeological Resources Protection Act; the Archaeological and Historical Preservation Act; the Native American Graves and Repatriation Act, and the National Historic Preservation Act of 1966. There are no known archaeological or historical sites at the Refuge, therefore fire is not expected to affect these resources (A. Raymond, pers. comm.).

FISH AND WILDLIFE

The Refuge provides important habitat for many types of wildlife. Recent observations of mammals have been limited, but include mule deer and black-tailed jack rabbit. Amphibian and reptile species include arboreal salamander, California slender salamander, Ensatina, Pacific treefrog, Western fence lizard, Western skink, ringneck snake, and Western terrestrial and aquatic garter snakes. Surveys on the Refuge have identified 56 species of birds, including mallard, black-crowned night heron, red-shouldered hawk, band-tailed pigeon, Anna's hummingbird, ash-throated flycatcher, olive-sided flycatcher, California thrasher, common yellowthroat, red-wing blackbird, lesser goldfinch and other migratory and resident birds.

ENDANGERED SPECIES

Santa Cruz Long-toed Salamander (SCLTS):

The Refuge and Reserve provide both breeding and estivation habitat for the endangered SCLTS. The SCLTS spends most of its life underground in animal burrows and along the root systems of plants in chaparral and oak-woodland areas where it is protected from heat and the drying rays of the sun. The adult SCLTS leave their summer retreats with the onset of the rainy season in November and begin their annual migration to the breeding pond. The SCLTS appear to migrate only on warm nights of rain, mist, or fog. They arrive at the pond in varying numbers from November through February (Ruth 1988).

After the SCLTS enter the pond they breed and lay eggs. The adults then leave the pond, typically before March, and return to upland estivation areas. The eggs hatch in about a week and the larvae metamorphose into juveniles in 90 to 140 days, usually in May to August. The juveniles seek underground refuge at or near the pond and migrate to more permanent estivation sites during the first fall rains. They return to the breeding pond when they are sexually mature at about three to four years of age (Ruth 1988).

California Red-legged Frog (RLF)
The Refuge and Reserve may also provide breeding and non-breeding habitat for the endangered RLF. Breeding and non-breeding habitat use by the RLF has never been thoroughly assessed at the Refuge and Reserve. However, private consultants have reported to Refuge personnel that they have heard RLFs calling at Ellicott pond. Refuge personnel have dipped and seined potential RLF breeding habitat on the Refuge and Reserve (i.e. ditches and ponds) and have not found RLF larvae. On the Calabasas Pond Unit of the Refuge, the presence of RLF larvae have been confirmed through dip-net surveys of pond.

The season of activity for the RLF appears to vary with the local climate (Storer 1925); individuals from coastal populations, which rarely experience low temperatures, are rarely inactive. Adult frogs are largely nocturnal (Storer 1925; Klauber 1932) and are closely tied to dense riparian vegetation (Hayes and Jennings 1988, Jennings 1988b). The RLF breeds in late November through late March (Storer 1925; Jennings and Hayes 1989). Females lay eggs on emergent vegetation and eggs hatch after one to two weeks. Larvae are thought to then feed on algae until they metamorphose between July and September (Storer 1925, Wright and Wright 1949, Jennings and Hayes 1989). The RLF does not appear to move out of riparian zones to adjacent upland forests, instead it makes seasonal movements within aquatic and riparian habitats that appear to be related to the reproductive requirements of adults and seasonal changes that likely influence habitat quality (Jennings and Hayes 1989). The RLF moves from breeding sites in late summer or early fall, and returns to the vicinity of breeding sites in late fall or early winter.

California Tiger Salamander
The Refuge and Reserve provide both breeding and estivation habitat for the CTS, a Species of Special Concern. The CTS's life history is similar to the SCLTS. Metamorphosed CTS estivate throughout the summer and autumn in burrows of California ground squirrels or valley pocket gophers, and emerge after autumn rains commence, usually by early November (Storer 1925). Adults congregate at breeding sites, which usually are shallow ephemeral pools and ponds that fill during heavy winter rains. Spawning occurs within a few days of migration and the adults leave the ponds at night soon afterward (Storer 1925). After the eggs hatch, the larvae feed on algae and aquatic invertebrates, and then metamorphose as the pond water level recedes in late spring or summer (Storer 1925; Holland *et al.* 1990).

VEGETATION
The Refuge upland areas consist of chaparral, oak woodland, and grassland community. The chaparral community occurs in dense stands throughout the ridge lines and sloped areas of the Refuge. Dominant species include coyote brush, poison oak, California coffee-berry, and sticky monkey flower. Oak woodland also occurs on the open slopes and valleys and consists mainly of coast live oak with grass spp. understory. Refuge riparian habitat surrounding the ephemeral ponds and drainage areas include willow spp. and California blackberry.

Non-native vegetation, primarily eucalyptus trees and pampas grass have invaded these communities. Approximately 25 acres of eucalyptus were removed from the upland areas between 1997 and 2001. Most of the trees were removed from the site and native grass seed was sown into the bare areas. The area is also currently being restored to native oak woodland and shrubs. Approximately 30 acres of pampas grass also occurs in the upland areas. These stands are being removed using mechanical and chemical methods.

STRUCTURES AND FACILITIES
The Refuge and Reserve are closed to the public and there are no facilities on the Refuge or Reserve. Structures on the properties include a Pacific Gas and Electric (PG&E) power box, which supplies

electricity to a pump installed in a well located on the Service owned parcel, and PG&E power lines and poles that run through both properties. The pump and well are used to augment the water level of the pond during drought years to ensure metamorphosis of the SCLTS. There is a second well and pump on the Refuge parcel which will provide water to a new pond in the design process. Currently, there is no structure associated with this well. There are no known archaeological sites at the Refuge or Reserve. Private property, including houses and agricultural fields, lie adjacent to the Refuge and Reserve.

Residential and agricultural development surround the Refuge and Reserve . A Kampground of America lies on the northern border, approximately seven houses are located in the valley on the eastern border, and scattered houses are located on the western and southern boundaries (Figure 3). Several parks also occur close to the Refuge. Manresa State beach is due west 0.5 aerial miles from the Refuge and Sunset State Beach is 1.5 miles south of the Refuge. Both parks provide camping and combined receive approximately 1 million visitors per year (R. Culbertson, pers. comm.). The nearby agricultural areas are dominated by cash crops such as artichokes, strawberries, broccoli, lettuce, cauliflower, and cut flowers.

The Calabasas Pond Unit is also closed to the public and contains no facilities, structures, or known archaeological sites. Private property, including houses, agricultural fields, and pasture lands surround the entire Unit (Figure 4).

Figure 2

Figure 3

Figure 4

WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

Fire season is generally from June through early November (as declared by CDF). Although fire is common in the California Coastal Chaparral Forest and Shrub Province as a result of lighting during the summer dry season, the history of fire at the Refuge is not documented or well known.

Pre-settlement fires

The Ellicott Slough National Wildlife Refuge (Refuge) and State Ecological Reserve (Reserve) lie within the California Coastal Chaparral Forest and Shrub Province described by Bailey (1995). Fire is fairly common in this province, usually set by lightning during the summer dry season, and thus native vegetation is adapted to periodic occurrence of fire (Bailey 1995). Rundel (1999) notes that typical fire frequency estimates range from 30 to 50 years between fires. Westman (1982) found that coastal sage communities burned at 20-year intervals, while chaparral communities burned every 25 to 40 years in southern California and every 30 to 60 years in central California. Westbrooks (1998) gives fire return intervals of less than 35 to 100 years in coastal sagebrush and California chaparral. Keeley *et al.* (1999) determined fire return intervals in several California counties from San Diego County in the south to Monterey County in the north. Fire return intervals ranged from 35 to 225 years before 1950 and 29 to 81 years after 1950. In Monterey County, the closest to Ellicott Slough NWR, the fire return interval was 115 years prior to 1950 and 64 years after 1950. The history of fire at the Refuge, however, is not documented or well known.

Post-settlement Fire History

Shared Applications Computer System (SACS) records indicate only one wildland fire in the last ten years (0.1 acres in 1994). CDF does not have any additional records of wildland fires occurring in the area.

Prescribed fire history

From May 1998 - April 1999, a prescribed fire program was used to eliminate eucalyptus slash piles created during restoration activities. Approximately 30 piles were burned throughout the upland chaparral/grassland habitat.

RESPONSIBILITIES

Ellicott Slough NWR does not have onsite fire management staff or any onsite fire suppression equipment. There is a Service fire crew stationed part time (late spring to early fall) at San Luis NWRC and a limited number of fire qualified personnel stationed at San Francisco Bay NWRC. Both of these sites are approximately 90 miles from the Refuge. Because the unit is an un-staffed satellite refuge, Refuge personnel presence is limited to periodic surveys. Wildland fires in this area are generally reported by the public and suppressed by firefighters from the Santa Cruz County Fire Department.

Responsibilities for fire management at Ellicott Slough are shared by: the Ellicott Slough Refuge Manager, Refuge Biologist, San Francisco Bay NWR Complex Project Leader, and the San Luis NWR Complex Fire Management Officer (Appendix E). Primary wildland fire management responsibilities are to:

- Provide overall management of the Refuge including the fire program.
- Ensure collateral duty fire personnel are meeting Service standards.
- Establish appropriate formal and information fire-related agreements/contracts.
- Monitor results of wildland fires.
- Update fire management and associated plans (dispatch, training, etc.), call-out lists, and

mobilization guidelines.

- $ Maintain the Refuge fire cache and fire equipment in a ready state.

Agency Administrator/ Project Leader (PL)

- $ Is the primary line officer responsible for implementation of all Fire Management. activities within the Complex and will ensure compliance with Department, Service and Refuge policies.
- $ Selects the appropriate management responses to wildland fires.

Deputy Project Leader (DPL)

- $ Coordinates Complex programs to ensure personnel and equipment are made available and utilized for fire management activities including fire suppression and fire effects monitoring.
- $ Ensures that the fire management program has access to Refuge and Complex resources when needed.
- $ Ensures that Refuge Managers and Complex staff consider the fire management program during Refuge related planning and implementation.

Refuge Manager (RM)

- $ Acts as the primary Refuge Resource Management Specialist during fire management planning and operations.
- $ Prepares an annual report detailing fire occurrences each calender year. This report will serve as a post-year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record at the Refuge.
- $ Is responsible for planning, coordinating, and directing preparedness activities including fire training, physical fitness testing and Interagency Fire Qualification System (IFQS) data entry, fire cache and equipment inventory accountability, maintenance, and operation, cooperation with cooperative agencies.

Biologist

- $ Coordinates through Refuge Managers and DPL to provide biological input for the fire program with the FMO and PFS.
- $ Ensures fire effects monitoring is being implemented and drafts wildland fire. Rehabilitation Plans for the DPL.
- $ Participates, as requested, in wildland fire suppression.

Zone Fire Management Officer (FMO)

- $ Responsible for all fire related planning and implementation for the Refuge.
- $ Integrates biological Refuge objectives into all fire management planning and implementation.
- $ Solicits program input from the RM and Biologist.
- $ Coordinates fire related training.
- $ Coordinates with cooperators to ensure adequate resources are available for fire operational needs.
- $ Is responsible for implementation of this Plan. This responsibility includes coordination and supervision of all prevention, per-suppression, detection, wildland fire , suppression, monitoring, and post-fire activities involving Refuge lands.
- $ Is responsible for preparation of fire reports following the suppression of wildland fires.
- $ Submits budget requests and monitors FIREBASE funds.

- $ Maintains records for all personnel involved in fire suppression activities, detailing the individual's qualifications and certifications for such activities.
- $ Updates all fire qualifications for entry into the Fire Management Information System.
- $ Nominates personnel to receive fire-related training, as appropriate.

Fire Management/ Suppression Personnel

- $ Consist of all Refuge personnel, whether permanent or seasonal, who meet the minimum standard set by the National Wildfire Coordinating Group (NWCG) for firefighters.
- $ Are fully equipped with proper personal protective equipment, have taken and passed the minimum classroom training, and meet physical fitness standards required.
- $ Are responsible for their personal protective equipment and physical conditioning, qualifying annually with the work capacity test before May 31.

Incident Commander

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

Initial attack teams

Initial attack teams will consist of experienced, fully-qualified firefighters, those on their first fire, and well-qualified leadership. Teams will be prepared and equipped with hand and power tools as needed and will be dispatched with a day's supply of food and water, so they can continue work for 24 hours without additional support.

Employees participating in any wildland fire activities on Fish and Wildlife Service or cooperator's lands will meet fitness requirements established in PMS 310-1, except where Service-specific fitness requirements apply.

Exceptions to fitness requirements on Initial attack activity are available from the Regional Fire Management Coordinator per guidelines in Chapter 1.5 of the Fire Management Handbook (USFWS 2000).

INTERAGENCY OPERATIONS

There are no formal cooperative fire agreements in place at this time, all agreements at this time are informal. However, a Memorandum of Understanding is currently being established between the Refuge

and the Santa Cruz County Fire Department. County fire services are contracted out to the California Department of Forestry contract unit. Santa Cruz County Fire Department has traditionally responded to wildland fires at the Refuge because of their legal fire protection responsibility to the property surrounding the Refuge. Thus, any wildland fire originating on Refuge lands is considered a threat to their property.

Ellicott Slough NWR will use the Incident Command System (ICS) as a guide for fireline organization. Qualifications for individuals is per DOI Wildland Fire Qualifications and Certification System, part of NIIMS and the National Wildland Fire Coordination Group (NWCG) Prescribed Fire Qualification Guide. Depending on fire complexity, some positions may be filled by the same person.

The Santa Cruz County Fire Department has the responsibility for preventing, controlling, and extinguishing fire throughout unincorporated portions of their county. The Santa Cruz County Fire Department responds to fires near the Refuge border because of their protection responsibilities for county property. Any fire starting on Refuge lands would be suppressed by local county resources because of their interest in preventing fires from spreading onto their Local Responsibility Area. While no formal agreement is currently in place, the Santa Cruz County Fire Department has expressed a willingness to respond to emergency suppression activities (Appendix G)

Monterey Bay APCD is responsible for all non-point and point source air degradation within their designated area of responsibility. Like all APCD's Monterey Bay has regulatory authority and enforces all District, state and federal laws relating to the emissions of air pollutants.

A listing of key interagency contacts can be found in the Fire Dispatch Plan. The plan is an annual assembly of information required to facilitate a rapid response to a fire report and to coordinate the initial attack (Appendix E).

PROTECTION OF SENSITIVE RESOURCES

Aggressive attack of all unplanned ignitions with minimum acreage burned is a goal. Heavy equipment shall not be used due to the sensitivity of the habitat, except in cases where life, fire-fighter safety, or private property is threatened or when the Refuge Manager determines necessary. Safety of personnel and sensitive habitat at risk will determine its use. Dozer lines should only be constructed, when necessary in open grassland habitat, preferably along established road lines (Figures 3&4). No fire lines shall be constructed within the ephemeral ponds and surrounding willow/blackberry habitat without approval from the Refuge Manager or Delegate (Figures 3&4). Foam and/or retardant has not yet been determined to be compatible with Refuge resources.

The Regional Archaeologist and/or his/her staff will work with Refuge 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 (Appendix H) will be used to inform the Regional Archaeologist of impending activities, thereby meeting the regulations and directions governing the protection of cultural resources as outlined in Department 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 and suppression 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 wildfire holding actions.

The following actions will be taken to protect archaeological and cultural resources from 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 use will be minimized in areas known to harbor cultural significance.
- 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 using the RCRC.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at Ellicott Slough NWR. 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, documentation, and fire investigation.

All fires are wildland fires and will be appropriately suppressed. Suppression operations will generally be conducted by the local county fire department.

Records show that fire season is typically from June 1 through October 31. Depending on the specific weather of any particular year the seasons may be shorter or longer and, therefore, may start earlier or last longer.

FIRE MANAGEMENT STRATEGIES

All unplanned wildland fires will be suppressed in a prompt, safe, and cost-effective manner to produce fast, efficient action with minimum damage to resources using appropriate management strategies. Wildland fires will not be used as a resource management tool.

Fire suppression strategies at Ellicott Slough NWR will include a range of techniques in order to provide for protection of values at risk, natural resources, firefighter safety, and cost efficiency. Suppression strategies and tactics will be unique to each fire, predicated by weather parameters, fuel conditions, safety considerations, resources, and threats to the ponds and willow/blackberry habitat, and planted trees. Determination of strategies and tactics will be made by the Incident Commander on scene utilizing knowledge of Refuge fire management objectives and input from Refuge advisors.

The primary suppression strategy employed at the Refuge will be aggressive direct attack. However, there will be occasions when direct attack in high intensity, rapidly spreading wildland fire would jeopardize firefighter safety and may not be appropriate. In these cases indirect strategy will be employed utilizing natural and man-made features as wildfire control points.

The following will be employed to meet fire management objectives:

1) Suppress (aggressive direct attack) all unplanned ignitions in a safe and cost-effective manner consistent with resources and values at risk. Minimum impact strategies and tactics will be used when possible, particularly near sensitive habitat types such as the ponds and willow areas that support high densities of salamanders.

2) Conduct all fire management programs in a manner consistent with applicable laws, policies and regulations.

3) Utilize mechanical means to remove eucalyptus and pampas grass slash piles to achieve hazardous fuel reduction and resource management objectives.

Although resource impacts of suppression alternatives must always be considered in selecting a fire management strategy, resource benefits will not be the primary consideration. Appropriate suppression action will be taken to ensure firefighter safety, public safety, and protection of the resources.

Critical protection areas, such as SCLTS breeding ponds and surrounding willow and blackberry habitat and will receive priority consideration in fire control planning efforts. In all cases, the primary concerns

of fire suppression personnel shall be the safety, and if needed, all individuals not involved in the suppression effort may be evacuated.

Suppression strategies should be applied so that the equipment and tools used to meet the desired objectives are those that inflict the least impacts upon the natural and cultural resources. Minimum impact suppression strategies will be employed to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction will be conducted in such a way as to minimize long-term impacts to resources.

Vehicle access to normally closed areas of the Refuge, will be made using existing roads when possible (Figures 3&4). When off-road travel is determined to be necessary, vehicle access will be allowed with approval of the Refuge Project Leader or Delegate.

Heavy equipment such as crawlers, tractors, or graders will not be used due to the sensitivity of the habitat, except in cases where life, fire-fighter safety, or private property is threatened or when the Refuge Manager determines necessary. Safety of personnel and sensitive habitat at risk will determine its use. The use of any heavy equipment requires approval from the Refuge Manager or Delegate. Foam and/or retardant has not yet been determined to be compatible with Refuge resources.

Sites impacted by fire suppression activities or by the fire will be rehabilitated as necessary, based on an approved course of action for each incident.

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 monument. Preparedness efforts are to be accomplished in the time frames outside the normal fire season dates.

The U.S. Fish and Wildlife Service has minimum training requirements for all fire positions. The Service is a member of the National Wildfire Coordinating Group (NWCG) and accepts its standards for interagency operations. There is a required refresher training for all personnel that are involved with wildland fire activities. These requirements are found in the USFWS Fire Management Preparedness and Planning Handbook, Section 1.5; Training, Qualification, and Certification (USFWS 2000b)

The traditional approach to a step-up plan does not work in this situation. Due to the availability of a large number of local fire department resources, it would be a rare situation if Service fire crews were deployed to the Refuge during a step-up situation.

HISTORICAL WEATHER ANALYSIS

Prevailing winds are from the west. Mean daily humidities range from around 80% in the winter to about 10% in the spring and summer. Typically, humidity is lowest during the early morning hours and highest during the mid-afternoon hours. Daytime temperatures fluctuate seasonally. Daytime temperatures in summer can range between mid 70s to high 80s. Spring and fall daytime temperatures can hover around the low 70s to mid 80s. Winter temperatures are generally in the 50s to 60s. Frost is common during the winter months.

Fire season is determined by the California Department of Forestry (CDF) Santa Mateo-Santa Cruz Unit. The fire season generally begins with the curing of annual grasses in early June and extends until the first rains in late-October. In general though, fire history does not apply to seasonal wetlands such as the ephemeral breeding ponds due to the nature of wetlands.

Ellicott Slough NWR does not have a weather station and does not monitor weather at the Refuge. The CDF Command Center in Felton calculates the BI and fire danger for NFDR area 550. Ellicott Slough NWR is within this fire danger rating area. The daily BI is obtained by calling CDF Command Center in Felton at (831) 335-6719. Corralitos RAWS (WIMS ID #043802) is used by CDF/Santa Cruz County Fire Department to determine the fire danger rating in the area surrounding the Refuge. For more general weather information ,Watsonville Municipal Airport has a weather station that can be accessed by their web site, www.watsonvilleairport.com, but the site mentions no specifics for the weather conditions at the Refuge.

Fire Prevention

An active fire prevention program will be conducted, as needed, 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 may be implemented. Public contact, handouts and interpretive programs may be utilized to increase neighbor awareness of fire hazards. Trained employees need to relate to the public the potential severity of human-caused wildland fires and how to prevent them.

During periods of extreme or prolonged fire danger (Red Flag Warnings), emergency restrictions regarding Refuge operations may become necessary. No heavy machinery, ATV's lawnmowers, etc. will be permitted on the Refuge at these times. The Refuge Manager or FMO will recommend when such restrictions are necessary.

Staffing Priority Levels

There is no fire-funded staffing stationed at the Refuge. Fire suppression response is provided by local county fire department, therefore, they will adjust staffing levels based on current fire danger. Because the Refuge headquarters is located 90 miles from the Refuge, the local county fire department will be first responders. The Refuge has no facilities located within the boundaries and will not require any closures (except to machinery previously mentioned) during Red Flag Warnings.

Training

Departmental policy requires that all personnel engaged in wildfire suppression duties meet the standards set by the NWCG. Ellicott Slough NWR will conform strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Basic wildland fire training refreshers are offered annually for red-carded firefighters and records kept in a centralized database. Additional training is available from surrounding agencies in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, and helicopter safety. 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.

The Refuge supports the development of individual Incident Command System (ICS) overhead personnel from among qualified and experienced Refuge staff for assignment to overhead teams at the local, regional, and national level.

Fire suppression is an arduous duty. Poor physical condition of crew members can endanger safety and lives during critical situations. Therefore, personnel performing fire management duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test. Personnel must complete a three mile hike with a 45 pound pack in less than 45 minutes.

Supplies and Equipment
A small, 10-person cache for the refuge is located at the Complex headquarters in Fremont, 1 ½ hours from the Refuge. The cache is maintained by the Complex staff and is accessible 24 hours a day. The cache consists of personal protective equipment (e.g. clothing and boots) and fire tools (e.g. shovel and rake).

Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel and equipment are made through the Mendocino NF Dispatch. The contact list can be found in the Dispatch Plan (Appendix E).

Annual fire readiness requires an inventory of existing cache items. The cache should be capable of outfitting six personnel for wildfire activities and will be inventoried as ready by June 1 of each year.

DETECTION
Most wildland fires are reported by the public to 9-1-1. The 9-1-1 dispatchers contact Santa Cruz County Fire Department for suppression response. The Refuge is contacted by county fire command center with a report of all wildland fire activities. The Fire Management Plan does not discriminate between human-caused and lightening caused fires. All wildland fires will be suppressed. Any human-caused fires of suspicious origin as determined by the Refuge Manager or FMO 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
There is no open radio communication frequency for refuge personnel. Instead, the staff utilize a direct connect cellular phone system (Appendix E).

There is currently no common communication link between Service personnel and local county fire personnel. At this time, the Santa Cruz County Fire Department contacts the San Francisco Bay NWR Complex headquarters in Fremont after responding to wildland fires at Ellicott Slough NWR, unless sensitive habitat areas are affected. Because of the distance from headquarters to Ellicott Slough NWR, it is unlikely that Refuge firefighters would arrive in time to assist in suppression efforts. The possibility of a common communication link will be incorporated into the forthcoming MOU with Santa Cruz County Fire Department.

PRE-ATTACK PLAN
Maps showing locations of water sources, roads, sensitive plant communities, sensitive wildlife habitat, private property, etc. will be kept at Refuge headquarters and distributed to Cooperators to facilitate actions that effectively suppress fires while protecting values at risk. The Refuge will use San Andreas Road as the primary firebreak and other arterial cross roads as holding line (Figure 3). The Calabasas Pond Unit will use Ardilla Canyon Road as the primary firebreak with the pond levees and arterial cross roads as holding lines (Figure 4).

FIRE MANAGEMENT UNITS

The Refuge will be managed as one unit, as the Calabasas Pond Unit is close in proximity to the main Refuge area and contains the same vegetation communities. Although there are six distinct vegetation communities, the overall objective is to restore and maintain the area with native vegetation. Because the salamanders estivate underground during the fire season, fire would most likely not negatively affect them. However, fire could detrimentally affect the salamander if it killed and consumed the pond, willow, oak, and/or chaparral vegetation, because the salamanders rely on this vegetation for both breeding and estivation activities. Therefore, suppression of all unplanned ignitions with control at minimum acreage loss will be employed over the entire Refuge.

The lack of knowledge of fire activity on the Refuge makes it difficult to describe normal and extreme fire years. However, fire behavior under drought conditions is expected to range from a fast fire with 6-10 foot lengths in open grassland to a slow smoldering fire in intact willow riparian forest.

Due to staff limitations, relatively small land management parcels, long response times, 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.

Vegetation Types

There are six habitat founds on the Refuge and Reserve: Ellicott ephemeral pond (approximately 3 acres) and Calabasas ephemeral pond (approximately 5 acres; both begin to fill with water early winter and dry late summer); willow riparian habitat surrounding ponds (approximately 20 acres); oak woodland with annual and perennial grass in under story (approximately 80 acres); non-native eucalyptus woodland (approximately 5 acres); chaparral dominated by coyote brush, coffeeberry, and non-native pampas grass (approximately 68 acres); and oak-woodland restoration areas (approximately 20 acres). The majority of the vegetation on the Refuge, annual and perennial grasses, have a high rate of fire spread when dry.

Fuel Types and Fire Behavior

Habitat Type	**NFDRS Model**	**FBFM Model**
Willow Riparian Habitat	E	9
Ephemeral Pond	N	3
Oak Woodland	C	2
Non-Native Eucalyptus	R	8
Chaparral	F	5

Fire behavior in Fire Behavior Fuel Models (FBFM) 2,3,5,8 and 9 can be simulated through computer modeling such as BEHAVE.

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 from initial attack to final suppression. All wildland fires will be suppressed.

Personnel and equipment must be efficiently organized to suppress fire effectively and safely. To this end, the FMO assumes the command function on major or multiple fire situations, setting priorities for the use of available resources and establishing a suppression organization.

There will be only one Incident Commander responsible through the FMO , Refuge Manager or Delegate.

The Incident Commander will designate all overhead positions on fires requiring extended attack.

Suppression Conditions
The typical fire suppression response to a fire at Ellicott Slough NWR would consist of an IC provided by the local county fire department and two engines. Water is the primary method for extinguishing fires. Handline is not usually needed for suppression efforts. Foam and/or retardant has not yet been determined to be compatible with Refuge resources.

Aggressive attack of all unplanned ignitions with minimum acreage burned is the goal. Heavy equipment shall not be used due to the sensitivity of the habitat, except in cases where life, fire-fighter safety, or private property is threatened or when the Refuge Manager determines necessary. Safety of personnel and sensitive habitat at risk will determine its use.

Suppression guidelines listed in this FMP will be incorporated into the forthcoming MOU with Santa Cruz County Fire Department.

Wildland Fire Situation Analysis
For fires that cannot be contained in one burning period, a WFSA must be prepared (Appendix I). In the case of a wildland fire, the Incident Commander, in conjunction with the FMO, will prepare the WFSA. Approval of the WFSA resides with the Refuge Project Leader.

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 Refuge staff and the IC. Notices should be posted to warn neighbors, 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, 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.

EMERGENCY STABILIZATION AND REHABILITATION
When suppression action is taken, rehabilitation is appropriate. The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression techniques.

Rehabilitation will be initiated by the Incident Commander, FMO, or Refuge Manager. 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:

1. Backfill control lines, scarify, and seed.
2. Install water bars and construct drain dips on control lines to prevent erosion.
3. Install check dams to reduce erosion potential in drainages.
4. Restore natural ground contours.
5. Remove all flagging, equipment and litter.
6. Consider and plan more extensive rehabilitation or revegetation to restore sensitive impacted areas.

If revegetation or seeding is necessary, only native plant species will be used.

If Emergency Stabilization and Rehabilitation (ESR) measures are needed or if rehabilitation is needed to reduce the effects of a wildland fire then the Refuge can request appropriate funding through the burned area ESR fund. The ESR fund is administered through the Service's ESR coordinator at the National Interagency Fire Center.

Fire rehabilitation will be as prompt as possible to prevent erosion and spread of non-native plants. This will be developed by the Refuge staff and submitted to the Regional Fire Management Coordinator for review within 90 days of the unplanned ignition being declared out.

REQUIRED REPORTING

A D1-1202, fire report, will be filled out and submitted to the Regional Fire Management Officer for input into the Fire Management Information System (FMIS) within 20 days of the fire being declared out. Copies of the report from the local county fire department will be obtained and a report will be written to summarize the specifics of the fire, actions taken and the outcome of those actions. A formal review will be conducted on all serious injuries and losses of significant resources.

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.

The Refuge Manager, FMO, or IC may request a fire investigator through the local county fire department 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.

Personnel and services of other agencies may be utilized to investigate wildland fire arson or fire incidents involving structures. All fire investigations should follow the guidelines outlined in 4.1-2 of the Fire Management Handbook (2000a).

AIR QUALITY / SMOKE MANAGEMENT GUIDELINES

Air quality is managed by the Monterey Bay Unified Air Pollution District (MBUAPD). Burn permits must be issued to conduct a prescribed burn. The Refuge would need to obtain an annual Prescribed Burn Permit should prescribed burns be included in future FMP revisions. The Refuge would follow all conditions of the permits. MBUAPD is currently in the process of revising fee structure. There has been no determination, yet direction is forthcoming.

The Refuge is located in an area that is classified by EPA and the California State Air Resources Board as "Non-Attainment" for Particulate Matter -10 (PM-10). No prescribed burning is planned at the refuge at this time and therefore smoke management issues should not be encountered.

FIRE RESEARCH

The Refuge would collect data and monitor the revegetation of areas subject to wildland fire burns. Additional research may be conducted as funds become available, however, normal fire program monies will not be used to fund these fire research activities.

PUBLIC SAFETY

Ellicott Slough NWR is dedicated to ensuring the safety of all residents and property adjacent to the Refuge's boundary.

Firefighter and pubic safety will always take precedence over property and resource protection during any fire management activity. For public safety, the fire scene will remain clear of unauthorized people. The responsibility for managing public safety lies with the Incident Commander for wildland fire.

Residents adjacent to the Refuge will be notified if any fire poses a threat to burn outside the Refuge boundaries (Appendix G).

PUBLIC INFORMATION AND EDUCATION

Informing the public is an important part of the fire management program. During wildfire, the Incident Commander is responsible for providing information to the public.

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 Refuge will use the most appropriate and effective means to explain the overall fire and smoke management program. This may include supplemental handouts, signing, or personal contacts. When deemed necessary, interpretive presentations will address the fire management program and explain the role of fire in the environment.

The public information program will be developed as follows:

1. The fire management program may be incorporated into public contacts. Particular attention will be given when fires are conspicuous from roads.
2. News releases will be distributed to the media as appropriate.
3. The public information outlets of neighboring and cooperating agencies and the regional office will be provided with all fire management information.
4. The fire management program will be discussed in informal talks with all employees , volunteers, residents, and neighbors.

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

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUE

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

The fire management plan will be updated as major policy decisions are made. At a minimum, this plan will be reviewed once a year by the individual on the Refuge with fire responsibility to maintain the integrity of the plan. Amendments to the fire management plan itself will be made as needed by sending them to the Regional Fire Management Coordinator for concurrence and to be approved by the Regional Director in Portland. Minor changes to the appendices, such as phone number corrections and personnel changes, can be made at the Refuge level and attached to the plan during this yearly review process without involvement of the Regional Office.

CONSULTATION AND COORDINATION

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

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

Richard Hadley, Team Leader, Land Prot., USFWS, Sacramento, CA

Rachel Hurt, Wildlife Biologist, San Francisco Bay NWRC, USFWS, Fremont, CA

Diane Kodama, Wildlife Biologist, Ellicott Slough NWR, USFWS, Fremont, CA

Ivette Loredo, Refuge Manager, Ellicott Slough NWR, USFWS, Fremont, CA

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

James Roberts, Fire Planner, Pacific Region, USFWS, Portland, OR

Dave Paullin, Klamath/Central Vallley Refuge Supervisor, USFWS, Sacramento, CA

Tom Romanello, Assistant Fire Management Officer, Sheldon-Hart NWR, USFWS, Lakeview, OR

APPENDICES

APPENDIX A: REFERENCES CITED

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APPENDIX B: 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 C: NEPA AND NHPA COMPLIANCE

UNITED STATES FISH AND WILDLIFE SERVICE
ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act of 1969 (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of:

Implementation of the Wildland Fire Management Plan (revised in 2001) for Ellicott Slough NWR.

_x_ Is a categorical exclusion as provided by 516 DM 6 Appendix1. No further NEPA documentation will be made (Exclusion 1.4 B. (5)00 relating to Fire Management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures).

_____ Is found not to have significant environmental effects as determined by the attached environmental assessment and finding of no significant impact.

_____ Is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.

____ Is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, regulations, or procedures.

____ Is an emergency action within the context of CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents (list): ESA-Intra Service Section 7 Consultation.

*_____
Project Leader Date

(1)_____
Initiator Date

*Approving official: Project Leader for Categorical Exclusions; Assistant Regional Director for EA/FONSIs; Regional Director for Environmental Impact Statements.

Categorical Exclusion

for the
Implementation of the Wildland Fire Management Plan
Ellicott Slough National Wildlife Refuge
San Francisco Bay National Wildlife Refuge Complex

Objectives

The Fire Management Plan (FMP) for Ellicott Slough National Wildlife Refuge will help achieve resource management objectives of reducing fuel accumulations to decrease the potential for large wildland fires. The Department of the Interior policy requires that all refuges with vegetation that can sustain fire must have a Fire Management Plan that details fire management policies, the use of prescribed fire for attaining resource management objectives. At this time, prescribed fire will not be used to obtain management objectives. Fuel accumulations of eucalyptus and pampas grass slash piles will be reduced through mechanical means.

This plan is written as an operational guide for managing the refuge's wildland fire program. It defines levels of protection needed to ensure safety, protect facilities and resources, and restore and perpetuate natural processes, given current understanding of the complex relationships in natural ecosystems. It is written to comply with a service-wide requirement that refuges with burnable vegetation develop a fire management plan (620 DM 1).

The FMP outlines procedures for wildland fire suppression. The fire plan furthers the mission of the Refuge by providing increased protection for Refuge resources. Increasing coordination and preparedness to suppress wildland fires will help to ensure quick responses to fires which have the potential to be devastating to Refuge resources,

There is no dedicated fire staff at Ellicott Slough NWR or the San Francisco Bay NWRC. All wildland fires will be suppressed by local cooperating agencies with the oversight of the Project Leader and Zone Fire Management Officer (FMO).

Recommendations

It is our determination that this project succeeds in fulfilling the U.S. Fish and Wildlife Refuge mission to protect and enhance endangered species populations through the implementation of preventative wildland fire measures and documentation of strict fire suppression guidelines to protect critical habitat. This Plan qualifies as a Categorical Exclusion because it directly relates to Fire Management activities, including prevention, suppression, and restoration measures, while adhering to departmental and Service procedures.

APPENDIX D: SECTION & CONSULTATION AND BIOLOGICAL OPINION

San Francisco Bay National Wildlife Refuge Complex
P.O. Box 524
Newark, CA 94560

September 18, 1998

MEMORANDUM
To: Field Supervisor, Ecological Services, Ventura, CA

From: Project Leader, San Francisco Bay NWR Complex, San Francisco, CA

Subject: Amendment of the Biological and Conference Opinion on Prescribed Burning of Eucalyptus Slash Piles at Ellicott Slough National Wildlife Refuge (1-8-98-F/C-26)

We request to amend the Description of Proposed Action in the Biological Opinion for Prescribed Burning at Ellicott Slough NWR (1-8-98-F/C-26) to include the use of mechanical methods to remove eucalyptus slash piles.

In our updated plan, slash piles would be mechanically removed by a contractor with the use of heavy equipment. Contractor would load each designated slash pile into a dump truck using a front-end loader (or other similar type of heavy equipment). The contractor would transport the piles to a facility where they will be recycled. All heavy equipment would stay on designated preexisting roads. Slash piles that are not easily accessible to heavy equipment would be removed through burning.

The Impacts of Action for mechanical removal of slash piles will be the same as those of prescribed burning, therefore the Cumulative Effects of the project on the Santa Cruz long-toed salamander, California red-legged frog, and California tiger salamander will not change.

We will follow all the **Reasonable and Prudent Measures** and **Terms and Conditions** as outlined in the Biological Conference and Opinion (1-8-98-F/C-26) and amendment (6-1-98).

We request your concurrence on this amendment. If you have any questions regarding this request, please contact Erin Fernández of my staff at (510)792-0222.

Margaret T. Kolar

INTRA SERVICE SECTION 7 EVALUATION FORM
CONSULTATION/CONFERENCE/CONCURRENCE

Originating Person: Erin Fernandez, Wildlife Biologist

Date: December 2, 1997

I. Region: Region 1

II. U.S. Fish and Wildlife Service Activity:

Burn non-native eucalyptus slash piles at Ellicott Slough National Wildlife Refuge and California State Ecological Reserve.

III. A. Listed Species which may be affected by the action:

Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)
California red-legged frog (*Rana aurora draytonii*)

B. Proposed Species which may be affected by the action:

None

C. Category 1 Candidate Species which may be affected by the action:

California tiger salamander (*Ambystoma californiense*)

IV. Geographic Area/Action:

Prescribed burning of non-native eucalyptus slash piles at Ellicott Slough National Wildlife Refuge (Refuge) and California State Ecological Reserve (Reserve). The project will be supervised by San Francisco Bay NWRC personnel and FWS Regional Fire Management Officer with work being conducted by California Department of Forestry and Fire Protection (CDF). Burn activities will be coordinated with California Department of Fish and Game (CDFG).

V. Location:

Ellicott Slough NWR and California State Ecological Reserve located in Santa Cruz County (see attached map).

VI. Action Objectives:
Objectives are to restore native upland habitat for the endangered Santa Cruz long-toed salamander

(SCLTS), California tiger salamander (CTS), and possibly non-breeding habitat for the Red-legged frog (RLF). This will be accomplished by eliminating non-native eucalyptus slash piles on the Refuge and Reserve through a prescribed burn. The piles were created in 1997 when approximately 10 acres of eucalyptus trees were logged to restore estivation habitat for the SCLTS. The majority of the eucalyptus trees were removed from the site, however the smaller trees and remaining slash were piled into burnable size slash piles.

The Refuge and Reserve were created to protect SCLTS breeding and estivation habitat. Removal of non-native vegetation, such as eucalyptus and pampas, is part of the habitat management plan for the Refuge and Reserve to restore estivation habitat for the SCLTS. Non-native vegetation encroachment into upland habitat is a threat because the SCLTS depends on native woodland habitat, including groves of willow, riparian vegetation, coastal scrub, or coast live oak forest during the majority of the year (USFWS, 1986; Ruth, 1988). Eucalyptus and pampas are aggressive, non-native species that displace native vegetation and offer poor quality habitat for wildlife species (Ruth, 1988).

Restoration at the Refuge and Reserve includes removal of non-native plant species, primarily eucalyptus and pampas, and planting of native grasses, shrubs, and oaks, which offer high quality habitat for the SCLTS and other native wildlife species. The restoration plan is consistent with the Service's and State's goals for the area as well as the SCLTS Recovery Plan, which requires habitat enhancement for the benefit of the SCLTS.

After consulting with ecologists experienced in eucalyptus removal for habitat restoration, the CDF, and FWS Ventura Ecological Services Office, it was determined that burning of slash piles was the most time- and cost-effective method of slash removal, while causing minimal environmental and biological impact. Other options that were considered and eliminated were: 1) leaving the slash to decompose and 2) chipping and/or cutting and removing. Leaving the piles is not a viable option because a previous SCLTS Endangered Species Consultation required removal of the slash. Leaving slash would also create a considerable fire hazard to endangered species and their habitat, and to adjacent property owners. Chipping and/or cutting and removing would be extremely labor and cost intensive and would have similar biological impacts to endangered species as burning (i.e. removing piles may result in some take of SCLTS, CTS, and RLF using piles as transitory cover).

VII. Impacts of Action:

A burn plan will be prepared specifying weather and fuel conditions under which burning can occur so as to prevent escaped fire. Slash piles will be burned sometime in the spring or early summer, when the heavy rains have stopped but fuel moisture levels are still high, in order to prevent escaped fire. Additionally, firebreaks will be placed around each slash pile before it is burned to prevent escaped fire. Despite precautions that will be taken to prevent escaped fire, prescribed burning of slash piles could adversely affect endangered species if the fire escapes a slash pile. The selection of, and adherence to, a proper prescription and careful coordination with CDF, Monterey Bay Area Air Quality Management District, Santa Cruz Fire Department, and FWS Regional Fire Management Officer will greatly reduce these threats.

Burning of slash piles may result in some take of SCLTS and CTS because these species may utilize the slash piles as cover. In order to limit take of the salamanders, burning will be conducted after the rainy season, when the adult and sub-adult salamanders are most likely estivating beneath the ground in animal burrows and along the root systems of plants in chaparral, oak-woodland, and riparian areas and the larval salamander are still utilizing the pond environment (Ruth 1988). The salamanders may be more likely to

utilize wood piles as transitory cover when they are migrating to and from the breeding pond from November through March. They would be less likely to use these slash piles for permanent estivation habitat during the remainder of the year because the piles are located in open areas, where the eucalyptus stands were logged, away from typical estivation habitat (Ruth, pers. comm.)

Although salamanders have been found in wood piles at various sites (Ruth, pers. comm), there is less chance that they will be present in eucalyptus slash piles because the toxins in the leaves of the eucalyptus are thought to be harmful to the sensitive skin of salamanders. Salamanders would be expected to avoid these piles if the toxins have not yet deteriorated.

Burning activities may also impact the RLF. Breeding and non-breeding habitat use by the RLF has never been thoroughly assessed at the Refuge and Reserve. However, private consultants have reported to Refuge personnel that they have heard RLFs calling at Ellicott pond. Refuge personnel have dipped and seined potential RLF breeding habitat on the Refuge and Reserve (i.e. ditches and ponds) and have not found RLF larvae. Therefore, it is not certain they will be in the vicinity during the burn time in late spring or early summer. If RLF's are present in the area, there is a high likelihood they may use the slash piles as transitory cover during the rainy season. It is less likely, however, that they would utilize the piles after the rainy season (when we plan to burn) because during the dry season they seek riparian habitat and other areas that remain wet throughout the entire year (Seymour, pers. comm.).

Ultimately burning of slash piles will benefit the salamanders and possibly the RLF because the cleared areas will be restored to the native oak-woodland and chaparral habitat. Once the burn is completed the ashes will be spread and native oaks and grasses will be planted and/or seeded in these areas.

VIII. Effect Determination and Response Requested:

A. Listed Species/designated critical habitat:

Determination	Response Requested
no effect/no adverse modification (species:)	___*Concurrence
is not likely to adversely affect species/ adversely modify critical habitat	___ Concurrence
(species:)	___*Formal Consultation
is likely to adversely affect species/ adversely modify critical habitat (species: Santa Cruz long-toed salamander, California red-legged frog)	_____Formal Consultation

B. Proposed Species/Proposed critical habitat: NONE

C. Candidate Species: NONE

Determination	Response Requested
no effect (species:)	___*Concurrence
may affect, but is not likely to adversely affect (species:)	___Concurrence
may affect, and is likely to adversely affect (species: California tiger salamander)	___Informal conference
is likely to jeopardize the continued existence of candidate species (species:)	___Conference

_____ _____

signature date

title/office of supervisor at originating station

IX. Reviewing ESO Evaluation:

A. Concurrence _____ Nonconcurrence

B. Formal consultation required

C. Conference required

D. Informal conference required

E. Remarks (attach additional pages as needed):

_____ ____

signature date

_____

title/office of reviewing official

APPENDIX E: ANNUAL FIRE DISPATCH PLAN

When a report of smoke or fire on the Refuge is received, get as much information from the caller or messenger as possible:

Location of smoke or fire?
Location of caller?
Name and telephone number or contact point of the caller or messenger?
Color of smoke?
Size of fire?
Type of fuel (What is burning?)
Character of the fire (Active, smoldering, etc.)?
Is anyone fighting the fire? How many personnel? Equipment?
Did they see anyone in the vicinity or vehicles leaving the area?
Is the fire site accessible by a slip-on unit?
What are the weather conditions at the fire?

1) Report to:

Santa Cruz County Fire Department
(831)335-6719

Refuge Address:
Ellicott Slough NWR -San Andreas Rd. Between Buena Vista Dr. and Spring Valley Rd.
Calabasas Pond Unit - Ardilla Canyon Rd off of Larkin Valley Rd.

2. Due to the distance of Ellicott Slough NWR from the Fremont HQ, the fire will likely have already been extinguished before Refuge personnel arrive. However, a Refuge police officer and Refuge firefighter unit should be dispatched for mop-up, fire investigation and report purposes.

3. If discovered while on the Refuge, call 911 or the County Fire Department at (831)335-6719 or Refuge Headquarters (510)792-0222 for assistance.

4. Dispatch Refuge firefighters if the fire is on the Refuge or threatens Refuge property.

5. Notify Refuge Manager (Ivette Loredo - (510) 792-0222), Project Leader (Marge Kolar - (510) 792-0222), on-duty Police Officer (see list below), and Zone Management Officer (Roger Wong -(209)826-3508).

6. For fires occurring at night or on weekends, the following individuals should be notified in order:

a. On-call Police Officer: Call Park Police Dispatch (415) 561-5510

   Barry Tarbet (510)247-3357
   Jon Adamson (510)782-1154

b. Refuge Manager
   Ivette Loredo (510)792-0222 Cell(510)377-5956

c. Project Leader
Marge Kolar (510)792-0222 Cell(510)377-9450

d. Wildlife Biologist
Diane Kodama (510)792-0222 Cell(510)377-5695

e. Zone Fire Management Officer
Roger Wong (209)826-3508 Cell(209)704-4508

f. Refuge Fire Crew:

Ivette Loredo	Cell(510)377-5956
Clyde Morris	Cell(510)377-2781
Carmen Leong	Cell(510)377-9229
Joelle Buffa	Cell(510)377-5958
Joy Albertson	Cell(510)377-5693
Art Chan	Cell(510)377-3119
Juan Flores	Cell(510)377-5891
Mike Parker	Cell(510)928-0497

g. Other personnel to be involved if necessary:

Andy Anderson, Regional Fire Management Officer
(503) 231-6175 business or residence (360) 666-5031

Amanda McAdams, Fire Planner, Pacific Region
Regional Office: (503) 872-2756

Pam Ensley, Regional Fire Management Coordinator,
Regional Office: (503) 231-6174 or residence (360) 835-7004

Roddy Baumann, Regional Prescribed Fire Specialist
Regional Office: (503) 231-2075 or (360) 573-9444 residence

Mendocino NF Dispatch
Willows, CA
(888) 663-3479

APPENDIX F: DELEGATION OF AUTHORITY

Ellicott Slough NWR

Delegation of Authority
for

_____ Incident

_____ is assigned as Incident Commander. You have full authority and responsibility for managing the fire suppression activities within the framework of laws, Agency policy, and direction provided in the Wildland Fire Situation Analysis and the Agency Administrator Briefing.

Your primary responsibility is to organize and direct your assigned resources for efficient and effective suppression of the fire. You are accountable to the Agency Administrator or the representatives designated below.

Specific direction for this incident covering management and environmental concerns are:

1. Protection of life and private property is your highest priority task.
2. Give special consideration to firefighter safety, especially with respect to aviation operations, working around dozers, snags, and entrapments. Avoid sensitive environmental areas. When in doubt, sacrifice acres not people in your strategic and tactical decisions.
3. You are authorized to utilize helicopters, chainsaws, portable pumps, fireline explosives, and retardant at Ellicott Slough NWR. You are not authorized to use equipment within the _____.
4. Manage human resources assigned to the fire in a manner that promotes mutual respect and is consistent with the enclosed U.S. Fish & Wildlife Service "Harassment-Free Workplace" policy.
5. Be cost effective; final costs should be no more than 120% of the preferred WFSA alternative.
6. Manage equipment and supplies to ensure losses are within Acceptable Fire Loss/Use Rates.

You should takeover management of the incident on or before _____, _____.

_____ _____

Marge Kolar, Project Leader, San Francisco Bay NWRC Date

Delegation of Authority - Guidelines for Mitigating the Effects of Fire Suppression

LINE BUILDING

1. Do not fall snags on the outside of the line unless they are an obvious safety hazard.
2. On the inside of the line, fall only those snags that would reach the fire line should they burn and fall over, or if they are an obvious safety hazard.
3. Don't cut live trees over 12" d.b.h. unless deemed absolutely necessary by the Complex Manager. Limbing of these trees, as necessary, should be the first choice.
4. Cut brush or small trees flush with the ground if the area is visible from roads.
5. Lop and scatter cut limbs so the depth will not exceed 15 inches.

MOP-UP

1. Extinguish fire in living trees or snags within 200 feet of the fires perimeter with water or dirt. Fell those trees as a last resort.
2. If felling occurs in the vicinity of service roads/trails, cut the stumps flush with the ground.
3. Buck fallen trees across service roads/trails only to the extent necessary to facilitate road/trail passage.

AIR OPERATIONS

1. Consider fixed wing delivery of water vs. standard colored retardant.
2. When possible, use long line slings instead of cutting helispots.

APPENDIX G: WILDLAND FIRE CONTACT LIST

Santa Cruz County Fire Department
P.O. Drawer Box F-2, 6059 Highway 9
Felton, CA 95018
(831) 335-5355

Patricia Anderson - California Department of Fish and Game
P.O. Box 4008
Aromas, CA 95004

Ellicott Slough Refuge
Michael and Sandy Lansdale
1022 A San Andreas Rd.
La Selva, CA 95076
(831)722-7125

Current Resident
1022 B San Andreas Rd.
La Selva, CA 95076

Larry Delaney
1022 C San Andreas Rd.
La Selva, CA 95076
(831) 722-9354

Dixie Allen and Bob Shelts
1022 D San Andreas Rd.
La Selva, CA 95076

Current Resident
1022 E San Andreas Rd.
La Selva, CA 95076

Current Resident
1022 F San Andreas Rd.
La Selva, CA 95076

Paticia Gates
1022 San Andreas Rd.
La Selva, CA 95076

Dave and Virginia Templeton
Kampground of America
1186 San Andreas Rd.
La Selva, CA 95076

Calabasas Pond Unit

Katherine and Hal Hauk 825
Ardilla Canyon Rd.
Watsonville, CA 95076

John Wright
Richard Mativer
916 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1000 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1110 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1120 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1130 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1140 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
1147 Larkin Valley Rd.
Watsonville, CA 95076

Current Resident
145 Valley Vista Lane
Watsonville, CA 95076

Current Resident
195 Valley Vista Lane
Watsonville, CA 95076

Current Resident
200 Valley Vista Lane
Watsonville, CA 95076

Current Resident
205 Valley Vista Lane
Watsonville, CA 95076

Current Resident
212 Frogsong Way
Watsonville, CA 95076

Current Resident
230 Frogsong Way
Watsonville, CA 95076

Current Resident
425 White Rd.
Watsonville, CA 95076

Current Resident
434 White Rd.
Watsonville, CA 95076

Current Resident
436 White Rd.
Watsonville, CA 95076

Current Resident
507 White Rd.
Watsonville, CA 95076

Current Resident
551 White Rd.
Watsonville, CA 95076

Current Resident
785 White Rd.
Watsonville, CA 95076

Current Resident
787 White Rd.
Watsonville, CA 95076

Current Resident
795 White Rd.
Watsonville, CA 95076

Current Resident
797 White Rd.
Watsonville, CA 95076

Current Resident
799 White Rd.
Watsonville, CA 95076

Current Resident
800 White Rd.
Watsonville, CA 95076

Current Resident
801 White Rd.
Watsonville, CA 95076

APPENDIX H: CULTURAL RESOURCES COMPLIANCE

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?

APPENDIX I: SAMPLE WFSA

WILDLAND FIRE SITUATION ANALYSIS

3. Jurisdiction: **US Fish and Wildlife Service**	4. Geographic Area: **Northwest Coordination Center**
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 constrants)

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 J: SAMPLE BURN PLAN

Prescribed Fire Plan

Refuge or Station

Unit

Prepared By: _____ Date:

Reviewed By: _____ Date:
Refuge Manager

Reviewed By: _____ Date:
Prescribed Fire Burn Boss

Reviewed By:_____ Date:
Regional Fire Management Coordinator

Reviewed By: _____ Date:
(Others)

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.

Approved By: _____ Date:

PRESCRIBED FIRE PLAN

Refuge: _____ Refuge Burn Number:

Sub Station: _____ Fire Number:

Name of Area: _____ Unit No.

Acres To Be Burned: ____ Perimeter Of Burn:

Legal Description: Lat. ___ Long. ___ T __ R __ S

County:

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review? Yes No (circle).

(Page 2 of this PFP should be a refuge base map showing the location of the burn on Fish and Wildlife Service land.)

The Prescribed Fire Burn Boss/Specialist must participate in the development of this plan.

I. GENERAL DESCRIPTION OF BURN UNIT

Physical Features and Vegetation Cover Types (Species, height, density, etc.):

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

Objectives of Fire (Be specific. These are different than management goals):

Acceptable Range of Results (Area burned vs. unburned, scorch height, percent kill of a species, range of litter removed,

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.):

Other:

III. PLANNING AND ACTIONS

Complexity Analysis Results:

Site preparation (What, when, who & how. Should be done with Burn Boss):

Weather information required (who, what, when, where, how, and how much):

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.)

Special Safety Precautions Needing Attention (Aerial ignition, aircraft, ignition from boat, etc.):

Media Contacts (Radio stations, newspaper, etc., list with telephone numbers):

Special Constraints and Considerations (Should be discussed with Burn Boss):

Communication and Coordination on the Burn (Who will have radios, frequencies to be used, who will coordinate various activities.):

IV. IGNITION, BURNING AND CONTROL

Planned or Proposed Actual

Scheduling: Approx. Date(s)

Time of Day

Acceptable Range

FBPS Fuel Model	Low	High	Actual
Temperature			
Relative Humidity			
Wind Speed (20' forecast)			
Wind Speed (mid-flame)			
Cloud Cover (%)			
ENVIRONMENTAL CONDITIONS			
Soil Moisture			
1 hr. Fuel Moisture			
10 hr. FM			
100 hr. FM			
Woody Live Fuel Moisture			
Herb. Live Fuel Moisture			
Litter/Duff Moisture			
FIRE BEHAVIOR			
Type of Fire (H,B,F)			
Rate of Spread			
Fireline Intensity			
Flame Length			
Energy Release Component NFDRS Fuel Model _____			

Cumulative effects of weather and drought on fire behavior:

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):

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.)

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):

Distance and Direction from Smoke Sensitive Area(s):

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

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

Actions to Reduce Visibility Hazard(s):

Residual Smoke Problems (Measures to reduce problem, i.e., rapid and complete mop-up, mop-up of certain fuels, specific fuel moistures, time of day, etc.):

Particulate emissions in Tons/Acre and how calculated (This should be filled in after the burn so more precise acreage figures can be used):

VI. FUNDING AND PERSONNEL

Activity Code:

Costs

	Equipment & Supplies	Labor	Overtime	Staff Days	Total Cost
Admin. (planning, permits, etc.)					
Site Preparation					
Ignition & Control					
Travel/Per Diem					
Total					

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.)

Burn Boss/Manager -

Ignition Specialist -

Ignition Crew -

Holding Specialist -

Holding Crew -

Aircraft Manager -

FWBS -

Dispatcher-

Other -

Crew Briefing Points (Communications, hazards, equipment, water sources, escape fire actions, etc., to be done by Burn Boss. Refer to Safety Considerations in Planning Actions and points listed below):

Ignition Technique (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:

Holding and Control:

Critical Control Problems:

Water Refill Points:

Other:

Contingency Plan for Escaped Fire (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.)

Mop Up and Patrol:

Rehabilitation Needs:

DI 1202 Submission Date:_____

Special Problems:

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:

Other: