WILDLAND FIRE MANAGEMENT PLAN

STONE LAKES NATIONAL WILDLIFE REFUGE

2001

SEPTEMBER 2001

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INTRODUCTION

The Stone Lakes National Wildlife Refuge (NWR) was established to preserve and enhance native Central Valley plant communities and their associated fish, wildlife and plant species. It currently consists of 4,000 acres within an approved project boundary of 18,129 acres (Figure 1). Approximately 5,000 acres within the boundary are owned by a number of state and county agencies. Through a cooperative agreement, the U.S. Fish and Wildlife Service (Service) manages over 2,700 acres of these lands as part of the National Wildlife Refuge System. The Refuge land base protects important habitats that have largely been eliminated in the Central Valley of California. The Refuge supports essential habitats for numerous federal and state listed-threatened and endangered species, such as giant garter snake, Swainson's hawk, and California hibiscus. One of the goals of the Refuge is to reduce non-native grasses and forbs and restore native habitats. A fire management program will assist the Refuge in reaching that goal. Cultivation, livestock overgrazing, disturbances, and years of neglect have converted Refuge grasslands to a condition where primarily annual non native grasses and forbs predominate. There is also a significant fire hazard due to heavy accumulations of flashy fuels immediately adjacent to an urban setting.

When approved, this document will become the Stone Lakes National Wildlife Refuge (NWR) Fire Management Plan. Major components include:

- Refuge policy documents referenced (grazing management plan, CCP when completed).
- Format changes under the direction of Fire Management Handbook.
- Continue a program of prescribed burning and full suppression of all wildland fires.

This plan is written to provide guidelines for appropriate suppression and prescribed fire programs at Stone Lakes NWR. Prescribed fires may be used to reduce hazard fuels, restore the natural processes and vitality of ecosystems, improve wildlife habitat, remove or reduce non-native species, and/or conduct research.

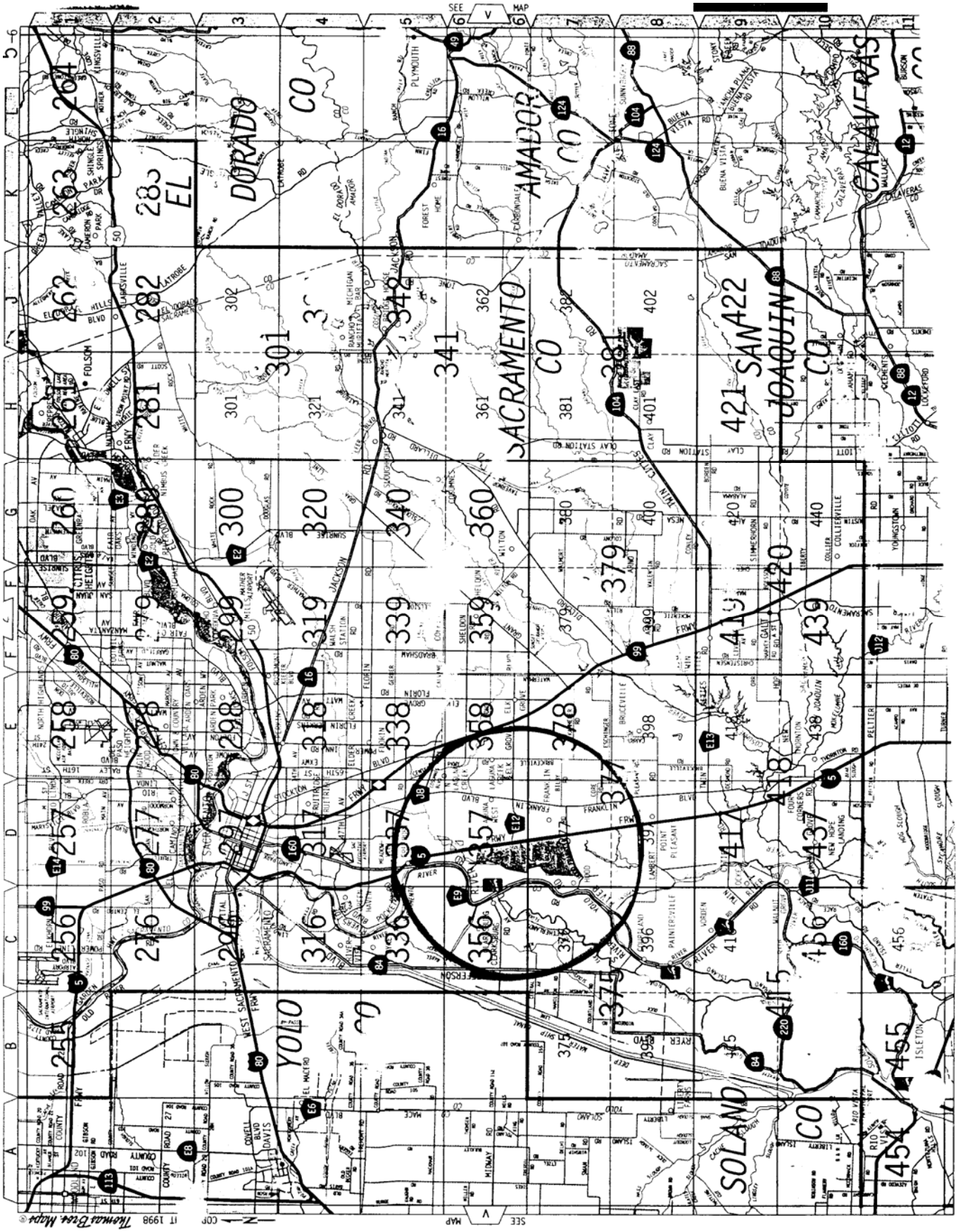
This Fire Management Plan (FMP) will help achieve resource management objectives by enabling the Refuge to utilize prescribed fire, as one of several tools, to control non-native vegetation and reduce fire hazards in grassland and riparian habitats. It will be used in conjunction with other management tools that are currently applied on Refuge properties (i.e., grazing, mowing, and herbicide applications) to meet resource objectives.

This plan will meet the requirements of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). An Environmental Action Statement for a Categorical Exclusion was completed and signed by the Project Leader (Appendix C). This FMP meets the guidelines established by the Intra-service Section 7 Handbook for Endangered Species Consultation; the Project Leader determined that wildland and prescribed fire activities will have "no effect" on Threatened and Endangered species on the Refuge.

There are significant archaeological resources on the Refuge, including burial sites. Theses resources will be protected during all fire activities except in the case of threats to life.

There is currently no dedicated fire staff located at Stone Lakes NWR. An agreement (Appendix D) is in place with Elk Grove Community Service District (CSD) to provide suppression services to the Refuge. Fire staff located at Sacramento National Wildlife Refuge Complex (NWRC) will respond when requested to any wildland fire and will be responsible for implementing the prescribed fire program. Collateral firefighters located at the Refuge will assist, as needed and qualified, on all fires.

Figure 1. Vicinity Map.



COMPLIANCE WITH USFWS POLICY

Stone Lakes NWR was established in 1994 to preserve, restore, and manage disappearing Central Valley habitats. Specific habitats to be managed under this program include permanent and seasonal wetlands, grasslands, and riparian corridors for the benefit of waterfowl and other wildlife. The primary objective of the fire management program is to protect and enhance the necessary habitats native species while controlling non-native vegetation.

No Refuge master plan or Comprehensive Conservation Plan (CCP) has been prepared for Stone Lakes NWR. However, the Refuge will begin the planning process for preparation of a CCP during the second half of FY 2001. Through cooperative agreement with Sacramento County the Refuge manages the 2,700-acre North Stone Lake property according to the *Draft North Stone Lake Restoration and Management Master Plan* until a CCP for the entire Refuge is completed. The Cooperative Agreement for Grassland Management on North Stone Lake Wildlife Refuge authorizes the Service to manage Sacramento County's North Stone Lake property as part of the National Wildlife Refuge System, as directed in Title 50, United States Code, as well as other laws, regulations and policies for the administration of the National Wildlife Refuge System (Appendix D). The Service has full management responsibilities for the North Stone Lake property, including fire management.

Service policy mirrors Departmental policy (620 DM 1.4) relating to wildland fire and prescribed fire, and Departmental policy states:

- Firefighter and public safety is always the first priority. All Fire Management Plans and activities must reflect this commitment.

- Every area with burnable vegetation must have an approved Fire Management Plan. Fire management plans must be consistent with firefighter and public safety, values to be protected, and land, natural, and cultural resource management plans and must address public health issues. Fire management plans must also address all potential wildland fire occurrences and include the full range of wildland fire management actions. Bureau fire management plans must be coordinated, reviewed, and approved by responsible agency administrators, to insure consistency with approved land management plans.

- Fire, as a critical natural process, will be integrated into land, natural, and cultural management plans and activities on a landscape scale, across bureau boundaries, and will be based upon best available science. All use of fire for natural and cultural resource management requires an approved plan which contains a formal prescription.

- Wildland fire will be used to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, be allowed to function in its natural ecological role.

- Bureaus will ensure their capability to provide safe, cost-effective fire management programs in support of land, natural, and cultural resource management plans through appropriate planning, staffing, training, and equipment.

- Management actions taken on wildland fires must be cost effective, consider firefighter and public safety, benefits, and values to be protected, and be consistent with natural and cultural resource objectives.

- Bureaus will work together and with other affected groups and individuals to prevent unauthorized ignition of wildland fires.

- Protection priorities are (1) human life and (2) property and natural/cultural resources. If it becomes necessary to prioritize between property and natural/cultural resources, this is done based on relative values to be protected, commensurate with fire management costs. Once people have been committed to an incident, these human resources become the highest value to be protected.

- Fire management planning, preparedness, wildland fire and prescribed fire operations, monitoring, and research will be conducted on an interagency basis with the involvement of all partners.

- Bureaus will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, values-to-be-protected methodologies, and public education programs for all fire management activities.

- Fire management programs and activities will be based on economic analyses that incorporate commodity, non-commodity, and social values.

- The operational role of the bureaus as a partner in the wildland/urban interface is wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical assistance. Structural fire protection is the responsibility of Tribal, State, and local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding. (Some Federal agencies have full structural protection authority for their facilities on lands they administer and may also enter into formal agreements to assist Tribes, State and local governments with full structural protection.)

- Employees who are trained and certified will participate in the wildland fire program as the situation demands; non-certified employees with operational, administrative, or other skills will support the wildland fire program as needed. Agency Administrators will be responsible, and will be held accountable, to make employees available to participate in the wildland fire program.

The authority for funding (normal fire year programming) and all emergency fire accounts is found in the following authorities:

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

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

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

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

The Reciprocal Fire Protection Act of May 27, 1955 (42 USC 815a; 69Stat 66) provides Authorities to enter into agreements with other Federal bureaus and agencies; with state, county, and municipal governments; and with private companies, groups, corporations, and individuals regarding fire activities. Authority for interagency agreements is found in “Inter-agency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service of the United States Department of the Interior and the Forest Service of the United States Department of Agriculture” (1996).

FIRE MANAGEMENT OBJECTIVES

Refuge fire management objectives include:

- Protect life, property, and natural and cultural resources.
- Safely suppress wildland fires using strategies and tactics appropriate for the situation.
    - Use of heavy equipment will be prohibited except in cases of threats to life and/or property or by specific approval of the Refuge Manager.
    - Off-road travel will be limited to areas outside fenced-off archaeological sites.
- Use prescribed fire as a tool to control non-native vegetation and reduce fuel loads.
- Integrate prescribed fire into the mix of habitat restoration, in conjunction with other management tools already utilized such as grazing, mowing, and spraying of herbicides.
- Protect wildlife, with special emphasis on endangered, threatened and species of special concern.

DESCRIPTION OF REFUGE

The Stone Lakes NWR is located approximately 1.5 miles east of the Sacramento River and two miles south of the town of Freeport in Sacramento County, California (Figure 1). The Refuge is located along the I-5 Corridor, and is largely surrounded by state and county highways and waterways (to the west). The Refuge consists of a combination of fee title, easement, and county and state-owned properties. The Refuge ranges from 2.8-12.9 feet in elevation. The Refuge is surrounded by agricultural and urban lands. Urban development and vineyards are encroaching on the eastern and southern borders.

CLIMATE

The climate is classified as Mediterranean with cool, wet winters and hot, dry summers. Rainfall is fairly well distributed throughout the winter, occurring in steady but gentle 2-3 day storms. The annual average precipitation is 16-18 inches. Heavy fogs are common during the winter months, while thunderstorms, hail and snow are a rare occurrence. The mean annual temperature is 62EF with extremes of 118EF and 15EF. Southerly winds are associated with storms in the winter and cooling trends in the summer. North winds are usually dry following winter storms and hot and dry in the summer when the most hazardous wildland fire conditions occur. Winds during summer are generally west or southwesterly coming from the Sacramento-San Joaquin River Delta. High winds and gusts are frequent during summer.

CULTURAL RESOURCES

Numerous archaeological and historic properties are located throughout the Refuge, since many higher elevation areas are former Plains Miwok Indian village and burial sites. Due to historic farming practices, many of these sites have human remains and artifacts at or near the surface. Therefore, ongoing coordination and consultation to ensure protection of these resources will continue, as needed, between Refuge staff and the State Historic Preservation Office, California Native American Heritage Commission, local tribal representatives, and Service archaeologists with the assistance of private archaeological consultants. As properties are acquired for the Refuge, they are surveyed by archaeologists and historic sites are identified and delineated. Refuge staff consult annually with archaeological experts and local tribal representatives to ensure that all legal responsibilities under the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act are observed and historic properties are protected during any habitat management activities. Any ground disturbance associated with firelines that may be necessary will only be constructed when considered absolutely necessary.

VISITOR USE

Along the eastern Refuge boundary, Refuge lands are immediately adjacent with urban residential and commercial development. As a result, there is substantial community interest in visitor use opportunities on the Refuge. At present a Refuge hiking trail and wildlife observation platform are only open every other Saturday and other visitation is limited.

FISH AND WILDLIFE

The Refuge provides habitats for migratory and resident bird species. The Refuge also contains aquatic habitats for species such as the western pond turtle. The Refuge has a large rookery (great blue heron, great egret and double crested cormorant). A species list for the Refuge is attached (Appendix E).

THREATENED AND ENDANGERED SPECIES

Stone Lakes NWR currently supports habitat for six threatened and endangered species. The fire management program will be implemented in accordance with the Endangered Species Act of 1973 and will take appropriate action to identify and minimize adverse effects on any threatened or endangered species.

Threatened and endangered species include:

- Vernal pool fairy shrimp (*Branchinecta lynchi*) (Threatened)
- Vernal pool tadpole shrimp (*Lepidurus packardi*) (Endangered)
- Giant garter snake (*Thamnophis gigas*) (Threatened)
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (Threatened)
- Delta smelt (*Hypomesus transpacificus*) (Threatened)
- Sacramento splittail (*Pogonichthys macrolepidotus*) (Threatened)

All of these species, except the valley elderberry longhorn beetle, occur in aquatic habitats. The beetle occurs only on elderberry.

Service Endangered Species Division staff from the Sacramento Fish and Wildlife Office were informally consulted on the Refuge grassland habitat management program including the use of prescribed burning as a management tool. As result of this verbal consultation and the small scope of the Refuge burn program, the Project Leader determined that this management program will have "no affect" on listed, proposed, and/or candidate species or designated critical habitat.

HABITATS

The major natural habitats of the Refuge are: (1) grasslands, (2) riparian woodlands, and (3) seasonal and permanent wetlands. Portions of the Refuge remain as agricultural lands (vineyards and crops), although restoration of these areas is planned.

Grasslands

The grasslands on the Refuge occur on clay-rich soils that are moist in winter and very dry in summer. These areas are open habitats supporting grasses and forbs and little in the way of woody vegetation. Grasslands are composed of a mix of native and non-native grasses and forbs. They are currently dominated by exotic annual grasses such as wild oat (*Avena fatua*), soft chess (*Bromus mollis*), annual rye (*Lolium perenne*), and ripgut brome (*Bromus diandrus*). However, one native, creeping wild rye (Ley*mus triticoides*) still occurs abundantly. Some perennials such as meadow barley (*Hordeum brachyantherum*) and other native wild flowers cannot compete as well with the non-natives. Vernal pools occur within the grassland habitat, and may contain water from December through April. These pools may contain the Vernal pool fairy shrimp, the Vernal pool tadpole shrimp, as well as a unique assemblage of plants.

Riparian Woodlands

The riparian woodlands are very diverse, multilayered communities which experience occasional flooding. The canopy is very diverse consisting of mostly willow species, cottonwood, and valley oak. This habitat supports a rich array of native wildlife as well as an extensive colonial bird rookery. The rookery is one of the largest in the Central Valley and supports nesting by the great blue heron, great egret, snowy egret, black-crowned night-heron and double crested cormorant.

Seasonal and Permanent Wetlands

Refuge wetlands contain a wide variety of plants (Appendix E) some of which have special state status. These include: dwarf downingia (*Downingia humilis*), Legenere (*Legenere limosa*), California hibiscus (*Hibiscus lasiocarpus*), and Sandford's arrowleaf (*Sagittaria sanfordii*). The seasonal and permanent wetlands on the Refuge occur in low lying areas that are inundated with water for long periods during the year and may contain water for at least part of the summer. The seasonal wetlands mostly consist of rushes, sedges and smartweeds. The permanent wetlands consist of cattail, tule and water primrose.

PHYSICAL RESOURCES

The Refuge has a gentle slope from east to west, with the east being the higher elevation. There are twelve soil types in the North Stone Lakes area. These types can be classified into three general categories: 1) alluvial flood basins bordering natural levees of the Sacramento River, 2) low terraces of the valley plain composed of old alluvium, and 3) transitional areas.

There are two lakes on the Refuge, North and South Stone Lake (Figure 2). The Lewis property is bordered by a slough to the north. The Southern Pacific (SP) cut is a major waterway used to divert water from the Sacramento River to private and public lands for irrigation purposes. It forms the western edge of the Refuge and flows year-round. Irrigation on the Refuge is managed by Refuge staff. All other water levels are managed by non-Refuge entities or through natural water fluctuations (e.g., tidal influences).

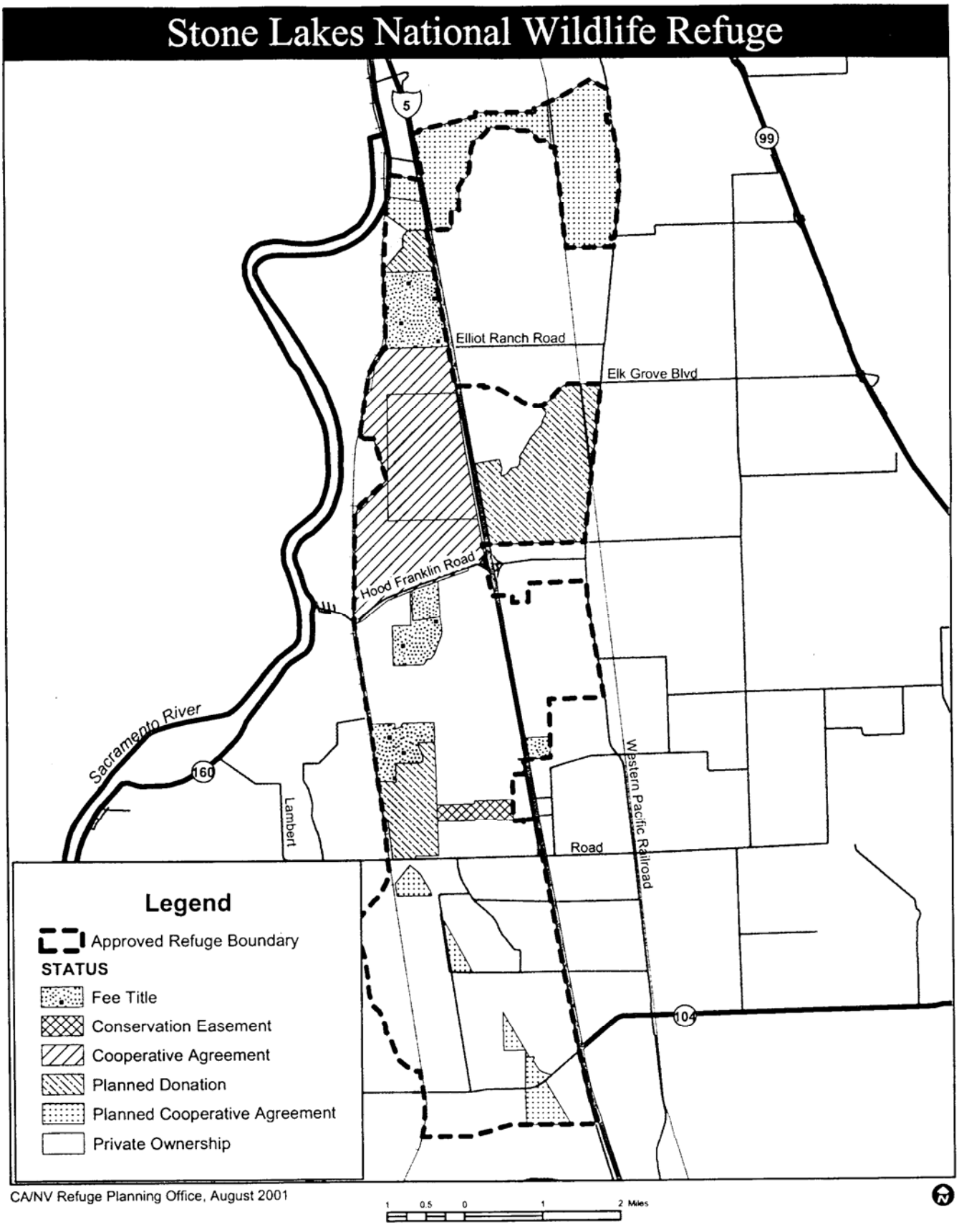
The Refuge is located in the Sacramento Metropolitan Air Quality Management District (SMAQMD), which is identified by Environmental Protection Agency (EPA) as a non-attainment area.

STRUCTURES AND FACILITIES

The Refuge has two management sites, each with two buildings. Other structures on the Refuge are in the process of being removed. The main office is at 1624 Hood-Franklin Road in Elk Grove. The maintenance shop is located on Fogg Road in Point Pleasant.

A viewing platform exists on the Lewis property and is located at the end of the hiking trail. A kiosk, which is not currently used, is located at the start of the trail.

Figure 2. Stone Lakes NWR.



WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

The typical period of high fire danger is from May through early November based on information from the California Department of Forestry (CDF). Most fires on the Refuge have lasted no more than one burning period.

Pre-settlement Fires

Most of the Stone Lakes NWR was and is grassland. Lightning-caused fire in the Sacramento Valley is uncommon, although fires which began in the foothills may have historically spread to the Valley floor. Native American practices likely included burning of the area, although frequency is unclear. Native grasslands were probably well-adapted to fire, but information on these native plant communities is extremely limited due to the intense agriculture that has existed in the area since the 1800's.

Post-settlement Fire History

Since the establishment of the Refuge in 1994, there have been 2 wildland fires on the Refuge that were contained at less than 1 acre each. Other fires have occurred within the planned Refuge boundary, but documentation of these fires is poor. Most wildland fires that have occurred within the entire Refuge have been fire trespass incidents along the Refuge boundaries (i.e., adjacent to public use areas, roadways, and a railroad line). Damage from these fires may have negative effects on resident or nesting wildlife, threatened and endangered species, or habitat.

Prescribed Fire History

Prescribed fire has been utilized since 1998 as part of Refuge habitat management. Fire is used to produce the desired habitat conditions that meet specific needs of wildlife or to reduce non-native plant species. Stone Lakes NWR had a total of three prescribed fires between 1998-2000. These fires averaged 10 acres.

RESPONSIBILITIES

Stone Lakes NWR does not have an onsite fire management staff and only limited suppression equipment. The Refuge landbase consists of several isolated units spread over the Refuge project area. This necessitates reliance on the Elk Grove CSD. The closest Service fire crew is stationed at Sacramento NWRC, about 75 miles to the north. Responsibilities for fire management at Stone Lakes NWR are shared by the Refuge Manager, Refuge Biologist, Central Valley Zone Assistant Fire Management Officer stationed at Sacramento NWRC, and the Zone Fire Management Officer stationed at San Luis NWRC.

The Stone Lakes NWR Project Leader is the primary line officer responsible for all aspects of the Refuge fire management program and for ensuring that all fire management program elements are carried out in accordance with Service policies, regulations, and guidelines. The Central Valley Zone Assistant Fire Management Officer assists with preparing and submitting the fire management plan updates, prescribed burn plans, and the annual fire budget. The prescribed burn plans are approved by the Refuge Manager.

Red-carded staff will assist with the overall implementation of the fire management program. Assistance from local fire department and neighboring Refuges will be needed.

Project Leader (PL)

- Is responsible for implementation of all Fire Management activities within the Refuge and will ensure compliance with Department, Service and refuge policies.
- Selects the appropriate management responses to wildland fire in the WFSA process.

- Coordinates Refuge programs to ensure personnel and equipment are made available and utilized for fire management activities including fire suppression, prescribed burning and fire effects monitoring.
- Ensures that the fire management program has access to Refuge resources when needed.
- Ensures that Refuge Staff considers the fire management program during Refuge related planning and implementation.

Biologist

- Identifies prescribed burn units and biological objectives to Central Valley Zone AFMO, notifies FMO of prescribed fire project constraints, and ensures that Refuge resources are available to accomplish prescribed fire and fire suppression objectives.
- Acts as the primary Refuge Resource Management Specialist during fire management planning and operations.
- Ensures fire effects monitoring is being implemented, drafts wildfire Rehabilitation Plans for Project Leader, and is responsible for posting and enforcing fire restriction regulations.
- Coordinates through Project Leader to provide biological input for the fire program with the Zone AFMO.
- Assists in design and implementation of fire effects monitoring, with Zone AFMO.
- Participates, as requested, in prescribed burning and fire suppression.

Zone Fire Management Officer (FMO)

- Responsible for all fire related planning and implementation for the Complex, which includes Stone Lakes NWR, San Luis NWRC, Kern NWRC, Sacramento NWRC, and San Francisco Bay NWRC.

Zone Assistant Fire Management Officer (AFMO)

- Integrates biological Refuge objectives into all fire management planning and implementation.
- Solicits program input from the PL and Biologist.
- Supervises prescribed fire planning.
- Coordinates fire related training.
- Coordinates with cooperators to ensure adequate resources are available for fire operational needs.
- Is responsible for preparation of fire reports following the suppression of wildland fires and for operations undertaken while conducting prescribed fires.
- Prepares an annual report detailing fire occurrences and prescribed fire activities undertaken in each calendar 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 for the complex.
- Submits budget requests and monitors FIREBASE funds.
- Maintains records for all personnel involved in suppression and prescribed fire activities, detailing the individual's qualifications and certifications for such activities.

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.
- Undertake fire management duties as assigned by the qualified IC on each suppression action or by the Prescribed Fire Burn Boss on each prescribed fire project.

- Are responsible for their personal protective equipment and physical conditioning, qualifying annually with the work capacity test.

Incident Commander
Incident Commanders (of any level) use strategies and tactics as directed by the Project Leader 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 the National Wildfire Coordinating Group (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 AFMO.
- 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 Modules
Initial attack modules will consist of red-carded firefighters with appropriate red-carded supervision. A Type 5 (ICT5) or Engine Boss (ENGB) is the basic requirement of leadership when responding to a fire with an organized suppression module, i.e. engine. Modules 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 cooperators' lands will meet fitness requirements established in PMS 310-1, except where Service-specific fitness requirements apply.

- Continue to develop a cadre of "red-carded" firefighters for wildland fire; trained and equipped to accomplish the fire management program.
- Maintain the Refuge fire cache and fire equipment in ready state.

INTERAGENCY OPERATIONS
There is currently a cooperative agreement between the Refuge and the Elk Grove Community Services District to provide initial attack for wildland fires within the Refuge (Appendix D). Other interagency contacts will be established at the federal, state, and local levels to provide the most efficient level of fire management operations. Other agreements and memoranda of understanding (MOU) will be established, as needed, to establish guidelines for assistance from local cooperators. The MOU allows the responding agency to assume command of the incident until a representative of the Refuge arrives to establish a unified command or assume responsibility for the incident, if qualified. The Refuge Dispatch Plan (Appendix G) contains guidelines for a reported fire and the proper dispatching to effect a quick and orderly initial attack by the closest local resource.

PROTECTION OF SENSITIVE RESOURCES

To protect Refuge resources, mechanical line construction (dozers, discing) must be authorized by the Refuge Manager or their designate, unless human life and/or property are threatened. Sensitive areas will be mapped and distributed to suppression resources.

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

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

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

Wildland Fires

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

Prescribed Fires

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

WILDLAND FIRE ACTIVITIES

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

All fires not classified as prescribed fires are wildland fires and will be appropriately suppressed. Records show that fire season is typically from May through early November, based on information provided by CDF.

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 while using appropriate management strategies.

- Suppress all wildland fires in a safe and cost effective manner;
- Conduct all fire management programs in a manner consistent with applicable laws, policies and regulations;
- Develop and maintain cooperative agreements with local fire agencies, since the Refuge will rely largely on local fire departments for suppression as well as prescribed fire back up;
- Develop monitoring to see if objectives are being met and that wildlife and special status species are not negatively affected.
- Develop and implement fire prevention/education programs.
- Utilize mechanical treatments to reduce hazardous fuels or disrupt fuel continuity.

Although the 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 resources.

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 (i.e., initial attack, extended, and expanded), equipment inventory, personnel qualifications, training, and fire prevention.

Fire readiness planning is to be done on an annual basis. This will ensure that all personnel, engines, fire cache, Personal Protective Equipment (PPE), and training are identified and prepared for the fire season. Lists of engines, equipment, and inventory are located in Appendix H.

Historical Weather

The fire season generally begins with the curing of annual grasses in late May and extends to the first rains in mid October to early November. Easterly and northerly winds in September and October increase the potential for large fires in the local area. However, there is some potential for prescribed and wildland fires year-round. Neither Elk Grove CSD nor the Sacramento County Fire Protection District have any weather station data that could be used to characterize historical weather trends.

Fire Prevention

Stone Lakes NWR fire prevention program is designed to protect human life and property, and prevent damage to cultural resources or physical facilities. A program of internal and external education regarding potential fire danger will be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs may be utilized to increase visitor and neighbor awareness of fire hazards.

Qualified Refuge staff will interpret for the public the beneficial effects of prescribed fires as opposed to unwanted human-caused fires. Emphasis will be placed on information essential to understanding the potential severity of human-caused wildland fires, and how to prevent them. Zone fire staff will keep Refuge staff informed about changes in existing conditions throughout the fire season.

During periods of extreme or prolonged fire danger, emergency restrictions regarding Refuge operations or area closures may become necessary. Such restrictions, when imposed by the Project Leader, will usually be consistent with those implemented by Refuge cooperators. It will remain the duty of the Central Valley Zone AFMO to inform the Project Leader of extreme fire danger.

Staffing Levels

There are no fire-funded staff stationed at Stone Lakes NWR, therefore there will be no formalized step-up plan. Elk Grove CSD will be responsible for suppression operations and will determine their staffing levels based on their own indicators. Indicators include weather, fire location and proximity to the highway. There are no automatic triggers for shutting down equipment or instituting closures, however, the PL may restrict equipment and visitation as deemed necessary and as authorized by the Fire Management Handbook.

Training

Departmental policy requires that all personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). Stone Lakes NWR will conform strictly to the requirements of the wildland and prescribed fire management qualification and certification system (PMS 310-1) and Service guidelines.

Service policy sets training, qualification, and fitness standards for all fire positions. All fire personnel (full time fire or collateral duty) will be provided with the training (classroom and on-the-job) required to meet Service fire position qualification standards for the positions they are expected to perform. All firefighters will be required to participate in an annual refresher to remain qualified. Refreshers will focus on local needs; fire shelter deployment; Look outs, Communications, Escape Routes, Safety Zones (LCES); fire orders; and watch out situations. On-the-job training is encouraged and will be conducted at the field level. Whenever appropriate, the use of fire qualification task books will be used to document the fire experience of trainees. The AFMO will coordinate fire training needs with those of other nearby Refuges, cooperating agencies, and the Regional Office (RO).

All fire-qualified employees are required to pass the mandatory fitness and training requirements prior to May 30 or within 2 weeks of entering duty. Employees not meeting fitness and training requirements may assist in support capacities, but will not be permitted on the fireline. Personnel will not perform fire jobs they are not qualified for.

Refuge engines may be used for prescribed burning and may assist Elk Grove CSD in suppression operations. All Refuge engines will be equipped with tools, firing devices, and water handling accessories. To ensure engine readiness, all annual maintenance should be completed by Sacramento NWRC fire staff in the off season (by May 30), and Refuge staff will maintain the equipment during fire season.

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.

Supplies and Equipment
A small fire cache for three people will be located at Refuge headquarters, and the engines are typically located at the maintenance shop. All firefighters will be issued the required personal protective equipment to include: Nomex pants and shirts, gloves, helmet and goggles, field pack with shelter, overnight pack, sleeping bag, headlamp, and personal first aid kit.

DETECTION
Fires are typically reported by members of the general public to the 9-1-1 system, and Sacramento County dispatchers initiate suppression response. If Refuge staff observe a wildland fire, they are to call 9-1-1. Sacramento County dispatch notifies Elk Grove CSD, who initiates suppression response. Elk Grove CSD will notify Refuge staff as specified in the MOU (Appendix D).

COMMUNICATIONS
Elk Grove CSD uses 800 megahertz radios for primary communication. The Refuge will acquire one or more radios to be able to communicate directly with Elk Grove CSD personnel. The Refuge is currently working on frequency authorization. Telephones may be used as a secondary communication tool. A complete contact list with phone numbers for Refuge staff and cooperators is located in the dispatch plan (Appendix G).

Some of the local agencies have capability to communicate using the NIFC and CDF tactical Channels. The most frequently used for all operations on Refuges is NIFC tactical channel 2 (168.200). For those local agencies that do not have that capability, a Service radio will be provided and cell phone information exchanged to ensure communication during the incident. Cell phones will not be used as the primary communication tool on fires, unless no other options exist.

PRE-ATTACK PLAN
Pre-attack planning data will be updated annually by Refuge staff. Pre-attack plans will be placed in each engine, the Fire Management Office, and with the Dispatch Plan at the Refuge. Pre-attack plans should include:

- Response map: roads, gates, water sources, mutual aid zones / fire cooperator districts.
- Hazard/Risk map: power lines, main ditches and canals.
- Natural and cultural resources map: sensitive zones, non-sensitive zones, restricted vehicle access areas.
- Structure list and maps.
- Ownership maps.

FIRE MANAGEMENT UNITS
Stone Lakes NWR will be managed as a single Fire Management Unit (FMU). Suppression strategies, management restrictions, fuels, fire environment, and values at risk are similar throughout the Refuge.

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

Fuel Types and Fire Behavior
The following behaviors are based on the average conditions found on the Refuge in a normal fire season or mid-July averages for the 14:00 weather. These averages include: maximum temp of 98 degrees F, 25% relative humidity, mid-flame wind speed of 8 mph, and 4% average 1hr (< ¼" diameter) dead fuel

moisture. The slope is 0 to 2% and the rate of spread is for a head fire. The outputs are from the BEHAVE - Fire Behavior Prediction Models based on the conditions above and for the major fuel models found within the Refuge:

- Fuel Model 1 - Upland Grass and Vernal Pools: Fire spread is governed by the fine and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. The fire behavior is directly related to the fuel moisture and windspeed. Fuel loading is 0.74 tons/acre and consists of ¼" or smaller (1 hr) dead fuel component. Spot fires are generally not produced because fuels are consumed too quickly and thoroughly. Resistance to control is low to moderate, depending on windspeed. The behavior output includes:
    - Rate of Spread - 275 chains/hr (3.5 mph)
    - Flame Length - 7.7 feet

- Fuel Model 3 - Seasonal Marsh: Fires in this model display high rates of spread under the influence of wind. Wind may drive fire into the uppers heights of the bulrush and across standing water. Stands are tall, averaging about 3-6 feet but considerable variation may occur. Approximately 1/3 or more of the stand is considered dead or cured and maintains the fire. Fuel loading is 3.0 tons/acre and consists of up to ¼" 1 and 10 hr) dead fuel component. Fire behavior is directly related to the fuel moisture and windspeed. Short-range (up to 100') spotting usually occurs and causes high to extreme control problems. The behavior output includes:
    - Rate of Spread - 259 chains/hr (3.0 mph
    - Flame Length - 20.4 feet

- Fuel Model 9 - Riparian Woodland: Fires are carried by dead, loosely compacted leaves and understory grasses. Wind tumbled leaves and torching trees may cause short-range spotting that may increase the rate of spread above the predicted value. Fuel loading is 3.5 tons/acre and consists of <3"of dead and live fuel. Fire behavior is directly related to the fuel moisture and fuel loading with windspeed in exposed areas. Resistance to control is moderate except during drought conditions when extreme fire conditions are present. The behavior output includes:
    - Rate of Spread - 22 chains/hr (0.2 mph)
    - Flame Length - 4.8 feet

SUPPRESSION TACTICS

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

Personnel and equipment must be efficiently organized to suppress fire effectively and safely. To this end, the Elk Grove Fire Protection District 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 (IC) Commander responsible to the Refuge Manager. The Incident Commander will designate all overhead positions on fires requiring extended attack.

Suppression Conditions

The Cooperative agreement with Elk Grove ensures that a qualified IC is assigned for each fire occurring on the Refuge. The IC will be responsible for all aspects of the fire's management, within the predetermined guidelines of this Plan. The IC will select the appropriate suppression strategies and tactics. Minimum impact tactics will be used whenever possible. Dozers, plows, discs, or graders will be

used inside Refuge boundaries only in cases where necessary to protect life and/or property, or where specifically authorized by the Refuge Manager or their designate.

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

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

- Completion and daily review of a WFSA (Wildland Fire Situation Analysis; Appendix I);
- Assignment or ordering of appropriate resources;
- Completion of Delegation of Authority if needed; and
- Development of standards and guidelines for use of heavy equipment, foam, retardant, aircraft, etc. using an interdisciplinary process.

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 IC, in conjunction with the Zone AFMO, will prepare the WFSA. Approval of the WFSA resides with the Refuge Project Leader.

The purpose of the WFSA is to allow 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 may be posted to warn visitors of possible trail closures and traffic control may be necessary where smoke crosses roads. Where wildland fires do cross roads, the adjacent burned areas 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.

REHABILITATION AND RESTORATION

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. All wildland fire sites will be evaluated for rehabilitation needs as soon as possible. Re-seeding needs

will be determined according to Service policy and regulations. Per Service policy, only damage to improvements caused by suppression efforts can be repaired with fire funds. 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. Completely restore camping areas and improved helispots.
7. Consider and plan more extensive rehabilitation or re-vegetation to restore sensitive impacted areas.

If re-vegetation or seeding is necessary, only native plant species will be used.

If emergency rehabilitation 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 Emergency Stabilization and Rehabilitation (ESR) fund.

REQUIRED REPORTING

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

FIRE INVESTIGATION

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

The Project Leader, Zone FMO/AFMO, or Incident Commander may order a fire investigator through normal dispatch channels.

PRESCRIBED FIRE ACTIVITIES

PRESCRIBED BURN PROGRAM OBJECTIVES

Stone Lakes National Wildlife Refuge has pursued a prescribed burning program as part of the overall management of the Refuge. Prescribed fire has been an integral part of the resource management on the Refuge since 1998. Planning and coordination for any prescribed fire activity is conducted on an annual basis. The use of prescribed fire to remove excess vegetation in wetlands and uplands reduces the accumulation of dead fuels. It also creates an improved mosaic of open water and emergent vegetation that provides for less intense fires in the future and better quality habitat for many waterbirds and other species. The prescribed fire program goals are hazard fuel reduction and resource/habitat management.

Hazard fuel reduction (i.e., mechanical removal or prescribed fire) will be pursued within or near Refuge development zones, sensitive natural resources areas, and Refuge boundary areas to reduce the risks of wildland fire. To the greatest extent possible, hazard fuel burns should compliment resource management objectives. Resource management prescribed fire is used to restore/create/maintain a diversity of plant communities in order to restore and perpetuate native wildlife species. The frequency of achieving many of the goals requires repeated prescribed burns every 5-10 years in marsh units and every 1-5 years in upland units. Goals of prescribed burning include:

- maintain fuel loadings within the natural ranges (determined by fuel type).
- protect resources / habitat from wildland fire trespass.
- establish defensible space around improvements and structures.
- aid in control of noxious weeds.
- control dense hardstem bulrush and cattail growth in wetlands.
- enhance native upland species production.
- maintain/rejuvenate quality “green browse” for ducks, geese, and cranes in upland areas.
- maintain/rejuvenate quality nesting cover for waterfowl.

Complexity is dependent upon fuels/vegetation, objectives, burn boundaries, and size. Burns on the Refuge vary from low-medium in fuel models 1 and 3, which represents approximately 80-90% of the total acres treated, to low- high in the model 9 fuels. Complexities are determined by using the FIREBASE analysis described in the Service Fire Management Handbook.

The Refuge reserves the option to utilize an interagency team approach for complex burns carried out on the boundaries and close to developed areas or burns of large acreage. The most highly qualified and experienced personnel in the regional interagency community would be requested to serve on this team.

FIRE MANAGEMENT STRATEGIES

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

- Conduct all fire management programs in a manner consistent with applicable laws, policies and regulations.
- Maintain Memoranda of Understanding with local fire agencies and protection districts to support prescribed fire activities.
- Utilize prescribed fire as a management treatment for achieving hazard fuel reduction and resource management objectives.
- Initiate cost effective fire monitoring to assist managers ascertain if objectives are being met. Monitoring information will also be used to refine burn prescriptions to better achieve objectives.
- Integrate fire ecology, management, and prevention themes into existing interpretive and education programs.

PRESCRIBED FIRE PLANNING

The climate of the Sacramento-San Joaquin River Delta and the Sacramento Valley and their diverse plant communities combined with habitat management objectives, allow prescribed burns to be conducted at any time of the year. However, most burning will occur from June through November.

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

The Refuge Biologist and Project Leader, in conjunction with fire staff, are responsible for identifying annual prescribed fire needs and developing resource goals and treatment objectives for Refuge units/areas. The AFMO determines if prescribed fire can be utilized to meet the treatment objectives and identifies a burn boss to complete the Prescribed Fire Plan. Burn plans will meet all training, personnel, equipment, and other requirements as specified in the Service Fire Management Handbook. Prescribed fires will be planned to minimize the risk of escape and/or to mitigate necessary risks and provide an adequate contingency plan for suppressing the fire should an escape occur. The plan will then go through the review process with input from the Refuge Biologist and FMO/AFMO before final approval from the Project Leader.

Agricultural Burn Permits will be obtained from the Sacramento Metropolitan Air Quality Management District (issued by the Sacramento County Agricultural Commissioner). Permit parameters and fees may vary and be subject to change. An estimate of total acres to be treated should be provided early in the planning process to allow the air district to complete and coordinate for the proposed emissions.

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

The Prescribed Fire Burn Boss will conduct a field reconnaissance of the proposed burn location with the FMO, AFMO, Prescribed Fire Specialist (PFS), Refuge Biologist, and/or Refuge Manager to discuss objectives, special concerns, and gather all necessary information to prepare the burn plan. After completing the reconnaissance, a qualified Prescribed Fire Burn Boss will prepare the prescribed fire burn plan.

All prescribed fires will have prescribed fire burn plans. The prescribed burn plan is a site specific action plan describing the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined. No burn will be ignited unless all prescriptions of the plan are met. Fires not within those parameters will be suppressed.

Strategies and Personnel
The Sacramento NWRC fire staff will oversee and assist the Refuge field staff with the unit preparations including equipment maintenance, fuel break mowing, and blacklining. Refuge staff will be responsible for assisting with public relations and education regarding the use of fire as a management practice.

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

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

Weather and fuel moisture conditions must be monitored closely in planned burn units to determine when the prescription criteria are met. A belt weather kit may also be utilized to augment monitoring.

When all prescription criteria are within the acceptable range, the Burn Boss will select an ignition time based on current and predicted weather forecasts. A thorough briefing will be given by the Burn Boss and specific assignments and placement of personnel will be discussed. An updated spot weather forecast will be obtained on the day of ignition and all prescription elements will be rechecked to determine if all elements are still within the approved ranges. If all prescription and plan elements are met using the Go-No-Go check list and concurrence with the Project Leader or their designate, a test fire will be ignited to determine on-site fire behavior conditions as affected by current weather. If conditions are not satisfactory, the test fire will be suppressed and the burn will be rescheduled. If conditions are satisfactory the burn will continue as planned.

Prior to ignition the burn boss will verify that contingency resources are available. Minimum contingency resources for the Refuge are: a qualified Incident Commander Type III (within 30 minutes), and suppression resources to be determined based on each burn plan. If the prescribed burn escapes the predetermined burn area, all further ignition will be halted except as needed for suppression efforts. Suppression efforts will be initiated, as discussed in the pre-burn briefing. The Zone AFMO or FMO will be notified immediately of any control actions on a prescribed burn. If the escaped prescribed fire escapes initial suppression efforts, the burn will be declared a wildland fire and suppressed using guidelines established in this plan. If the escaped fire continues into the next burning period, a WFSA will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local cooperating agencies via the servicing dispatch. A management overhead team may be requested to assume command of the fire.

Monitoring and Evaluation

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on Refuge resources while generating an historical record. Monitoring will measure the parameters common to all fires: fuels, topography, weather and fire behavior. In addition, ecological changes such as plant and wildlife species composition and structural changes will be monitored. This information will then be utilized to fine-tune the prescribed burn program.

During prescribed burns, monitoring can serve as a precursor to invoking suppression action to help determine if the fire is in prescription, assess its overall potential, and determine the effects of the prescribed burn.

Monitoring and evaluation are part of the prescribed fire process. Monitoring is completed in three steps: pre-burn, burn day, and post-burn. Burn day evaluations document temperature, relative humidity, wind speed, rate of spread, flame length, smoke dispersal, and objectives.

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

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

Prescribed Burn Critique
Prescribed fires will be critiqued by the burn boss and documented in the burn plan. The Zone AFMO and Project Leader will conduct a formal critique if:

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

AIR QUALITY / SMOKE MANAGEMENT GUIDELINES

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

Smoke management is a concern in the southern Sacramento River Valley. The Refuge is situated in a non-attainment area. When air quality is poor, a "no-burn" day is declared by the Sacramento Metropolitan Air Quality Management District (SMAQMD) in Sacramento. All Refuge prescribed burns should be conducted between 10:00 a.m. and 5:00 p.m. to help reduce air pollution. Early morning and late afternoon fires tend to produce more smoke that persists longer (due to more stable atmospheric condition). If smoke on public roads is anticipated, the California Highway Patrol should be notified. Prior to any burns, a public notice should be placed in local newspapers to avoid unnecessary public concern.

All prescribed burns must comply with the State of California Air Quality Regulations for Burning (CCR Title 17, Subchapter 2 "Smoke Management Guidelines for Agricultural and Prescribed Burning"), and local implementation plans. All burns are required to have a permit ("credits") from SMAQMD.

The management of smoke will be incorporated into the planning of prescribed fires and to the extent possible, in the suppression of wildland fires. A sample Burn permit is located in Appendix K. Sensitive areas will be identified and precautions will be taken to safeguard visitors and Refuge neighbors. When burning occurs adjacent to roads and highways, close monitoring will be conducted of wind conditions to prevent traffic hazards. There will be no hesitation to postpone a burn if wind conditions become questionable.

FIRE RESEARCH

Assessing the effects of fire upon Refuge plant and animal communities will involve ongoing monitoring and research. Through applied research and careful application of fire, data collection will provide a better understanding of the natural ecological effects of fire and the information needed to refine prescriptions to meet resource objectives. Normal fire-year funding cannot be used to fund research projects.

Any research will comply with accepted scientific guidelines. This data, along with information gathered through research studies, will be used to improve the effectiveness of the fire management program.

Conducting the following fire research would be beneficial at Stone Lakes NWR:

- comprehensive inventory and assessment of Refuge hazard fuels and the identification and prioritization of hazard fuel units;
- assessment of hazard fuel management options, and their effects upon Refuge resource objectives;
- assessment of long and short term fire effects on upland and wetland habitats of the Refuge with recommendations for using prescribed fire in conjunction with other management tools to meet resource objectives; and
- assessment of fire effect monitoring needs and preparation of fire effect monitoring plan..

PUBLIC SAFETY

Firefighter and public safety will always take precedence over property and resource protection during any fire management activity. The greatest threat to public safety from Refuge wildland fires or escaped prescribed fires is entrapment by extremely fast moving fire fronts or fingers. Of particular concern are hunters or visitors who may be present in the area of the fire and neighbors who initiate their own suppression actions without proper training, equipment, or communication. Refuge staff will attempt to ensure that the fire scene is clear of people except for Service firefighters and any resources requested from cooperators.

Another concern is smoke from a Refuge wildland or prescribed fire, particularly smoke that drifts into a roadway causing dangerously reduced visibility. The fire dispatcher may notify the local law enforcement agency (i.e., Sacramento County Sheriff's Department) whenever the IC believes that drifting smoke may compromise public safety. The California Highway Patrol may also be consulted to assess the situation and take action as needed.

A final concern is fires which may escape the Refuge and expand onto inhabited nearby private property. The IC is responsible for contacting the appropriate official (Sacramento County Sheriff's Department) to warn and evacuate the public from potentially dangerous wildland fires.

PUBLIC INFORMATION AND EDUCATION

Providing effective public outreach is an important part of fire suppression, fire prevention, prescribed fire, and the Service mission. During fire operations, the IC and/or burn boss is responsible for providing fire information to the press and the public. The IC may delegate this task as needed.

Informing the public is a vital element of the prescribed fire program. Areas that have been burned may present an opportunity for the public to actually see the effects of fire and offer an excellent opportunity for Refuge staff to interpret the goals of the fire program to the public. These programs should demonstrate the Refuge's capability to safely conduct prescribed fire operations and increase the public's tolerance of the short-term aesthetic impacts.

Approximately 90-95 percent of the Refuge's wildland fires have been human caused (i.e., traffic along county and state roads, equipment, power poles) and could have been prevented. Human-caused fires have the potential to cause significant damage since they can occur at a time of year when few initial attack resources are available and fuels are well cured.

In general, the local public and many visitors to the Refuge are well aware of fire prevention. However, the Refuge should employ the following, as needed:

- signing,
- closures when necessary,
- public contacts through press releases and verbal contacts,
- enforcement of regulations and prosecution of violators,
- employee training and awareness,
- implementation of state regulations and restrictions,
- contacts with Refuge cooperators and neighbors, and
- maintenance of a fuel break and/or blackline around headquarters each spring.

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUES

Wildland fires with be critiqued by the IC. The FMO will conduct formal fire critiques in the event of:

- significant injury/accident.
- significant property or resource damage.
- significant safety concerns are raised.
- an extended attack is necessary.

ANNUAL FIRE SUMMARY REPORT

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

ANNUAL FIRE MANAGEMENT PLAN REVIEW

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

CONSULTATION AND COORDINATION

Numerous agencies, organizations and/or individuals were consulted in the course of developing the fire management program for Stone Lakes NWR. All fire management program activities will continue to be implemented in cooperation and coordination with federal, state, county, and local agencies. Other agencies and organizations will be consulted as needed. General program consultation and coordination will be sought from the Regional Fire Management Coordinator, Regional Prescribed Fire Specialist, and the National Interagency Fire Center (NIFC).

During the planning process for establishment of the Refuge in the early 1990's, the Service received over 6,000 public comments in the form of letters, petitions and received input from the public in the course of 24 public meetings. In the course of this public involvement, there were numerous opportunities to comment on the full range of potential Refuge habitat management approaches, including use of fire.

In the course of finalizing the Cooperative Agreement with the Elk Grove Community Services District, Refuge staff attended two public district meetings and solicited input on the Refuge fire management program. As part of the pre-planning process for prescribed burns conducted in 1999 and 2000, the Refuge provided public notices to several local newspapers. No comments on these notices were received and no opposition to prescribed burning was conveyed to the Refuge. Rather, support for the use of prescribed fire has been communicated to Refuge staff by adjacent private landowners on several occasions.

Service and Refuge fire planning staff have also hosted a number of meetings with staff of the Sacramento Metropolitan Air Quality Management District, the California Air Resources Board, and the Sacramento County Agricultural Commission. At these meeting, these entities expressed their support for the goals of the Refuge fire program and agreed to cooperate during its implementation. Coordination meetings with these agencies will be held by Refuge staff on an annual basis.

Since some fire management activities occur on lands owned by Sacramento County Department of Regional Parks, Recreation and Open Space and California Department of Parks and Recreation which are managed as part of Stone Lakes NWR through cooperative agreement, the Service will continue ongoing coordination and consultation with those agencies, as needed.

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

Michael Brady, Wildlife Biologist, Stone Lakes NWR, Elk Grove, CA

Michael Durfee, Prescribed Fire Specialist, Walkill NWR, Sussex, NJ

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

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

Vince Nyvall, Sacramento County Agricultural Commissioner, Sacramento, CA

David Paullin, Refuge Supervisor, California-Nevada Operations Office, Sacramento, CA

Roger Wong, Zone Fire Management Officer, San Luis NWRC, Los Banos, CA

APPENDICES

APPENDIX A: REFERENCES CITED

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EA Engineering, Science, and Technology. 1990. Draft Land Use and Management Plan for the Proposed North Stone Lake Wildlife Refuge. Prepared for: Sacramento County Department of Parks and Recreation. 27 pp.

Hart, J.A. and U.S. Fish and Wildlife Service. In Draft. North Stone Lake Restoration and Management Master Plan. HART Inc. Prepared for Sacramento County, Department of Regional Parks, Recreation and Open Space.

Tremaine, K. 1994. Preliminary Observations on lacustrine adaption in the Central Valley, California. Paper presented at the 28th Annual Meeting, Society for California Archaeology, Ventura, California.

U.S. Fish and Wildlife Service. 1992. Final Environmental Impact Statement with appendices for Stone Lakes National Wildlife Refuge Project, Sacramento County, California. With Technical Assistance provided by Jones and Stokes, Associates, Inc. (JSA 91-047), Sacramento, California.

Tremaine and Associate. In Preparation. Archaeological Survey Report for the North Stone Lake Unit of Stone Lakes National Wildlife Refuge, Sacramento County, California.

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 guides 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 U.S. 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. Actions to (1) limit the adverse effects of suppression on soils, watershed, or other values, or (2) 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: COMPLIANCE DOCUMENTS

UNITED STATES FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ACTION STATEMENT FOR CATEGORICAL EXCLUSION

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the following proposed action is categorically excluded from NEPA documentation requirements consistent with 40 CFR 1508.4 and 516 DM 2.3A.

Proposed Action and Alternatives

The U.S. Fish and Wildlife Service (Service) proposes to adopt a Fire Management Plan for Stone Lakes National Wildlife Refuge (NWR) that will utilize fire as a habitat management tool for the maintenance and enhancement of grasslands and wetlands and reduction of hazardous fuels on the refuge. The Service currently manages 4,000 acres within the approved refuge boundary, consisting of both Service-owned properties and lands belonging to other agencies including, California Department of Transportation, Sacramento County Department of Regional Parks, Recreation and Open Space, and California Department of Parks and Recreation. The refuge supports a variety of habitats including grasslands, seasonal and permanent wetlands, and riparian woodlands. Alternate vegetation management approaches which the refuge is pursuing include livestock grazing, mowing, discing, and planting of native grasses and woody vegetation. All methods may be incorporated, to varying degrees, into the grassland and wetland management programs of the refuge, when appropriate and feasible to implement. For example, a successful domestic livestock grazing program has been in place on the 2,600-acre North Stone Lake unit and Gallagher property within the refuge for three years and will continue to be utilized. However, the refuge has determined that fire should continue to be utilized for restoration of native grass communities and hazardous fuel reduction due to it's cost effectiveness and since not all refuge properties are suitable for the alternative vegetation techniques.

Categorical Exclusion(s)

The specific categorical exclusions from NEPA allowing for this action pursuant to 516 DM 2.3A (2) are:

B.(4) The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws.

B.(5) Fire management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures.

Permits/Approvals

In accordance with Service policy, a Prescribed Burn Plan will be prepared and approved by the Project Leader prior to conducting a prescribed burn.

An Agricultural Burn Permit will be obtained from the Sacramento County Agricultural Commission on behalf of the Sacramento Metropolitan Air Quality Management District.

Stone Lakes NWR has also entered into a cooperative agreement with the Elk Grove Fire Protection District (District). In accordance with this agreement, the refuge is required to provide copies of Prescribed Burn Plans to the District in advance of any prescribed burning. The Service must also acquire a District radio prior to prescribed burn.

Service Endangered Species Division staff from the Sacramento Fish and Wildlife Office were informally consulted on the refuge grassland habitat management program including the use of fire as a management tool. As result of this consultation, the refuge Project Leader determined this management program will have "no affect" on listed, proposed, and/or candidate species or designated critical habitat.

Due to the presence of a number of cultural resource sites within the refuge boundary, ongoing coordination and consultation to ensure protection of these sites will continue, as needed, between refuge staff and the State Historic Preservation Office, California Native American Heritage Commission, local tribal representatives, and private archaeological consultants. All refuge lands have been surveyed and known historic properties delineated. Archaeological specialists and local Native American representatives are annually consulted in the planning of refuge habitat management activities to ensure that all responsibilities under Section 106 of the National Historic Preservation Act are satisfied.

Public Involvement/Interagency Coordination

During the planning process for establishment of Stone Lakes NWR (U.S. Fish and Wildlife Service 1992), the Service received over 6000 public comments in the form of letters, petitions and received input from the public in the course of 24 public meetings. In the course of this public involvement, there were numerous opportunities to comment on the full range of potential refuge habitat management approaches, including use of fire.

In the course of finalizing a cooperative agreement with the Elk Grove Fire Protection District, refuge staff attended two public district meetings and solicited input on the refuge fire management program. As part of the pre-planning process for prescribed burns conducted in 1999 and 2000, the refuge provided public notices to several local newspapers. No comments on these notices were received and no opposition to prescribed burning was conveyed to the refuge. Rather, support for the use of prescribed fire has been communicated to refuge staff by adjacent private landowners on several occasions.

Service and refuge fire planning staff have also hosted a number of meetings with staff of the Sacramento Metropolitan Air Quality Management District, the California Air Resources Board, and the Sacramento County Agricultural Commission. At these meeting, these entities expressed their support for the goals of the refuge fire program and agreed to cooperate during its implementation. Coordination meetings with these agencies will be held by refuge staff on an annual basis.

Since some fire management activities occur on lands owned by Sacramento County Department of Regional Parks, Recreation and Open Space and California Department of Parks and Recreation which are managed as part of Stone Lakes NWR through cooperative management agreement, the Service will continue ongoing coordination and consultation with those agencies, as needed.

Supporting Documents

Sacramento County and U.S. Fish and Wildlife Service. February 1999. Cooperative Agreement for Grassland Management on the North Stone Lake Wildlife Refuge and Notice of Exemption. 8 pp.

Elk Grove Fire Protection District. 1998. Cooperative Agreement with U.S. Fish and Wildlife Service. 3 pp.

EA Engineering, Science, and Technology. 1990. Draft Land Use and Management Plan for the Proposed North Stone Lake Wildlife Refuge. Prepared for: Sacramento County Department of Parks and Recreation. 27 pp.

Hart, J. A. and U.S. Fish and Wildlife Service. In Draft. North Stone Lake Restoration and Management Master Plan. HART Inc. Prepared for Sacramento County, Department of Regional Parks, Recreation and Open Space.

Tremaine, K. 1994. Preliminary Observations on lacustrine adaption in the Central Valley, California. Paper presented at the 28th Annual Meeting, Society for California Archeology, Ventura, California.

U.S. Fish and Wildlife Service. 1992. Final Environmental Impact Statement with appendices for Stone Lakes National Wildlife Refuge Project, Sacramento County, California. With Technical assistance provided by Jones and Stokes, Associates, Inc. (JSA 91-047), Sacramento, California.

Tremaine and Associate. In Preparation. Archaeological Survey Report for the North Stone Lake Unit of Stone Lakes National Wildlife Refuge, Sacramento County, California.

_____ _____

Project Leader Date
Stone Lakes National Wildlife Refuge

APPENDIX D: COOPERATIVE AGREEMENTS

COOPERATIVE AGREEMENT
FOR
GRASSLAND MANAGEMENT ON
NORTH STONE LAKE WILDLIFE REFUGE

THIS AGREEMENT is made and entered into by and between the United States Fish and Wildlife Service, an executive agency of the United States Department of The Interior (hereinafter referred to as "Service"), and the County of Sacramento (hereinafter referred to as "County").

R E C I T A L S:

WHEREAS, the Service and the County share a common interest in protecting, enhancing, and managing habitat for the benefit of migratory birds and other wildlife and native plan communities; and

WHEREAS, this agreement allows for the limited interchange of services, personnel, equipment, facilities, and funds; and provides for the long term management and administration of the lands which as of the date of this agreement constitute the North Stone Lake Wildlife Refuge in South Sacramento County; and

WHEREAS, this Cooperative Agreement is made and entered into under the following authorities of the Parties, among others:

A. Service:
Section 1 of the Fish and Wildlife Coordination Act (48 Stat/401 as amended; (6 U.S.C. 661 et seq.), Section 7 of the Fish and Wildlife Act of 1956, 16 U.S.C. 742f (a)(4), and the Migratory Bird Conservation Act (45 Stat. 1222).

B. County:
Government Code, Section 23004. Board of Supervisors Resolution No. _____ dated _____; and

WHEREAS, the County, as landowner of 1,567 acres of the North Stone Lake Wildlife Refuge, desires to enable the long term protection, care, regulation, administration, enhancement, and management of these lands by making available the herein described land base; and

WHEREAS, the Service as designated land manager, desires to secure through established wildlife refuge management practices the long term protection, care, regulation, administration, enhancement, and management of these lands; and

WHEREAS, the purpose and objective of this Cooperative Agreement is to establish a framework for the management and administration of the property subject to this Agreement consistent with the goals and objectives of the “Grasslands” chapter of the Draft North Stone Lake Restoration and Management Master Plan (hereinafter referred to as "Management Plan") and as a component of and consistent with the native plant restoration goals of Stone Lakes National Wildlife Refuge.

NOW, THEREFORE, in consideration of the mutual promises and covenants hereinafter set forth the parties agree as follows:

Section 1. APPLICATION. This Cooperative Agreement applies to the administration and management of the following lands, which are collectively referred to herein as "property subject to this Agreement" (See Map, Figure A);

All portions of the County's existing holdings in the vicinity of North Stone Lake, known as the North Stone Lake Wildlife Refuge (Assessors Parcel Numbers: 119-230-20,48,49; 132-010-54-58,64,65,68,69; 132-120-24-26; 132-131-27,28), hereinafter referred to as "the Refuge", in Sacramento County as of the date of this Agreement.

Section 2. PURPOSE. Service agrees that it will manage the grasslands on the Refuge in a manner consistent with the goals and objectives of the “Grasslands” chapter of the Management Plan and the native plant restoration goals described in the Final Environmental Impact Statement for Stone Lakes National Wildlife Refuge (May 1992).

Section 3. LIMITATIONS. In the event that the Management Plan is ultimately approved by the County, the Service agrees to abide by the “Grasslands” chapter of such plan.

Section 4. COOPERATIVE AGREEMENT ADMINISTRATORS. The parties agree to appoint the following project officers, or their designees, to coordinate the implementation of this Cooperative Agreement:

The County of Sacramento:
Director
Department of Regional Parks, Recreation and Open Space
3711 Branch Center Road
Sacramento, California 95827
Phone: (916) 366-2932; 366-2950 (fax)

The U.S. Fish and Wildlife Service:
Project Leader
Stone Lakes National Wildlife Refuge
2233 Watt Avenue, Suite 230
Sacramento, California 95825
Phone: (916) 979-2085; 979-2058 (fax)

Section 5. SERVICE OBLIGATIONS. The Service, as designated on-site land manager, shall:
A. develop a grassland management strategy for the Refuge, select a qualified grazing permittee, and in consultation with the County, oversee implementation of a cooperative land management agreement with the grazing permittee. The cooperative land management agreement will identify: the season of use, stocking rate, estimated animal unit months (AUM), the rate charged per AUM, and a program for the control of noxious weeds as defined by the County Agricultural Commissioner;

B. provide necessary staff, commensurate with available funding, to pursue the goals of Stone Lakes National Wildlife Refuge; related to grassland management and habitat protection and enhancement;

C. provide expertise in planning and consulting on habitat enhancement activities including securing of funds to implement improved management of the Refuge;

D. coordinate any law enforcement activities on the Refuge with County law enforcement authorities;

E. prepare and present for review by the Sacramento County Recreation and Park and Fish and Game Commission, an annual report for the previous year and an annual work plan for the current year summarizing Service management of the Refuge;

F. not permit hunting nor the possession or discharge of firearms on the Refuge pursuant to County Ordinances;

G. protect any cultural resources on the Refuge from routine maintenance and other activities pursuant to Section 106 of the National Historic Preservation Act and the California Public Resources Code Section 5097.5 and 5097.9 *et seq;* and

H. manage the Refuge as part of the National Wildlife Refuge System, as directed in Title 50, United States Code, as well as other laws, regulations and policies for the administration of the National Wildlife Refuge System.

Section 6. COUNTY OBLIGATIONS. The County, as landowner, shall:
A. provide the necessary land base as described by the aforementioned Refuge for the purposes of accomplishing the goals described in this Cooperative Agreement and in the "Grasslands" chapter of the Management Plan; and

B. allow the Service with the agreement of the County, to exercise flexibility in requiring the permittee to perform a variety of maintenance and management tasks on the property subject to this Agreement in lieu of providing grazing fees to the County.

Section 7. SPECIAL PROVISIONS. The Service and the County further agree:
A. to provide neighboring landowners and reclamation districts with advance notification of any proposed physical modification of the property subject to this Agreement; notification will be the responsibility of the party proposing the modification and any modification must comply with the Sacramento County Water Resources Division Flood Management Plan and not result in any net loss in flood plain storage;

B. that in the event the County proposes to establish a habitat mitigation bank or mitigation site on the Refuge, consistent with the Management Plan, the Service agrees, consistent with Service mitigation policy, to cooperate in the creation of said mitigation site in conformance with a Habitat Restoration Program as adopted by the Sacramento County Department of Regional Parks, Recreation and Open Space. Any funds generated from the sale of mitigation credits will go to the Sacramento County Department of Regional Parks, Recreation and Open Space Trust Fund and not back to management of the Refuge;

C. to meet at least semi-annually. The Stone Lakes National Wildlife Refuge Project Leader shall be responsible for scheduling meetings in this regard;

D. that nothing herein shall be considered as obliging the Service or the County to expend funds or otherwise obligate the Service or County for the future payment of money in excess of

appropriations authorized by law and administratively allocated for the provisions of this Agreement;

E. to recognize each other's interests as parties to this Agreement and the development of the Refuge in public media releases, public signs, and promotional materials where such acknowledgment is appropriate; and

F. to administer the grassland and refuge management programs on the property so that traditional and historic agricultural practices on adjacent properties can continue. In the event of a conflict between this program and adjacent agriculture, an adequate buffer zone will be established on the Refuge in consultation with the County Agricultural Commissioner.

G. to continue to recognize and allow historic drainage flows into the Stone Lakes Slough from neighboring reclamation districts.

Section 8. FUNDING. Revenues resulting from use of the property subject to this Agreement, such as those generated by grazing, will go back for use on the Refuge for maintenance, security, capital improvements for the grassland management program, management, enhancement, and other operations. Any revenues that may result that are not applied back to the Refuge will be deposited in the Sacramento County Department of Regional Parks, Recreation and Open Space Trust Fund.

Section 9. TERMINATION. Either party may terminate this Agreement by providing to the other written notice of such termination one year prior to the date such termination is to take effect. The County may immediately suspend this agreement in the event of a health or safety emergency or other related cause as determined by the Director of the Sacramento County Department of Regional Parks, Recreation and Open Space.

Section 10. MODIFICATIONS. Modifications to the Agreement may be proposed by either party but no modification or amendment to this Agreement shall be effective unless in writing and executed by both parties.

Section 11. NOTICES. Any notice required or authorized to be given pursuant to this Agreement shall be deemed delivered twenty-four (24) hours after being deposited, postage prepaid, in the United States Post and addressed in the manner set forth in Section 4 hereof.

Section 12. EXECUTION. This Cooperative Agreement is executed in three (3) copies, each of which is to be considered an original.

Section 13. ELECTED OFFICIALS NOT TO BENEFIT. No member of or delegate to the Congress or resident commissioner shall be entitled to any share or part of this Management Agreement or to any benefit that may arise from it.

Section 14. EFFECTIVE DATE. This Agreement shall become effective upon being executed by the Parties and remain in effect for a period of five (5) years from the date of initiation of a cooperative land management agreement with the grazing permittee, but not to exceed six (6) years, unless terminated prior to that time by either of the parties, or until such time as the County ultimately approves the Management Plan and the terms of this Agreement are revisited.

EXECUTED THIS _____ DAY OF _____, 1998, in Sacramento, County, California.

"Service"
U.S. FISH AND WILDLIFE SERVICE

_____ _____
Name Title

_____
Signature

Contract Sufficiency Review (U.S. Fish and Wildlife Service):

_____ Date: _____
Signature

_____
Title

"County"
COUNTY OF SACRAMENTO - BOARD OF SUPERVISORS

_____ _____
Name Title

_____
Signature

ATTEST:

_____
Clerk of the Board of Supervisors

DEPARTMENT OF REGIONAL PARKS, RECREATION AND OPEN SPACE

_____ _____
Name Title

_____
Signature

COOPERATIVE AGREEMENT

BETWEEN THE
U.S. FISH AND WILDLIFE SERVICE
AND THE
ELK GROVE FIRE PROTECTION DISTRICT

I. INTRODUCTION

The U.S. Fish and Wildlife Service (hereinafter referred to as the Service), an agency of the Federal Government, is primarily responsible for the welfare and protection of lands, structures and wildlife within the boundaries of National Wildlife Refuge (hereinafter referred to as the Refuge). Because wildfires sometime threaten to damage those resources, and local fire districts have historically provided fire protection assistance to the Refuges, the Service desires to enter an agreement with the Elk Grove Fire Protection District (hereinafter referred to as the District) which will formalize responsibilities of both parties and provide for remuneration to the District for fire suppression services rendered.

II. AUTHORITY

The Service enters into agreement under the authority of the "Protection Act of September 20, 1922", (42 Stat.857; 16 USC 594), the "Reciprocal Fire Protection Act of May 27, 1955"60 Stat.66, 67; 42 USC 1856, 1856a and b" and 31 USC 6305 (Cooperative Agreements).

III. PURPOSE

The purpose of this agreement is to provide fire protection services to those portions of National Wildlife Refuge within the boundaries of the Fire Protection District and to remunerate the District for costs incurred in providing fire suppression services to those lands.

IV. TERMS OF AGREEMENT

This agreement shall become effective upon being executed by both parties and shall remain in effect through December 31, 2005. This agreement terminates and supersedes any previous agreements between the District and the Service.

V. SPECIFIC OBLIGATIONS OF THE PARTIES

A. The Service shall:

1. Delegate authority to the District as necessary to put the Fire Chief or his delegate in Unified command of the fire fighting effort.
2. Provide manpower and/or equipment, as available, to assist the District in fighting fires on or adjacent to Service lands when so requested by the District.
3. Provide funds (as indicated in Section VII, herein) for fire suppression services.

B. The District shall:

1. Provide, as available, manpower and equipment necessary to suppress wildland and structural fires on Service lands within the District's jurisdiction.
2. Respond as quickly as possible when asked to suppress any such fire on Service lands.

VI. PROJECT OFFICERS

A. The Service's project officer shall be:

Refuge Manager - Stone Lakes National Wildlife Refuge
2233 Watt Ave. Suite 230
Sacramento, CA 95825
916-979-2086

VII. FUNDING

A. The Service agrees to pay the District for actual fire suppression costs incurred by the District while suppressing fires on Refuge lands. Reimbursement to be claimed by the District (as determined by the District and approved by the Service) shall include:

1. Salaries and wages for District personnel used to suppress a fire. Reimbursement for the salary or wage of any employee shall be computed on the direct daily or hourly wage of that employee, including both actual overtime payments and related employee benefit cost
2. The actual cost to the District for use of personnel from other agencies, and for paid "pickup" labor used to suppress a fire.
3. The actual cost to the District for food services, transportation, and sleeping accommodations for personnel engaged in suppressing a fire.
4. The actual equipment operation costs expended by the District to suppress a fire. These costs shall be calculated using an hourly or mileage based rate for each class of equipment or vehicle.
5. The total cost to the District for equipment rented to suppress a fire.
6. Replacement or repair costs to the District for equipment and tools damaged, destroyed or lost as a result of a fire. However, any such claim shall be reduced by any salvage value and be based on the depreciated value of such equipment and tools prior to the fire, as determined by the District. Furthermore, the District shall eliminate from said claims any costs directly attributable to the negligence of District personnel operating the equipment or tool.
7. Costs will include direct expenditures, as well as indirect or administrative costs.
8. Fire Cost Reimbursement Tables for manpower and equipment are attached as Appendix A, and the District will update these costs annually.

B. Reimbursement to the District for fires which burn onto the Refuge from adjacent property shall be based on the percentage of the total acres burned that were actually within the Refuge.

C. Reimbursement to the District for fire suppression on lands in accordance with this agreement may not exceed $50,000 per response or $150,000 per fiscal year without further approval of the Refuge Manager.

D. Reimbursement will be made to the District within 60 days of receiving the District's invoice for suppression costs. Each payment will be made to the District at the address listed above.

E. All invoices prepared by the District should be submitted to the Refuge Manager at the address listed above.

VIII. SPECIAL PROVISIONS

A. This agreement shall not affect the rights of any party to recover suppression costs and/or damages sustained as a result of the negligent or willful act of any person causing a fire.

B. No party shall be liable to any other for loss, damage, personal injury or death occurring in consequence of the performance of this agreement, except as provided herein.

C. Both parties may work jointly on fire trespass investigations. Fire law enforcement reports may be prepared independently.

D. Copies of fire reports shall be mutually provided to the other agency as soon as possible.

IX. GENERAL PROVISIONS

The U.S. Office of Management and Budget Circular numbers: 87, 102 and 128; shall be applicable to this agreement and are incorporated herein as Attachments 1,2 and 3.

X. AMENDMENTS

Amendment to this agreement may be proposed by either party and shall become effective upon being reduced to a written document executed by both parties.

XI. TERMINATION

This agreement may be terminated in whole or in part when all parties agree that the continuation of the agreement would not produce satisfactory results. The parties shall agree upon the termination conditions including the effective date and, in the case of partial terminations, the portion to be terminated. The parties shall not incur new obligations after the effective date of termination, and shall cancel as many outstanding obligations as possible. The Service shall allow full credit to the other parties for the Federal share of non-cancelable obligations properly incurred by the other parties prior to termination.

U.S. Fish and Wildlife Service - Stone Lakes National Wildlife Refuge

_____ _____
Signature **Date**

_____
Title

Elk Grove Fire Protection District

_____ _____
Signature **Date**

_____
Title

Sufficiency Review:

U.S. Fish and Wildlife Service

_____ _____
Signature **Date**

_____
Title

APPENDIX E: SPECIES LIST

Amphibians
Cal tiger Salamander
western toad
western spadefoot
Pacific treefrog
bull frog

Reptiles
western fence lizard
Cal horned lizard
northern alligator lizard
gopher snake
common kingsnake
common garter snake
giant garter snake
western yellow-bellied racer

Mammals
Virginia opossum
broad-footed mole
brush rabbit
desert cottontail
black-tailed hare
Cal ground squirrel
western gray squirrel
Botta's pocket gopher
beaver
dusky-footed woodrat
Cal vole
muskrat
coyote
gray fox
ringtail
raccoon
American badger
skunk
river otter
black-tailed deer

Birds
GREBES
- Pied-billed Grebe
- Eared Grebe
- Western Grebe
- Clark's Grebe
- Horned Grebe

PELICANS AND CORMORANTS
- American White Pelican
- Double-crested Cormorant

BITTERNS, HERONS AND EGRETS
- American Bittern
- Great Blue Heron
- Great Egret
- Snowy Egret
- Cattle Egret
- Green-backed Heron
- Black-crowned Night-Heron

IBISES
- White-faced Ibis

WATERFOWL
- Tundra Swan
- Greater White-fronted Goose
- Snow Goose
- Ross' Goose
- Canada Goose
- Wood Duck
- Green-winged Teal
- Mallard
- Northern Pintail
- Blue-winged Teal
- Cinnamon Teal
- Northern Shoveler
- Gadwall
- Eurasian Wigeon
- American Wigeon
- Canvasback
- Redhead
- Ring-necked Duck
- Lesser Scaup
- Common Goldeneye
- Barrow's Goldeneye
- Bufflehead
- Hooded Merganser
- Common Merganser
- Ruddy Duck

VULTURES
- Turkey Vulture

OSPREY, KITES, EAGLES AND HAWKS
- Osprey
- White-tailed Kite
- Bald Eagle

Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Swainson's Hawk
Red-tailed Hawk
Rough-legged Hawk
Golden Eagle

FALCONS
American Kestrel
Merlin
Peregrine Falcon
Prairie Falcon

GALLINACEOUS BIRDS
Ring-necked Pheasant
California Quail

RAILS
Virginia Rail
Sora
Common Moorhen
American Coot

CRANES
Sandhill Crane

SHOREBIRDS
Black-bellied Plover
Killdeer

Black-necked Stilt
American Avocet
Greater Yellowlegs
Lesser Yellowlegs
Spotted Sandpiper
Whimbrel
Long-billed Curlew
Western Sandpiper
Least Sandpiper
Dunlin
Long-billed Dowitcher
Common Snipe
Wilson's Phalarope

GULLS AND TERNS
Ring-billed Gull
California Gull
Herring Gull

Caspian Tern
Forster's Tern

DOVES
Rock Dove
Mourning Dove

OWLS
Barn Owl
Western Screech-Owl
Great Horned Owl
Burrowing Owl
Short-eared Owl

HUMMINGBIRDS
Black-chinned Hummingbird
Anna's Hummingbird

KINGFISHERS
Belted Kingfisher

WOODPECKERS
Acorn Woodpecker
Red-breasted Sapsucker
Nuttall's Woodpecker
Downy Woodpecker
Northern Flicker

FLYCATCHERS
Western Wood-Pewee
Pacific-slope Flycatcher
Black Phoebe
Say's Phoebe
Ash-throated Flycatcher
Western Kingbird

LARKS
Horned Lark

SWALLOWS
Tree Swallow
Violet-green Swallow
Northern Rough-winged Swallow
Cliff Swallow
Barn Swallow

JAYS, MAGPIES AND CROWS
Western Scrub-Jay
Yellow-billed Magpie
American Crow

TITMICE & BUSHTITS
Oak (Plain)Titmouse
Bushtit

NUTHATCHES
White-breasted Nuthatch

WRENS
Bewick's Wren
House Wren
Marsh Wren

KINGLETS, BLUEBIRDS AND THRUSHES
Golden-crowned Kinglet
Ruby-crowned Kinglet
Western Bluebird
Hermit Thrush
American Robin
Varied Thrush

WRENTIT
Wrentit

MOCKINGBIRDS
Northern Mockingbird

PIPITS
American Pipit

WAXWINGS
Cedar Waxwing

PHAINOPEPLA
Phainopepla

SHRIKES
Loggerhead Shrike

STARLINGS
European Starling

VIREOS
Hutton's Vireo
Warbling Vireo

WARBLERS
Orange-crowned Warbler
Nashville Warbler
Yellow Warbler

Yellow-rumped Warbler
Black-throated Gray Warbler
Hermit Warbler
MacGillivray's Warbler
Common Yellowthroat
Wilson's Warbler
Yellow-breasted Chat

TANAGERS
Western Tanager

GROSBEAKS AND BUNTINGS
Black-headed Grosbeak
Blue Grosbeak
Lazuli Bunting

TOWHEES AND SPARROWS
Spotted Towhee
California Towhee
Lark Sparrow
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Dark-eyed Junco

BLACKBIRDS, MEADOWLARKS AND ORIOLES
Red-winged Blackbird
Tricolored Blackbird
Western Meadowlark
Yellow-headed Blackbird
Brewer's Blackbird
Brown-headed Cowbird
Bullock's Oriole

FINCHES
Purple Finch
House Finch
Pine Siskin
Lesser Goldfinch
American Goldfinch

WEAVER FINCHES
House Sparrow

Plant Species

FERNS AND ALLIES

MARSILEACEAE

Marsilea vestita, hairy pepperwort
Pilularia americana, American pillwort

SALVINIACEAE

Azolla mexicana Presl, water fern

DICOTYLEDONS

AMARANTHACEAE

Amaranthus albus, tumbleweed
Amaranthus retroflexus, rough pigweed

ANACARDIACEAE

Toxicodendron diversilobum, posion oak

APIACEAE

Eryngium aristulatum, Jepson coyote thistle
Foeniculum vulgare, sweet fennel

ASCLEPIADACEAE

Asclepias fascicularis, narrowleaf milkweed

ASTERACEAE

Achyrachaena mollis, blow-wives
Ambrosia psilostachya, common ragweed
Anthemis cotula, dog fennel
Aster chilensis var. medius, Jepson aster
Aster exilis, slim aster
Baccharis pilularius ssp. Consanguinea, coyote brush
Bidens frondosa, stick tight
Centaurea solstitialis, yellow star thistle
Cichorium intybus, chichory
Cirsium vulgare, bull thistle
Gnaphalium beneolens, fragrant everlasting
Gnaphalium luteo-album, weedy cudweed
Gnaphalium palustre, lowland cudweed
Grindelia camporum, Great Valley gumplant
Helianthus annuus spp. lenticularis, common sunflower
Hemizonia luzulaefolia ssp. rudis, hatfield tarweed
Hemizonia parryi ssp. rudis, pappose spikeweed
Holocarpha virgata, virgate tarweed
Hypochoeis glabra, smooth cat's-ear
Lactuca serriola, prickly lettuce
Lasthenia fremontii, Fremont goldfields
Lasthenia glaberrima, smooth goldfields
Matricaria matricarioides, pineapple weed
Matricaria occidentalis, Valley pineapple weed
Microseris douglasii spp. douglasii, Douglas' microseris

Picris echioides, prickly ox-toungue
Psilocarphus brevissimus, woolly marbles
Psilocarphus brevissimus var. multiflorus
Psilocarphus oregonus, Oregon woolly-heads
Senecio vulgaris, common groundsel
Sonchus asper, prickly sow-thistle
Sonchus oleraceus, common sow-thistle
Silybum marianum, milk thistle
Taraxacum officinale, common dandelion
Xanthium strumarium, cocklebur

BORAGINACEAE
Amsinckia intermedia, common fiddleneck
Amsinckia lycopsoides, bugloss fiddleneck
Amsinckia menziesii, rigid fiddle-neck
Heliotropium curassavicum var. oculatum, heliotrope
Plagiobothrys bracteatus, bracted allocarya
Plagiobothrys stipitatus var. micranthus, vernal pool allocarya
Plagiobothrys trachycarpus, rough-fruited allocarya
Plagiobothrys undulatus, coast allocarya

BRASSICACEAE
Brassica campestris, common mustard
Brassica geniculata, Mediterranean mustard
Capsella bursa-pastoris, shepherd's-purse
Lepidium latifolia
Lepidium latipes, dwarf peppergrass
Lepidium nitidum, shining peppergrass
Lepidium oblongum, wayside peppergrass
Raphanus sativus, wild radish
Rorippa curviliqua, western yellow-cress
Sibara virginica, Virginia rock-cress
Sisymbrium officinate, hedge mustard

CALLITRICHACEAE
Callitriche marginata, California water-starwort

CAMPANULACEAE
Downingia bicornuta, double-horned downingia
Downingia humilis, dwarf downingia

CAPRIFOLIACEAE
Sambucus mexicana, southwestern elderberry

CARYOPHYLLACEAE
Cerastium glomeratum, mouse-ear chickweed
Silene gallica, windmill pink
Spergularia boncconii, Boccone's sand spurry
Spergularia marina, alkali sand-spurry
Spergularia rubra, purple sand spurry

Spergularia villosa, white sand spurry
Stellaria media, common chickweed

CHENOPODIACEAE
Atriplex hastata, arrowleaf orache
Chenopodium album, lamb's quarters

CRASSULACEAE
Crassula aquatica Schoenl, water pigmy-weed

CONVOLVULACEAE
Convolvulus arvensis, bindweed
Cressa truxillensis, alkali weed

CUSCUTACEAE
Cuscuta campestris, field dodder
Cuscuta indecora, pretty dodder

ELATINACEAE
Elatine californica, California waterwort
Elatine rubella, reddish waterwort

EUPHORBIACEAE
Chamaesyce nutans, nodding spurge
Chamaesyce ocellata, Valley spurge
Chamaesyce serpyllifolia, thyme-leaved spurge

FABACEAE
Glycyrrhiza lepidota, wild licorice
Lotus corniculatus, bird's-foot trefoil
Lotus purshianus, Spanish clover
Lupinus micranthus, annual lupine
Lupinus pachylobus, Greene's annual lupine
Medicago lupulina, black medic
Medicago polymorpha, bur-clover
Melilotus albus, white sweet-clover
Melilotus indicus, Indian sweet-clover
Robinia pseudo-acacia, black locust
Trifolium amplectens, pale sack clover
Trifolium amlectens var. truncatum
Trifolium bifidum var. decipiens, notchleaf clover
Trifolium depauperatum, dwarf sack clover
Trifolium dubium, shamrock
Trifolium fucatum, sour clover
Trifolium hirtum, hairy clover
Trifolium hybridum, Alsatian clover
Trifolium repens, white clover
Trifolium variegatum, white-tipped clover
Vicia dasycarpa, winter vetch
Vicia villosa, woolly vetch

FAGACEAE
Quercus lobata, valley oak

FRANKENIACEAE
Frankenia gradifolia var. campestris, alkali heath

GERANIACEAE
Erodium botrys, long beaked filaree
Erodium cicutarium, cutleaf filaree
Erodium moschatum, musk filaree
Erodium obtusiplicatum, Moroccan filaree
Geranium dissectum, cutleaf geranium

HALORAGACEAE
Myriophyllum spicatum ssp. exalbescens, American water-milfoil

LAMIACEAE
Lycopus americanus, cutleaf water-horehound
Pogogyne zizyphoroides, Sacramento pogogyne
Stschys ajugoides, bugle hedge-nettle

LYTHRACEAE
Lythrum hyssopifolia, hyssop loosestrife
Lythrum tribracteatum, Mediterranean loosestrife

MALVACEAE
Malva nicaeensis, bull mallow
Malva parviflora, cheese weed
Sida hederacea, alkali mallow

MORACEAE
Ficus carica, common fig
Maclura pomifera Schneid, Osage-orange

ONAGRACEAE
Boisduvalia cleistogama, Valley boisduvalia
Boisduvalia glabella, smooth boisduvalia
Epilobium paniculatum, branching willow herb
Ludwigia peploides, yellow waterweed

PAPAVERACEAE
Eschscholzia californica, California poppy

PLANTAGINACEAE
Plantago bigelovii, annual coast plantain
Plantago lanceolata, English plantain
Plantago major, common plantain

POLYGONACEAE
Polygonum argyrocoleon, Persian wireweed
Polygonum aviculare, wire-grass
Polygonum coccineum, swamp knotweed
Polygonum hydropiperoides var. asperifolium, water smartweed
Polygonum lapathifolium, willow smartweed
Polygonum mexicanum, giant smartweed
Rumex crispus, curly dock
Rumex pulcher, fiddle dock
Rumex stenophyllus, narrowleaf dock
Rumex transitorius, willow dock

PORTULACACEAE
Calandrinia ciliata var. menziesii, red maids

RANUNCULACEAE
Myosurus minimus var. filiformis, slender mousetail
Ranunculus muricatus, spiny buttercup
Ranunculus sclerstus, cursed buttercup

ROSACEAE
Pyracantha crenulata Roemer, Himalayan firethorn
Rosa californica, California wild rose
Rubus procerus, Himalayan blackberry
Rubus vitifolius ssp. ursinus, California blackberry

RUBIACEAE
Cephalanthus occidentalis var. californicus, button bush

SALICACEAE
Populus fremontii, Fremont's cottonwood
Salix gooddingii var. variabilis, black willow
Salix hindsiana, sandbar willow
Salix lasiandra, yellow willow
Salix lasiolepis, arroyo willow
Salix melanopsis var. bolanderiana, dusky willow

SCROPHULARIACEAE
Kickxia spuria, roundleaf fluellin
Orthocarpus attenuatus, narrowleaf owl's-clover
Veronica peregrina ssp. xalapensis, purslane speedwell

SOLANACEAE
Solanum nodiflorum, small flowered nightshade

URTICACEAE
Urtica dioica ssp. holosericea, stinging nettle

VERBENACEAE
Phyla nodiflora var. repens, creeping lippia

Phyla nodiflora var. reptens

VISCACEAE
Phoradendron tomentosum ssp. macrophyllum, long spiked mistletoe

VITACEAE
Vitis californica, wild grape

MONOCOTYLEDONS
ALISMATACEAE
Alisma lanceolatum With., narrowleaf water-plantain
Alisma plantago-aquatica, common water plantain
Machaerocarpus californicus, fringed water plantain
Sagittaria montevidensis ssp. calycina, Valley arrowhead

CYPERACEAE
Carex praegracilis, clustered field sedge
Cyperus eragrostis, tall nut sedge
Eleocharius macrostachya, creeping spike rush
Scirpus acutus, hardstem bulrush

IRIDACEAE
Sisyrinchium bellum, blue eyed grass

JUNCACEAE
Juncus balticus, Baltic rush
Juncus bufonius, toad rush

LEMINACEEAE
Lemna minor, lesser duck weed

LILAEACEAE
Lilaea scilloides, flowering quillwort

LILIACEAE
Asparagus officinalis, common asparagus
Brodiaea elegans, harvest brodiaea

POACEAE
Alopecurus saccatus, Pacific meadow-foxtail
Avena barbata, slender wild oat
Avena fatua, wild oat
Avena sativa, cultivated oat
Avena fatua sativa
Briza minor, little quaking-grass
Bromus diandrus, ripgut
Bromus mollis, soft chess
Bromus stamineus, brome
Crypsis schoenoides Lam., swampgrass, swamp timothy
Crypsis vaginiflora Opiz, compact swampgrass

Cynodon dactylon, Bermuda grass
Deschampsia danthonioides, annual hairgrass
Digitaria sanguinalis, crab grass
Distichlis spicata var. nana, valley saltgrass
Echinochloa crusgalli, barnyard grass
Elymus triticoides, creeping wild rye
Festuca arundinacea, reed fescue
Festuca pratensis, meadow fescue
Glyceria declinata, spreading manna-grass
Hordeum brachyantherum, meadow barley
Hordeum californicum, meadow barley
Hordeum geniculatum, Mediterranean barley
Hordeum leporinum, hare barley
Hordeum vulgare var. trifurcatum, cultivated barley
Leptochloa fascicularis, bearded sprangletop
Lolium multiflorum, annual ryegrass
Paspalum dilatatum, Dallis grass
Paspalum distichum, knotgrass
Phalaris lemmonii, Lemmon's Canary grass
Phalaris paradoxa, hooded Canary grass
Poa annua, annual bluegrass
Poa pratensis, Kentucky bluegrass
Polypogon interruptus, Mediterranean beardgrass
Polypogon maritimus, ditch beardgrass
Setaria glauca, yellow bristle-grass
Vulpia bromoides, brome fescue
Vulpia myuros, rattail fescue

SPARGANIACEAE
Sparganium eurycarpum var. greenei, Greene's bur-reed

TYPHACEAE
Typha latifolia, broadleaf cattail
Typha glauca, hybrid cattail

APPENDIX F: DELEGATION OF AUTHORITY

REFUGE NAME

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 such as the Little White Salmon River and hatchery fish production ponds and intakes. 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 REFUGE NAME. You are not authorized to use equipment within the ANY AREAS. Do not use hatchery raceways as a helicopter bucket dip site. Do not use retardant adjacent to fish production ponds.
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 _____, _____.

_____ _____

NAME, Project Leader, REFUGE NAME 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.
6. There will be no dozer line construction unless qualified person is present to protect archaeological sites.

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.
3. Do not dip helicopter buckets into hatchery raceways.

APPENDIX G: DISPATCH PLAN

Stone Lakes National Wildlife Refuge

1. When a report of smoke or fire is received the following information should be taken from the caller:

Location of smoke or fire:
Location of person reporting:
Name and telephone number of person reporting:
Size of fire:
Character of fire (running, creeping, direction, etc.):
Type of fuel:
Color of smoke:
Anyone fighting fire?:
Did they see anyone in vicinity or vehicles leaving area?:
Time since caller first noticed fire to time call placed:

2. Notify Refuge:

Stone Lakes National Wildlife Refuge	Office (916) 775-4421(8:00 am to 4:30pm)	
IF NO ANSWER ABOVE OR NOTIFY:		
Elk Grove Fire Protection District:	911 or (916) 685-1426	
Deputy Refuge Manager: Beatrix Treiterer	Wk: (916) 775-4421	Hm: (916) 966-7676
Refuge Manager: Thomas Harvey	Wk: (916) 775-4421	Hm: (916) 988-9707

3. Dispatch Refuge Staff Fire Personnel and Refuge Engine (if Fire Crew not available):

Fire is on refuge property
Fire is threatening refuge property
If requested by Local Fire District for assistance.

4. Other contacts:

Zone Fire Manager - Roger Wong	Wk: (209) 826-3508 Cell: (209) 777-4504	Hm: (209) 827-4390
Zone AFMO - Perry Grissom	Wk: (530) 510-6326	Hm: (530) 934-5869
Refuge Supervisor - Dave Paullin	(916) 414-6464	
Regional Fire Management Coordinator (Pam Ensley or Andy Anderson)	(503) 231-6174 or (503) 231-6175	

APPENDIX H: EQUIPMENT INVENTORY

- Chevy Brush Truck with 150 gallon slip on unit

- Caterpillar D7 Dozer

- 98 International Dump Truck with towing package

- Jacob's flatbed equipment trailer

- John Deere 7410 Tractor with disk and mower

APPENDIX I: WFSA

WILDLAND FIRE

SITUATION ANALYSIS

Incident Name: _____

Jurisdiction: _____

Date and Time Completed: _____

I. WILDLAND FIRE SITUATION ANALYSIS

A. Jurisdiction(s)	B. Geographic Area
C. Unit(s)	D. WSFA #
E. Fire Name	F. Incident #

G. Accounting Code: _____

H. Date/Time Prepared: _____ @ _____

I. Attachments: _____

Complexity Matrix/Analysis * _____

Risk Assessment/Analysis * _____

Probability of Success * _____

Consequences of Failure * _____

Maps * _____

Decision Tree ** _____

Fire Behavior Projections * _____

Calculations of Resource Requirements * _____

Other (specify) _____

* Required

** Required by FWS

This page is completed by the Agency Administrator(s)

II. OBJECTIVES AND CONSTRAINTS

A. Objectives (must be specific and measurable)

1. Safety

   - Public

   - Firefighter

2. Economic

3. Environmental

4. Social

5. Other

B. Constraints

This page is completed by the Agency Administrator(s)

III. ALTERNATIVES

	A	B	C
A. Wildland Fire Strategy			
B. Narrative			
C. Resources Needed			
Handcrews	_____	_____	_____
Engines	_____	_____	_____
Dozers	_____	_____	_____
Airtankers	_____	_____	_____
Helicopters	_____	_____	_____
D. Final Size			
E. Estimated Contain/ Control Date			
F. Costs			
G. Risk Assessment			
Probability of Success	_____	_____	_____
Consequences of Failure	_____	_____	_____
H. Complexity			
I.	**Attach maps for each alternative**		

This page is completed by the Agency Administrator(s) and FMO/Incident Commander

IV. EVALUATION OF ALTERNATIVES

A. Evaluation Process	A	B	C
Safety			
Firefighter	_____	_____	_____
Aviation	_____	_____	_____
Public	_____	_____	_____
Sum of Safety Values			
Economic			
Forage	_____	_____	_____
Improvements	_____	_____	_____
Recreation	_____	_____	_____
Timber	_____	_____	_____
Water	_____	_____	_____
Wilderness	_____	_____	_____
Wildlife	_____	_____	_____
Other (specify)	_____	_____	_____
Sum of Economic Values			
Environmental			
Air	_____	_____	_____
Visual	_____	_____	_____
Fuels	_____	_____	_____
T & E Species	_____	_____	_____
Other (specify)	_____	_____	_____
Sum of Environmental Values			
Social			
Employment	_____	_____	_____
Public Concern	_____	_____	_____
Cultural	_____	_____	_____
Other (specify)	_____	_____	_____
Sum of Social Values			
Other			

This page is completed by the Agency Administrator(s) and FMO/Incident Commander

V. ANALYSIS SUMMARY

Alternatives	A	B	C
A. Compliance with Objectives			
Safety			
Economic			
Environmental			
Social			
Other (specify)			
B. Pertinent Data			
Final Fire Size			
Complexity			
Suppression Cost			
Resource Values			
Probability of Success			
Consequences of Failure			

C. External/Internal Influences

National & Geographic Preparedness Level: _____

Incident Priority: _____

Resource Availability: _____

Weather Forecast (long range): _____

Fire Behavior Projections: _____

This page is completed by the Agency Administrator(s) and FMO/Incident Commander

VI. DECISION

The Selected Alternative is: _____

Rationale: _____

_____ _____

Agency Administrator's Signature **Date/Time**

This page is completed by the Agency Administrator(s) or designate

VII. DAILY REVIEW

To be reviewed daily to determine if still valid until containment or control

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

IF WFSA IS NO LONGER VALID, A NEW WFSA WILL BE COMPLETED!

This page is completed by the Agency Administrator(s) or designate

VIII.	FINAL REVIEW	
The elements of the selected alternative were met on:	_____ Date	_____ Time
By: _____ Agency Administrator(s)		

INSTRUCTIONS

Section I. WFSA Information Page

A. Jurisdiction(s): Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.

B. Geographic Area: Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.

C. Unit(s): Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.

D. WFSA #: Identify the number assigned to the most recent WFSA for this fire.

E. Fire Name: Self-explanatory.

F. Incident #: Identify the incident number assigned to the fire.

G. Accounting Code: Insert the local unit's accounting code.

H. Date/Time Prepared: Self-explanatory.

I. Attachments: Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.

Section II. Objectives and Constraints

A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighter, aviation, and public must receive the highest priority. Suppression objectives must relate to resource management objectives in the unit resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

Section III. Alternatives

A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.

B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."

C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.

D. Final Fire Size: Estimated final fire size for each alternative at time of containment.

E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.

F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.

G. Risk Assessment - Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as park closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.

H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.

I. A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

Section IV. Evaluation of Alternatives

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the Fire Management Plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

Section V. Analysis Summary

A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Must have clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) is mandatory.

Section VII. Daily Review

The date, time, and signature of reviewing officials are reported in each column for each day of the incident. The status of Preparedness Level, Incident Priority, Resource Availability, Weather Forecast, and WFSA validity is completed for each day reviewed. Ratings for the Preparedness Level, Incident Priority, Resource Availability, Fire Behavior, and Weather Forecast are addressed in Section V.C. Assign a “yes” under "WFSA Valid" to continue use of this WFSA. A "no" indicates this WFSA is no longer valid and another WFSA must be prepared or the original revised.

Section VIII. Final Review

This Section is completed by the Agency Administrator(s). A signature, date, and time are provided once all conditions of the WFSA are met.

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."

2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.

3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.

4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rock slide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy - Differing fire policies between suppression agencies when the fire involves multiple ownership is an example.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted **YES/NO**

1. Burning Index (from on-site measurement of weather conditions) predicted to be above the 90% level using the major fuel model in which the fire is burning. _____
2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.). _____
3. Crowning, profuse or long-range spotting. _____
4. Weather forecast indicating no significant relief or worsening conditions. _____

Total _____

B. RESOURCES COMMITTED

1. 200 or more personnel assigned. _____
2. Three or more divisions. _____
3. Wide variety of special support personnel. _____
4. Substantial air operation which is not properly staffed. _____
5. Majority of initial attack resources committed. _____

Total _____

C. RESOURCES THREATENED

1. Urban interface. _____
2. Developments and facilities. _____
3. Restricted, threatened, or endangered species habitat. _____
4. Cultural Sites. _____
5. Unique natural resources, special designation zones, or wilderness. _____
6. Other special resources. _____

Total _____

D. SAFETY **YES/NO**

1. Unusually hazardous fire line conditions. _____
2. Serious accidents or fatalities. _____
3. Threat to safety of visitors from fire and related operations. _____
4. Restricted and/or closures in effect or being considered. _____
5. No night operations in place for safety reasons. _____

Total _____

E. OWNERSHIP

1. Fire burning or threatening more than one jurisdiction. _____
2. Potential for claims (damages). _____
3. Conflicting management objectives. _____
4. Disputes over fire management responsibility. _____
5. Potential for unified command. _____

Total _____

F. EXTERNAL INFLUENCES

1. Controversial wildland fire management policy. _____
2. Pre-existing controversies/relationships. _____
3. Sensitive media relationships. _____
4. Smoke management problems. _____
5. Sensitive political interests. _____
6. Other external influences. _____

Total _____

G. CHANGE **YES/NO**

1. Change in strategy to confine/contain to control. _____
2. Large amount of unburned fuel within planned perimeter. _____
3. WFSA invalid or requires updating. _____

Total _____

H. EXISTING OVERHEAD

Worked two operational periods without achieving initial objectives. _____

Existing management organization ineffective. _____

IMT overextended themselves mentally and/or physically. _____

Incident action plans, briefings, etc. missing or poorly prepared. _____

Total _____

I. SIGNATURE

_____ _____

Name and Title **Date and Time**

APPENDIX J: SAMPLE BURN PLAN

REFUGE OR STATION:	**UNIT:**

Prepared By:	Prescribed Fire Specialist	Date
Reviewed By:	Refuge Biologist	Date
Reviewed By:	Prescribed Fire Burn Boss	Date
Reviewed By:	Fire Management Officer	Date
Reviewed By:	Biological Investigation Unit	Date
Reviewed By:	Refuge Manager	Date
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:	Project Leader	Date

PRESCRIBED FIRE BURN PLAN

Refuge:	**Refuge Burn Number:**
Substation:	**Fire Number:**
Name of Area:	**Unit Number:**
Acres to be Burned:	**Perimeter of Burn:**
Legal Description: **T_____ R_____ S_____ Meridian:_____** **Latitude:_____ Longitude:_____**	
County:	**State:**

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review ? Yes__No (check one).

(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):

1)

2)

3)

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

1)

2)

3)

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

1)

2)

3)

[*Attach Project Map Here*]

[*Attach Project Pre-Burn Photos Here*]

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: (Attach a completed copy of the Complexity Analysis worksheet to this plan.)

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)			
Wind Direction			
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)	B	H	
Rate of Spread (ch/hour)			
Fireline Intensity			
Flame Length			
Energy Release Component NFDRS Fuel Model: _____			

Note: Attach BEHAVE Runs as an appendix to the end of this plan.

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 burnt 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. Also attach pertinent smoke variances (if any) and all SASEM runs.

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
Administration (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.)

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:

GO-NO-GO CHECKLIST

_____
Unit

_____ Is burn plan complete and approved?

_____ Are all fire prescriptions specifications met?

_____ Are all smoke management prescriptions met?

_____ Is the current and projected fire weather forecast favorable?

_____ Have all air quality considerations and smoke requirements been met?

_____ Have all required cultural resource protection objectives been met?

_____ Are all personnel required in the prescribed burn plan on-site and are they all qualified for their assigned duties?

_____ Have all personnel been briefed on the prescribed burn plan requirements?

_____ Have all personnel been briefed on safety hazards, escape routes, and safety zones?

_____ Is all required equipment in place and in working order?

_____ Are available (including back-up) resources adequate for containment of escapes under the worst-case conditions?

_____ Are answers to all of the above questions AYES@?

_____ In your opinion, can the burn be carried out according to the plan and will the burn meet planned objectives?

_____ Is there an adequate contingency plan developed and proofed?

All 14 questions have been answered AYES@.

_____ _____
Burn Boss Date

_____ _____
Refuge Manager or Designee Date

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:

DAILY FIRE BEHAVIOR MONITORING SHEET

Refuge: _____

Project Name: _____ RX Fire Number: _____

Date of Burn: _____

Ignition Time: Start: _____ Finish: _____

Weather Observations During Burn:

Time of Weather Observations

Dry Bulb Temp							
Wet Bulb Temp							
RH							
Wind Speed							
Wind Direction							
Cloud Cover %							

Comments Concerning Weather:

Last Live Fuel Moisture Measurement: ___1-Hour Fuel Moisture:

10-Hour Fuel Moisture (from fuel stick): _____ Haines Index: _____

Test Fire Results:

Firing Pattern:

Fire Behavior Characteristics (Rate of Spread, Flame Length, Fire Spread Direction, etc

Acres Treated:

Smoke Dispersal Narrative (venting height, transport wind speed & direction, visibility, holding problems, problem spots, complaints, etc

Burn Severity
Effects to Vegetation Narrative:

Ground Char (%): Unburned _____ Light _____ Moderate _____ Deep _____

Soil Moisture on Day of Burn:

Were Resource Objectives Met? (If burn was successful, what conditions made it possible, ie: low live fuel moisture, high winds, etc.):

Photos of Fire Area:	Preburn	Yes _____	No _____
	During Burn	Yes _____	No _____
	Postburn	Yes _____	No _____

Daily Burn Cost:

Personnel Cost:	$ _____	_____
Equipment Cost:	$ _____	_____
Fuel Cost:	$ _____	_____
Total:	$ _____	_____
Cost per Acre:	$ _____	_____

Vehicles Used:

Burn Organization:

Burn Boss: _____

Ignition Specialist:	_____	Holding Specialist:	_____
Lighting Crew:	_____	Holding Crew:	_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____

Burn Evaluation Prepared By: _____ Date: _____

**Attach pertinent Spot Weather Forecast,WIMS/NFDRS, Smoke Mgt Variance, etc. information for burn day to back of sheet.

APPENDIX K: AIR QUALITY BURN PERMIT

ATTACHMENT TO AGRICULTURAL BURNING PERMIT

No. 013178

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT (SMAQMD)
issued by
SACRAMENTO COUNTY AGRICULTURAL COMMISSIONER
4137 Branch Center Road, Sacramento, CA 95827
(916) 875-6603 / 875-6641

EXPIRATION DATE: June 30, 2000

Name of Permittee U.S. Fish & Wildlife Service

BURN SITE LOCATION	SITE ID	WASTE TYPE	ACRES
Stone Lakes National Wildlife Refuge between Lambert & Hood-Franklin		weeds/grasses (tule)	25.0
		flood debris + other prunings	10.0

ORCHARD/VINEYARD ACREAGE SUBTOTAL TO BE ADDED TO PERMIT ➤	
ORCHARD REMOVAL ACREAGE SUBTOTAL TO BE ADDED TO PERMIT ➤	
ALL OTHER WASTE ACREAGE SUBTOTAL TO BE ADDED TO PERMIT ➤	35.0

I, the undersigned permittee, affirm that the above statements are true to the best of my knowledge. I authorize the addition of these sites to my previously issued permit as cited above. I acknowledge that my signed affirmation on that permit applies to these sites, as well.

PERMIT FEES

(Use this box if fees were not added to first permit)

ORCHARD/VINEYARD FEE:		ACRES X $0.50 / ACRE	$ —	
ORCHARD REMOVAL FEE:		ACRES X $3.50 / ACRE	$ —	
ALL OTHER WASTE FEE:	35.0	ACRES X $1.75 / ACRE	$ 61.25	
		SUBTOTAL	$ 61.25	
		CREDIT FROM PREVIOUS PERMIT NO. —	(—)	REMAINING CREDIT
✓ CASH	CHECK NO.:	TOTAL FEE ➤	$ 61.25	

Signature of Permittee: [signature] Rx Fire Spec **Date:** 1/27/2000

Signature of Issuing Officer: [signature] **Date:** 1/27/2000

Permit issued on authority of the District Air Pollution Control Officer pursuant to District Rules 501 and 303, H&SC Sec. 41080 (a) and 42311.

AG-C80-059 (79) Rev. 3/98 Copies: WHITE - Issuing agency YELLOW - Permittee PINK - Fire District GOLDENROD - SMAQMD

STANDARD PERMIT CONDITIONS

1. **Contact your permit issuing agency for verbal permission prior to each burn.**
2. **Contact your fire department for verbal permission prior to each burn.**
3. This permit is valid only on those days on which burn operations are not prohibited by the State Air Resources Board or the SMAQMD.
4. Burning hours shall be between 10:00 A.M. and 5:00 P.M. except from September 15 through November 30 when burning hours shall be between 10:00 A.M. and 3:00 P.M.. These hours may be modified by the SMAQMD or your fire district.
5. Agricultural waste shall be arranged so that it will burn with a minimum of smoke and shall be free of material not produced in an agricultural operation, including, but not limited to, refuse, livestock bedding, construction materials and tires.
6. Agricultural waste shall be reasonably free of dirt, soil and visible moisture.
7. Agricultural burns shall be ignited with approved devices only. **The use of burning tires is expressly prohibited.**
8. Tree stumps and branches over 6 inches in diameter must be dried for six weeks. Smaller branches must be dried for at least 3 weeks and dried sufficiently to provide effective combustion.
9. Spread rice straw must be dried for three days. Windrowed rice straw must be dried for 10 days. Such rice straw may be burned earlier, if it passes the "crackle" test. Do not burn rice straw after a rain exceeding 0.15 inch, until the straw dries enough to pass the "crackle" test. Drying times for rice straw harvested by a stripper header shall be 3 days beyond the first frost and the straw must pass the crackle test; or three days after mowing, spreading, or chopping.
10. Field crop residue shall be ignited only by backfiring or strip firing into the wind, unless other firing patterns are expressly designated on this permit by the permit issuing agency.
11. Irrigation systems (levees) shall not be burned between October 1 and November 15, inclusive, and shall be free of refuse.
12. No burning shall be conducted in Northwest Sacramento during any north wind without verbal permission from the permitting agency. Such authorization may only be obtained prior to burning and on the day of the proposed burn.
13. This permit shall be available for inspection at the burn site during the burning operation.
14. You must take reasonable steps to abate a fire that causes or will cause a public nuisance. Reasonable steps may include, bu are not limited to, one or both of the following:

    - making immediate contact with your fire department for assistance

    - discing a fire break

WARNING

Be advised that your fire department may impose additional burning restrictions such as:

- A 30 foot fire break
- A source of water for fire control
- More limited burning hours
- No burning on windy days
- No burning where path of smoke would impact roadways
- On-site, two-way communication, such as a cellular telephone, for immediate contact with your fire department.

This permit may be revoked or suspended for violation of permit conditions, SMAQMD Rules or Health and Safety Code laws or regulations pertaining to agricultural burning. Such violations may result in civil penalties or criminal prosecution.

REQUEST FOR CULTURAL RESOURCE COMPLIANCE

Project Name: _____

USFWS Unit: _____

Org Code: _____

Ecoregion: _____
(By ARD; CBE, IPE, KCE, NCE)

Program: _____
(Partners, WSECP, Refuges, Hatcheries, Jobs, Federal Aid, Other)

NHPA COMPLIANCE

❑ Appendix _____ Item _____
of the Programmatic Agreement applies.

❑ 36CFR800.4 to 800.6 applies.

_____ _____
Cultural Resources Team Date

Location: _____ **County:** _____ **State:** _____
(nearest town)

Township(s): _____ **Range(s):** _____ **Section(s):** _____ **Meridian:** _____

7.5' USGS Quad(s): _____
(Name, Date)

Project acres or linear meters/feet: _____

Date you want to start the project: _____ **Date of this request:** _____

USFWS Contact: _____ **Phone:** _____

Address: _____ **Fax:** _____

Directions to project (if not obvious):

Attach to this form:

- A **project (sketch) map** showing the Area of Potential Effect with locations of specific ground altering activities *(required)*.
- A **photocopy** of the **USGS quad** clearly marking the project area *(required)*.
- A **photocopy** of an **air photo** showing the project may be attached *(if available)*.

Return form and direct questions to:

USFWS Region 1 Cultural Resources Team
c/o Tualatin River NWR
20555 SW Gerda Lane
Sherwood, OR 97140

Phone: (503) 625-4377
Fax: (503) 625-4887

The Undertaking: *Describe the proposed project and means to facilitate it (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 feet of 3 foot high check dam)?*

Area of Potential Effect: *Describe where disturbance of the ground will occur. What are the dimensions of the area to be disturbed? How deep will you excavate? How long is the ditch, fence, etc? Where will fill be obtained? Where will spoil be dumped? What tools or equipment will be used? Are you replacing or repairing a structure? Are you 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 versus 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 meters or feet for all elements of the undertaking.*

Environmental Setting: *Describe the environmental setting of the Area of Potential Effect. A) What was the natural habitat prior to modifications, reclamation, agriculture, settlement? B) What is the land-use history? When was it first settled, modified? How deep has it been cultivated? Grazed? etc. C) What is the land-use and habitat today? What natural agents (e.g., sedimentation, or vegetation) 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?*