

Appendix A. Compatibility Determinations

Compatibility Determination for Recreational Fishing on the Stone Lakes National Wildlife Refuge

Use: Fishing

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System (System) is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Fishing is one of six priority public uses (i.e., hunting, fishing, wildlife observation, photography, environmental education and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. Fishing has occurred within the Stone Lakes Basin and surrounding Delta waterways since prior to European settlement of the region. The visitor use program in the CCP proposes to open portions of the Refuge to fishing from boats from June through September and to expand visitor opportunities for wildlife-dependent recreation (USFWS 2006a). Due to limitations in parking space, launching sites, and the navigability of Refuge waterways, only cartop, hand-launched boats, such as canoes and kayaks will be permitted. Gas-powered outboard motors will not be allowed and a no wake zone will be enforced but use of electric motors will be possible in the South Stone Lake unit. Fishing will not include take of frogs or crayfish and will only be with rod and reel. The Service does not intend to allow bank fishing on the Refuge, due to a number of concerns, including: erosion of banks and other habitat impacts from trampling of vegetation, lack of staff to monitor use, and lack of infrastructure such as piers or platforms.

Game fish species to be allowed for legal take will include all native and introduced species listed in the California Freshwater Sport Fishing Regulations (e.g., bass, catfish, crappie, bluegill, sunfish, shad, carp). Fishing will be permitted in accordance with State and Federal regulations to ensure it will not interfere with conservation of fish and wildlife and their habitats. An informational kiosk with maps and brochures on regulations, health warnings, species identification, and Refuge boundaries will be available near the boat launch area. Chapter 5 of the Comprehensive Conservation Plan, Refuge Vision, Goals and Objectives, is herein incorporated by reference.

Availability of Resources:

Staff necessary to oversee the Refuge fishing program will be shared with other programs as described in the Draft Stone Lakes NWR CCP (USFWS 2006a). Shared staff member(s) would be sufficient to operate the modest program described in this plan. Facilities to support the program will require capital outlays and recurring costs however, some of the costs will be available through other visitor use programs, such as wildlife observation and photography. If unexpected costs arise, such as the need for more enforcement or higher than expected maintenance needs, we will reevaluate the program and make necessary adjustments, such as seeking volunteers or other partnerships to maintain facilities and administer the program.

Item	One Time Cost	Recurring Costs
Boat Ramp	\$30,000	\$5,000
Parking Area	\$20,000	\$5,000
Maintenance of Parking Lots and Boat Launches	N/A	\$5,000
Maintenance (0.50 FTE)	\$26,000	\$26,000
Restroom	\$50,000	\$2,000
Law Enforcement (0.50 FTE)	\$25,000	\$25,000
Administration	\$2,000	\$2,000
TOTAL	\$153,000	\$70,000

Anticipated Impacts of the Use(s):

Impacts are discussed in detail in the environmental assessment for the Draft Comprehensive Conservation Plan (USFWS 2006). Fishing and other human activities may cause disturbance to wildlife (Burger 1981) and the cumulative effects of this expanded use will likely have effects on habitat and the fisheries resource (Buckley and Buckley 1976, Glinski 1976, Miller et al. 1998, Reijnen and Foppen 1994, Smith and Hunt 1995). Fishing

may result in increased problems with vandalism and litter such as discarded monofilament line and tackle. Because few native fish species are found at Stone Lakes, and non-native game species are plentiful, the impact on the native fishery is not expected to be significant.

Federally-listed species that may occur on the Refuge include the giant garter snake, valley elderberry longhorn beetle, and the vernal pool tadpole and fairy shrimp (USFWS 2006b). No impacts to vernal pool species are anticipated from fishing because fishing will be permitted only on waterways of the Beach Lake, North Stone Lake and South Stone Lake units where there are no vernal pools. State-listed species that may inhabit the Refuge include greater sandhill crane and Swainson's hawk. The most sensitive period for Swainson's hawk is during the nesting season, typically mid-February through July. Likely nesting areas would be closed to visitors during the nesting season. Impacts to greater sandhill cranes are not anticipated since the fishing season does not coincide with wintering crane use at the Refuge.

The following measure will be taken to avoid impacts to fish and wildlife:

- Provide printed materials to inform anglers about fishing regulations and boundaries of fishing areas;
- Maintain parking areas, roads, and boat launches to prevent erosion or habitat damage;
- Monitor fishing to ensure that facilities are adequate and wildlife disturbance is minimal;
- Prohibit gas-powered watercraft to protect water quality and submerged vegetation;
- Implement a seasonal closure from October through May to reduce disturbance to wintering, nesting, resting, and foraging birds and other wildlife, their habitats, and public engaged in other wildlife-dependent uses;
- Prohibit watercraft within 0.25 miles of occupied Swainson's hawks nests until the young have fledged (i.e., 2nd half of July);
- Refuge law enforcement staff will randomly check anglers for compliance with state fishing laws and refuge-specific fishing regulations; and
- Comply with all measures identified in the CCP Section 7 Consultation to minimize or eliminate conflicts with federally-listed or non-target species.

Public Review and Comment: One person commented that bank fishing requires no additional staff and should be allowed.

Response: Allowing bank fishing would require additional staff effort based largely on the need for regular trash removal and public safety associated with bank fishing on the Refuge. A step-down fisheries management plan is proposed for completion in 2008 (page 95 of the CCP), which will address management of fishing on the Refuge possibly including bank fishing.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Fishing will be permitted at Stone Lakes NWR with the following stipulations:

- Fishing will be conducted exclusively from boats
- No trailered boats will be permitted. Cartop, hand-launched boats with or without electric motors will be permitted; gas motor boats will not allowed;
- No vehicles will be allowed in boat launch areas;
- All closed areas will be identified in printed materials provided to anglers and posted and

- patrolled to prevent trespass through adjacent properties;
- Littering regulations will be strictly enforced;
- Use or possession of alcohol while sport fishing will be prohibited;
- No building or maintaining of fires will be permitted on the Refuge;
- The western portion of the South Stone Lake Unit will be closed to fishing during the waterfowl hunting season; and
- Fishing will be allowed during daytime hours only.

The Refuge Manager will have authority to close certain areas during critical wildlife use periods and cancel any activities deemed necessary to fulfill Refuge purposes or ensure visitor safety. Sensitive nesting areas will be protected from disturbance by visitors with signs and barriers. Visitors will be directed away from areas where major habitat restoration or management projects are under way.

Justification:

Fishing is an appropriate wildlife-dependent recreational activity. Based upon biological impacts described in the Refuge Draft Comprehensive Conservation Plan and environmental assessment, it is determined that fishing within the Refuge will not materially interfere with or detract from the purposes for which the Refuge was established.

Fishing is a priority wildlife-dependent visitor use provided for in the National Wildlife Refuge System Improvement Act of 1997. By facilitating this use on the Refuge, we hope to increase the visitors’ knowledge and appreciation of fish and wildlife, which may lead to increased public stewardship of wildlife and their habitats on the Refuge. Increased public stewardship will support and complement the Service’s actions in achieving the Refuge’s purposes and the mission of the National Wildlife Refuge System. This program as described is determined to be compatible and will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Reevaluation Date (provide month and year):

February, 2022 Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

- Conducted with Comprehensive Conservation Plan
- _____ Categorical Exclusion without Environmental Action Statement
- _____ Categorical Exclusion and Environmental Action Statement
- X CCP Environmental Assessment and Finding of No Significant Impact
- _____ Environmental Impact Statement and Record of Decision

References Cited:

Buckley, P. A. and F. G. Buckley. 1976. Guidelines for protection and management of colonially nesting waterbirds. North Atlantic Regional Office, National Park Service, Boston, MA. 52pp.

Burger, J. 1981. The effect of human activity on birds at a coastal bay. *Biol. Cons.* 21:231-241.

Glinski, R. L. 1976. Bird watching etiquette: the need for a developing philosophy. *Am. Bird* 30(3):655-657.

Miller, S. G., R. L. Knight, and C. K. Miller. 1998. Influence of recreational trails on breeding bird communities. *Ecol. Appl.* 8:162-169.

Reijnen, R. and R. Foppen. 1994. The effects of car traffic on breeding bird populations in woodland. I. Evidence of reduced habitat quality for willow warbler (*Pyloscopus trochilus*) breeding close to a highway. *J. Appl. Ecol* 31: 85-94.

Smith, L. and J. D. Hunt. 1995. Nature tourism: impacts and management. Pp. 203-219 in Knight, R. L.; Gutzwiller, K. J. (Wildlife and recreationists: coexistence through management and research, eds.). Island Press, Washington, D. C.

U.S. Fish and Wildlife Service (USFWS). 2006a. Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment, 2006. U. S. Fish and Wildlife Service, Sacramento, California.

U.S. Fish and Wildlife Service (USFWS). 2002b. Biological Opinion for the Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan. U.S. Fish and Wildlife Service, Sacramento, California.

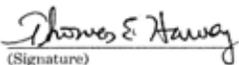
Refuge Determination:

Prepared by:


(Signature)

12/06/06
(Date)

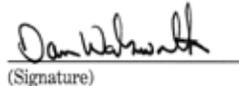
Refuge Manager/
Project Leader
Approval:


(Signature)

12/07/06
(Date)

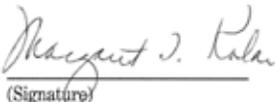
Concurrence:

Refuge Supervisor:


(Signature)

2/27/07
(Date)

Assistant Manager,
Refuges,
California/Nevada
Operations:


(Signature)

2/28/07
(Date)

Compatibility Determination for Wildlife Observation and Photography on the Stone Lakes National Wildlife Refuge

Use: Wildlife Observation and Photography

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System (System) is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use(s):

Wildlife observation and photography are two of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental educations and interpretation)

identified in the National Wildlife Refuge System Improvement Act of 1997. Currently, visitor access to Stone Lakes National Wildlife Refuge (Refuge) is limited to two days per month and as a result the expectations of the visiting public are not being met. The Refuge proposes to provide adequate facilities to observe, photograph and enjoy wildlife and natural habitats during daylight hours in all seasons of the year

The Refuge would provide opportunities for wildlife observation and photography by constructing approximately 4.6 miles of universally accessible trails on the Headquarters, North Stone Lake and South Stone Lake Units, two photography blinds and two viewing platforms, expanding entrance roads and parking areas, and by offering boat access and guided tours to areas of interest, including vernal pools and wetlands. For additional details about this proposed use, please see the Stone Lakes National Wildlife Refuge Final Comprehensive Conservation Plan (USFWS, 2006) which is herein incorporated by reference.

Availability of Resources:

Staff necessary to oversee the wildlife observation and photography programs will be shared with other programs described in the 2006 Draft CCP for Stone Lakes NWR. To fully implement this program as described in the CCP, significant increases in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will require capital outlays and recurring costs, however, some of the costs will be shared with other visitor used programs. If unanticipated costs arise, the program will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for educational grants.

Item	One Time Cost	Annual Costs
Photo Blinds (HQ, North Stone Lake)	\$ 30,000	\$ 2,500
Viewing Platforms (HQ, North Stone Lake)	\$620,000	\$ 5,000
Parking Areas (HQ, North Stone Lake)	\$520,000	\$ 5,000
Trails		
2.6 miles at South Stone Lake Unit	\$150,000	\$15,000
2 miles at Headquarters Unit	\$400,000	\$10,000
Boardwalks		
1500 feet at Sun River	\$1,590,000	\$ 7,000
200 feet at HQ	\$200,000	\$ 2,500
Entrance Road Sun River Property (BLU)	\$400,000	\$ 5,000
Restrooms (HQ, BLU)	\$150,000	\$ 6,000
Park Ranger (0.5 FTE)	\$ 25,000	\$ 5,000
Maintenance Staff (0.5 FTE)	\$ 26,000	\$26,000
Administration	\$2,000	
TOTAL	\$4,113,000	\$89,000

Anticipated Impacts of the Use(s):

Human activity may disturb migratory birds utilizing the Refuge’s habitats for feeding or nesting. Off-trail human activity in habitat restoration areas can slow restoration efforts through soil compaction, vegetation trampling and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. The construction and maintenance of trails and boardwalks may impact soils, vegetation, and in some instances hydrology around the trails. This could include an increased potential for erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole and Marion 1988).

Federally-listed species that may occur on the Refuge include the giant garter snake, valley elderberry longhorn beetle, vernal pool tadpole and fairy shrimp. No impacts to vernal pool species are anticipated from wildlife observation and photography. California state-listed species that inhabit the Refuge include greater sandhill crane and Swainson's hawk. The primary disturbance season for Swainson's hawk is during their nesting season, typically mid-February through July. Prime nesting habitat would be closed to visitors during the nesting season.

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers, with low-power lenses, to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants. Impacts of wildlife observation and photography are also discussed in the Compatibility Determination for environmental education and interpretation.

Public Review and Comment: Many written and oral comments recommended that high-speed boating should not be allowed to continue on the refuge in part because it is disruptive of visitors participating in wildlife observation and photography on the refuge.

Response: High-speed boating was found to be not compatible through a Compatibility Determination. According to the compatibility policy (part 603 FW 2, 2.14) "Existing uses determined to be not compatible will be expeditiously terminated...this process of termination...will not exceed 6 months (without written authorization from the Director)..." The Refuge will follow the Service compatibility policy and eliminate high speed boating as expeditiously as possible, while making a good faith effort to assist high-speed boaters to find an alternative location where this use can be relocated off of the Refuge.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To allow visitor access to the Refuge for wildlife observation and photography, the following measures would be taken:

- By 2008, interpretive signs and an orientation kiosk will be installed on the Headquarters Unit of the Refuge to inform visitors about Refuge habitats and wildlife and how to minimize adverse impacts. Access to the Refuge will be allowed only between sunrise and sunset, unless a permit for alternative hours is issued by the Refuge Manager in advance.
- The main kiosks on the Headquarters Unit and South Stone Lake units will clearly state the regulations governing wildlife observation and photography on the Refuge and will include the following information:
 - (1) a trail map, trail information and regulations;
 - (2) a description of the National Wildlife Refuge System; and

(3) an interchangeable sign for any closures during the waterfowl hunting or Swainson's hawk nesting seasons.

- Trails will be well marked and symbolic fencing will be installed to guide visitor access through sensitive habitats. This will minimize trespass into closed areas and reduce disturbance to nesting birds and other sensitive species.
- The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.

Justification: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and wildlife photography as priority visitor uses for national wildlife refuges, along with hunting, fishing, environmental education and interpretation. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation and photography opportunities on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Central Valley. The Refuge has one of the few remaining natural riparian areas in the valley as well as wetlands, vernal pools, and open water habitats harboring many species of migratory waterfowl, raptors and other wildlife species. Due to its proximity to urban areas, the Refuge attracts a high number of visitors. With management consistent with the stipulations herein, expanding wildlife observation and photography opportunities would substantially increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory Reevaluation Date (provide month and year):

February, 2022 Mandatory 15-year Reevaluation Date (for priority visitor uses)

_____ Mandatory 10-Year Reevaluation Date (for all uses other than priority visitor uses)

NEPA Compliance for Refuge Use Decision (check one below):

Conducted with Comprehensive Conservation Plan

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

Cole, D. N. and P. B. Landres. 1995. Indirect effects of recreation on wildlife. Pages 183-201 in R. L.

Cole, D. N. and J. L. Marion. 1988. Recreation impacts in some riparian forests of the

eastern United States. *Env.Manage.* 12:99-107.

Dobb, E. 1998. Reality check: the debate behind the lens. *Audubon*: Jan.-Feb.

Klein, M. L. 1993. Waterbird behavioral responses to human disturbances. *Wildl. Soc. Bull.* 21:31-39.

Liddle, M. J. 1975. A selective review of the ecological effects on human trampling on natural ecosystems. *Biol.Conserv.* 7:17-36.

Morton, J. M. 1995. Management of human disturbance and its effects on waterfowl. Pages F59-F86 in W. R.

U.S. Fish and Wildlife Service (USFWS). 2006. Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment, 2006. U. S. Fish and Wildlife Service, Sacramento, California.

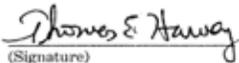
Refuge Determination:

Prepared by:


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12/06/06
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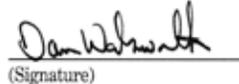
Refuge Manager/
Project Leader
Approval:


(Signature)

12/07/06
(Date)

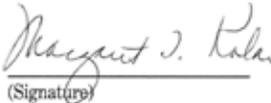
Concurrence:

Refuge Supervisor:


(Signature)

2/27/07
(Date)

Assistant Manager,
Refuges,
California/Nevada
Operations:


(Signature)

2/28/07
(Date)

Compatibility Determination for Environmental Education and Interpretation on the Stone Lakes National Wildlife Refuge

Use: Environmental Education and Interpretation

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

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Description of Use(s):

Environmental education and interpretation are two of the six priority public uses (e.g., hunting, fishing, wildlife observation and photography, environmental educations and

interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. Stone Lakes National Wildlife Refuge (Refuge) is one of the few urban refuges in the western region and has the potential to attract thousands of visitors annually from the greater Sacramento area to experience Central Valley habitats including wetlands, grasslands and riparian habitats. Currently, public access to the Refuge is limited to two days per month and as a result expectations of the visiting public are not being addressed.

The Refuge proposes to provide for expanded environmental educational use by: (1) offering staff and/or docent led tours on the Refuge, (2) conducting teacher workshops, (3) developing a class or group staging area, (4) developing a Refuge relevant elementary school curriculum, and (5) exploring the feasibility of a Refuge fee demonstration area.

The Refuge plans to develop an interpretive program by: (1) developing a self-guided trail system, (2) developing interpretive panels and exhibits, and (3) by building an open air interpretive shelter on the Headquarters Unit as part of the Blue Heron Trails project. In addition, the Refuge would develop environmental education and interpretive materials, including fact sheets on particular species and habitats, and an education guide for educators on Central Valley habitat conservation and restoration issues. Additional information about this proposed use are in the Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan (USFWS, 2006) which is herein incorporated by reference.

Availability of Resources: Staff necessary to oversee the Refuge Environmental Education and Interpretation program will be shared with other programs as described in the 2006 Draft CCP for Stone Lakes NWR. Additional staff will be required to fully implement this program, such as an Interpretative Specialist. Facilities and materials to support the program will require capital outlays and recurring costs, however, some of the costs will be shared with other visitor programs. If unanticipated costs arise, the program will be reevaluated and necessary adjustments made, such as securing additional volunteers or financial assistance.

Item	One Time Cost	Recurring Costs
Interpretive Panels	\$210,000	\$15,000
Kiosks (1 main + 4 small)	\$300,000	\$5,000
Trails*	\$1,630,000	\$10,000
Outdoor Rec Planner	\$50,000	\$50,000
Maintenance Staff	\$26,000	\$26,000
Administration	\$2,000	\$2,000
Total	\$2,118,000	\$108,000

**Includes "Junior Biologist Trail" at Headquarters Unit, complete with entrance signs, universally accessible trails, entrance kiosk, and interpretive panels.*

Contingent on increased funding and staff identified in the CCP, the Refuge would expand interpretation and environmental education opportunities, as well as generate additional educational materials.

Anticipated Impacts of the Use(s):

Disturbances to wildlife resulting from environmental education and interpretation activities are considered to be of minimal impact because: (1) the total number of students permitted through the reservation system will be limited, (2) students and teachers will be trained in trail etiquette and how to minimize wildlife disturbance, (3) educational groups will be required to have a sufficient adult to student ratio for adequate supervision, (4) trail design will provide adequate cover for wildlife, and (5) observation areas and scopes will be provided to view wildlife at a distance

Human activity may disturb migratory birds utilizing Refuge habitats for feeding or nesting activities. Off-trail human activity in habitat restoration areas can slow restoration efforts through soil compaction, vegetation trampling, and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. The construction and maintenance of trails and boardwalks will impact soils, vegetation and in some instances hydrology around the trails. This could include an increased potential for erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole and Marion 1988).

Federally-listed species that may occur on the Refuge include the giant garter snake, valley elderberry longhorn beetle, vernal pool tadpole and fairy shrimp. No significant impacts to vernal pool species are anticipated from environmental education and interpretation as visitors to vernal pools areas (e.g., Wetland Preserve) will be confined to established trails or led by docents or Refuge staff. California-listed species that inhabit the Refuge include greater sandhill crane and Swainson's hawk. The primary disturbance season for Swainson's hawk is during the nesting season, typically mid-February through July. Prime nesting habitat would be closed to visitors during the nesting season. Impacts are also discussed in Chapter 5 of the Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan (USFWS, 2006).

Public Review and Comment: One comment suggested that educational materials should be developed and employed to define and promote low-impact styles of recreation for the wildlife resources present.

Response: The Refuge agrees and content related to environmentally-friendly recreation already is and will continue to be a part of the educational programs proposed for the Refuge in the CCP.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: In order to allow public access to the Refuge for environmental education and interpretation, the following measures will be taken:

- Access to the Refuge will be allowed only during daylight hours unless a permit for alternative hours is issued by the Refuge manager. The Refuge manager will have the authority to close certain areas to interpretive programs or to cancel activities to fulfill Refuge purposes.
- Public access will be restricted to areas where the least disruption to wildlife and their habitats would occur. Visitors will be directed to remain a safe distance from nesting areas with signs and barriers. Visitors will be directed away from areas where sensitive habitat restoration projects are underway
- Educators or groups who wish to visit or learn about the Refuge would receive interpretive materials in advance.
- Trails from parking lots to viewing areas will be well marked to minimize trespass through closed areas and reduce disturbance to nesting migratory birds and other sensitive resources.

- The Refuge will maintain an adequate law enforcement capability to ensure public safety and compliance with all rules and regulations.

Justification:

The goals of the National Wildlife Refuge System (System) include providing an understanding and appreciation of fish and wildlife ecology and the human role in the environment and providing Refuge visitors with high quality and safe recreational experiences oriented toward wildlife, to the extent that these activities are compatible with the purposes for which a refuge was established and the mission of the System. Moreover, the National Wildlife Refuge System Improvement Act of 1997 identifies environmental education and interpretation as priority public uses for National Wildlife Refuges, along with hunting, fishing, wildlife observation and photography. As expressed priority uses of the Refuge system, these uses take precedence over other potential public uses in Refuge planning and management. The Service strives to provide priority public uses when compatible with the purpose and goals of the Refuge and the mission of the System.

Environmental education and interpretive programs provide opportunities for the visiting public to learn about and experience native plants, fish and wildlife in their natural habitat. The Refuge can also educate the public about its role within the agency and the National Wildlife Refuge System, developing better community awareness, volunteer involvement and advocacy. The Refuge also has the opportunity to provide the community educational information on habitat restoration, migratory waterfowl and wetland conservation in the Central Valley.

Mandatory Reevaluation Date (provide month and year):

February, 2022 Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

Conducted with Comprehensive Conservation Plan

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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Fish and Wildlife Service, Sacramento, California.

Refuge Determination:

Prepared by: Alex M. [Signature] 12/06/06
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: Thomas E. Hawley 12/07/06
(Signature) (Date)

Concurrence:

Refuge Supervisor: Dan Wabnitz 2/27/07
(Signature) (Date)

Assistant Manager,
Refuges,
California/Nevada
Operations: Margaret J. Kaler 2/28/07
(Signature) (Date)

Compatibility Determination for High-Speed Boating on the Stone Lakes National Wildlife Refuge

Use: High-Speed Boating

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. “ 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. “ 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. “ 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. “ 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. “ 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System (System) is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

High-speed boating, primarily associated with waterskiing, has occurred on Refuge waterways since before lands and waterways were incorporated into the National Wildlife

Refuge System as part of Stone Lakes NWR. Most of the high-speed boaters are members of a private club, Beach Lake Ski Club, who launch power boats from privately-owned land within the approved Refuge boundary. Approximately 85 percent of the 2.6 miles of waterway used for waterskiing lies within Stone Lakes NWR in the Beach Lake and North Stone Lake units. The waterway consists of portions of Lower Beach Lake and Southern Pacific Railroad (SP) Cut and is bounded to the west by the abandoned railroad levee and primarily by Refuge lands to the east. Most of the channel is relatively narrow, approximately 200 to 250 feet across but it expands to approximately 750 feet at its widest point. Boaters first pass through 0.47 miles of a privately-owned portion of SP Cut. The remainder of the waterski route lies in 1.0 mile of water owned in fee title by the Refuge and 1.2 miles owned by the state of California and managed by the Refuge under cooperative agreement (see Figure 1).

Standard waterskiing, slalom, wake board, and barefoot waterskiing all occur on Refuge waters. Boats travel up to 45 mph for barefoot waterskiing (American Barefoot Club 2005) and up to 35 mph for slalom waterskiing (USA Waterskiing 2005). Waterskiers modify Refuge aquatic habitat by removing floating and submerged woody snags and debris presenting a navigational and/or safety hazard and by anchoring a slalom course marked by floats and a covered float for docking boats.

Availability of Resources: No additional funding required.

Anticipated Impacts of Use:

Riparian habitat adjacent to Lower Beach Lake and SP Cut on the Beach and North Stone Lake units provides crucial foraging, resting, and breeding habitat for wide variety of migratory songbirds, raptors, and waterbirds including waterfowl, waders, and shorebirds. Raptors such as the California Endangered Species Act listed Swainson's hawk, red-tailed hawk, red-shouldered hawk, and white-tailed kite and colonially-nesting species such as great blue heron, great egret, black-crowned night-heron, snowy egret, and double-crested cormorant, may all nest in the woody riparian habitat adjacent to Refuge waterways and may be affected by high-speed boating. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter use patterns, reduce use of particular habitats, alter feeding behavior and nutritional status, and cause premature departure by migratory birds from areas (Knight and Cole 1995). In England, an increased rate of disturbance from boats partly caused a decline in roosting numbers of shorebird species (Burton et al. 1996). In addition, boaters have been observed to cause massive flights of diving ducks on the Mississippi River (Thornburg 1973). Motorized boats within 100 meters of shore caused all wintering waterfowl and shorebirds to flush between the craft and shore in south San Diego Bay, regardless of speed (Huffman 1999). Bow wakes of power boats have been reported to tip over free-floating grebe nests as well as other nests near the fringe of reeds (Reichholf 1976). However, disturbance to birds, in general, was reduced when boats traveled at or below the 5 mph speed limit (Huffman 1999).

The visitor use program proposed in the Comprehensive Conservation Plan (CCP) for Stone Lakes NWR (USFWS 2006) includes wildlife viewing and fishing from non-motorized boats in the South Stone Lake, Beach Lake, and North Stone Lake units, including the same portion of the Refuge currently utilized for waterskiing (Beach Lake and North Stone Lake units). High-speed boating will likely not be feasible alongside non-motorized boaters because wakes created while traveling at high speed may represent a significant safety risk to non-motorized boaters (American Canoe Association 2004). Wakes generated by high-speed boaters within SP Cut's narrow, shallow channel cannot readily dissipate and increase in height and steepness as they pass over the shallow nearshore zone that kayakers and canoeists are likely to frequent. Even in cases where high-speed boat wakes do not actually capsize smaller, non-motorized boats, the waves can create instability sufficient to

discourage other boaters using the channel and diminish their experience of the Refuge (C. Courtright, USFWS, pers. comm.). Boats traveling at high speeds in the narrow channel could experience difficulty in ceding the right of way to smaller vessels because they may lack space in which to give an adequate berth to other boats. In order to drive responsibly, previous studies have indicated that waterskiing boats should allow a safety area of 100 feet on either side of the boat (Bostian 2005, USCG 2006). Where Refuge channels are less than 250 feet wide, a high-speed boat would not be expected to be able to safely share the waterway with non-motorized craft.

Opportunities for wildlife observation and photography the Refuge proposes to offer visitors on waterways in the Beach and North Stone Lake units would also be negatively impacted by waterskiing because the noise and speed associated with high-speed boating disturbs and displaces wildlife. Moreover, visitors to wildlife refuges and natural areas typically seek a natural experience and their wildlife observation experience would be diminished by noise. Previous monitoring has indicated that non-motorized boaters find power boats to be obtrusive and disruptive of their experience (Pinto, A. 2002).

Wakes generated by power boats are also known to cause levee erosion (U.S. Army Corps of Engineers 1997). In non-flow dominated channels, such as SP Cut, boat-generated waves exert the greatest erosive energy against levee banks (Ellis 2002). As a result, concerns have been expressed regarding wakes generated by motorized boats in SP Cut causing significant erosion to the abandoned railroad levee which provides flood protection to Reclamation District 744 (Van Loben Sels 2005, Baxter 2005). Continued high-speed boat traffic could lead to the need for extensive levee repair or even levee failure. Moreover, erosion of the SP Cut levee has resulted in the undermining and toppling of mature riparian trees such as valley oaks, eliminating habitat for an array of wildlife species. Therefore, a no-wake speed limit is warranted to ensure a quality experience for visitors engaging in wildlife-dependent uses, reduce levee erosion, and prevent further loss of property and wildlife habitat.

As part of engaging in high-speed boating within Refuge waters, members of the waterski club periodically remove navigational hazards that may constitute valuable wildlife habitat. These hazards consist largely of submerged snags and floating woody debris which, while hazardous for motorized, high-speed boats, provide valuable basking habitat for western pond turtles (a State and Federal species of concern). In addition submerged snags and floating woody debris provide cover and foraging areas for fish and other wildlife.

Western pond turtle populations are declining throughout most of their range, particularly in Southern California, and the major cause of the decline appears to be the destruction of suitable habitat (Brattstrom 1988, Brattstrom and Messer 1988). The only extensive populations of turtles currently occur in Northern California and Southern Oregon. Despite its name, the western pond turtle is only rarely a pond dweller and prefers the deep, slow-flowing waters of sloughs or pools in rivers (Brury 1986). The quiet waters of SP Cut and Lower Beach Lake are ideal pond turtle habitat. Moreover, recent graduate studies have confirmed that successful nesting by western pond turtles has occurred in tributaries of Lower Beach Lake (S. Oliver, pers. comm.). Other components of optimal turtle habitat include emergent basking sites, emergent vegetation, mud, rocks and logs (Holland 1992). Research conducted on the Trinity River suggests that the preservation and restoration of structural features, such as underwater cover and emergent basking sites, is of prime importance for promoting pond turtle survival (Reese 1998). Removal of snags and floating woody debris for navigational safety purposes degrades the quality of the riparian habitat and is therefore not consistent with Stone Lakes NWR purposes or the National Wildlife Refuge System mission.

Public Review and Comment: One written and several oral comments recommended that high speed boating, associated with water skiing, should be allowed to phase out over a 7 year period, ending in 2013. Many written and oral comments recommended that high speed boating should be eliminated from the Refuge as soon as possible.

Response: High-speed boating was found to be not compatible through this Compatibility Determination. According to the compatibility policy (part 603 FW 2, 2.14) "Existing uses determined to be not compatible will be expeditiously terminated...this process of termination...will not exceed 6 months (without written authorization from the Director)..." The Refuge will follow the Service compatibility policy and eliminate high speed boating as expeditiously as possible, while making a good faith effort to assist high-speed boaters to find an alternative location where this use can be relocated off of the Refuge.

Determination:

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: Not applicable.

Justification:

High-speed boating is not a wildlife-dependent recreational public use. In light of its adverse effects on Refuge natural resources and its affect on the ability of Refuge visitors to engage in wildlife-dependent uses, high-speed boating should not be allowed on Refuge waters. Instead, it is proposed that a no-wake speed limit be enforced for the following reasons:

- 1) High-speed boaters present a safety risk to non-motorized boaters within the narrow confines of this waterway.
- 2) High-speed boating disturbs and displaces wildlife because of noise and wake.
- 3) Wave action from high-speed boating, in narrow waterways, erodes shorelines and levees and causes loss of woody riparian habitat.
- 4) High-speed boating may adversely affect wildlife-dependent visitor uses and noise associated with high-speed boating may also directly impact visitors.
- 5) High-speed boating within Refuge waters necessitates removal of navigational hazards that constitute valuable habitat for special status species and other fish and wildlife.

Refuge staff will cooperate with high-speed boaters to seek alternative sites for waterskiing outside of the approved Refuge boundary. Other waterskiing sites are available outside the approved Refuge boundary that do not have significant adverse effects on visitors to the Refuge, wildlife and their habitats, or levee integrity.

Mandatory Reevaluation Date (provide month and year): N/A.

Mandatory 15-Year Reevaluation Date (for priority public uses)

Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

Conducted with Comprehensive Conservation Plan

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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Van Loben Sels, R. 2005. Letter to the US Fish and Wildlife Service. Reclamation District #744 Sacramento, California.

Personal Communications

Clay Courtright, US Fish and Wildlife Service, Sacramento, California, June 4, 2003.

Refuge Determination:

Prepared by: Alex Mott 12/06/06
 (Signature) (Date)

Refuge Manager/
 Project Leader
 Approval: Thomas E. Haway 12/07/06
 (Signature) (Date)

Concurrence:

Refuge Supervisor: Dan Wabnitz 2/27/07
 (Signature) (Date)

Assistant Manager,
 Refuges,
 California/Nevada
 Operations: Margaret J. Kalar 2/28/07
 (Signature) (Date)

Compatibility Determination for Recreational Boating on the Stone Lakes National Wildlife Refuge

Use: Recreational Boating Associated with Hunting, Fishing, Wildlife Observation, and Photography

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include the following.

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

“The mission of the National Wildlife Refuge System (System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The visitor use program proposed in the Comprehensive Conservation Plan (CCP) for Stone Lakes NWR (USFWS 2006a) includes recreational boating that supports priority visitor uses, including hunting, fishing, wildlife observation, photography, environmental education, and interpretation. The recreational boating uses addressed in this compatibility determination consist of car-top, hand-launched boats, such as kayaks and canoes and boats with electric motors, with some restrictions.

Regulation of recreational boating on the Refuge will be managed to minimize safety risks, as well as adverse effects on wildlife, habitat, and other recreational users, particularly those engaged in wildlife-dependent uses. These restrictions will include a no-wake speed limit throughout Refuge waters, seasonal closures, and limitations on use of electric motors. No gas-powered outboard motors will be permitted. The no-wake zone is intended to protect non-motorized boaters, wildlife and wildlife habitat. The restrictions are also intended to protect levees from deterioration by wave action (Baxter 2005, Van Loben Sels 2005) and to reduce noise levels that could adversely affect wildlife.

Waterways open to boating will include South Stone Lake, Southern Pacific Railroad (SP) Cut, and Lower Beach Lake. Boat launch, access, and parking for Lower Beach Lake and SP Cut on the Beach Lake Unit will be from the west end of Elliott Ranch Road. Current facilities are limited to a gravel parking area and an unimproved boat launch. Parking approximately 10 cars and an improved boat launch will be constructed at Elliot Ranch Road, contingent upon available funding. The second boat launch site is on the Sun River property of the South Stone Lake Unit where parking will be expanded to accommodate approximately 20 cars. Depending on availability of staff and funding, a new boat haul-out and associated trail and observation blind will be provided at the Lodi Gun club property of the South Stone Lake Unit to be accessible only by boat.

All Refuge waterways will be open for recreational boating from June through September only. Waterways will be closed to recreational boating for October 1 through May 31, to minimize disturbance to nesting waterbirds and raptors such as herons, egrets, grebes, and Swainson’s hawks. Waterways being treated for invasive aquatic weeds (e.g., water hyacinth, *Egeria densa*) will be closed to boating during herbicide applications. Temporary closures to boating may also be required during particular habitat restoration or management projects. Private vendors wishing to lead boating groups will be required to apply for a Refuge Special Use Permit. Chapter 5 of the Comprehensive Conservation Plan, Refuge Vision, Goals and Objectives, are herein incorporated by reference.

Availability of Resources:

The following funding/annual costs would be required to administer and manage boating activities as described above:

Activity	One-time Costs	Recurring Costs
Improvement of boat ramp and parking LOT	\$30,000	
Maintenance of Parking Lots and Boat Launches		\$5,000
Maintenance (0.50 FTE)	\$26,000	\$26,000
Law Enforcement (0.5 FTE)	\$25,000	\$25,000
Install Signs (includes all public use signs)	\$10,000	
Maintain Signs		\$5,000
Administration	\$2,000	\$2,000
TOTAL	\$93,000	\$63,000

Funding will be sought through the Service budget process. Other opportunities may

include: expanded partnerships with the State and recreational user groups, grants, coordination with other law enforcement agencies, and additional Refuge operations. All funding will be utilized to support a safe, quality public use program as described above.

Anticipated Impacts of Use:

Stone Lakes NWR provides crucial foraging and breeding habitat for wintering migratory birds, including waterfowl, shorebirds, and other waterbirds. Great blue herons, great egrets, double-crested cormorants, and Swainson's hawks, in particular, may be affected by recreational boating since they nest in tall riparian trees adjacent to waterways used by boaters. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). In the Ozark National Scenic Riverway, green heron activity declined on survey routes when canoes and boat use increased on the main river channel (Kaiser and Fritzell 1984). Canoes or slow moving boats have also been observed to disturb nesting great blue herons (Vos et al. 1985). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (Jahn and Hunt 1964, Huffman 1999, DeLong 2002) and disturbance to birds, in general, is reduced when boats travel at or below the 5 mph speed limit (Huffman 1999). To protect waterbirds and raptors that nest in riparian trees, the Beach Lake and South Stone Lake units will be closed to recreational boating from October through May, during nesting and breeding seasons. Monitoring of nesting great blue herons, Swainson's hawks and other waterbirds will be periodically conducted to assess the impact of recreational boating use.

Federally-listed species that may occur on the Refuge include the giant garter snake, valley elderberry longhorn beetle, vernal pool tadpole, and vernal pool fairy shrimp (USFWS 2006b). No effects on the beetle or vernal pool species are anticipated because recreational boating will occur outside of the habitats of these species. However, giant garter snakes could be affected by vehicular use of the area if they happen to be crossing a roadway. Vehicular speed limits will therefore be enforced within the Refuge to reduce effects to wildlife.

Western pond turtle populations are declining throughout most of their range, particularly in Southern California, and the major cause of the decline appears to be the destruction of suitable habitat (Brattstrom 1988, Brattstrom and Messer 1988). Because of its precipitous decline in numbers, the Western pond turtle has been designated as a Federal and State species of concern. The only extensive populations of turtles currently occur in Northern California and Southern Oregon. Despite its name, the western pond turtle is only rarely a pond dweller and prefers the deep, slow-flowing waters of sloughs or pools in rivers (Brury 1986). The quiet waters of the Beach Lake and South Stone Lake units are ideal pond turtle habitat. Recent graduate studies have confirmed that western pond turtles successfully nest on the Refuge (S. Oliver, pers. comm.). Other components of optimal turtle habitat include emergent basking sites, emergent vegetation, mud, rocks, and logs (Holland 1992). Research conducted on the Trinity River suggests that the preservation and restoration of structural features, such as underwater cover and emergent basking sites, is of prime importance for promoting pond turtle survival (Reese 1998). To occur safely, high-speed boating necessitates removal of snags and other underwater hazards that also provide valuable turtle habitat. However, no such alteration of habitat is necessary to provide no-wake boating opportunities. Nevertheless, canoes, kayaks, and car-top boats with electrical motors can still be expected to have some disturbance effect on turtles by displacing them from basking sites.

Public Review and Comment: Several written comments recommended that the Refuge be opened to paddle boat (canoe, kayak, etc.) recreation.

Response: The Refuge intends to open the SP cut waterway on the Refuge, from the west end of Elliott Ranch Road southward, to car top boating beginning in 2008.

Determination:

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

The following stipulations are required to ensure that recreational boating is compatible:

- A no-wake speed limit will be implemented throughout Refuge waters. Only human-powered canoes and kayaks, and electric-powered car-top boats (that is, non-trailer boats which can be carried on top of, inside of, or in the back of a vehicle and can be hand-launched into the water) will be permitted throughout Refuge waters.
- A seasonal closure from October through May will be implemented to reduce disturbance to wintering, nesting, resting, foraging, and breeding birds and other wildlife, their habitats, and other recreational users, especially those participating in wildlife-dependent visitor uses.
- Removal of snags and floating woody debris for navigational safety purposes will not be permitted.
- Signs will be installed and maintained to mark closed areas, convey seasonal closures, and indicate no-wake regulations on the Refuge.
- Periodic law enforcement will help ensure compliance with speed limit regulations and area closures. Regulations will be described in brochures and posted at Refuge headquarters and at boat launch sites. Recreational boaters are required to be in compliance with all applicable Refuge, U.S. Coast Guard and State of California regulations and laws.
- Boating activities and associated effects will be monitored with regard to waterfowl, shorebirds, birds of prey, other wildlife and their habitats, and other recreational users, especially those participating in wildlife-dependent visitor uses.
- Monitoring data will be used by the Refuge manager in making necessary adjustments in regulations or other aspects of the Refuge boating program and in the periodic reevaluation of this Compatibility Determination.

Justification: Boating itself is not wildlife-dependent recreation, but many wildlife dependent recreational activities (waterfowl hunting, fishing, wildlife observation, photography, and environmental education and interpretation) are associated with boating. A carefully regulated boating program would help the Refuge provide opportunities for wildlife-dependent priority visitor uses, which would contribute toward fulfilling provisions under the National Wildlife Refuge System Administration Act as amended in 1997.

Although boating has a potential to impact wildlife, implementing the prescribed stipulations listed above will reduce many of these impacts. Adequate habitat will be available for

wintering and breeding waterfowl, birds of prey, and other wetland-dependent species because high wildlife use areas will be closed to boating during critical periods. Boating regulations will be maintained and enforced in order to minimize the impact of visitor use on wildlife and wildlife habitat. Thus, migratory birds will find sufficient food resources and resting places so their abundance and use of the Refuge will not be measurably lessened; their physiological condition and production will not be impaired; their behavior and normal activity patterns will not be dramatically altered; and their overall status will not be impaired. The Refuge will also implement a monitoring program to help assess disturbance effects on wildlife and habitat. The impacts associated with boating activities can be reduced through improved outreach and educational information for Refuge visitors involved in these activities.

Mandatory Reevaluation Date (provide month and year):

_____ Mandatory 15-Year Reevaluation Date (for priority public uses)

February, 2017 Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X CCP Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

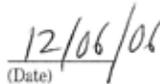
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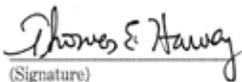
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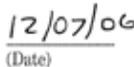
Prepared by:


(Signature)


(Date)

Refuge Manager/
Project Leader
Approval:


(Signature)


(Date)

Compatibility Determination for Research on the Stone Lakes National Wildlife Refuge

Use: Research

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System (System) is “To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use(s):

Stone Lakes National Wildlife Refuge (Refuge) periodically reviews proposals for scientific research to be conducted on the Refuge or may recommend possible research topics

to professors or students from nearby academic institutions. Although research is not identified as a priority public use by the National Wildlife Refuge System Improvement Act of 1997, scientific research can benefit Refuge resources and support the purpose of the Refuge and mission of the System. The Refuge proposes to give priority to studies that contribute to the conservation, enhancement, , management, or use of native Refuge fish and wildlife populations and their habitats. Research proposals would be reviewed by Refuge staff or other specialists, as appropriate. Research proposals that met the following criteria, would be given priority consideration for approval:

- Research that would contribute to Refuge conservation, enhancement, management, or visitor use programs;
- Research that would not conflict with other ongoing management, monitoring, or research programs;
- Research that could only be conducted on the Refuge;
- Research that did not result in undue disturbance to Refuge fish and wildlife and their habitats; and
- Research that could be monitored by the Refuge within existing staffing or logistical constraints.

Availability of Resources:

Adequate funding and staff exist to manage research at the Stone Lakes NWR. .

Anticipated Impacts of the Use(s):

Some level of disturbance is expected from many research activities since they commonly occur in areas normally closed to the public and may involve collecting samples or handling fish and wildlife. However, minimal impact to Refuge resources would be anticipated since research studies would be governed by a Special Use Permit (SUP) annually issued by the Refuge. SUP conditions would ensure that impacts to wildlife and habitats are minimized. All projects would be reviewed annually to assess compliance with SUP conditions. Prior to their approval, research proposals would be evaluated to ensure their study design resulted in the least possible level of disturbance to sensitive Refuge resources.

Public Review and Comment: No public comments were received related to research occurring on the Refuge.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Research applicants would be required to submit a proposal summarizing:

- (1) Objectives of the study;
- (2) Justification for the study;
- (3) Description of study methodology and schedule;
- (4) Description of potential impacts on Refuge fish and wildlife and/or habitats, including short-term and long-term disturbance, injury, or mortality;
- (5) Summary of research personnel required and their qualifications/experience;
- (6) Status of necessary permits (e.g., scientific collecting permits, endangered species permit),;

- (7) Anticipated costs to the Refuge and any requests for Refuge staff assistance; and
- (8) Planned deliverables and end products (e.g., reports, publications).

If proposed research methods adversely affect or have the potential to adversely affect Refuge resources, the researcher will be required to implement mitigation measures to minimize potential impacts. Mitigation measures will be included as conditions on the Special Use Permit. Refuge staff will monitor and inspect research projects to assess any unanticipated environmental effects and will have authority to terminate any research project, if necessary. All Refuge rules and regulations will be adhered to by researchers, unless specifically waived under a Special Use Permit issued by Refuge management.

Justification: Well-defined research projects developed in consultation with Service staff, would contribute directly to the conservation, enhancement, protection, management, and use of native Refuge fish and wildlife populations and their habitats. Adequate SUP conditions will be imposed on any research project to ensure that short and long-term impacts on Refuge resources are minimized, Only research that is compatible with the purposes of the Refuge and mission of the System would be permitted on the Refuge

Mandatory Reevaluation Date (provide month and year):

_____ Mandatory 15-Year Reevaluation Date (for priority public uses)

February, 2017 Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

Conducted with Comprehensive Conservation Plan

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

U.S. Fish and Wildlife Service (USFWS). 2006. Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment, 2006. U. S. Fish and Wildlife Service, Sacramento, California.

Refuge Determination:

Prepared by: Alex M. [Signature] 12/06/06
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: Thomas E. Haway 12/07/06
(Signature) (Date)

Concurrence:

Refuge Supervisor: Dan Wabnitz 2/27/07
(Signature) (Date)

Assistant Manager,
Refuges,
California/Nevada
Operations: Margaret J. Kaler 2/28/07
(Signature) (Date)

Compatibility Determination for Plant Gathering on the Stone Lakes National Wildlife Refuge

Use: Plant Gathering

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System (System) is “To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use(s):

The gathering of plants in and around Stone Lakes National Wildlife Refuge by Native Americans occurred historically and continues to be an ongoing use today. Plants are

gathered for a variety of uses; for medicinal uses, ceremonial uses, as food stuffs and for utilitarian or artistic purposes such as basket weaving or cord making. Plants gathered for traditional uses may include; willow bark and branches (*Salix* spp.), mugwort (*Artemisia douglasiana*), tule (*Schoenoplectus acutus* var. *occidentalis*, syn. *Scirpus acutus*), Santa Barbara sedge (*Carex barbarae*), wild rose (*Rosa californica*), indian hemp (*Apocynum cannabinum*), oak acorns (*Quercus* spp.) and others. Plants are gathered during various seasons; acorns, bulbs and berries are gathered in the late summer or fall, while medicinal or ceremonial herbs and basketweaving materials may be gathered in spring. The amount of plant material being harvested is traditionally low and is not expected to increase. Special Use Permits will be issued by the Refuge for plant gathering and access regulated to ensure protection of critical habitat during nesting or breeding periods. The use of Refuge lands for collections is considered to be of vital importance to Native American cultural groups such as the California Indian Basketweavers Association.

For additional details about this proposed use, please see the Environmental Assessment (Appendix B) for the Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan (USFWS 2006) which is herein incorporated by reference.

Availability of Resources: No additional resources will be needed to support this use.

Anticipated Impacts of the Use(s):

Impacts are also discussed in the Environmental Assessment (Appendix B) for the Stone Lakes National Wildlife Refuge Draft Comprehensive Conservation Plan (USFWS 2006) Impacts to habitat and wildlife associated with plant gathering on the Refuge are minimal. The amount of plant material being harvested is small enough not to constitute any meaningful impact on habitat. The level of disturbance to wildlife will vary depending on the season, but is considered to be low overall. The gathering of acorns, berries, bulbs and other plant materials that occurs from late summer through fall will have little or no impact on migratory or nesting birds. Gathering of new plant growth in springtime, herbs for medicinal/ceremonial purposes and willow twigs and bark for basket weaving may coincide with use of the refuge by migratory waterfowl, but as gathering activities are limited, impact is also expected to be limited.

Disruptions to Refuge management may occur if routine herbicide applications for invasive terrestrial weeds require modification due to plant gathering activities. Refuge staff avoid application of herbicides to plants known to be valuable for food, medicinal, ceremonial, and ornamental or other cultural uses. However, this adjustment of management practices is not considered burdensome and will not adversely affect control of invasive weeds or habitat restoration projects.

Federally listed species that may occur on the Refuge include the giant garter snake, valley elderberry longhorn beetle, vernal pool tadpole and fairy shrimp. No impacts to vernal pool species are anticipated from plant gathering since gathering activities will not be occurring on or near the vernal pool Wetland Preserve Unit of the Refuge. State listed species that inhabit the refuge include greater sandhill crane and Swainson's hawk. The primary disturbance season for Swainson's hawk is during the nesting season, typically mid-February through July. Prime nesting habitat would be closed to visitors during the nesting season.

Public Review and Comment: No public comments were received related to plant gathering on the Refuge.

Determination (check one below):

Use is Not Compatible

Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility:

In order to accommodate access to the Refuge for plant gathering, the following measures will be taken:

Plant gathering activities will be reviewed as part of annual coordination with tribal representatives. If monitoring by the Refuge reveals that impacts from plant gathering have increased so the activity is adversely affecting wildlife or habitat, then permittees will be required to adjust their activities to avoid impacts. Adjustments may include reductions in harvest, changes in timing of gathering, or reductions in numbers of visitors or frequency of visitors.

The Refuge manager will have the authority to close areas within the Refuge during sensitive wildlife use periods and cancel any collecting activities deemed necessary to fulfill Refuge purposes or ensure visitor safety. Sensitive nesting areas will be protected from disturbance by visitors with signs and barriers. Visitors will be directed away from areas where major habitat restoration or management projects are under way.

Justification:

One of the goals of the National Wildlife Refuge System (System) is providing the public an understanding and appreciation of fish and wildlife ecology, wildlife habitat and the human role in the environment. The Service strives to provide priority visitor uses when compatible with the purpose and goals of the Refuge and the mission of the System. The National Wildlife Refuge System Improvement Act of 1997 identifies environmental education and interpretation as priority public uses for National Wildlife Refuges, along with hunting, fishing, wildlife observation and photography. Though plant gathering is not a wildlife-dependent recreational use, it is an activity that contributes to environmental education and awareness. An understanding of plant ecology is essential to successful plant harvesting, thus this activity helps to educate participants about Central Valley habitats, while sustaining cultural practices.

Mandatory Reevaluation Date (provide month and year):

_____ Mandatory 15-year Reevaluation Date (for priority public uses)

February, 2017 Mandatory 10-Year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

Conducted with Comprehensive Conservation Plan

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

U.S. Fish and Wildlife Service (USFWS). 2006. Stone Lakes National Wildlife Refuge
Draft Comprehensive Conservation Plan and Environmental Assessment, 2006. U. S.
Fish and Wildlife Service, Sacramento, California.

Refuge Determination:

Prepared by: Alex Pelt 12/06/06
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: Thomas E. Haway 12/07/06
(Signature) (Date)

Concurrence:

Refuge Supervisor: Dan Walsworth 2/27/07
(Signature) (Date)

Assistant Manager,
Refuges,
California/Nevada
Operations: Margaret J. Kaler 2/28/07
(Signature) (Date)

Compatibility Determination for Mosquito Control on the Stone Lakes National Wildlife Refuge

Use: Monitor and Control Mosquitoes

Refuge Name:

Stone Lakes National Wildlife Refuge
Sacramento County, California

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System (System) is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Stone Lakes National Wildlife Refuge (Refuge) proposes to continue to collaborate with Sacramento-Yolo Mosquito Vector Control District (District) in monitoring and controlling

mosquitoes to address the human health concerns of neighboring communities. The Refuge is located within Sacramento County, 10 miles south of downtown Sacramento and bordered by the city of Elk Grove on the east. The potential for mosquito production in Refuge waters is worrisome to residents, and indeed, urbanized areas adjacent to the Refuge are within the flying range of many species of mosquitoes. Because of this, Refuge staff and SYMVCD (District) entered into a Memorandum of Understanding (MOU) in 1993, to establish a framework within which the District may continue to control and abate mosquitoes within the Refuge, consistent with the goals and objectives of the Refuge. Both the Refuge and the District agree that biological, cultural and physical mosquito control methods are preferred over chemical methods and that wetlands can be designed and managed to avoid or minimize mosquito breeding. In summary, the MOU provides for: 1) allowing the District to comment on planned Refuge wetland projects, 2) providing the District an annual summary of planned Refuge water management and notification of flood-ups and irrigations, 3) the District providing a proposed annual mosquito abatement operating plan to the Refuge, 4) the Refuge submitting pesticide use permits (PUP's) for mosquito control chemicals requested by the District, 5) providing access for mosquito monitoring and biological control measures such as mosquito fish planting as defined in a Special Use Permit (SUP) and 6) with notification and coordination, application of larvicides or adulticides, when specified thresholds are exceeded.

Many species of mosquitoes are known vectors of serious diseases in California. Although 12 mosquito-borne viruses are known to occur in California, only West Nile virus (WNV), western equine encephalomyelitis virus (WEE), and St. Louis encephalitis virus (SLE) are significant causes of human disease as of 2006 (CDHS 2006). As was learned with the recent (2005, 2006) WNV outbreaks, it is possible that new mosquito-borne diseases may cause outbreaks in the future. Since, each disease and associated vector has specific biological and ecological characteristics, a wide variety of control methods, in accordance with the principles of integrated pest management, must be kept available to prevent and respond to new outbreaks in a timely manner. WEE tends to be most serious in very young children, whereas elderly people are most at risk to SLE and WNV (CDHS 2003). California is also at risk for West Nile virus (WNV) which was first detected in the summer of 2003 in adult mosquitoes in Imperial County and in crows in Orange County. WNV was detected within Sacramento County in 2004, though it has principally affected birds and horses. In 2005, West Nile Virus (WNV) became established in Sacramento and Yolo counties, triggering aggressive and widespread mosquito control efforts. In August of 2005 the number of human WNV cases and rate of infected adult mosquitoes were so high that the District conducted aerial applications of pyrethrin over a major portion of Sacramento County (Sacramento County 2006). WEE and WNV can cause serious diseases in horses and emus and WNV kills a wide variety of endemic and imported birds. Mosquito control is the only known practical method of protecting people and animals from WEE, SLE, and WNV (CDHS 2003). With the exception of available vaccines to protect horses against WEE and WNV, there are no known specific treatments or cures for diseases caused by these viruses (CDHS 2003).

Mosquito control at the Refuge follows an ordered succession, using nonchemical treatments first (e.g., water control strategies, vegetation management, mosquitofish, etc.), resorting to chemical treatment only when necessary, as determined through standard mosquito monitoring procedures. Among chemical treatments, adulticides will be used as a last resort. For example, wetlands that have produced large mosquito populations in the past will be flooded as quickly as possible to minimize multiple emergencies that may cause a need for adulticiding. Refuge staff work closely with the District to reduce or eliminate mosquitoes on the refuge by means of biological controls and habitat management. The MOU signed

by the District and the Refuge outlines an effective biological mosquito suppression program that includes wetland design, water level management recommendations, research partnerships, and the introduction of native and non-native fish that prey on mosquito larvae.

The mosquito species identified by SYMVCD for monitoring and control are *Culex tarsalis*, *Anopheles freeborni*, *Aedes vexans*, *Aedes melanimon*, *Aedes nigromaculis*, and *Aedes increpitus*. *Culex tarsalis* is the primary vector of WEE and SLE in California and is also considered to be a significant vector of WNV (CDHS 2003). *Anopheles freeborni* can transmit the malaria parasite to humans and is common in the rice growing regions of California. *Aedes melanimon* is involved in the encephalitis virus (sleeping sickness) cycle and is a severe outdoor pest (SYMVCD 2004).

Mosquito Monitoring

The District's monitoring activities are designed to estimate the abundance of immature (larvae and pupae) and adult mosquito populations. Monitoring activities that may be conducted on the Refuge include, larval sampling, adult light traps and host-seeking traps, leg counts, wild bird sera testing and chicken sera testing (off the Refuge). The wild bird sera testing is part of an ongoing cooperative program between the District and the Refuge to assess populations of resident and migratory songbirds and their role in the transmission of disease.

Monitoring visits by District staff may occur as often as 3-4 times per week during the summer irrigation (May 1 - July 31) and fall flood-up (August 1 - October 15). If temperatures are above average beyond October 15, District staff may continue to require access to the Refuge for additional monitoring.

Dip counts are used to estimate the numbers of immature mosquitoes and to determine the need for mosquito control. The dipper method entails using a long-handled ladle (ca 500 ml) called a dipper to collect water samples from pools potentially serving as mosquito sources. Captured immature mosquitoes would be identified taxonomically by skilled technicians. All Refuge wetland units could potentially be monitored using the dipper method. However, the areas of Refuge wetland units that are potential mosquito habitat would be targeted. Target areas would include wetland margins, shorelines and riparian areas.

Light and carbon dioxide traps are used to capture adult mosquitoes for monitoring purposes. Light traps are cylinders with a light, fan and collecting jar. The mosquitoes are attracted to the light and enter the cylinder. The fan creates an air current that moves the mosquitoes into the collecting jar. Carbon dioxide (CO₂) baited traps are used to monitor density of adult mosquitoes and to identify adults to species. The trap used is baited with 1-2 kg (2.2-4.4 lbs.) of dry ice next to the trap. A motor and fan on the three inch diameter trap sucks mosquitoes down into a container like a modified gallon ice cream carton with tubular surgical stockinet attached to the bottom of the motor housing unit to retain the collected mosquitoes.

As part of monitoring conducted by the District for the presence of these viruses, a sentinel chicken flock is maintained in a pen nearby, but not on, Refuge lands. Sentinel chickens are exposed to the environment and to mosquitoes moving through the area that may choose to feed on them. Regular blood samples are periodically taken from the chickens to detect any mosquito-vector pathogen activity.

The monitoring activities described above are conducted under a SUP between the Refuge and SYMVCD. The Refuge proposes to allow the SYMVCD to continue these activities

under an annual SUP.

Mosquito Control with larvicides/pupacides:

The District proposes to control mosquitoes by treating areas infested with larval stages of *Culex tarsalis*; *Aedes melanimon*, *Aedes nigromaculis*, *Anopheles freeborni* and *Aedes* spp. Treatment thresholds as of 2006 were 0.1 mosquito larvae per 350-ml dipper of water for all species; however, this may change to respond to changes in mosquito populations, disease levels, or other factors that affect public health (Boyce 2005). The District would use the biological larvicides *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bsp) and the insect growth inhibitor methoprene. Use of the petroleum distillate GB1111 as a pupacide was discontinued after 2000 and has been replaced with the monomolecular film Agnique. These treatments would be applied via ground methods.

Bti is a microbial insect pathogen used to control larval stages of mosquitoes and black flies. It is a naturally occurring anaerobic spore forming bacteria that is mass produced using modern fermentation technology. Bti produces protein endotoxins that are activated in the alkaline mid-gut of insect species and subsequently binds to protein specific receptors of susceptible insect species resulting in the lethal response (Lacey and Mulla 1990). Bti must therefore be ingested by the target insect to be effective. It is most effective on younger mosquito larval instars but does not affect pupae or adult mosquitoes. The District prefers to use Bti because of the low impacts to the environment and non-target organisms and its effectiveness in reducing the numbers of target pests. The Bti formulations Vectobac 12AS or Vectobac G would be employed at the Refuge by the District.

Like Bti, Bsp is a microbial insect pathogen with a similar mode of action (Walton, 1998). Formulated Bsp products used as mosquito larvicides consist of bacterial spores and protein endotoxins. The granular formulation of Bsp, Vectolex CG, would be applied by the District. Both Bti and Bsp may be applied as a spot treatment to small areas or broadcast over larger areas.

Methoprene is a synthetic insect growth regulator (IGR) that mimics juvenile hormones (Tomlin 1994). It interferes with the insect's maturation stages preventing the insect from transforming into the adult stage, thereby precluding reproduction. Methoprene is a contact insecticide that does not need to be ingested. It is most effective on early larval instars but does not affect pupae or adult mosquitoes (ETN 1996). Treated larvae will pupate, but will not emerge as adults. The District proposes to use the insect growth regulators, most commonly the formulated methoprene products such as Altosid™ Liquid, Altosid™ Pellets and Altosid™ XR-G.

The monomolecular film, Agnique, reduces water surface tension. This interferes with larval orientation at the air-water interface and/or increases wetting tracheal surfaces, thus suffocating the organism. As the film spreads over the water surface, it tends to concentrate mosquito pupae, which may increase mortality from crowding stress (Dale and Hulsman 1990).

Applications of larvicides may occur anywhere in the wetland and moist soil units of the Refuge. The potential wetland areas for mosquito breeding and consequently mosquito treatment include managed permanent wetlands (106 acres), irrigated pastures (490 acres) and occasionally perennial wetlands (193 acres), totaling approximately 790 acres. The shorelines of open water areas may be treated. In addition, the District will treat ditches, culverts and low areas not classified as wetlands.

The total area of the Refuge that is treated varies with the conditions of each year. Annual precipitation amounts have a direct effect on mosquito populations. During drought years mosquito populations tend to be low, and during wet years mosquito populations tend to be high. The range in area treated in the last five years varied from a low of 104 acres in 2000 to a high of 477 acres in 2004. The majority of the treatments occur from August to October, but applications of larvicides can begin as early as March and extend into November.

Mosquito control with adulticides

Treatment thresholds for adult control are based on multiple factors including: date, mosquito-borne virus response level, mosquito species, and meteorological conditions. As with larval treatment thresholds, adult thresholds are subject to change to respond to changes in mosquito populations, disease levels, or other factors that affect public health (Boyce 2005).

If efforts to control immature mosquitoes fail to prevent the adult mosquito population from exceeding thresholds, and WNV and/or WEE or SLE are detected within or near the Refuge, the District proposes to treat infested areas with a mosquito adulticide. The District proposes to continue to use currently labeled adulticides containing active ingredients pyrethrin (ex. Pyroicide 7338™, Evergreen 60-6™), and phrethroids (ex. Scourge™). Though the District has also proposed usage of the adulticide Trumpet (Naled) if necessary, this particular chemical has not been used at the Refuge to date.

Pyrethrins are non-systemic contact poisons which quickly penetrate the nerve system of the insect and cause paralysis and subsequent death (ETN 1994, Tomlin 1994). A few minutes after application, the insect cannot move or fly away. But, a “knockdown dose” does not mean a killing dose. Pyrethrins are swiftly detoxified by enzymes in the insect. Thus, some pests will recover. To delay the enzyme action so a lethal dose is assured, commercial products are formulated with synergists such as piperonyl butoxide, which inhibit detoxification (Tomlin, 1994). Trumpet (Naled) is a non-systemic, broad-spectrum organophosphate insecticide which affects the nervous system of adult mosquitoes and other insects by cholinesterase inhibition. The products SYMVCD proposes, Pyroicide 7338, Scourge and Trumpet, are applied as an ultra-low volume (ULV) fog by ground. To minimize pesticide drift, dispersing vehicles will follow routes on existing roads set up to fog downwind or outside buffers of 300 feet from areas supporting listed or proposed special status species. All chemical applications will occur when wind speeds are between 2 and 8 mph.

Adult mosquito control measures were applied only once in 1998 to 5 acres (0.09 gallons of Scourge) and once in 1999 to 4 acres (0.05 gallons of Pyroicide 7338). Both adulticide applications were performed at the same location, at a drain in an agricultural field, due to the large population. In August of 2005 the number of human WNV cases and rate of infected adult mosquitoes were so high that SYMVCD initiated aerial applications of pyrethrin over significant portions of Sacramento County. The Refuge received ultra-low volume (ULV) ground applications of pyrethrin on 16 occasions between July 28 and October 12, 2005. As of August 18, 2006, 16 human cases of WNV have been documented in Sacramento and Yolo counties and the Refuge has had adulticides applied 12 times.

Availability of Resources: Monitoring and control will not require refuge personnel. The District is responsible for coordination of monitoring and control through the Refuge Manager or the Assistant Refuge Manager. In order to monitor treatment of wetland, moist soil and riparian areas, it is estimated that 5% of a full-time employee’s time would be required. Monitoring of treatments would include observations of sprayed areas before and after treatment and coordination of permitting, documentation and record keeping.

Additional funding would be required if a detailed, long-term study were to be conducted to determine effects of mosquito treatment on Refuge resources.

Anticipated Impacts of the Use: The impacts of monitoring will be confined to pathways and to shorelines where dip net samples will be taken. Small areas of vegetation may be crushed in transit to pools of water, but the vegetation will likely spring back after it has been bent under foot. Placing and checking of light or CO₂ traps may also create a transient impact from footsteps on the vegetation going to and from the traps.

Toxicity and Effects to Non-target Organisms

The dominant impact of mosquito control will relate to the toxicity and effects of the treatments on non-target organisms. The possible effects of the larvicides *Bacillus* spp. and methoprene, the pupacide Agnique, and the adulticides will be discussed separately.

Bti

Bti has practically no acute or chronic toxicity to mammals, birds, fish or vascular plants (USEPA 1998). Extensive acute toxicity studies indicated that Bti is virtually innocuous to mammals (Siegel and Shaddock, 1992). These studies exposed a variety of mammalian species to Bti at moderate to high doses and no pathological symptoms, disease, or mortality were observed. Laboratory acute toxicity studies indicated that the active ingredient of Bti formulated products is not acutely toxic to fish, amphibians or crustaceans (Brown et al. 2002, Brown et al. 2000, Garcia et al. 1980, Lee and Scott 1989, Wipfli et al. 1994). However, other ingredients in formulated Bti products are potentially toxic. The acute toxicity response of fish exposed to the formulated Bti product Teknar® HPD was attributed to xylene (Fortin et al. 1986, Wipfli et al. 1994). Field studies indicated no acute toxicity to several fish species exposed to Bti (Merritt et al. 1989, Jackson et al. 2002); no detectable adverse effects to breeding red-winged blackbirds using and nesting in Bti treated areas (Niemi et al. 1999, Hanowski 1997); and no detectable adverse effects to tadpole shrimp 48 hours post Bti treatment (Dritz et al. 2001).

In addition to mosquitoes (Family Culicidae), Bti affects some other members of the suborder Nematocera within the order Diptera. Also affected are members of the Family Simuliidae (black flies) and some chironomids midge larvae (Boisvert and Boisvert 2000, Garcia et al. 1980). The most commonly observed Bti effects to non-target organisms were to larvae of some chironomids in laboratory settings when exposed to relatively high doses (Boisvert and Boisvert 2000, Lacey and Mulla 1990, Miura et al. 1980). In field studies, effects to target and susceptible nontarget invertebrates have been variable and difficult to interpret. Field study results are apparently dependent on the number, frequency, rate and aerial extent of Bti applications; the Bti formulation used; the sample type (e.g., benthic, water column or drift); the sampling interval (e.g., from 48 hrs to one or more years after treatment); the habitat type (e.g., lentic or lotic); the biotic (e.g., aquatic communities), and abiotic factors (e.g., suspended organic matter or other suspended substrates, temperature, water depth); the mode of feeding (e.g., filter feeder, predator, scraper or gatherer); the larval development stage and larval density (Ali 1981, Boisvert and Boisvert 2000, Lacey and Mulla 1990). Bti activity against target and susceptible nontarget invertebrates is also related to Bti persistence and environmental fate which are in turn affected by the factors associated with field study results (Dupont and Boisvert 1986, Mulla 1992). Simulated field studies resulted in the suppression of two unicellular algae species, *Closterium* sp. and *Chlorella* sp. resulting in secondary effects to turbidity and dissolved oxygen of aquatic habitats, with potential trophic effects (Su and Mulla, 1999). For these reasons, Bti effects to target and susceptible nontarget organisms and potential indirect trophic impacts in the field are difficult to predict.

Bsp

Bsp has slight to practically no acute mammalian toxicity, practically no acute avian toxicity, slight to practically no acute fish toxicity, and slight aquatic invertebrate toxicity (USFWS 1984, and FCCMC, 1998). Insecticidal activity may persist longer than 20 days because Bsp can reproduce and sporulate in larval cadavers and can retain its larvicidal properties after passing through the gut of a mosquito. Bsp is insoluble in water. Spores and toxin become suspended in the water column and retain insecticidal activity in water with high organic matter content and suspended solids. Because Bsp is a more recently developed larvicide than Bti, there are fewer studies that have examined the non-target effects of this pesticide. The data available, however, indicate a high degree of specificity of Bsp for mosquitoes, with no demonstrated toxicity to chironomid larvae at any mosquito control application rate (Mulla, 1984, Ali, 1986, Lacey, 1990). Therefore risks to sensitive wildlife resources resulting from direct exposure to a single Bsp application and indirect food chain effects are expected to be negligible. However, the ability for a population to re-colonize a wetland following multiple larvicide treatments would depend on the intensity and frequency of applications at different spatial scales.

Agnique (Monomolecular film)

Monomolecular film has practically no acute mammalian or avian toxicity, and slight acute fish toxicity (USEPA 2000, USFWS 1984). The risk quotient for mammals is well below the EPA endangered species level of concern (LOC) indicating negligible risk resulting from direct exposure, Table 1 (Urban and Cook 1986). Risk quotients for birds and fish exceed EPA endangered species LOCs indicating a hazard to those taxa resulting from direct exposure. Risk to fish will be limited by the insolubility of monomolecular film in water. Monomolecular film is insoluble in water, average persistence in the environment is 5 to 14 days (Borgerding 2001). Indirect effects to animals dependent on invertebrate food resources are possible resulting from a reduction of those resources caused by monomolecular film. The magnitude of the impact would depend on the aerial extent of the treatment, the number of treatments, treatment frequency and the location of the treatment relative to the areas used by invertebrate feeding animals.

Table 1. Monomolecular film risk quotients.

Animal	Acute tox (ppm)	EEC (ppm)	RQ	LOC (ES)
bird	> 5000 (8 D LC 50)	850 (short grass)	0.2	0.1
fish	98 (96 hr LC 50)	2600 (6" water)	26.5	0.05
mammal	>20,000 (LD 50)	850 (short grass)	0.004	0.1

EEC calculated using a rate of 0.5 gal/ac (3.6 lbs ai/ac)

LD 50 for mammals converted to 1 Day LC50 using a conversion factor of 0.1 for RQ calculation

Methoprene

Methoprene has moderate acute fish toxicity, slight acute avian toxicity, and practically no acute mammalian toxicity (USEPA 2000, USFWS 1984). In mallard ducks, dietary concentrations of 30 parts per million (ppm) caused some reproductive impairment (USEPA 1991). This figure exceeds the estimated environmental concentration by a factor 10 (Table 2). Methoprene residues have been observed to bioconcentrate in fish and crayfish by factors of 457 and 75, respectively (USEPA 1991). Up to 95 % of the residue in fish was excreted within 14 days (USEPA 1991). Risk quotients for birds, fish and mammals are below EPA levels of concern for endangered species indicating negligible risk to those taxa resulting from direct exposure using maximum labeled rates for mosquito control (Table 1) (Urban et al. 1986). In field studies no detectable adverse effects to breeding red-winged

Table 2. Risk assessment for Methoprene.

Animal	Acute Tox (ppm)	*EEC (ppm)	RQ	LOC (ES)
Bird	> 4640 (8 D LC 50)**	3.0 (short grass)	0.0006	0.1
Fish	0.4 (96 hr LC 50)	0.01 (6 inches)	0.025	0.05
Mammal	> 34,000 (LD 50)	3.0 (short grass)	0.00001	0.1

*EEC calculated using a rate of 0.013 lbs ai/ac (1.0 fluid oz/ac Altosid 20 % methoprene)

**LD 50 for mammals converted to 1 Day LC50 using a conversion factor of 0.1 for RQ calculation

blackbirds using and nesting in areas treated with methoprene were observed (Niemi et al. 1999).

Methoprene affects terrestrial and aquatic invertebrates and is used to control fleas, sciarid flies in mushroom houses; cigarette beetles and tobacco moths in stored tobacco; Pharaoh's ants; leaf miners in glasshouses and midges (Tomlin 1994). Methoprene may also be fed to livestock in a premix food supplement for control of hornfly (WHO 2006). Methoprene is highly toxic to aquatic invertebrates with a 48 hour EC50 of 0.89 ppm for *Daphnia magna* (USEPA 1991). Laboratory studies show that methoprene is acutely toxic to chironomids, cladocerans and some decapods (Horst and Walker 1999, Celestial and McKenney 1994, McKenney and Celestial 1996, Chu et al. 1997). In field studies, significant declines of aquatic invertebrate, mollusk and crustacean populations have been directly correlated to methoprene treatments for mosquito control (Breud et al. 1977, Miura and Takahashi 1973, Niemi et al. 1999, Hershey et al. 1998).

Methoprene has a ten day half life in soil, a photolysis half life of ten hours, and solubility in water is 2 ppm (Zoecon 2000). Degradation in aqueous systems is caused by microbial activity and photolysis (USEPA 1991). Degradation rates are roughly equal in freshwater and saltwater systems and are positively correlated to temperature (USEPA 1991).

Adulticides

There are only two general classes of adulticides, organophosphates and pyrethroids. The pyrethroids include both natural products called pyrethrins and synthetic molecules that mimic the natural pyrethrins, such as permethrin, resmethrin, and sumithrin. One organophosphate, Trumpet (Naled), is proposed for use at the Refuge but has not been applied to date. The two pyrethroid products proposed for use at the Refuge, Pyroicide 7336 and Source, are both synthetic pyrethrins.

In general, pyrethroids have lower toxicity to terrestrial vertebrates than organophosphates. Although not toxic to birds and mammals, pyrethroids are very toxic to fish and aquatic invertebrates (Anderson 1989, Siegfried 1993, Milam et al. 2000). The actual toxicity of pyrethroids in aquatic habitats, however, is less than may be anticipated because of the propensity of these pesticides to adsorb organic particles in water (Hill et al. 1994). Pyrethrins are toxic to all invertebrates, but the method of application via ultra-low volume atomizer limits toxicity and contact with non-targets. To minimize pesticide drift, applications would take place during the evening hours, when wind speeds are reduced and temperatures decreased. The evening is also the period when mosquito activity is the greatest.

Naled is a fast acting, nonsystemic contact and stomach organophosphate insecticide used to control aphids, mites, flies and mosquitoes. Naled is highly to moderately toxic via the oral route. It is moderately toxic through skin exposure, may cause skin rashes and skin sensitization and may be corrosive to the skin and eyes. Naled is highly to moderately toxic to birds. The reported acute oral LD50 for naled is 52 mg/kg in mallard ducks, 65 mg/kg

in sharp-tailed grouse, 36-50 mg/kg in Canadian geese, 120 mg/kg in ring-neck pheasants. Naled is highly to moderately toxic to fish and may be very highly toxic to aquatic invertebrate species (ETN 1996).

However, Trumpet (Naled) is practically nonpersistent in the environment, with reported field half-lives of less than 1 day. It is not strongly bound to soils and is rapidly broken down if wet. Soil microorganisms break down most of the naled in the soil. It therefore should not present a hazard to groundwater (ETN 1996).

Threatened and Endangered Species

The Refuge provides potential habitat for the following endangered species: giant garter snake, Sacramento splittail, Delta smelt, valley elderberry beetle, vernal pool tadpole shrimp and vernal pool fairy shrimp.

Vernal Pools

The growth regulator Methoprene (Altosid or A.L.L) can have deleterious effects on vernal pool shrimp by delaying the development of adult shrimp and thus the number of eggs laid before the pools dry up (Lawrenz 1984). Because of the effects of Methoprene on fairy shrimp and a lack of information on how long the agent remains in the soil, use of the larvicide methoprene within vernal pools or swales at any time, in either wet or dry conditions, is prohibited (USFWS 2001).

The majority of vernal pools and seasonal swales will be dry during the main pesticide application period (June-October). In general, vernal pool habitats are not significant mosquito-producing habitat and should not require chemical treatments for control of mosquito larvae because they are sufficient predators in naturally functioning vernal pools to keep larval numbers below the treatment threshold. In the event that the use of a larvicide does become necessary in the vicinity of vernal pools, Bti, which is relatively specific to mosquitoes and flies, will be the agent of choice.

The majority of the vernal pools at the Refuge occur on the Wetland Preserve property which became part of the Refuge under a conservation easement in 2004. During the spring of 2004, before the conservation easement went into effect, numerous vernal pools were treated with Bti. Relatively warm spring temperatures in 2004 likely contributed to elevated larval populations, but other factors may also be involved. The mosquito abatement district had increased larval monitoring in the area because the Wetland Preserve property is adjacent to a housing development and WNV had recently arrived in Sacramento county. Many of the vernal pools in the Wetland Preserve property are man made mitigation pools that may not be functioning as a naturally occurring vernal pool would. The hydrologic regime and/or diversity and number of invertebrates in man made vernal pools may create more favorable conditions for mosquito larvae in that mitigation pools may hold water longer and may harbor fewer invertebrates that prey on mosquito larvae (Stan Wright pers. comm.). The increase in grazing that has occurred since the Service assumed management may reduce mosquito larvae populations by increasing water movement in the vernal pools due to wind action. Future mosquito abatement activities in the Wetland Preserve property will be closely monitored by Refuge staff to avoid conflicts between wildlife habitat improvement goals and mosquito control goals.

Giant Garter Snake

Mosquito control activities in giant garter snake habitat may affect giant garter snakes by harassment or injury from vehicle use. The District will only operate vehicles in existing roads; therefore, harassment or injury from vehicle use would occur only if snakes are in the roadway. Regarding the effects of the proposed pesticides, a Fish and Wildlife Service

sponsored study indicated that the short-term effects of adulticides approved for mosquito control on the Sacramento NWR Complex did not significantly reduce abundance or biomass of the snake's prey items, macro-invertebrates and fish, in treated wetlands (Lawler et al. 1997). However, no information is available on the toxicity of the proposed pesticides directly to the giant garter snake. Without further information, it must be assumed that exposure of giant garter snakes to these chemicals could result in direct impacts, such as loss or sublethal effects to individual animals. Adverse effects to the giant garter snake from mosquito control activities will therefore be minimized by avoiding any wetland habitat suitable for giant garter snakes while applying chemical treatments for control of mosquitoes.

Valley Elderberry Longhorn Beetle

Adverse effects on the valley elderberry longhorn beetle are not likely since the main mosquito abatement period (June-September) does not coincide with the period of adult beetle emergence (late April through mid-May or early June). Also, the riparian corridors that house the valley elderberry longhorn beetle, generally do not require treatment with chemical control agents. If control measures are needed in these areas, some granular applications of Bti or Altocid (Methoprene) may be used during February or March when adult beetles are not present.

Delta Smelt and Sacramento Splittail

Both Delta smelt and Sacramento splittail are not likely to be adversely affected by mosquito abatement activities. Delta smelt and Sacramento splittail have never been recorded within Refuge waterways. In addition, the open water areas of the Refuge in which these species could occur are not considered mosquito production areas and would not be subject to any chemical treatment (USFWS 2001).

In general, species of concern will not be adversely affected by mosquito control activities provided the conservation measures detailed in the Intra-Agency Formal Section 7 Consultation on Pest Management Activities and the stipulations contained herein are followed (USFWS 2001).

Wetlands and Waterfowl

The Refuge was established to provide habitat for migratory birds, in particular waterfowl. The District will continue to minimize disturbance and non-target effects to wildlife by limiting mosquito abatement activities between October 15 and February 15 when the majority of migratory bird species would be arriving on the Refuge. However, since the District continues to treat until temperatures have dropped sufficiently to reduce the abundance of mosquitoes, in warmer years there may well be a longer period of overlap between the arrival of migrants and continued mosquito abatement activities. In addition, if mosquito thresholds are exceeded, or the presence of WNV is detected in or around the Refuge, then the District may need to extend mosquito surveillance and control into late fall.

In some years, most notably 2004, the District has applied Bti or planted mosquito fish as early as March when some migratory waterfowl may still be lingering before departing on their spring migration. However, Bti and Bsp have not been found to be toxic to birds (USFWS 2001). In addition, it has been found that birds are not negatively affected by utilizing foods exposed to Bti or methoprene (Niemi et al. 1999). Although physico-chemical data and environmental fate data are limiting, *Bacillus* spp. are virtually non-toxic to mammals, birds and fish. During the last 8 years methoprene has not been applied prior to June and was applied as late as October in only one instance. Thus, applications of methoprene have not directly or indirectly affected migratory birds utilizing the Refuge because migratory birds have not been present during mosquito abatement activities.

There is not likely to be much impact on geese and swans from pesticides because they are year round herbivores. Geese feed mainly on grasses and agricultural lands, while swans feed mainly on roots, tubers, stems, and leaves of submerged and emergent aquatic vegetation. In contrast, ducks are known to be opportunistic feeders on both plants and invertebrates, utilizing the most readily available food sources. Invertebrates, plants, and seeds compose the majority of their diet, varying with the season and the geographic location. A study in California's Sacramento Valley has shown that plant foods are dominant in fall diets of northern pintails, while invertebrate use increases in February and March (Miller 1987). Seeds of swamp timothy comprise the most important duck food in the summer; dry habitats of the San Joaquin Valley (Miller 1987). Waterfowl in general tend to feed on seeds when they reach their wintering areas, perhaps to regain energy lost during long flights (Heitmeyer 1988, Miller 1987). Thus any food chain impacts resulting from larvicide and adulticide treatment will have limited impacts to the mainly seed diet of newly arriving ducks. Their diet shifts to invertebrates after mosquito treatments are expected to be reduced in frequency, thereby allowing the invertebrate populations to recover.

Resident Waterfowl

Birds utilizing the Refuge during the summer months and early fall, when most of the mosquito abatement occurs, could have a greater risk of being affected by pesticide applications. These species include herons, egrets, white pelicans, mallards and wood ducks. The pesticides being applied at the Refuge have not been shown to be toxic to birds, but could potentially affect resident waterfowl indirectly by reducing invertebrate food sources. Shorebirds could also be of concern, since they feed on a wide variety of invertebrates all year, feeding which intensifies at the onset of spring migration. However, documentation of indirect food-chain effects have not come to light. Hanowski et al. (1997) studied 19 different bird species after collecting data on wetlands two years before treatment and three years after treatment of both Bti and methoprene applications and found no negative effects. Jensen et al (1999) found that no decreases were detected in the biomass or abundance of aquatic invertebrates in seasonal wetlands from ultra-low volume applications of pyrethrin, permethrin or malathion.

Public Review and Comment: If through monitoring it is determined that targeted mosquito species; 1) are known carriers of Encephalomyelitis viruses and 2) occur in densities that warrant control, the public will be notified. However, given the nature of potentially serious health risks and the rapid development of mosquito larvae, applications may occur simultaneously with public notification or before public notice.

Several written comments were received suggesting technical corrections to the CCP and the Integrated Pest Management (IPM) plan for mosquito associated threats. One oral comment suggested that vector control should be a higher priority in the CCP.

Response: All of the technical corrections recommended were made to the CCP and mosquito IPM plan. Control of mosquito associated threats continues to be a high priority on the Refuge as evidenced by the preparation of the IPM plan for mosquito associated threats and the close working relationship between the Refuge and the Sacramento Yolo Mosquito Vector Control District.

Determination (Check One Below)

Use is not compatible

Use is compatible

Stipulations Necessary to Ensure Compatibility:

1. The District will notify the Refuge manager as soon as possible when mosquito larval thresholds are exceeded and ground treatment is warranted by calling refuge headquarters.
2. When adult thresholds are exceeded, and in the event of a planned adulticiding or aerial application of any kind, the District will contact and personally coordinate with the Refuge Manager or Assistant Refuge Manager prior to conducting the treatment.
3. The District will notify the Refuge Manager in the event of detection of virus activity within or near the Refuge and the method of disease surveillance yielding positive results.
4. The District will provide the Refuge Manager with an annual report summarizing mosquito control activities during the previous year.
5. The District has and will continue to consider environmental conditions, including water temperature, density of mosquito larvae and presence of mosquito predators, when deciding mosquitoes on the Refuge pose a serious threat to human health and whether to treat.
6. Access will be prohibited in closed areas on Wednesdays and Sundays during the waterfowl hunt season.
7. Application of mosquito control measures is to be conducted in accordance with approved Pesticide Use Proposals.
8. Mosquito control will be authorized on an annual basis by a Special Use Permit (SUP). The SUP conditions will stipulate that all mosquito control work will be carried out under the guidance of pre-approved Pesticide Use Proposals.

Justification:

For many years the Refuge has worked cooperatively with the District and its associated mosquito control activities. After a review of these activities, the Refuge has determined that allowing these uses to continue would not interfere or derogate from the purpose for the Refuge, nor the mission of the National Wildlife Refuge System.

The Refuge is located within a 10 mile radius of various urban and rural communities. Species of mosquito like *Culex tarsalis*, *Anopheles freeborni*, *Aedes melanimon* and *Aedes nigromaculis*, are found on the Refuge and are capable of dispersing various miles to obtain a blood meal. With the exception of *Culex tarsalis*, the remaining fore mentioned species are capable of dispersing 5-10 miles; *Culex tarsalis* is known to disperse over 25 miles. All species are known to be vectors for Saint Louis encephalitis, California encephalitis and western equine encephalitis; additionally, *C. tarsalis* is particularly known to transmit West Nile virus. Mosquito control is conducted on Refuge lands to prevent populations of adult mosquitoes from rising to levels that could pose a public health hazard or significant nuisance to neighboring communities, following the guidance of the stipulations within this document. Cooperative efforts between the Refuge and the District have successfully controlled larval mosquito populations on the Refuge to the extent that adulticide applications have only been necessary twice over the last 8 years. Since the approved adulticides are generally more toxic to wildlife and wildlife food sources than larvicides, it is in the best interest of wildlife to minimize adulticide applications.

Because mosquito treatment occurs during the early weeks of fall flood-up before most migratory birds have arrived, and since the frequency of treatments are low and spaced apart on a per unit basis, overall effects to non-target organisms are not expected to be significant. In addition, the number of treatment days per year is fairly low, and if the applicator follows the stipulations previously outlined and within the SUP, mosquito abatement practices should not materially interfere with or detract from the Refuge purpose or the mission of the National Wildlife Refuge System. If additional biological monitoring of this activity documents substantial negative impacts to migratory birds or other wildlife, this determination would be re-analyzed on the basis on new evidence.

Mandatory Re-Evaluation Date (provide month and year):

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

February, 2017 Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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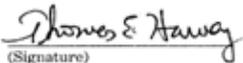
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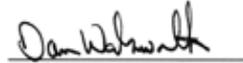
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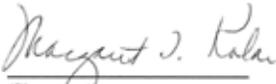
Refuge Determination:

Prepared by:  12/06/06
(Signature) (Date)

Refuge Manager/
Project Leader
Approval:  12/07/06
(Signature) (Date)

Concurrence:

Refuge Supervisor:  2/27/07
(Signature) (Date)

Assistant Manager,
Refuges,
California/Nevada
Operations:  2/28/07
(Signature) (Date)

Compatibility Determination for Grazing Programs on the Stone Lakes National Wildlife Refuge

Use:

Grazing program to provide (1) suitable habitat for wintering sandhill cranes, arctic nesting geese such as Aleutian cackling geese, shorebirds and breeding habitat for nesting grassland birds such as Western meadowlark; (2) expand native grasses (3) reduce fire danger by reducing thatch layer (Alternative B, Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan Environmental Assessment).

Refuge Name:

Stone Lakes National Wildlife Refuge

Establishing and Acquisition Authorities:

Stone Lakes National Wildlife Refuge (NWR) was established in 1994 under the authority of the Emergency Wetlands Resources Act of 1986, the Fish and Wildlife Act of 1956, the Migratory Bird Conservation Act, and the Endangered Species Act of 1973. The approved refuge boundary contains about 18,000 acres, of which the Service owns or manages approximately 6,000 acres. Additional funding sources used to acquire land include: the California Environmental License Plate Fund, the Cigarette and Tobacco Product Surtax (California Proposition 99, 1988), the North American Wetland Conservation Act, the Land and Water Conservation Fund, the Sacramento County Environmental Mitigation Grant/Packard Foundation, the Central Valley Improvement Act, the National Fish and Wildlife Fund, the Trust for Public Land Grant/Packard Foundation, the City of Sacramento and the CalFed Bay Delta Program.

Refuge Purpose(s):

Stone Lakes NWR purposes include the following:

“... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” (Emergency Wetlands Resources Act of 1986)

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” (Fish and Wildlife Act of 1956)

“... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” (Fish and Wildlife Act of 1956)

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (Migratory Bird Conservation Act of 1929)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ...@ (Endangered Species Act of 1973)

National Wildlife Refuge System Mission:

“The mission of the National Wildlife Refuge System (System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The Stone Lakes National Wildlife Refuge (Refuge) will administer a grazing program on the North Stone Lake (2,791 acres) and South Stone Lake (582 acres) Units of the Refuge. The North Stone Lake Unit is comprised of approximately 1,900 acres of mostly non-native grassland and 891 acres of open water, riparian and wetland habitat. The Gallagher tract of the South Stone Lake Unit is comprised of approximately 45 acres of irrigated pasture. The Sun River tract of the South Stone Lake Unit consists of 140 acres of irrigated pasture, and 397 acres of seasonal, permanent wetlands, open water and riparian habitats.

Grazing has been occurring on the properties for over 50 years. The Refuge will continue to administer this use as outlined in this Compatibility Determination. Although grazing is not identified as a wildlife dependent public use by the National Wildlife Refuge System Improvement Act of 1997, grazing will allow the Refuge to manage mostly non-native grassland habitats on the Refuge for the benefit of wildlife and native plants while reducing the fire danger to adjacent communities. This use will provide short grass foraging and loafing habitat to a variety of wintering migratory birds such as the greater sandhill crane (*Grus canadensis tabida*), arctic nesting geese including Aleutian cackling goose (*Branta hutchinsii leucopareia*) and white fronted goose (*Anser albifrons*), shorebirds including white faced ibis (*Plegadis chihi*), long billed curlew (*Numenius americanus*) and black bellied plover (*Pluvialis squatarola*). These grasslands also provide nesting and foraging habitat for western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), northern harrier (*Circus cyaneus*), white tailed kite (*Elanus leucurus*) and Swainson's hawk (*Buteo swainsoni*), and have the potential to provide habitat for nesting and wintering burrowing owls (*Athene cunicularia*), Savannah sparrows (*Passerculus sandwichensis*) and grasshopper sparrows (*Ammodramus savannarum*). Habitat consists of introduced (> 70% annual rye [*Lolium multiflorum*]) and native grasses (including creeping wildrye [*Leymus triticoides*], saltgrass [*Distichlis* spp.] and meadow barley [*Hordeum branchyntherum*]) as well as other forbs and associated native plant food resources.

Only the grazing of cattle is to be considered on the Refuge; grazing by sheep (*Ovis aries*), goats (*Capra hircus*), or other creatures such as bison (*Bison bison*) will not be considered. During drought years or years of low rainfall, cattle will not be allowed to graze on the Refuge.

The timing of the placing of cattle on the Refuge are termed "turn in dates" (November 1 or slightly later) and are adjusted year to year based upon the date of the first effective germinating rainfall, and the amount of dry forage available in the fall (Stechman 1995). The timing of removing cattle from the Refuge is termed "turn out dates" and is determined solely on the amount of residual dry matter (RDM) within the unit, but will be no later than July 15th. If and when 800 lbs per acre, of RDM, or less is achieved cattle will be removed from the unit.

The unit of measure used to summarize the quantity of cattle grazing on the Refuge is termed Animal Unit Month (AUM). AUM is defined as the amount of forage needed by an "animal unit" (AU) grazing for one month (USDA-NRCS 2004). An AU is defined as one mature 1,000 pound cow and her sucking calf. An assumption in this definition is that a cow nursing her calf will consume about 26 pounds of dry matter per day. Other types of livestock are assigned AUM equivalents based on body size and consumption of dry matter.

The optimal time for grazing in the Central Valley begins in November and may continue through mid July depending on winter and spring rainfall. Prior to the beginning of the grazing season, an assessment is made to determine the amount of residual dry matter (RDM) available to the cattle. The number of cattle allowed to graze on the Refuge, for a

specific amount of time, varies with the amount of local rainfall. Because grazing on the Refuge supports various wildlife populations, this RDM level is linked to the needs of wildlife and not the needs of the cattle. The RDM is determined by clipping, drying, and then weighing the amount of RDM in representative samples from the unit cattle are to graze and varies upon temperature, monthly rainfall and the density of new grass/forb growth.

The Refuge has developed a 5-year grazing management plan with the assistance of the Natural Resource Conservation Service that promotes variability in grass height and density among the five dry pasture units to provide habitat for a suite of grassland dependent species. This plan rotates grazing pressure (low, medium and high) in five pastures (see Figure 1) resulting in a range of grass heights and densities (see Table 1). The rotational grazing should result in higher quality habitat for species that inhabit short grasses such as burrowing owls, without impacting other grassland dependent species. A monitoring program will be implemented to determine if increasing grazing rates and rotating grazing pressure through the units will have the desired effects of providing a variety of nesting, foraging and breeding cover for a variety of birds and other wildlife. If the RDM level drops below 800 lbs/acre, prior to or anytime during the grazing season, the Refuge manager may request that the grazing permit holder reduce the number of cattle grazing in that unit or remove them all together in order to prevent degradation of the resources in the unit.

Table 1. Residual Dry Matter (RDM) targets over a five year period on the North Stone Lake Unit of the Stone Lakes National Wildlife Refuge in California.

<u>RDM Value at the End of the Grazing Season (Nov – June)*</u>					
Pasture	Year 1	Year 2	Year 3	Year 4	Year 5
A	Medium	Low	Medium	High	Low
B	High	Medium	Low	Medium	Medium
C	Low	Medium	High	Low	Medium
D	Medium	High	Low	Medium	High
E	Low	Low	Medium	Low	Low
F**	Medium	Medium	Medium	Medium	Medium

*RDM values – Low(1200-1750 lbs/acre), Medium (1750-2500 lbs/acre), High (+2500 lbs/acre).

** Southwestern portion of South Irrigated Pasture (Fig. 1). Cattle will be in unit for 30-60 days from March-May to control weeds.

Grazing in the irrigated/wet meadow units (371 acres) on the North Stone Lake and South Stone Lake units begins in mid summer, corresponding to the removal of cattle from the dry pasture and continues until approximately November 1. Grazing rates typically range between 1.1 – 1.3 acres per AUM. These pastures, which are not grazed during the winter season, are heavily used by cranes, geese and shorebirds.

The grazing cooperator is chosen following guidance in U.S. Fish and Wildlife Service Refuge Manual under heading 5 RM 17. At the time of this writing, there are no anticipated changes to grazing on the Refuge.

North Stone Lake Unit

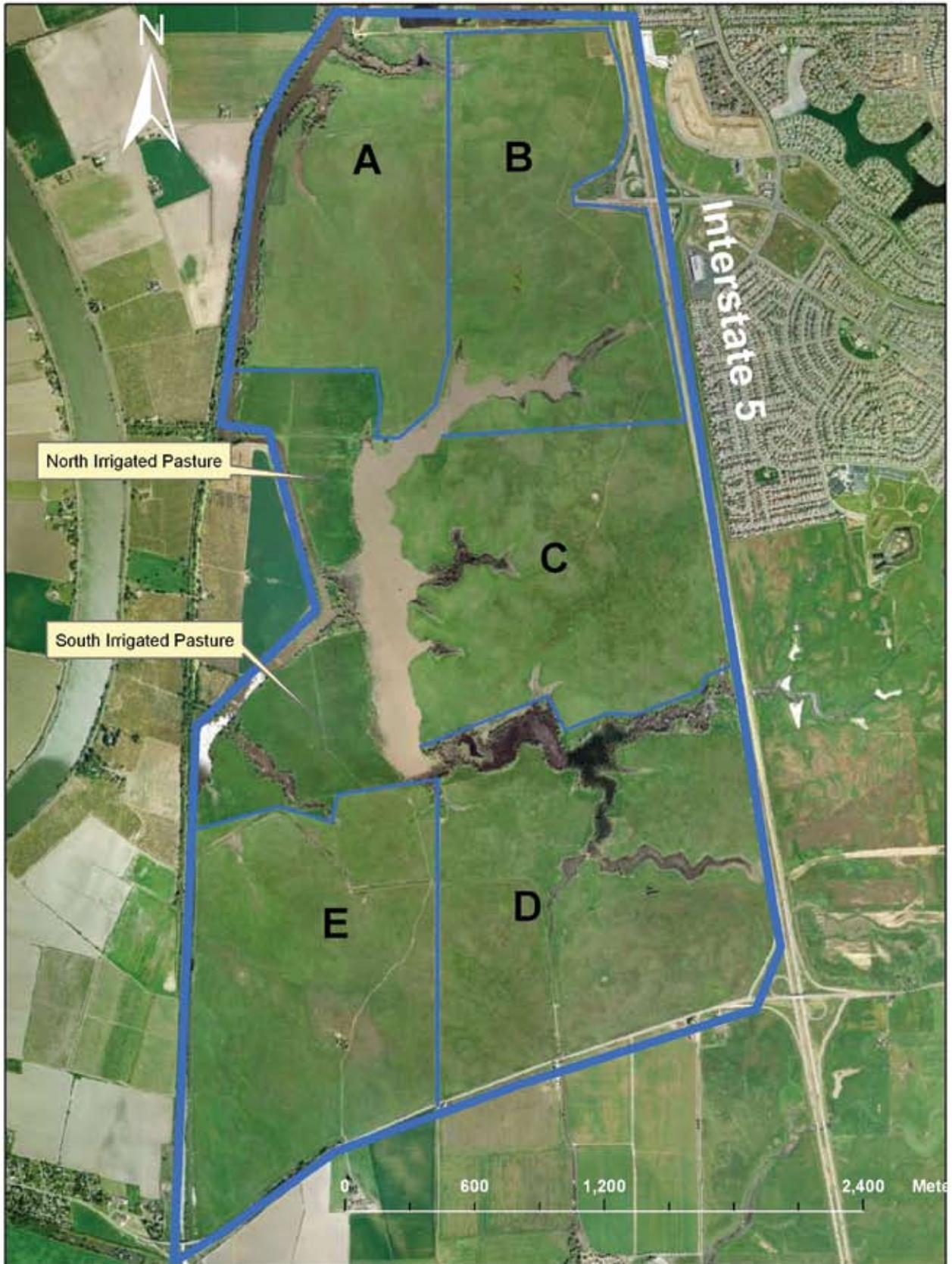


Figure 1. Map of the North Stone Lake Unit of the Stone Lakes National Wildlife Refuge showing the designation of pasture units and location of perimeter and cross fences in blue.

Availability of Resources:

The assistant refuge manager, under the direction of the project leader, will manage the grazing program. The permittee, working under a Cooperative Land Management Agreement, will accomplish certain facility management and improvement projects under the direction of the assistant manager. Accomplishments will be in direct support of the Refuge grazing program; these projects may include maintenance or improvements of existing facilities or installation of new facilities. Projects may include: deep well construction and maintenance; installing and/or maintaining water control structures, watering troughs; fence installation, repair, and/or removal; sign repair, removal, or installation; gate installation; noxious weed control; road building and maintenance; parking lot maintenance; and vegetation control around facilities. Facilities that are installed primarily for Refuge purposes are constructed or maintained at Refuge expense. All projects will be agreed upon before the beginning of the grazing season and will directly support the unit being grazed.

Rates charged per AUM are based on a survey of grazing rates in the area and were done on an upward sliding scale. Rates are now fixed until the end of the current grazing contract with the County of Sacramento which ends in 2008. Rates will then be renegotiated based on a survey of grazing rates in the area.

At the end of each grazing season, the permittee submits information that includes AUMs per month per grazing unit and the cost of various projects completed on the unit that year. The project list is then revised for the following year. Work contributions of this type will be associated with improvement projects for the particular grazed unit.

The Refuge receives adequate funding to cover the costs associated with management of the grazing program including the RDM assessment conducted at the end of every grazing season. Staff costs associated with this use emanates from the annual review of Special Use Permits, Cooperative Land Management Agreement and monitoring the impacts of this use as outlined in the grassland management plan. Annual costs to manage the grazing programs averages \$25,000, which includes all costs associated with monitoring, weed control, law enforcement, improvements and planning activities.

Anticipated Impacts of the Use:

To provide this use, the Refuge has adequate staff which includes biological, administrative and managerial personnel. The grazing program results in both long and short term effects, both negative and positive. The following is a list of possible short and long-term negative impacts to wildlife resources from grazing: trampling of desirable vegetation, disturbances to ground nesting species, trampling of rodent burrows, soil compaction especially during wet periods and erosion of the bank along North Stone Lake. The following activities can minimize these negative impacts associated with grazing: fencing off sensitive habitats, development of alternative watering sources for cattle to drink from, allowing the use in years of adequate rainfall only and supporting grazing within the same unit areas and not moving animals to un-grazed or sensitive areas.

Conversely, short and long-term positive impacts of the grazing program include: an overall reduction of undesirable, non-native vegetation; re-establishment of native grass, forb, and shrub communities; reduced fire danger to surrounding communities; and increased habitat for grassland dependent species. Prior to reestablishment of a grazing program by the Refuge, the North Stone Lake Unit was left idle for approximately 12 years. Over that time, the grass became dense with vegetation reaching 6-8 feet tall. Bird surveys revealed no use by sandhill cranes, arctic nesting geese or shorebirds, although these birds used the area historically. Once the grazing plan was implemented, these birds returned within two years,

and the, California State Endangered Species Act, listed greater sandhill crane now number over 300 birds. Native grass stands have also benefited from the grazing program and are expanding (Huitt 2003). Adjacent landowners are also satisfied with the decrease in thatch and the fire break that further reduces the threat of fire spreading across the property and onto neighboring lands.

The impact of cattle to existing water supplies is negligible and being diminished as alternative watering sources are being developed. Alternative watering sources help keep cattle from watering in the lake where they can erode the bank in high use areas. A solar powered well now brings water to cattle in Pastures A and B, and a pipeline from the well at the HQ will bring water to cattle in Pasture E. A well already exists in Pasture D and plans are being finalized to construct an additional well in pasture C.

Much of the topography is flat with little sedimentation and erosion entering the two arms of North Stone Lake. The south arm of the lake which is surrounded by riparian vegetation has been fenced off to cattle, as have the other sensitive riparian zones on the property.

Bird surveys indicate the grazing program provides a significant benefit to various species of concern that winter in the Central Valley including the greater sandhill crane, white faced ibis, long billed curlew, Aleutian cackling goose and white fronted goose. Furthermore initial studies of nesting songbirds found that western meadowlarks nested in a wide range of grass heights below 3.5 feet, but were not found in areas where the grass exceeded this height.

Cowbirds (*Molothrus ater*) are found over the entire Refuge and parasitize nests of various species in riparian areas. Therefore 85% of existing riparian areas have been fenced off to decrease suitable habitat for cowbirds. Whether the grazing program will contribute to increases in the cowbird population by providing additional foraging areas is unknown. Large mixed flocks of blackbirds are seen in the spring and fall, but no cowbirds were recorded during point count surveys done the spring of 2006. Efforts to fence off riparian remaining riparian areas will continue.

Impacts to known cultural resources from this use are negligible. Tremaine and Associates (2006) completed a survey of the entire property in 2005, and all cultural resource sites that could be impacted by cattle were fenced off. Furthermore, the grazed units are closed to the public, further protecting these sites. Any ground-disturbing activities will be coordinated with the Service's Regional Archaeologist, in order to preserve the Refuge's archaeological and historic resources.

The Draft Comprehensive Conservation Plan (USFWS 2006) identifies the need to develop additional information relating to the effects of grazing on resident and migratory species. While the effects have been determined to be generally positive, additional research and evaluation will allow the Refuge to refine its management strategies and objectives for grassland management.

Public Review and Comment: One comment recommended that the CCP should indicate how NEPA requirements were met for a prior cooperative agreement related to grazing. Another comment suggested that horses would have less impact on Refuge lands and waters than long-term cattle grazing. Another comment observed that the fact that grazing is an approved refuge use demonstrates that not all Refuge uses have to be wildlife dependent uses.

Response: The environmental assessment, Appendix B of the draft CCP, applies only

to the current proposed action described in the draft CCP. Refuge land conservation efforts such as cooperative agreements are provided for under the 1992 Final EIS establishing the approved Refuge boundary (USFWS 1992). As stated in the justification below, the goals for grazing on the Refuge are to conserve, enhance, restore and manage Central Valley wetland, riparian, grassland and other native habitats to benefit their associated fish, wildlife, plants and special status species.

Determination: (Check One Below)

_____ Use is not compatible

X Use is compatible, with Stipulations

Stipulations Necessary to Ensure Compatibility:

The Cooperator is operating under the terms and conditions of a Cooperative Land Management Agreement (2001), special use permit and a Refuge Grazing Plan. These documents provide the necessary information and assistance from the Refuge to determine start and end dates for cattle placement and removal.

Additional Stipulations are as follows:

- It is the responsibility of the Refuge Manager to determine fair market value of grazing, to issue special use permits, monitor permittee compliance and maintain up-to-date files on all grazing activities.
- All cattle grazing on the Refuge would be removed no later than July 15th.

Monitoring:

A monitoring program will be established to provide data on residual dry matter, cover density, bird use, and noxious weeds. These data will establish guidelines for making management decisions concerning the grazing program. Maps of RDM will be compiled using the comparative yield method (Dudley, pers. comm.) in September or October of each year. The comparative yield method measures the residual dry matter by clipping the grass in a 1 meter square and then weighing the dried sample. This is repeated until the observer can determine the residual dry matter by observation rather than clipping grass samples. Samples are still collected to ensure accuracy of the observations. Maps are then compiled from the data and visual observations. Data on grass height and density is collected during the nesting season (March-April) using the Robel Pole Method (Harmony et al. 1997). These data will be used to guide grazing rates the following year. Photo plots for each grazing unit will also be established and photos will be taken each year at the end of the grazing season (July – August). Wildlife surveys will include bimonthly waterfowl and shorebird surveys (November – March), greater sandhill crane surveys (September – March), and rookery surveys (March – June). Noxious weed surveys will include mapping noxious weed infestations using a hand-help GPS unit and developing and implementing integrated pest management techniques to control and/or eliminate target species.

Justification:

The primary management goals guiding the grazing of the Refuge are to conserve, enhance, restore, and manage Central Valley wetland, riparian, grassland, and other native habitats to benefit their associated fish, wildlife, plants and special status species, and to conserve, enhance, and restore high quality migrating, wintering, and breeding habitat for migratory birds within the Sacramento-San Joaquin Delta of the Central Valley. The mission of the National Wildlife Refuge System also includes the conservation, management and restoration of wildlife resources. When evaluating the appropriate management direction for refuges, Refuge Managers are required to use sound professional judgment to determine

their refuge's contribution to biological integrity, diversity and environmental health at multiple landscape scales as called for in (601 FW 3[3.7B]). The grazing program is designed to enhance habitat for a variety of special status species including greater sandhill crane, Swainson's hawk and Aleutian cackling geese. The regulated use of grazing to benefit these and other species clearly supports both the System mission and the purpose for which the Refuge was established.

With the dramatic changes to the plant communities in California over the past 150 years, has come an increase in the density of ground cover due to the introduction of nonnative grasses and forbs (Kuchler 1988). A limited grazing season can benefit the recovery of native perennials by reducing annual plant biomass, increasing seed production and stimulating native perennial production (Huitt 2003).

Prior to the management of the property by the Refuge, the uplands were altered from their original native condition by the introduction of non-native grasses and intensive grazing practices. In order to maintain the biological integrity and diversity of the Refuge, species of special concern must be provided for. The use of moderate grazing to reduce the build-up of annual introduced grassland biomass is viewed as beneficial to species such as greater sandhill crane, Aleutian cackling geese and others. By restricting the intensity and duration of grazing, and by adhering to the stipulations for this use, the environmental health of the Refuge will be maintained.

Mandatory Re-evaluation Date (provide month and year):

_____ Mandatory 15 year Re-evaluation Date (for priority uses)

February, 2017 Mandatory 10 year Re-evaluation (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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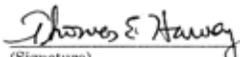
Refuge Determination:

Prepared by:


(Signature)

12/06/06
(Date)

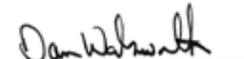
Refuge Manager/
Project Leader
Approval:


(Signature)

12/07/06
(Date)

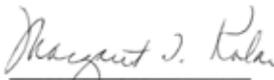
Concurrence:

Refuge Supervisor:


(Signature)

2/27/07
(Date)

Assistant Manager,
Refuges,
California/Nevada
Operations:


(Signature)

2/28/07
(Date)