Appendix A

Compatibility Determinations

Compatibility Determination
(Draft, May 2014)

Use: Upland Hunting

Refuge Name: San Diego National Wildlife Refuge (San Diego County, California)

Establishing and Acquisition Authorities:
The San Diego NWR was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

Refuge Purposes:
The purposes for the initial acquisition for the San Diego NWR included:

> ". . . 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);
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> ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . 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); and
>
> ". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System (Refuge 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).

Description of Use:
The Service is proposing to open approximately 160 acres of the San Diego NWR to upland hunting. The designated hunting area is located in the southeastern portion of the Otay Mesa and Lakes area within the Otay-Sweetwater Unit. Hunting in this area would occur per refuge-specific conditions and would allow the take of big game (i.e., deer, wild pig), resident small game (i.e., rabbits), and resident and migratory upland game birds (e.g., dove, quail, wild turkey).

This hunting area abuts other public lands open to hunting that are managed by the California Department of Fish and Wildlife (CDFW) and the Bureau of Land Management (BLM). Refuge specific hunting regulations would be generally consistent with State hunting regulations as they pertain to the CDFW Otay Mountain Ecological Reserve (California Code of Regulations, Title 14 [Public Resources] Section 630). Due to the lack of frontage along Otay Lakes Road on which to access the Refuge, along with the potential for the presence of Quino checkerspot butterfly larvae and associated host plants on the ridge within the northern portion of the site, no access into this area would be permitted from Otay Lakes Road. Access via foot would be permitted onto the Refuge from adjacent CDFW and BLM lands, where hunting is also permitted. No public access of any kind would be permitted within the Otay Lakes and Mesa area outside of the designated hunt area, and only hunters with valid hunting licenses would be permitted within the designated hunt area.

The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), which amended the National Wildlife Refuge System Administration Act (Administration Act), identifies hunting as one of the six wildlife-dependent recreational uses of a refuge, along with fishing, wildlife observation and photography, and environmental education and interpretation. Hunting is considered a priority general public use of the Refuge System that should receive enhanced consideration over non-priority uses. Because hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System, Refuge managers are encouraged to provide visitors with quality hunting opportunities when they are compatible with Refuge purposes.

The proposed hunt program on the Refuge will provide high quality, safe, and cost-effective hunting opportunities close to San Diego and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

- Mange wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;
- Promote visitor understanding of and increase visitor appreciation for America's natural resources;
- Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;
- Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

The Refuge must ensure that practices within the Refuge boundary do not put populations outside the Refuge at risk. Therefore, management of the hunt program will be based on good science and the ability to maintain a quality hunt program which, according to the Service Manual 605 FW 1.6:

- Promotes safety of participants, other visitors, and facilities;
- Promotes compliance with applicable laws and regulations and responsible behavior;
- Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation;
- Minimizes conflicts with neighboring landowners;
- Promotes accessibility and availability to a broad spectrum of the American people;
- Promotes resource stewardship and conservation;
- Promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources;
- Provides reliable/reasonable opportunities to experience wildlife;
- Uses facilities that are accessible to people and blend into natural setting; and
- Uses visitor satisfaction to help define and evaluate programs.

Prior to officially opening the Refuge to hunting and implementing a hunt program, the Refuge will develop a detailed step-down hunt plan that will provide the specific details of the hunting program. A step-down hunt plan will be initiated following the approval of a Final Comprehensive Conservation Plan (CCP) for the San Diego NWR. Listed here are potential topics to be included in the step-down plan.

- Purpose/goals of the hunting program.
- Regulatory framework.
- State hunting regulations.
- Species to be hunted.
- Refuge specific regulations, including:
    - Hunt area boundaries;
    - Methods of harvest;
    - Use of non-lead shot;
    - Access; and
    - Maintaining hunting dogs under voice control at all times within the approved hunt area boundaries.
- Public outreach.
- Safety.
- Law Enforcement management of the hunt.
- Harvest data collection and analysis.
- Facility improvements to support hunting.
- Annual post-season evaluation of the program.
- Partnership opportunities.

Although the specific details of the hunt plan will be refined during the step-down planning process, there are several provisions that must be included in all refuge hunt plans. Among these provisions is the requirement that each person while engaged in public hunting on a National Wildlife Refuge shall:

- Possess the required State license;
- Comply with all applicable State laws, unless further restricted by Federal law or regulation;
- Comply with the regulations authorizing access or use of a refuge, including the terms and conditions under which hunting permits are issued; and
- Comply with refuge-specific regulations governing hunting on a refuge.

National Wildlife Refuges in California and Nevada require use of non-toxic shot (as described in 50 CFR 20.21(j)) for hunting waterfowl, upland game birds, and small game. In accordance with recent State legislation (AB 711) non-lead ammunition will be required for all wildlife hunting by July 1, 2019.

The Refuge's hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and will be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will generally be permitted within the framework of State regulations as they apply to the CDFW Otay Mountain Ecological Reserve, which are intended to ensure that hunting will be compatible with the conservation of wildlife and their habitats. Therefore, upland hunting on the Refuge would comply with the Improvement Act and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

Availability of Resources:
The San Diego NWR does not currently have a hunting program. Implementing the proposed hunting program will require some initial staff time, as presented in Table 1, to prepare the step-down hunt plan and the refuge opening package, conduct public meetings and public outreach, coordinate with CDFW and BLM, and post the designated hunt area. Ongoing annual costs are estimated in Table 2. If CDFW manages the Refuge hunting program, the costs would be reduced. Minor costs associated with boundary markers, public outreach materials, and other refuge signage would be incurred during the first year.

Potential funding sources include the Refuge's annual budget, partnerships with the CDFW, San Diego Fish and Wildlife Advisory Council, individual hunting groups, and contributions from conservation groups, corporate sponsors, and Friends groups. Local hunting groups may be willing to support the program with funding for minor construction, boundary marking, and by providing volunteers for ongoing maintenance.

Table 1 First Year Staff Involvement Associated with Establishing and Implementing a Hunting Program on the San Diego NWR			
Position	**Involvement**	**FTE***	**Cost**
Project Leader	Participation and oversight in the development of the step-down hunt plan, including public meetings and coordination with CDFW regarding future management of the hunting program.	0.05	$8,700
Deputy Project Leader	Participation and oversight in the development of the step-down hunt plan, including public meetings and coordination with CDFW regarding future management of the hunting program.	0.10	$12,970
Refuge Manager	Preparation and oversight of the step-down hunt plan, participate in public meetings and coordinate with CDFW regarding future management of the hunting program, process the opening package, conduct public outreach, provide oversight of the first year hunt season.	0.30	$38,004
Refuge Operations Specialist	Assist in the preparation of the step-down hunt plan, mark and post hunting area boundaries	0.20	$16,512
Total FTE/Annual Costs for Staffing		**0.65**	**$76,186**

FTE (full time equivalent)

Table 2 Ongoing Annual Staff Involvement Associated with Managing a Hunting Program on the San Diego NWR			
Position	**Involvement**	**FTE**	**Cost**
Refuge Manager	General oversight of the hunt program	0.05	$6,334
Wildlife Biologist	Conduct monitoring and analyze harvest data	0.05	$4,828
Maintenance Worker	Maintain boundaries markers	0.05	$2,466
Federal Wildlife Officer	Conduct periodic patrol of hunting areas	0.10	$7,202
Total FTE/Annual Costs for Staffing		0.25	$20,830

Anticipated Impacts of the Use:
Hunting will result in direct and indirect impacts to Refuge upland wildlife. Direct impacts of hunting are the death hunted species. Indirect impacts to wildlife include indirect mortality (wounding or premature death caused by human activity), lower productivity, reduced use of the land, reduced use of preferred habitat and aberrant behavior/stress (Purdy et al. 1987; Pomerantz et al. 1988). Hunting can alter wildlife behavior, population structure, and distribution patterns of wildlife (Cole and Knight 1990).

Human disturbance associated with hunting includes human presence, walking through vegetation, vegetation trampling, rapid movements and loud noises, such as those produced by shotguns. This disturbance, especially when repeated over time, can cause some wildlife species to change foraging habits, feed only at night, or relocate (Hammitt and Cole 1998). Disturbance of wildlife and sensitive vegetation is the primary concern regarding Refuge hunting activity.

Individual plants and animals may be disturbed by human contact to varying degrees. Human disturbance in the form of trampling can result in the loss of sensitive plants, reptiles, and invertebrates. Human activities on trails can result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects, behavioral modifications, or death (Smith and Hunt 1995). Many studies have shown that birds can be affected by human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas (Holmes and Geupel 2005). Flushing, especially repetitive flushing, can strongly affect habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, change resting or feeding patterns, increase exposure to predation, or abandon sites with repeated disturbance (Smith and Hunt 1995). Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Knight and Temple 1995).

Hunting on the refuge will be conducted on foot by individuals or small groups, often accompanied by a hunting dog. Since hunting is not limited to designated trails, direct impacts to vegetation will occur from trampling. However, because hunters tend to travel in dispersed patterns over wide areas, rather than using the same pathway over and over again, the effects of trampling would be limited and short-term. As a result, impacts to Refuge vegetation by hunters would be expected to be minimal and insignificant.

The literature suggests that hunting impacts can be reduced by providing adjacent non-hunting areas where hunting does not occur and wildlife can feed and rest relatively undisturbed (King and Workman 1986). The Comprehensive Conservation Plan for the Refuge proposes to preserve large blocks of undisturbed habitat within the Otay-Sweetwater Unit, providing extensive sanctuary areas for hunted species. In addition, no other public uses are proposed for the Otay Mesa and Lakes area and Refuge management would be generally limited to species and habitat monitoring; therefore, the overall level of disturbance in this area would be low.

Recreational hunting will remove individual animals, but is not expected to negatively affect wildlife populations. This is because hunting on refuges is highly regulated and the effects of hunting are monitored annually. In addition, hunting generally takes place at specific times and seasons when game animals are less vulnerable, reducing the magnitude of disturbance to the population as a whole (Cline et al. 2007).

To manage wildlife populations subject to hunting, the Refuge takes into consideration the harvest regulations set by CDFW within Federal framework guidelines. The California Fish and Game Commission, in consultation with CDFW, annually review the population censuses to establish season lengths and harvest levels. Refuges use this information along with the results of annual habitat management reviews conducted to evaluate wildlife population levels, habitat conditions, and visitor service activities, in considering the need for any refuge specific hunting regulations.

Impacts to Hunted Species:
To avoid adverse effects to dove populations in California from hunting, the length and timing of the annual hunting season and bag limits for doves are developed based on population data derived from Call Count Survey heard and seen data, Breeding Bird Survey data, and a population abundance index derived from banding and harvest data that is collected within the mourning dove Western Management Unit. Additional information about dove management and the determination of hunting limits is provided in the Draft CCP/EA for the San Diego NWR (USFWS 2014).

CDFW has trustee responsibility for the conservation and management of deer, quail, and other wildlife in California. Section 1801 of the Fish and Game Code establishes the overall Wildlife Conservation Policy for CDFW, which includes the following relevant objectives:

> 1) perpetuate all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to all persons; and
> 2) maintain diversified recreational uses of wildlife, including the sport of hunting, as proper uses of certain designated species of wildlife, subject to regulations consistent with the maintenance of healthy, viable wildlife resources, the public safety, and a quality outdoor experience.

With respect to California quail, CDFG (2004) determined that the removal of individual animals from resident game bird populations statewide would not significantly reduce those populations and therefore would not have a significant adverse effect on resident game birds.

CDFW implements a Deer Management Program throughout the state, and as part of that program, biologists develop hunting regulations, provide expertise on habitat and population assessments, compile harvest information, conduct and direct research needs, monitor and estimate populations, and respond to various public inquiries related to deer in California. CDFW is currently developing a *Strategic Plan for California Deer* to provide the tools necessary to more effectively manage the State's deer population.

Within the south coastal area of California, which includes the areas in and around the San Diego NWR (Zone D-16), estimates of the deer population from 1990 to 1996 indicate a fairly stable population with a moderate increase between 1993 and 1994. The estimated population in 1996 was just under 20,000. In 2006, the San Diego Union Tribune (Ed Zieralski, September 16, 2006) reported that according to a CDFW biologist, the county's deer herd (excluding Camp Pendleton) was considered stable and slightly increasing with an estimated population of approximately 6,000.

To minimize the potential for adverse effects to natural resources from hunting activities on the Refuge, the following measures would be implemented as a part of the hunting program:

- Large contiguous areas of the Refuge will be closed to hunting to provide adequate sanctuaries for wildlife; and
- No motorized access associated with hunting will be permitted on the Refuge.

Impacts to Endangered and Threatened Species: Although the area proposed for hunting is located within designated critical habitat for the Quino checkerspot butterfly (*Euphydryas editha quino*), the boundaries of the hunt area have been designed to avoid any known or potential Quino habitat areas. To ensure that no adverse effects to Quino checkerspot butterflies occur outside of the hunting boundaries on Refuge land, the step-down hunt plan will include approved hunter access routes into the hunt area. The remainder of the Otay Mesa and Lakes area would be closed to all public access. Therefore, there is little potential for impacts to this species and any other listed species from the proposed hunting program.

Public Review and Comment:
Opportunities for hunting on the San Diego NWR were discussed at the scoping meetings held on June 14 and 15, 2006, to initiate the CCP process. A Notice of Intent was published in the Federal Register on May 24, 2006 (71 FR 29973). At that time, written comments were solicited. At the scoping meetings, the public was encouraged to provide verbal comments or to send us written comments following the meetings. Additional discussion on the topic of hunting, as well as other public uses, occurred at a public workshop held on January 6, 2007. A CCP web page was established to provide the public with information regarding the CCP process and the results of the public scoping. Planning Updates have been prepared to summarize the progress of the CCP and to discuss specific planning issues.

This draft Compatibility Determination is being made available for public review and comment as Appendix A of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (USFWS 2014).

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
The measures present here will be implemented to ensure that hunting on the Refuge is compatible with purposes for which this Refuge was established.

- Large contiguous blocks of land within the Refuge will be closed to public use, including hunting, to provide a sanctuary for wildlife;
- No public uses, other than hunting in the designated hunt area, will be permitted within the Otay Mesa and Lakes area to minimize disturbance to wildlife;
- Hunting will be conducted in accordance with State law and CDFW regulations as they pertain to hunting on the CDFW Otay Mountain Ecological Reserve, except as may be modified to protect refuge resources;
- Hunting area boundaries will be clearly posted;
- A public outreach program describing the Refuge hunting program will be developed and implemented prior to the opening of the initial hunting season;
- Only walk-in access to hunting areas will be provided (no access via motorized vehicle, bicycle, or horseback will be permitted);
- Federally approved non-lead shot will be used on the Refuge; and
- Field checks by Refuge Federal Wildlife Officers will be planned, conducted, and coordinated to maintain compliance with Federal, State and Refuge regulations.

Justification:
The Refuge's location adjacent to urban/suburban development provides an excellent opportunity to provide a hunting program close to where the demand for hunting exists. A secondary benefit of a hunting program comes from instilling an "ownership" ethic in those who participate in the program. Hunters using refuge lands will view the area as "their" land. This most likely reduces vandalism, littering, and poaching; it also strengthens Service visibility in the local community. Through a quality hunting program, the public can gain a deeper appreciation of wildlife and an enhanced understanding of the importance of conserving habitat, which ultimately contributes to the Refuge System mission.

Evaluation of the proposed hunt program has considered the purpose and goals of the San Diego NWR, the availability of resources, and the potential for adverse effects to Refuge trust resources, including listed and sensitive species. Based on the analysis conducted for the CCP and this Compatibility Determination, we have determined that allowing the implementation of limited hunting on the Refuge would not materially interfere with or detract from fulfilling the Refuge purpose of protecting endangered or threatened fish, wildlife or plants nor does it interfere with or detract from fulfilling the Refuge System mission.

Mandatory Reevaluation Date:

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

_____ Mandatory 10-Year Reevaluation (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

References Cited:

California Department of Fish and Game (CDFG). 2004. Final environmental documents regarding resident game bird hunting.

Cline, R., N. Sexton, and S.C. Stewart. 2007. A human-dimensions review of human-wildlife disturbance: a literature review of impacts, frameworks, and management solutions: U.S. Geological Survey, Open-File Report 2007-1111, 88 p.

Cole, D. N. and R. L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. Utah State University, Logan, Utah.

Hammitt, W. E. and D. N. Cole. 1998. Wildland Recreation: Ecology and Management. 2nd ed. New York: John Wiley and Sons.

Holmes, A. H. and G. R. Geupel. 2005. Effects of trail width on the densities of four species of breeding birds in chaparral. In C. J. Ralph, J. R. Sauer, and S. Droege, technical editors. Proceedings of the Third International Partners in Flight Conference. U.S. Forest Service General Technical Report PSW-GTR-191. Albany, California, USA.

King, M. M. and G. W. Workman. 1986. Response of desert bighorn sheep to human harassment: management implications. Transactions 51st North American Wildlife and Natural Resource Conference.

Knight, R. L. and S. A. Temple. 1995. Origin of wildlife responses to recreationists. In *Wildlife and recreation: Coexistence through management and research*, edited by R. L. Knight and K. J. Gutzwiller. Washington, D.C.: Island Press.

Pomerantz, G. A., D. J. Decker, G. R. Goff, and K. G. Purdy. 1988. Assessing impact of recreation on wildlife: A classification scheme. Wildlife Society Bulletin 16:58-62.

Purdy, K. G., G.A. Pomerantz, and N.A. Connelly. 1987. A guide to managing human activity on national wildlife refuges. Ft. Collins, Colorado: Office of Information Transfer. U.S. Fish and Wildlife Service.

Smith, L. and J. D. Hunt. 1995. Nature tourism: Impacts and management. In *Wildlife and recreationists: Coexistence through management and research*, edited by R. L. Knight and K. J. Gutzwiller. Washington, D.C., Island Press.

U.S. Fish and Wildlife Service (USFWS). 1995. Final Environmental Assessment for the Proposed Acquisition of Rancho San Diego, Sweetwater II, and Lot 707 Properties for the Resolution Trust Corporation for the Proposed San Diego National Wildlife Refuge, Otay Sweetwater Unit, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 1997. Environmental Assessment and Land Protection Plan. Otay-Sweetwater Unit, San Diego National Wildlife Refuge, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 2014. San Diego National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
(Draft, May 2014)

Use: Recreational Fishing

Refuge Name: San Diego National Wildlife Refuge (San Diego County, California)

Establishing and Acquisition Authorities:
The San Diego NWR was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

Refuge Purposes:
The purposes for the initial acquisition for the San Diego NWR included:

> ". . . 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);
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> ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . 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); and
>
> ". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge 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).

Descriptions of Use:
The proposed use is recreational fishing along the Sweetwater River. Fishing is a priority public use, as identified in the National Wildlife Refuge Improvement Act.

The San Diego NWR is not currently open to fishing, although evidence of fishing activity has been documented along the Sweetwater River, particularly around some year-round pools that exist along the Sweetwater River as it narrows south and west of State Highway 94. At the public scoping meetings for the Comprehensive Conservation Plan (CCP), a member of the public requested that we consider allowing fishing along the banks of the Sweetwater River.

Several wetland areas occur on the Refuge, including approximately 5.7 miles of the Sweetwater River, which flows through the Otay-Sweetwater Unit; a short portion of Steele Canyon Creek, an ephemeral drainage with a few small pools holding water for all or most of the year; and three small stock ponds located along the base of Mother Miguel Mountain, only one of which holds water throughout the year. Of these areas, only the Sweetwater River is known to support game fish.

No native game fish have occurred on the Refuge since the southern steelhead (*Oncorhynchus mykiss*) was extirpated from the Sweetwater River watershed (Good et al. 2005). While no specific fish surveys have been conducted on the Refuge, casual observations confirm the presence of four non-native fish species in the Sweetwater River. These include three game fish: green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), and carp (*Cyprinus carpio*), and western mosquitofish (*Gambusia affinis*). Also present on the Refuge are red swamp crayfish (*Procambarus clarki*) and Asian clam (*Corbicula fluminea*); these species are also non-native. There are no opportunities for fishing on the Del Mar Mesa Vernal Pool Unit of the Refuge.

If fishing were to be permitted on the Refuge, it would have to occur along the banks of the Sweetwater River. There are currently no facilities available to accommodate fishing, and access to potential fishing areas would require disturbance to and potential loss of sensitive riparian vegetation. An added constraint is the nature of the water flows within the Sweetwater River, which are managed by the Sweetwater Authority, the water district that maintains the Loveland Reservoir, located upstream of the Refuge, and the Sweetwater Reservoir, located downstream of the Refuge. The water flows in the river vary tremendously throughout the year, as water levels in the Sweetwater Reservoir and Loveland Reservoir are regulated by the Sweetwater Authority. When water levels are too high in the Loveland Reservoir or water levels are too low in the Sweetwater Reservoir, the Sweetwater Authority releases water from Loveland Reservoir that travels down through the Sweetwater River channel. Any fishing sites would have to be designed to accommodate these changes in flow volumes through the river.

Opportunities for fishing are currently available in the immediate vicinity of the Refuge, including at the Sweetwater Reservoir, Lower Otay Reservoir, and Loveland Reservoir.

Availability of Resources:

Funding would have to be identified to provide facilities to accommodate a recreational fishing program on the Refuge. No restrooms, water, or fish cleaning facilities are currently available on or near the Refuge. Direct costs to administer a recreational fishing program would include funding to construct facilities and staff time. Table 1 describes the level of involvement by Refuge staff that would be required annually to manage and monitor recreational fishing on the Refuge, and Table 2 describes the facilities and/or construction costs associated with implementing a recreational fishing program on the Refuge (based on FY 2011 costs).

Table 1 Annual Staff Involvement Associated with Managing a Recreational Fishing Program on the San Diego NWR			
Position	**Involvement**	**FTE**	**Cost**
Refuge Operations Specialist	Periodic on-site oversight, monitoring, public contact	0.10	$8,257
Wildlife Biologist	Monitoring and reporting	0.10	$9,655
Federal Wildlife Officer	Enforcement	0.10	$7,202
Maintenance Worker (new position)	Site cleanup, repair	0.20	$9,865
TOTAL FTES AND COSTS FOR STAFFING		0.50	$34,979

*FTE (full time equivalent)

Table 2 Equipment Associated with Managing a Recreational Fishing Program on the San Diego NWR		
Type of Equipment/Facility	**Explanation of Need**	**Cost**
On-Refuge Parking Area	Needed to provide small parking area (2-4 cars) and access onto the Refuge	$100,000
Restroom	Needed to avoid impacts to Refuge resources	$25,000
Water Source and Fish Cleaning Area	Needed to accommodate the use	$30,000
TOTAL COST FOR EQUIPMENT		$155,000

Anticipated Impacts of the Use:

Opening the Refuge to recreational fishing would increase human activity within sensitive riparian habitat along the Sweetwater River. The anticipated result is direct and indirect impacts to sensitive vegetation and the listed and sensitive nesting bird species supported by this vegetation. Anticipated impacts include trampling, damage, or removal of vegetation; loss or fragmentation of habitat; reductions in habitat quality; an increase in the number of pathways within riparian areas leading to the establishment of additional invasive plants along this riparian corridor; shoreline and streambed erosion; an increase in water turbidity; damage or loss of bird nests; and displacement of wildlife. Many species of migratory birds, including passerines, raptors, waterfowl, and wading birds, as well as native mammals, use the habitat in and around the Sweetwater River.

DeLong and Schmidt (2000), in their literature review of the effects of human disturbance on wildlife, summarized the results of a number of studies related to fishing. The majority of these studies concluded that fishing activities could influence the composition, distribution, abundance, and productivity of waterbirds. Such effects include bird fatalities resulting from entanglement with fishing line, trampling of vegetation, degraded habitat due to litter accumulation, and reduced water quality due to bank erosion and the deposition of sewage and other chemicals. DeLong's (2002) literature review of impacts associated with recreation identified a correlation between human disturbance from various activities, including fishing, and changes in bird distribution and

abundance, reduced reproductive success, increased predation rates, and changes in foraging behavior. Research suggests that anglers create an area around them within which birds will not venture (Liddle and Scorgie 1980), and fishing activity within naturally vegetated areas results in degradation of wildlife habitat (Liddle and Scorgie 1980). Other studies document the potential for human activity within riparian vegetation to result in damage or destruction of bird nests that occur at various levels throughout the vegetation, particularly cup nests of Neotropical migratory birds located on or near the ground.

In general, fishing results in longer periods of human presence within riparian habitat than occurs during regular trail use because fishing involves someone being present in a particular area for an hour or more. As a result, this continued human presence can disrupt bird foraging activity, and on the Refuge may lead to a reduction in species richness along those areas of the Sweetwater River where non-native game fish are present. For many passerine species, primary song occurrence and consistency can be affected by a single visitor (Gutzwiller et al. 1994, 1997). In areas where primary song was affected by disturbance, birds appeared to be reluctant to establish nesting territories (Reijnen and Foppen 1994).

Finally, the fish that are present on the Refuge are not native and have the potential to adversely affect other native aquatic species. Rather than allow for their proliferation on the Refuge, actions are included in the CCP to control and, where possible, eradicate non-native aquatic species to meet the Refuge's endangered species and other wildlife objectives.

Effect to Endangered and Threatened Species:
Human activity associated with fishing can have adverse impacts to endangered, threatened, and sensitive species, particularly when the associated disturbance disrupts nesting or foraging activities. The least Bell's vireo (*Vireo bellii pusillus*) is a federally listed endangered species that nests and forages within the Refuge's Sweetwater River riparian corridor. This corridor has been designated as critical habitat for the vireo (*Federal Register*, 59 FR 4845- 4867, February 2, 1994). Human disturbance, such as trampling of nests or nest sites or clearing of vegetation, can cause nest failure and abandonment (USFWS 1998). Kus (2002) indicated that brood parasitism and habitat fragmentation are the primary factors causing the species decline and are both results of human-induced disturbance. In addition, the federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*) nests and forages in coastal sage scrub adjacent to the Refuge's riparian habitat and ponds.

Although survey results have been negative for the federally listed endangered arroyo toad (*Anaxyrus californicus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), suitable habitat exists for these species on the Refuge along the Sweetwater River corridor. Suitable habitat is also available to support the southwestern pond turtle (*Emys marmorata pallida*), a species covered by the San Diego Multiple Species Conservation Program (MSCP). The San Diego NWR CCP includes strategies to reintroduce or improve habitat conditions to support the natural recruitment of these species within suitable habitat areas along the Sweetwater River. These efforts could be impacts by known threats to these species from the human activity associated with fishing. Such threats include disturbance during foraging and nesting and/or breeding, displacement from preferred feeding areas for prolonged periods, nest and/or breeding failure, direct habitat loss through trampling, and for the turtle, incidental capture by anglers (Madden-Smith et al. 2005). In addition, new user-created trails in Refuge riparian areas would invite increased human access and disturbance into this area for non-fishing related activities.

Increased access and activity could also promote the spread of invasive plants into native habitats. Non-native fish, crayfish, and clams have the potential to be competitors and predators of native listed species, such as the federally listed endangered arroyo toad and California red-legged frog (*Rana aurora draytonii*). As noted, the CCP and an Integrated Pest Management Plan prepared for the Refuge include actions to control these non-native species.

Public Review and Comment:
The potential to provide opportunities for fishing on the San Diego NWR were discussed at the scoping meetings held on June 14 and 15, 2006, to initiate the CCP process. A Notice of Intent was published in the *Federal Register* on May 24, 2006 (71 FR 29973). At that time, written comments were solicited. At the scoping meetings, the public was encouraged to provide verbal comments or to send us written comments following the meetings. A CCP web page was established to provide the public with specific information regarding the CCP process and the comments provided during public scoping. Planning Updates have also been prepared to summarize the progress of the CCP and to discuss specific issues related to the planning process.

This draft Compatibility Determination is being made available for public review and comment as Appendix A of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (USFWS 2014).

Justification:
Although the Refuge includes approximately 5.7 miles of the Sweetwater River, opportunities for fishing are limited by both minimal water depths along much of the River and the lack of the presence of native fish populations within this watershed. There are some deeper pools located along the river course that support non-native fish; however, the eradication of non-native fish from the Refuge is proposed to support the reestablishment of populations of southwestern pond turtle and the federally endangered arroyo toad along suitable segments of the Sweetwater River.

The general guidelines for wildlife-dependent recreation, as presented in 605 FW 1.6 of the Service Manual, provide a range of criteria to be considered when opening a refuge to a particular recreational experience. Some of these criteria include consideration of applicable laws and regulations, minimizing conflicts with fish and wildlife population and habitat goals, promoting accessibility and availability to a broad spectrum of the American people, promoting resource stewardship and conservation, providing reliable and reasonable opportunities to experience wildlife, and using visitor satisfaction to help define and evaluate programs. We develop and evaluate quality wildlife-dependent recreation programs based on these criteria, which necessarily involves considering the existing and projected future conditions on a refuge. Such conditions include the lack of native fish within the watershed and the projected future lack of non-native fish in accordance with the Integrated Pest Management Plan that accompanies the CCP.

The guidance also addresses the need to consider applicable laws and regulation, including the ESA, and minimizing conflicts with fish and wildlife population and habitat goals. The portion of the Sweetwater River that extends through the Refuge is designated as critical habitat for the least Bell's vireo and southwestern willow flycatcher, and has the potential to support the federally endangered arroyo toad and red-legged frog, and MSCP-covered southwestern pond turtle. The habitat adjacent to the Refuge's riparian and pond areas support the federally listed threatened coastal California gnatcatcher.

The opportunities to harvest fish from the Sweetwater River at present are low and will be essentially nonexistent in the future. Based primarily on the limited fishing opportunities available along the Sweetwater River, but also considering the potential for increased disturbance within habitat designated as critical for the recovery of the least Bell's vireo and southwestern willow flycatcher, the Refuge Manager has determined not to open the Refuge to recreational fishing.

Mandatory Re-Evaluation Date:

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

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

References Cited:

DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds – a literature review of impacts and mitigation measures – prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) *in* Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish and Wildlife Service, Region 1, Portland, OR.

DeLong, Anita and Janet Schmidt. 2000. Literature Review: Effects of Human Disturbance on Wildlife with Emphasis on Wildlife-Dependent Recreation Relevant to Stillwater National Wildlife Refuge (Draft).

Good, T. P., R. S. Waples, and P. Adams (eds.). 2005. Updated status of Federally listed ESUs of West Coast salmon and steelhead. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFSNWFSC-66.

Gutzwiller, K. J., E. A. Kroese, S. H. Anderson, and C. A. Wilkins. 1997. Does Human Intrusion Alter the Seasonal Timing of Avian Song During Breeding Periods? Auk 114(1):55-65.

Gutzwiller, K. J., R. T. Wiedenmann, K. L. Clements, and S. H. Anderson. 1994. Effects of Human Intrusion on Song Occurrence and Singing Consistency in Subalpine Birds. Auk 111:28-37.

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). *In* The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

Liddle, M. J. and H. R. A. Scorgie. 1980. The effects of recreation on freshwater plants and animals: a review. Biol. Conserv. 17:183-206.

Madden-Smith, Melanie C., Edward L. Ervin, Kathy P. Meyer, Stacie A. Hathaway and Robert N. Fisher. 2005. Distribution and status of the arroyo toad (*Bufo californicus*) and western pond turtle (*Emys marmorata*) in the San Diego MSCP and surrounding areas. Unpubl. report, prepared for California Dept. of Fish and Game and County of San Diego.

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 Warblers *Phylloscopus trochilus* breeding close to a highway. Journal of Applied Ecology 31:85–94.

U.S. Fish and Wildlife Service (USFWS). 1995. Final Environmental Assessment for the Proposed Acquisition of Rancho San Diego, Sweetwater II, and Lot 707 Properties for the Resolution Trust Corporation for the Proposed San Diego National Wildlife Refuge, Otay Sweetwater Unit, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 1997. Environmental Assessment and Land Protection Plan. Otay-Sweetwater Unit, San Diego National Wildlife Refuge, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 1998. Draft recovery plan for the least Bell's vireo. U.S. Fish and Wildlife Service, Portland, OR.

U.S. Fish and Wildlife Service (USFWS). 2014. Draft San Diego National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment. San Diego National Wildlife Refuge Complex, Chula Vista, CA.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
(Draft, May 2014)

Use: Wildlife Observation, Photography, Environmental Education, and Interpretation

Refuge Name: San Diego National Wildlife Refuge (San Diego County, California)

Establishing and Acquisition Authorities:
The San Diego NWR was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

Refuge Purposes:
The purposes for the initial acquisition for the San Diego NWR included:

> ". . . 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);
>
> ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . 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); and
>
> ". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge 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).

Descriptions of Use:
This Compatibility Determination addresses wildlife observation, photography, environmental education, and interpretation, all uses that are identified as priority public uses in the National Wildlife Refuge Improvement Act. These uses are presently occurring in various locations throughout the Refuge, generally, but not always, from existing trails and pathways that have been created within the Refuge. There is evidence of off-trail activity occurring in various parts of the Refuge that are resulting in wildlife disturbance and habitat degradation.

To address the need for providing opportunities for these uses while also protecting the species and habitats included within the Refuge boundaries, the draft San Diego NWR Comprehensive Conservation Plan (CCP) proposes to establish a designated trail system within the Refuge. A step-down trail plan will be developed upon completion of the CCP. The vast majority of the public uses proposed for the Refuge, with the exception of a limited hunting program, would take place on the designated trails. All other areas of the Refuge would be closed to public use.

The CCP includes an objective for wildlife and plant observation that states that by 2018, the Refuge will provide opportunities for 16,000 visitors annually to observe the native wildlife and plants preserved within on the Refuge. The objective for photography states that by 2018, the Refuge will provide quality opportunities for at least 250 annual visits to the Refuge for the purpose of nature photography. As stated, the vast majority of these activities will occur along the designated trail system.

The guiding principles of the Refuge System's environmental education programs (605 FW 6 of the Service Manual) are to:

- teach awareness, understanding, and appreciation of our natural and cultural resources and conservation history;
- allow program participants to demonstrate learning through refuge-specific stewardship tasks and projects that they can carry over into their everyday lives;
- establish partnerships to support environmental education both on- and off-site;
- support local, State, and national educational standards through environmental education on refuges;
- assist refuge staff, volunteers, and other partners in obtaining the knowledge, skills, and abilities to support environmental education;
- provide appropriate materials, equipment, facilities, and study locations to support environmental education;
- give refuges a way to serve as role models in the community for environmental stewardship; and
- minimize conflicts with visitors participating in other compatible wildlife-dependent recreation activities.

The San Diego NWR Complex's Environmental Education program works with Earth Discovery Institute, a local non-profit educational organization, to provide curriculum for elementary and middle school students. In the 2010-2011 school-year, the program expanded its study locations to include the San Diego NWR, and about 240 middle school students participated in various environmental education activities on the Refuge that addressed topics such as the importance of coastal sage scrub and willow riparian habitats to native wildlife and endangered species and the effects of habitat fragmentation on habitat quality and wildlife.

The Refuge has also worked with San Diego Audubon on their South County Student Stewardship and Education Initiative project. Under this grant-funded project, San Diego Audubon works with local elementary schools within two miles of conserved lands in the south county to determine how students at these schools might participate in an education or service learning opportunity on the Refuge or other area of conserved land in south county. Nature programs are developed at selected school sites based on the results of the school outreach and inventory process.

Some of the environmental education programs being implemented in the south county include:

- OutdoorExplore! is an after-school enrichment program conducted by San Diego Audubon for underserved elementary school children. The goal of this program is to connect children to their local open spaces through nature interpretation and experiential learning techniques. San Diego Audubon proposes to expand this program to include a minimum of three schools that will focus their activities within conserved lands in the Otay-Sweetwater region. Fourteen elementary schools located within one mile of Otay-Sweetwater conserved lands have been identified as potential participants in the program.

- Nearby Nature School Field Trips is a product of the San Diego Children and Nature Collaborative in which elementary school teachers are mentored in using nearby natural areas as "outdoor classrooms" to teach curriculum-based content. Through school outreach, San Diego Audubon will build relationships with local elementary school teachers that may be interested in implementing this locally-based science curriculum. A preliminary geographic analysis showed that there are a total of 29 elementary schools within two miles of Otay-Sweetwater conserved lands. The goal is to obtain program participation commitments from at least five classrooms, resulting in up to 150 student visits to South County conserved lands. Bus transportation will enhance access to these lands and will be offered to local schools based on need.

San Diego Audubon is also working on a service-learning program to benefit South County land conservation. In collaboration with the Refuge, the California Department of Fish and Wildlife (CDFW), and other landowners, San Diego Audubon will develop a service learning program that exclusively serves South County conserved lands. Approximately 100 students from up to eight local high schools will be recruited to take part in a structured, geographically-focused stewardship program that will educate students on local conservation efforts and engage them in natural resource management activities.

The Refuge, together with conservation partners such as Earth Discovery Institute, San Diego Audubon, CDFW, and Bureau of Land Management, will also promote opportunities on the Refuge for environmental education and connecting people with nature by supporting requests for Refuge visits by educational institutions, non-governmental organizations, and archaeological/historical societies.

The guiding principles of the Refuge System's interpretive programs (605 FW 7 of the Service Manual) are to:

- promote visitor understanding of, and increase appreciation for, America's natural and cultural resources and conservation history by providing safe, informative, enjoyable, and accessible interpretive opportunities, products, and facilities;
- develop a sense of stewardship leading to actions and attitudes that reflect interest and respect for wildlife resources, cultural resources, and the environment;
- provide quality interpretive experiences that help people understand and appreciate the individual refuge and its role in the Refuge System;
- provide opportunities for quality recreational and interpretive experiences consistent with criteria describing quality found in 605 FW 1.6;
- assist refuge staff, volunteers, and community support groups in attaining knowledge, skills, and abilities in support of interpretation; and
- minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

To date, interpretive signs on the Refuge can be found at some trailheads and along portions of the Sweetwater Loop and River Trail. The interpretive signs along the Sweetwater Loop Trail, which were installed by an Eagle Scout, provide information on some of the endangered and threatened species that may be observed in the area. The San Diego NWR CCP proposes the installation of additional interpretive elements at various locations on the Refuge per available funding.

Currently, opportunities for wildlife observation, photography, and interpretation are also provided through the "Hike with a Ranger" program. These hikes are offered approximately once a month. In addition, special tours are periodically conducted to support the Refuge's public use objectives. It is through these types of activities that visitors are introduced to the National Wildlife Refuge System, the San Diego NWR, and the many resources protected on the Refuge. Some walks have a special theme, such as a pollinator hike to coincide with the Pollinator Week, a migratory bird hike to highlight Migratory Bird Day, or they may address a specific habitat type, species, or Refuge project (e.g., reintroduction of the endangered plant, San Diego ambrosia [*Ambrosia pumila*]).

Community outreach events such as volunteer work days, combine interpretation and volunteer projects, and special activities for children that provide opportunities to view native wildlife, hike with a biologist, and create artwork and stories based on their observations, are also conducted periodically throughout the year.

These four wildlife-dependent recreational activities (i.e., wildlife observation, photography, environmental education, interpretation) are conducted on those portions of the Refuge open to the public. By providing opportunities for the public to participate in these activities, we are able to enhance the public's understanding and appreciation for the need to conserve the many species and habitats supported within the Refuge boundary.

As of 2014, Refuge facilities to accommodate these uses are limited. Only one parking area is available for the public to access the Refuge, and this parking area only provides access to the McGinty Mountain area of the Refuge. Some additional parking is available off the Refuge, but those lots are managed by other agencies, and have been provided primarily as access and staging areas for the County's Sweetwater Loop and River Trail, which extends through the Sweetwater River and San Miguel Mountain areas of the Refuge. A few kiosks have been erected where trails provide access onto the Refuge.

A number of additional facilities are proposed to accommodate wildlife-dependent recreational uses on the Refuge. These include a parking lot, visitor contact station, and trail staging area with restroom and information kiosk to be located to the west of Millar Ranch Road and south of Highway 94 on land proposed for transfer to the Refuge from Caltrans. These facilities will allow for staging of the Refuge's environmental education programs, as well as some of the guided hikes and other Refuge-sponsored activities that occur on the Refuge. Other facilities, that would be implemented per available funding, include a birding trail within the Las Montañas area of the Otay-Sweetwater Unit, a boardwalk and interpretive signage for guided hikes within the vernal pool restoration site in the San Miguel Mountain area of the Refuge, the construction of a universally accessible photography blind in an appropriate location within the Otay-Sweetwater Unit, and the installation of additional interpretive signage throughout the Refuge. The photo blind would be available on a first come, first serve basis. If necessary due to the popularity of the blind, a reservation system could be established to ensure that everyone who wishes the opportunity to use the blind has the chance to do so.

Availability of Resources:
Currently, the direct costs to provide opportunities for wildlife observation, photography, environmental education, and interpretation are primarily in the form of staff time. However, providing the new facilities and expanded programs described in the CCP would require additional staff and funding in excess of current annual allocations. The costs for providing additional staff are presented in Table 1. The funding needs for new construction projects (e.g., interpretive elements, parking areas, visitor contact station) are presented in Table 2 (additional project details are provided in Chapter 6 of the Daft San Diego NWR CCP/EA). New programs would be implemented and new facilities would be designed and constructed when funding is secured for individual projects. Potential funding sources include Federal cost share grants, interagency partnerships, state and private grants, and contributions from Friends groups.

Anticipated Impacts of the Use:

Once considered "non-consumptive" recreational uses, it is now recognized that recreational uses such as wildlife observation, nature photography, environmental education, interpretation, and trails can negatively impact wildlife by altering wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995). Purdy et al. (1987) and Pomerantz et al. (1988) described six categories of impacts to wildlife as a result of visitor activities:

- direct mortality (i.e., immediate, on-site death of an organism);
- indirect mortality (i.e., eventual, premature death of an organism caused by an event or agent that predisposed the organism to death);
- lowered productivity (i.e., reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site);

- reduced use of refuge (i.e., wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity);
- reduced use of preferred habitat on the refuge (i.e., wildlife use is relegated to less suitable habitat on the refuge due to visitor activity); and
- aberrant behavior/stress (i.e., wildlife demonstrating unusual behavior or signs of stress likely to result in reduced reproductive or survival rates).

Table 1
Annual Staff Involvement Associated with Managing Proposed Wildlife Observation, Photography, Environmental Education, and Interpretation on the San Diego NWR

Position	Involvement	FTE*	Cost
Project Leader/Deputy Project Leader	General oversight	0.05/0.05	$15,185
Refuge Manager	Coordinate with staff and Community Outreach Coordinator on events; public outreach with partners in environmental education delivery, Friends group coordination, conduct tours, process permits and NEPA compliance, and manage future construction.	0.30	$38,004
Refuge Operations Specialist	Periodic oversight, monitoring, outreach, enforcement, informational signs and kiosks maintenance, and participation in interpretive and educational events.	0.25	$20,642
Wildlife Biologist	Monitoring, reporting, reviewing interpretive plan, assessing impacts from visitor services related to construction and events, participation in interpretive and educational events, conducting outreach.	0.25	$48,277
Environmental Education Specialist	Coordinate the development of curriculum for the environmental education program and assist in the design of the interpretive plan, build partnerships with other agencies and organizations, and outreach to schools	1.00	$91,514
Park Ranger	Coordinate and assist in the delivery of the interpretive program	0.50	$41,283
Federal Wildlife Officer	Enforcement of Refuge regulations and protection of Refuge resources	0.30	$21,607
Maintenance Worker	Maintain interpretive areas and amenities	0.30	$14,797
Total FTES/Annual Costs for Staffing		**3.0**	**$291,309**

*FTE (full time equivalent)

Table 2 Construction and Facilities Costs Associated with Managing Wildlife Observation, Photography, Environmental Education, and Interpretation on the San Diego NWR		
Material/Facility Required	**Explanation of Need**	**Cost**
Visitor Staging Area/Temporary Contact Station	Currently, no facilities are available on the Refuge where visitors can interact with Refuge staff and have the opportunity to ask questions and receive information about Refuge resources, regulations, safety, or other topics. In addition, there is no formal parking/staging area available within the Sweetwater River and San Miguel Mountain areas, which represent the largest contiguous area of land (about 6,700 acres) within the Refuge.	$2,000,000
Enhanced Interpretive Elements Along the Sweetwater River	A number of listed and sensitive species occur in this area of the Refuge, providing an excellent opportunity to inform visitors of the importance of the habitat located within the Refuge.	50,000
Interpretive/Informational Kiosks(5) at Major Trailheads on the Refuge	Information in the kiosks will inform visitors that they are entering a NWR, and explain the purpose of the Refuge, its resources, and why those resources needed to be protected.	$120,000
Vernal Pool Interpretive Boardwalk Trail	The vernal pool habitat on the Refuge is one of the rarest habitats in the region, seasonal guided tours and interpretive elements will assist in developing a broader appreciation of this habitat and the listed species it supports.	$60,000
Bird Identification Signs on the future Las Montañas birding trail	These identification signs will support wildlife observation, photography, and interpretive programs throughout the Refuge.	$20,000
Develop and Implement an Expanded Environmental Education Program	Develop curriculum specific for the San Diego NWR and/or inland habitat/species for an elementary school program and implement annually.	$60,000
Total Cost For Facilities		**$2,310,000**

Individual plants and animals may be disturbed by human contact to varying degrees. Human disturbance in the form of trampling can result in the loss of sensitive plants, reptiles, and invertebrates. Human activities on trails can result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects, behavioral modifications, or death (Smith and Hunt 1995). Many studies have shown that birds can be affected by human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly affect habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, change resting or feeding patterns, increase exposure to predation, or abandon sites with repeated disturbance (Smith and Hunt 1995).

Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 1976), colonial nesting species (Buckley and Buckley 1976), and waterfowl (Boyle and Samson 1985) tends to increase in areas more frequently visited by people. In addition, for many passerine species, primary song occurrence and consistency can be affected by a single visitor (Gutzwiller et al. 1994). In areas where primary song was affected by disturbance, birds appeared to be reluctant to establish nesting territories (Reijnen and Foppen 1994).

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992, Burger et al. 1995, Knight and Temple 1995, Madsen 1995, Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommended 100 meters as an adequate buffer against pedestrian traffic; however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, Burger 1986, Klein 1993, Bowles 1995, Burger and Gochfeld 1998).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance effects (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 a slow approach by wildlife photographers can result in 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.

Education helps make visitors aware that their actions can have negative impacts on Refuge species, and can increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who had spoken with refuge staff or volunteers were less likely to disturb birds. Monitoring is recommended to adjust management techniques over time, particularly because it is often difficult to generalize about the impacts of specific types of recreation in different environments. Local and site -specific knowledge is necessary to determine effects on birds and other species and to develop effective management strategies (Hockin et al. 1992, Klein et al. 1995, Hill et al. 1997).

The construction and maintenance of trails and a boardwalk, interpretive elements, and parking lots will have minor impacts on soils and vegetation 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). The construction of a boardwalk in the vicinity of vernal pool habitat would minimize the potential for impacts related to human use by directing foot traffic onto an elevated structure, avoiding compaction of the soil and allowing the vegetation to remain undisturbed. To avoid impacts to water quality and adjacent native habitat during the construction of the boardwalk and other trail facilities proposed to support wildlife-dependent recreational use, the

CCP includes a range of best management practices that would be implemented prior to, during, and following construction.

Disturbance of wildlife and sensitive vegetation is the primary concern associated with the proposed uses. To reduce the overall effect of these uses on Refuge resources, large areas of the Refuge would be closed to public use. Where public use is permitted, disturbance would be localized, intermittent, and for the most part restricted to the trail corridor and areas located immediately adjacent to the trails. Increased activity around facilities and high visitation would likely cause some displacement of species and habitat. To minimize the effect of disturbance on the Refuge's most sensitive species, the development of facilities expected to attract larger numbers of visitors would occur well away from sensitive habitat areas.

Environmental education and interpretation activities generally support the Refuge's purposes and impacts can largely be minimized (Goff et al. 1988). The minor resource impacts attributed to these activities are generally outweighed by the benefits gained by educating present and future generations about refuge resources. Environmental education is a public use management tool used to develop a resource protection ethic within society. While it targets school age children, it is not limited to this group. This tool allows us to educate refuge visitors about endangered and threatened species management, wildlife management, and ecological principles and communities.

A secondary benefit of environmental education comes from instilling an 'ownership' or 'stewardship' ethic in visitors, which most likely reduces vandalism, littering, and poaching; it also strengthens service visibility in the local community. Disturbance by environmental education activities is considered to be of minimal impact because students and teachers will be instructed in wildlife observation etiquette and the best ways to view wildlife with minimal disturbance; education groups will be required to have a sufficient number of adults to supervise the group; and observation areas, binoculars, and scopes are provided to view wildlife at a distance which reduces disturbance.

The Refuge's location within and adjacent to urban/suburban development makes it attractive to the recreating public. While we acknowledge deleterious effects to wildlife from the presence of humans as noted by the references cited above, closing all access to the Refuge would reduce the human communities' support for the Refuge's overall conservation program, including land acquisition, species monitoring, habitat restoration, and management. By allowing the public onto the Refuge, and making education and interpretation of the Refuge's biological diversity an important component of everyday Refuge work, we can reduce the deleterious effects and garner support from the public for ongoing and future conservation actions.

Endangered and Threatened Species and Sensitive Species: As noted, human activity can have adverse impacts to wildlife species, particularly when reproductive or foraging activities are disrupted. Of particular concern are potential disturbances to the endangered least Bell's vireo (*Vireo belli pusillus*), Quino checkerspot butterfly (*Euphydryas editha quino*) and San Diego fairy shrimp (*Branchinecta sandiegonensis*), the threatened coastal California gnatcatcher (*Polioptila californica californica*), and candidate Hermes copper butterfly (*Hermelycaena [Lycaena] hermes*). Appropriate siting of visitor service facilities, interpretive signs, and trails would minimize disturbance to these species. Permanent trail closures of redundant or unsustainable user-created trails, seasonal trail closures in particularly sensitive areas (e.g., nest sites), posting

regulatory and interpretive signage to keep unauthorized users out of sensitive areas, and Refuge staff, including Federal Wildlife Officers, educating the public on how to minimize impacts to Refuge resources.

Other federally-listed species susceptible to harm as a result of off-trail activity are plants including the endangered San Diego ambrosia and San Diego thornmint (*Acanthomintha ilicifolia*), threatened Otay tarplant (*Deinandra conjugens*), and vernal pool plants including endangered San Diego button-celery (*Eryngium aristulatum* var. *parishii*), California Orcutt grass (*Orcuttia californica*), Otay mesa mint (*Pogogyne nudiscula*) and threatened spreading navarretia (*Navarretia fossalis*). The measures described above will also minimize the potential for impacts to these species as a result of authorized public uses. Fencing has been installed at several locations (e.g., the 30-acre vernal pool restoration southeast of Sweetwater Reservoir, adjacent to populations of San Diego ambrosia) to direct Refuge users away from these sensitive resources. Additional signage and/or fencing will be installed in other areas of the Refuge if monitoring indicates a need to protect plants or wildlife.

Sensitive species present on the Refuge include those covered by the Multiple Species Conservation Program (MSCP) such as burrowing owl (*Athene cunicularia*), San Diego horned lizard (*Phrynosoma coronatum*), Palmer's goldenbush (*Ericameria palmeri*), and San Diego barrel cactus (*Ferocactus viridescens*). As with listed species, impacts to sensitive species can be avoided and minimized by appropriate trail placement and maintenance, permanent and/or seasonal trail closures, and outreach and education about the Refuge's biological resources.

Disturbance as a result of the regular passage of the public along Refuge trails may decrease the functional area of suitable habitat for foraging and breeding listed and sensitive bird and butterfly species. However, public activity along these trails has been an ongoing regular activity for more than two decades and was occurring prior to establishment of the Refuge; therefore, the effect of human use may already have been manifested. By closing redundant or unauthorized trails and focusing wildlife-dependent recreational uses in areas with lower sensitivity, this disturbance can be reduced.

Public Review and Comment:

Opportunities for wildlife observation, photography, environmental education, and interpretation on the San Diego NWR were discussed at the scoping meetings held on June 14 and 15, 2006, to initiate the CCP process. A Notice of Intent was published in the *Federal Register* on May 24, 2006 (71 FR 29973). At that time, written comments were solicited. At the scoping meetings, the public was encouraged to provide verbal comments or to send us written comments following the meetings. A CCP web page was established to provide the public with specific information regarding the CCP process and the comments provided during public scoping. Planning Updates have also been prepared to summarize the progress of the CCP and to discuss specific issues related to the planning process.

This draft Compatibility Determination is being made available for public review and comment as Appendix A of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (USFWS 2014).

Determination:

__Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
The measures present here will be implemented to ensure that wildlife observation, photography, environmental education, and interpretation are compatible with purposes for which this Refuge was established.

- Adequate areas of the Refuge will be designated as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
- Regulations and wildlife friendly behavior (e.g., requirements to stay on designated trails, dogs must be kept on leash) will be posted on kiosks and at the visitor contact station and will be described in brochures.
- All public access onto the Refuge will be restricted to daylight hours (i.e., half hour before sunrise to half hour after sunset).
- Areas of the Refuge may be restricted seasonally or permanently to reduce impacts during breeding or nesting season, or to protect habitat or sensitive species.
- All activities associated with wildlife observation and photography will be restricted to the designated trail system, Refuge established overlooks, and photo blinds.
- Participants in the Refuge's environmental education and interpretation programs will be restricted to the designated trail system, visitor contact station, established environmental education areas, and other designated sites.
- A program regarding wildlife observation etiquette including ways to reduce wildlife disturbance will be established and this program will be presented to teachers during environmental education program orientation, as well as to students upon arrival during their welcome session, and to participants of guided Refuge hikes.
- Educational groups will be required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 12 students, and the teacher and adult supervisors are responsible for ensuring that students follow wildlife observation etiquette.
- Interpretive signage, displays, kiosks, and brochures will be maintained and updated as necessary to ensure that the public is receiving the message about the need to protect Refuge resources.
- Regular monitoring of public activities on the Refuge will be conducted by Refuge staff and monitoring results will be analyzed and used by the Refuge Manager to develop future modifications, if necessary, to ensure compatibility of wildlife observation, photography, environmental education, and interpretive programs.

Justification:
Providing opportunities for wildlife observation, photography, environmental education, and interpretation on the San Diego NWR will enhance the public's appreciation of the wildlife and habitat present on the Refuge. Public uses will support the Service's initiative for connecting people, particularly children, with nature, and lays a foundation for *Conserving the Future's* urban Refuge initiatives. Through these activities, the Refuge has the opportunity to introduce the public to the importance of protecting sensitive habitats not only because these habitats support federally

listed species, but because of the role these habitat play in supporting migratory birds, and rare and local plant and wildlife species. All of these outcomes are consistent with the Refuge purposes of protecting listed species. Information kiosks have been or will be installed at access points to inform visitors about Refuge habitats, wildlife, regulations, visiting opportunities, and techniques to minimize adverse impacts.

A review of the environmental consequences of implementing these uses is provided in Chapter 5 of the San Diego NWR CCP/EA (USFWS 2014). This analysis demonstrates that these uses would not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission, provided the stipulations to ensure compatibility are followed. Further, wildlife observation, photography, environmental education, and interpretation are four of the six priority public uses of the System, as defined by the Improvement Act. Therefore, implementation of these programs would contribute to the fulfillment of the Refuge System mission, and the achievement of the goals established for the Refuge, particularly the goal to enhance public appreciation, understanding, and enjoyment of the Refuge's biological and cultural resources.

Mandatory Re-Evaluation Date:

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

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

NEPA Compliance for Refuge Use Decision:

_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:

Bowles, A. E. 1995. Response of wildlife to noise. In *Wildlife and recreationists: Coexistence through management and research*, edited by R. L. Knight and D. N. Cole. Washington, D.C., Island Press.

Boyle, S. A. and F. B. Samson. 1985. Effects of non-consumptive recreation on wildlife: A review. Wildlife Society Bulletin 13:110-116.

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

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

Burger, J. 1986. The effect of human activity on shorebirds in two coastal bays in northeastern United States. Biological Conservation 13:123-130.

Burger, J. and M. Gochfeld. 1998. Effects of ecotourists on bird behavior at Loxahatchee National Wildlife Refuge, Florida. Environmental Conservation 25:13-21.

Burger, J., M. Gochfeld, and L. J. Niles. 1995. Ecotourism and birds in coastal New Jersey: Contrasting responses of birds, tourists, and managers. Environmental Conservation 22:56-65.

Cole, D. N. and J. L. Marion. 1988. Recreation impacts in some riparian forests of the eastern United States. Environmental Management 12:99-107.

Cole, D. N. and P. B. Landres. 1995. Indirect effects of recreation on wildlife. In *Wildlife and recreationists: Coexistence through management and research*, edited by R. L. Knight and K. J. Gutzwiller. Washington, D.C., Island Press.

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

Fox, A. D. and J. Madsen. 1997. Behavioral and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. Journal of Applied Ecology 34:1-13.

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

Goff, G. R., D. J. Decker, and G. Pomerantz. 1988. A diagnostic tool for analyzing visitor impacts on wildlife refuges: A basis for a systematic approach to visitor management. In *Transactions of the Northeast Section Wildlife Society 45:82*.

Gutzwiller, K. J., R. T. Wiedenmann, K. L. Clements, and S. H. Anderson. 1994. Effects on human intrusion on song occurrence and singing consistency in subalpine birds. Auk 111:28-37.

Hill, D. A., D. Hockin, D. Price, G. Tucker, R. Morris, and J. Treweek. 1997. Bird disturbance: Improving the quality and utility of disturbance research. Journal of Applied Ecology 34:275-288.

Hockin, D., M. Ounsted, M. Gorman, D. A. Hill, V. Keller, and M. A. Barker. 1992. Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. Journal of Environmental Management 36:253-286.

Klein, M. L. 1993. Waterbird behavioral responses to human disturbances. Wildlife Society Bulletin 21:31-39.

Knight, R. L. and D. N. Cole. 1995. Wildlife responses to recreationists. In *Wildlife and recreationists*, edited by R. L. Knight and K. J. Gutzwiller. Covelo, California: Island Press.

Knight, R. L. and S. A. Temple. 1995. Origin of wildlife responses to recreationists. In *Wildlife and recreation: Coexistence through management and research*, edited by R. L. Knight and K. J. Gutzwiller. Washington, D.C.: Island Press.

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

Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. Ibis 137:S67-S74.

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

Morton, J. M. 1995. Management of human disturbance and its effects on waterfowl. In *Waterfowl habitat restoration, enhancement and management in the Atlantic Flyway*, edited by W. R. Whitman, T. Strange, L. Widjeskog, R. Whittemore, P. Kehoe and L. Roberts. Dover, Delaware: Environmental Manage. Comm., Atlantic Flyway Council Techn. Sect., and Delaware Div. Fish and Wildl.

Pomerantz, G. A., D. J. Decker, G. R. Goff, and K. G. Purdy. 1988. Assessing impact of recreation on wildlife: A classification scheme. Wildlife Society Bulletin 16:58-62.

Purdy, K. G., G. R. Goft, D. J. Decker, G. A. Pomerantz, and N. A. Connelly. 1987. A guide to managing human activity on national wildlife refuges. Ft. Collins, Colorado: Office of Information Transfer, U.S. Fish and Wildlife Service.

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 (*Pylloscopus trochilus*) breeding close to a highway. Journal of Applied Ecology 31:85-94.

Rodgers, J. A., Jr. and H. T. Smith. 1997. Buffer zone distances to protect foraging and loafing waterbirds from human disturbance in Florida. Wildlife Society Bulletin 25:139-145.

Smith, L. and J. D. Hunt. 1995. Nature tourism: Impacts and management. In *Wildlife and recreationists: Coexistence through management and research*, edited by R. L. Knight and K. J. Gutzwiller. Washington, D.C., Island Press.

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment for the Proposed Acquisition of Rancho San Diego, Sweetwater II, and Lot 707 Properties for the Resolution Trust Corporation for the Proposed San Diego National Wildlife Refuge, Otay Sweetwater Unit, San Diego County, California.

U.S. Fish and Wildlife Service. 1997. Environmental Assessment and Land Protection Plan. Otay-Sweetwater Unit, San Diego National Wildlife Refuge, San Diego County, California.

U.S. Fish and Wildlife Service. 2014. San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
(Draft, May 2014)

Use: Non-Motorized Recreational Trail Use

Refuge Name: San Diego National Wildlife Refuge (San Diego County, California)

Establishing and Acquisition Authorities:
The San Diego NWR was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

Refuge Purposes:
The purposes for the initial acquisition for the San Diego NWR included:

> ". . . 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);
>
> ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . 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); and
>
> ". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge 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).

Descriptions of Use:
This Compatibility Determination addresses the proposal to allow non-motorized recreational trail use, including hiking, jogging, walking, walking a leashed dog, mountain biking, and horseback

riding, on portions of the Refuge. Trail use in and of itself is not identified as a priority public use in the National Wildlife Refuge Improvement Act; however, trails do accommodate priority public uses such as wildlife observation, photography, environmental education, and interpretation, all of which contribute to the public's understanding and appreciation of the Refuge's resources.

When the Refuge was established in 1996, the establishment document (USFWS 1995) recognized the community's interest in accessing for recreational purposes the lands to be acquired as part of the San Diego NWR. The document stated, "wildlife-oriented recreational, educational, and interpretive uses are identified as one of the purposes of the establishment of the proposed San Diego NWR." Following refuge establishment, two trails were approved for the Refuge. The Sweetwater Loop and River Trail is a designated San Diego County regional trail that traverses portions of the San Miguel Mountain and Sweetwater River areas of the Otay-Sweetwater Unit. This trail is open to non-motorized multiple uses (i.e., hiking, biking, equestrian). An additional trail was approved for the area west of Par Four Drive in the northern portion of the Sweetwater River area. This trail, also designated for multiple uses, is one of the primary equestrian routes used by Bright Valley Farms.

An estimated 16,000 to 22,000 people annually access the existing network of trails on the Otay-Sweetwater Unit to walk, run, and ride bicycles and horses. This may, however, be an underestimation of use based on the results of a short observational study conducted by a volunteer at the interpretive loop trail in spring 2011. Over 22 days of observation, 446 visitors were recorded, of which 310 were walking and 136 were running (Cortopassi 2011). Based on these observations, it was estimated that approximately 13,000 people annually use the interpretive loop, which represents only a small portion of the lands included within the Refuge. This study also revealed considerable use of the trails in the vicinity of the interpretive loop by dog walkers. During the study, a total of 140 dog walker visits were recorded, with several walkers accompanied by two or more dogs.

Bright Valley Farms, a horse stable and trail ride facility located adjacent to the Refuge, leads trail rides on the Refuge, and horse boarders at this facility tend to ride their horses primarily on Refuge land located to the north of Highway 94 and west of Par Four Drive. The interpretive loop study showed equestrians in that area on eight of the 22 observation dates. A total of 33 horses and riders were observed during the study. Equestrians may access the Sweetwater Loop and River Trail more frequently in other seasons when the area south of Highway 94 is accessible by crossing under the Highway 94 bridge at the Sweetwater River. During the time of the study, the area under the bridge was not accessible. Access to the loop trail area by equestrians is available from a county-maintained parking area located near Singer Lane and the old steel bridge parking area. Equestrians can also access this area from various neighborhoods near the Refuge and from the Summit site of Sweetwater County Park near the Sweetwater Reservoir in Bonita.

Mountain biking may be the most frequently observed use on Refuge trails. The study referenced previously noted cyclists on 20 of the 22 observation dates, with a total of 212 cyclists recorded. This user group typically travels greater distances than other users and, along with equestrians, comprises the more frequently encountered trail users in more remote portions of the Refuge. As with other user groups, cyclists access the Refuge from many locations, with the largest numbers accessing the Refuge from the Singer Lane/old steel bridge parking area and/or the community of Bonita.

Numerous unofficial pathways, old roads, utility easements, and user-created trails crisscross the lands included within the Refuge, representing more than 210 miles of disturbance within the Otay-Sweetwater Unit. The Comprehensive Conservation Plan (CCP) for the San Diego NWR (USFWS 2014) proposes a less extensive designated system of trails through the Refuge that will meet the Refuge purposes for protecting listed and sensitive species and habitats, while also addressing the desire to providing opportunities for wildlife-oriented recreation. This designated system of trails takes into consideration the availability of legal public access onto the Refuge through other public lands and from appropriate locations along adjacent public rights-of-way. Accessing the Refuge through privately owned land will not be permitted. Specific trail alignments for the Otay-Sweetwater Unit will be developed as part of a step-down trail plan.

The trail alignments on the Refuge parcels included within the Del Mar Mesa Vernal Pool Unit have been developed as part of the City of San Diego's Del Mar Mesa Preserve Management Plan. Additional information regarding the designated trail system and future access points are provided in the Draft San Diego NWR CCP/EA (USFWS 2014).

Availability of Resources:
The direct costs of providing a designated system of non-motorized recreational trails on the Refuge include costs associated with staff time, as well as costs for designing and implementing the designated trail system (e.g., realigning some trail segments to improve safety and/or sustainability, installing trail bridges, signing designated trails as open and signing other existing trails as closed); re-contouring and revegetating closed trails and pathways to reduce the extent of habitat fragmentation that has resulted from the proliferation of trails on the Refuge; and providing facilities to accommodate trail use, such as parking areas, informational and interpretive kiosks, restrooms, and a visitor contact station on the Refuge.

To fully implement a sustainable trail system with appropriate access points and signage would require staff time above and beyond the Refuge's current staffing level. The staff positions and estimated time allocations for managing and maintaining a designated trail system are presented in Table 1. The funding needs for construction and rehabilitation associated with this use are presented in Table 2 (additional project details are provided in Chapter 6 of the Draft San Diego NWR CCP/EA). New facilities would be designed and constructed as funding for these projects is identified. Potential funding sources include Federal cost share grants, interagency partnerships, State and private grants, and contributions from Friends groups.

Anticipated Impacts of the Use:
Impacts to Refuge resources associated with trails can occur due to trail construction, trail use, and/or the movement of water along or across the trail. The most obvious impacts relate to trail construction. In most cases, trail construction involves some loss of vegetation, fragmentation of habitat, and changes to the local hydrology. These impacts can be minimized by: 1) surveying potential trail alignments and selecting the alignment that has the least potential for disturbing sensitive species; 2) avoiding highly erosive soils and areas with standing water when designing a proposed alignment; and 3) ensuring that the trail alignment follows the existing contours and is designed in accordance with accepted sustainable trail design standards. On the San Diego NWR, new trail construction would only occur in association with the closure of a less sustainable route; therefore, the impacts related to vegetation loss from the new construction could be mitigated through the revegetation of the old route.

Table 1
Annual Staff Involvement Associated with Managing the Designated Trail System on the San Diego NWR

Position	Involvement	FTE*	Cost
Project Leader/Deputy Project Leader	General oversight.	0.05/0.05	$15,185
Refuge Manager	Oversight and management of the step-down trail plan; process permits; conduct NEPA compliance; oversee trail realignments, trail closures, and associated construction projects; general oversight of trail use.	0.30	$38,004
Refuge Operations Specialist	Assist in development of step-down trail plan; manage future trail realignments, trail closures, and associated construction projects; general oversight of trail use, including monitoring and outreach; informational signs and kiosks maintenance.	0.20	$16,513
Wildlife Biologist	Assist in development of step-down trail plan; monitor effects of trail uses on Refuge resources; assess the effects of trail closures and realignments on habitat and species.	0.20	$19,310
Park Ranger (NP)	Assist in development of step-down trail plan; maintain trails, signs, and other trail facilities; monitor dog activity on the trail to assess compliance with leash and cleanup requirements.	0.30	$24,770
Federal Wildlife Officer	Law enforcement.	0.30	$21,607
Maintenance Worker (NP)	Maintain trails, trail closures, signs, and other trail related facilities.	0.30	$14,797
Total FTES/Annual Costs for Staffing		**1.70**	**$150,186**

*FTE (full time equivalent) NP (New position)

Table 2
Construction and Facilities Costs Associated with Managing the Designated Trail System on the San Diego NWR

Material/Facility Required	Explanation of Need	Cost
Construct Realigned Segments of Trail within the Approved Trail System for the Otay-Sweetwater Unit	Implement the recommendations of the step-down trail plan, including the closure and rehabilitation of some 20 miles of user-created trails and the realignment of other trails to reduce impacts to Refuge trust species, re-contour eroded areas, improve trail sustainability, and/or address visitor safety.	$1,500,000

Table 2 Construction and Facilities Costs Associated with Managing the Designated Trail System on the San Diego NWR		
Material/Facility Required	**Explanation of Need**	**Cost**
Construct Visitor Parking Area, Trailhead, Information Kiosk, Temporary Contact Station	Currently, no facilities are available on the Refuge where visitors can interact with Refuge staff and have an opportunity to ask questions and receive information about Refuge resources, regulations, safety, or other topics. In addition, there is no formal parking/trail staging area available within the Sweetwater River and San Miguel Mountain areas, which represent the largest contiguous area of land (approximately 6,700 acres) within the Refuge.	$2,000,000
Interpretive/Informational Kiosks(5) at Major Trailheads on the Refuge	Information in the kiosks will inform visitors that they are entering a national wildlife refuge and explain the purpose of the Refuge, its resources, and why those resources needed to be protected.	$120,000
Install Two Trail Bridges	Design, construct, and install two trail bridges, including one near the confluence of Sweetwater River and Steele Canyon Creek and another over the drainage to the east of the Sweetwater River Trail Bridge, to reduce impacts to riparian habitat and ephemeral streams.	$230,000
Provide a Parking Area for the south Las Montañas Area	Design and construct a parking area, restroom, and required street improvements along Highway 94 for the south Las Montañas area to accommodate trail and wildlife-dependent recreational uses at this location. Access from Highway 94 is expected to require a traffic study and Caltrans encroachment permit, improvements to Highway 94 for ingress/egress, and a short vehicular bridge to cross Steele Canyon Creek.	$1,500,000
Improve Accessibility on the Sweetwater River Trail Bridge	Design, construct, and install two new access ramps for the Sweetwater River Trail Bridge to improve accessibility and better accommodate equestrians.	$100,000
Total Cost For Facilities		**$5,450,000[1]**

[1] Some of these same facilities are also listed in Compatibility Determinations for other uses proposed on the Refuge. For those facilities, the cost would only be incurred once, satisfying the needs of all such uses.

Impacts to Refuge resources from trail use can range from soil impacts to loss of listed or sensitive species. Foot traffic, bicycle tires, and horse hooves can all cause physical impacts on soil surfaces, particularly when the trail surface is damp or wet or the trail grade is steep (Cessford 1995). It is anticipated that trail use within the Refuge will cause minor soil erosion along some trails until the designated trail system becomes established. As discussed in detail in Chapter 5 of the Draft CCP/EA, existing erosion and siltation issues can be addressed through the realignment and/or closure of trails and pathways that follow the fall line of the slope and, in some cases, through trail tread improvements such as the addition of grade reversals to minimize the amount of water on the trail. At a minimum, existing trails that are experiencing excessive erosion will be realigned and/or closed to minimize adverse effects to the environment.

Trail use can also result in unauthorized off-trail activity, which can result in damage or loss of vegetation, trampling of invertebrates and reptiles, and/or disturbance or damage to nesting and breeding wildlife. Efforts involving public outreach, education programs, signage, and fencing would be implemented as appropriate on the Refuge to encourage trail users to stay on designated trails. Although many users will comply, some will not. We anticipate that noncompliance will be limited. In addition, large blocks of undisturbed habitat, closed to public use, will be available as sanctuary for native wildlife and plants.

Trail use, including dog walking, can also result in wildlife disturbance. The effects of disturbance vary with the wildlife species involved and the type, level, frequency, duration, and time of year that the disturbance occurs. A number of studies have been conducted to evaluate the effects of trail use on wildlife, with some of these studies summarized in a literature review prepared for the Stillwater NWR (DeLong and Schmidt 2000). In summarizing the findings of these studies, DeLong and Schmidt state, that wildlife observation can "negatively impact wildlife by altering wildlife behavior, reproduction, distribution, and habitat." Huffman (1999), in observing waterbird disturbance in South San Diego Bay, documented disturbance to migratory birds as a result of pedestrian activity along the shoreline. This disturbance was greatest when pedestrians left designated access ways to explore the mudflats.

Trulio and Sokale (2008), while conducting studies along the San Francisco Bay Trail, found that the number of birds decreased at trail sites as trail use increased on higher use over lower use days. Their results also seemed to support the proposal that disturbance to birds might be less when trail users are not directly approaching foraging areas, such as when they are traveling along a trail that is parallel to foraging areas rather than extending through foraging areas.

Fernández-Juricic et al. (2009) found that overall tolerance of the State listed endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) to human disturbance varies depending upon the level of disturbance occurring in a given area, as well as between seasons. In areas where there is little, if any, public use activity, alert and flight responses to human approaches were observed to be greater than those observed in higher use areas. A trend for greater alert distance and flight distance was also observed in the non-breeding season (Fernández-Juricic et al. 2009). Fernández-Juricic et al. *(*2005) found that in grassland systems, bird species differed in their alert and flight response when approached by humans depending on whether approached directly or from an angle.

Whittaker and Knight (1998) noted that wildlife response could include attraction, habituation, and avoidance. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat. According to Knight and Cole (1991), behavioral changes associated with disturbance from recreational use include short-term shifts in habitat use and complete abandonment of disturbed areas in favor of undisturbed sites.

Flight in response to other disturbance can lower songbird nesting productivity, cause disease, and in extreme cases (predation) can result in death. Knight and Cole (1991) suggest that recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife, mostly from unintentional harassment. Other studies of recreation effects on wildlife have found that smaller mammals flush from humans who are at a further distance away than do larger mammals (Taylor and Knight 2003) and that mammals exhibit both spatial and temporal displacement from recreational trails (George and Crooks 2006).

Seasonal sensitivities are also important in wildlife responses to human disturbance. For an animal species that is already stressed, human disturbance can compound the already stressful situation. Examples of such disturbance include regularly flushing birds during nesting, exposing juvenile animals to greater predation levels, or causing mammals to flee during winter months. Hammitt and Cole (1998) note that females (such as deer) with young are more likely to flee from a disturbance than those without young.

Anticipated impacts of bicycle use on wildlife would be similar to the impacts of foot travel and include temporal disturbances to species using habitat directly adjacent to the designated routes. Although there is some temporary disturbance to wildlife due to human activities, the disturbance is generally localized and does not have an adverse effect on overall populations. Wildlife disturbance from horseback riding is not well documented, but some studies suggest that many wildlife species are habituated to livestock and that equestrians can approach wildlife at closer distances than by other forms of travel. Burger (1986) found that people on horseback did not seem to threaten birds even though they frequently moved rapidly. Birds flushed only to avoid trampling. Burger (1986) surmised that the birds perceived only the horse and not the person riding the horse.

The presence of dogs, even on leashes, can have a negative effect on wildlife since they may be perceived as predators by wildlife that are prey for canids and scent-mark along the trail (George and Crooks 2006, Lenth et al. 2008). Off leash, while they may not be effective hunters, dogs may chase prey animals or alarm wildlife while moving through vegetation. Dogs, when leashed, are permitted on the Refuge but may only use those trails designated for multiple use. Nearly a third of trail users in the interpretive loop trail area are accompanied by dogs. Some of this user group has expressed to Refuge staff that they might not otherwise come to the Refuge but for their dog. The level of disturbance from dogs diminishes with distance (Sime 1999); therefore, large areas of the Refuge where no trail use is permitted would not be affected by the presence of dogs elsewhere on the Refuge.

The alternative of closing off access to dog walkers would likely reduce the neighboring communities' support for the Refuge's overall conservation program, including land acquisition, species monitoring, and habitat restoration and management. Therefore, members of the public will be conditionally allowed to walk leashed dogs on multiple-use trails, provided the leash is six feet or shorter in length and all dog waste is properly collected and disposed of in designated trash

receptacles. Refuge staff will continue outreach and education efforts to minimize the negative effects of dogs on wildlife and habitat quality. If the presence of dogs on the Refuge is determined in the future to have unanticipated deleterious effects on wildlife, habitat, or water quality, dogs may be prohibited on some or all areas of the Refuge without prior notice.

Education and public outreach can help make visitors aware that their actions can have negative impacts on birds and other wildlife, and it will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who had spoken with Refuge staff or volunteers were less likely to disturb birds. Increased surveillance may also help reduce visitor caused disturbance (Knight and Gutzwiller 1995). Refuge staff have developed a brochure for dog walkers that provides information on why dogs must be leashed and where off-leash dog parks are located. Monitoring is recommended to adjust management techniques over time, particularly because it is often difficult to generalize about the impacts of specific types of recreation in different environments. Local and site-specific knowledge is necessary to determine effects on wildlife and to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

Endangered and Threatened Species and Sensitive Species: As noted, human activity can have adverse impacts to wildlife species, particularly when reproductive or foraging activities are disrupted. Of particular concern are potential disturbances to the endangered least Bell's vireo (*Vireo belli pusillus*), Quino checkerspot butterfly (*Euphydryas editha quino*) and San Diego fairy shrimp (*Branchinecta sandiegonensis*); the threatened coastal California gnatcatcher (*Polioptila californica californica*); and candidate Hermes copper butterfly (*Hermelycaena [Lycaena] hermes*). Appropriate trail placement and maintenance that accommodates authorized trail use will avoid and minimize disturbance to these species. Permanent trail closures of redundant or unsustainable user-created trails, seasonal trail closures in particularly sensitive areas (e.g., breeding sites), posting regulatory and interpretive signage to keep unauthorized users out of sensitive areas, and Refuge staff, including Federal Wildlife Officers, educating the public on appropriate trail use will also aid in avoiding and reducing impacts.

Other federally-listed species susceptible to harm as a result of off-trail activity are plants, including the endangered San Diego ambrosia (*Ambrosia pumila*) and San Diego thorn-mint (*Acanthomintha ilicifolia*); threatened Otay tarplant (*Deinandra conjugens*); and vernal pool plants, including endangered San Diego button celery (*Eryngium aristulatum* var. *parishii*), California Orcutt grass (*Orcuttia californica*), Otay Mesa mint (*Pogogyne nudiscula*); and threatened spreading navarretia (*Navarretia fossalis*). The measures described here will also minimize the potential for impacts to these species as a result of authorized public uses. Fencing has been installed at several locations of these species (e.g., at the 30-acre vernal pool restoration southeast of Sweetwater Reservoir and at San Diego ambrosia populations) to direct Refuge users away and further minimize disturbance to these species. Additional signage and fencing could be installed in problem areas.

Sensitive species present on the Refuge include those covered by the Multiple Species Conservation Program (MSCP) such as burrowing owl (*Athene cunicularia*), San Diego horned lizard (*Phrynosoma coronatum*), Palmer's goldenbush (*Ericameria palmeri*), and San Diego barrel cactus (*Ferocactus viridescens*). As with listed species, impacts to sensitive species can be avoided and minimized by appropriate trail placement and maintenance, permanent and/or seasonal trail closures, and outreach and education to trail users about the Refuge's biological resources.

Listed birds and butterflies may be disturbed by the regular passage of the public along the trails, which may decrease the functional area of suitable habitat for foraging and breeding. However, trail use along proposed trails has been an ongoing regular activity for more than two decades and was occurring prior to establishment of the Refuge; therefore, the effect of human use may already have been manifested. By closing redundant or unauthorized trails, there is the potential to reduce the effects of that type of disturbance. Death of listed bird species is not anticipated from use of approved trails. Listed or candidate butterflies may have a small potential for death or injury since adults may be nectaring on or eggs/larvae may be present in habitat/plants immediately adjacent to trails. If a trail user steps off trail to allow another to pass (as is common for hikers and cyclists to do when passing equestrians), injury or death to these butterfly species may occur. Specific trail alignments developed during step-down trail planning will take into consideration sensitive habitats that support these and other potentially vulnerable species and will align trails in a manner that avoids the potential for such deleterious effects.

Sensitive species, such as San Diego horned lizard and orange-throated whiptail lizard (*Aspidoscelis hyperythra beldingi*), as well as snakes, small mammals, and insects, are more likely to be killed or injured from trail use since they may be encountered on the ground. Because a bicycle's tire is in constant contact along the trail, as opposed to discrete steps of either a horse or human foot, bikes may pose a greater death or injury risk to animals that are ground dwellers. Bicyclists, given their mode of transportation, are likely to travel longer distances and thus have more chance of encounters with trail-surface wildlife. We do not have robust data on these species' populations, and animals are rarely found dead on the trail since they are quickly removed by scavengers. Therefore, it would be difficult to detect if trail-related uses are negatively affecting populations. Educating trail users about the presence of such species will raise awareness and potentially lead to avoidance or minimizing impacts to these species.

Public Review and Comment:

Opportunities for trail use on the San Diego NWR were discussed at the scoping meetings held on June 14 and 15, 2006, to initiate the CCP process. A Notice of Intent was published in the *Federal Register* on May 24, 2006 (71 FR 29973). At that time, written comments were solicited. At the scoping meetings, the public was encouraged to provide verbal comments or to send us written comments following the meetings. A CCP web page was established to provide the public with specific information regarding the CCP process and the comments provided during public scoping. Planning Updates have also been prepared to summarize the progress of the CCP and to discuss specific issues related to the planning process.

This draft Compatibility Determination is being made available for public review and comment as Appendix A of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (USFWS 2014).

Determination:

__ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

- All trail uses are restricted to the Refuge's designated trail system, with non-motorized trail use, specifically pedestrian use, bicycling, horseback riding, and leashed dog walking, permitted on the Refuge on those trails designated and posted for multiple use.
- Only pedestrian use is permitted on Refuge trails designated and posted for hiking only.
- All public access, including trail use, on the Refuge will be restricted to daylight hours (i.e., half hour before sunrise to half hour after sunset).
- Areas of the Refuge may be restricted seasonally or permanently to reduce impacts during breeding or nesting season, or to protect habitat or sensitive species.
- Trail use by groups of more than 10 cyclists, equestrians, or pedestrians, or trail use for special events (e.g., non-Refuge hikes, runs, rides), will require a special use permit.
- Regulatory and directional signs will clearly mark designated routes of travel and areas closed to the public.
- Upon completion of the step-down trail plan, or earlier if available, trail maps and public use information will be made available at Refuge offices, kiosks, and the Refuge's website: http://www.fws.gov/sandiegorefuges/Otay.htm.
- Regulations and wildlife-friendly behavior (e.g., requirements to stay on designated trails, dogs must be kept on leash, clean up after dog) will be posted on kiosks and at the visitor contact station and will be described in brochures.
- Adequate areas of the Refuge will be designated as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
- Interpretive signage, displays, kiosks, and brochures will be maintained and updated as necessary to ensure that the public is receiving the message about the need to protect Refuge resources.
- Regular monitoring of trail use, including dog walking, on the Refuge will be conducted by Refuge staff, and monitoring results will be analyzed and used by the Refuge Manager to develop future modifications, if necessary, to ensure compatibility.
- Periodic law enforcement patrols will be conducted.

Justification:

The Refuge's location within and adjacent to urban/suburban development makes it attractive to the public. While we acknowledge deleterious effects to wildlife from the presence of humans, as noted by the references cited previously, restricting access to the Refuge would minimize our ability to generate support for the Refuge's overall conservation program, including land acquisition, species monitoring, and habitat restoration and management. By allowing the public onto the Refuge and making education and interpretation of the Refuge's biological diversity an important component of everyday Refuge work, we can reduce the deleterious effects and garner support from the public for ongoing and future conservation actions.

While not listed as a priority, wildlife-dependent recreational use under the National Wildlife Refuge Improvement Act, as amended, non-motorized trail use does provide opportunities for the public to observe wildlife and native habitats, engage in nature photography, and participate in interpretive and environmental education programs on the San Diego NWR. By providing for these opportunities, we can enhance the public's appreciation for the biological, cultural, and physical resources present within this Refuge. Public uses will support the Service's initiative for connecting people, particularly children, with nature, and lays a foundation for *Conserving the Future's* urban Refuge initiatives. Through these activities, the Refuge has the opportunity to introduce the public to the importance of protecting sensitive habitats—not only because these habitats support federally listed species, but also because of the role these habitat play in

supporting migratory birds and rare and local wildlife. All of these outcomes are consistent with the Refuge purposes of protecting listed species. Bicycling, horseback riding, and dog walking on designated trails are considered low impact uses. Many parts of the refuge are unavailable for day use without bike or horse access since distances are too great to allow access by foot. Allowing leashed dogs will permit the dog walking community to also gain appreciation of the conservation actions of the Refuge. Information kiosks have been or will be installed at access points to inform visitors about Refuge habitats, wildlife, regulations, visiting opportunities, and techniques to minimize adverse impacts, including areas closed to access.

The CCP envisions a trail system that includes sustainably constructed trails with alignments that avoid sensitive habitats and areas that support listed and sensitive species. However, achieving this vision will require staff time and the identification of funding sources in order to implement the various components of the trail system. A step-down trail plan will be developed upon completion of the San Diego NWR CCP that will define specific trail alignments and prioritize needs for trail realignments, reconstruction, and closure. As part of the step-down plan, those existing trail segments that represent the greatest potential for impact to Refuge resources will be identified, and short-term measures (e.g., full or seasonal trail closures, drainage corrections, minor realignments) will be developed that can be implemented using a combination of existing staff, available funding, and volunteer assistance. The step-down trail plan will also address long-term measures to minimize impacts related to existing user-created trails and old roads on the Refuge. Such measures include major trail realignments and restoring the natural contours and native vegetation in locations where unsustainable trail alignments were once present.

The analysis of potential effects to the environment provided in the environmental assessment prepared to accompany the CCP (USFWS 2014) demonstrates that trail use would not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission, provided the stipulations to ensure compatibility are followed. Further, trail use facilitates other uses such as wildlife observation, photography, interpretation, and environmental education, therefore contributing to the fulfillment of the Refuge System mission and the achievement of the goals established for the Refuge, particularly the goal to enhance public appreciation, understanding, and enjoyment of the Refuge's biological and cultural resources through outreach opportunities and quality wildlife-dependent recreation.

Mandatory Re-Evaluation Date:

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

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

NEPA Compliance for Refuge Use Decision:

_ 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:

Burger, J. 1986. The effect of human activity on shorebirds in two coastal bays in northeastern United States. Biological Conservation 13:123-130.

Cessford, G. R. 1995. Off-road mountain biking: A profile of participants and their recreation setting and experience preferences. Department of Conservation.

Cortopassi, R.L. 2011. Visitation Study at San Diego National Wildlife Refuge Interpretive Loop Trail. Cooperative Work Experience Report for Environmental Management ENVT 240, Section 8943. Cuyamaca College, El Cajon, CA. May 13, 2011.

DeLong, Anita and Janet Schmidt. 2000. Literature Review: Effects of Human Disturbance on Wildlife with Emphasis on Wildlife-Dependent Recreation Relevant to Stillwater National Wildlife Refuge (Draft).

Fernández-Juricic, E., M. P. Venier, D. Renison, D. T. Blumstein. 2005. Sensitivity of wildlife to spatial patterns of recreationist behavior: A critical assessment of minimum approaching distances and buffer areas for grassland birds. Biological Conservation 125:225-235.

Fernández-Juricic, E., E. F. Zahn, T. Parker, and T. Stankowich. 2009. California's endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*): tolerance of pedestrian disturbance. *Avian Conservation and Ecology - Écologie et conservation des oiseaux* 4(2): 1. [online] URL: http://www.ace-eco.org/vol4/iss2/art1/.

George, S.L., and K.R. Crooks. 2006. Recreation and large mammal activity in an urban nature reserve. Biological Conservation 133:107-117.

Hammitt, W. E. and D. N. Cole. 1998. Wildland Recreation: Ecology and Management. 2nd ed. New York: John Wiley and Sons.

Hill, D. A., D. Hockin, D. Price, G. Tucker, R. Morris, and J. Treweek. 1997. Bird Disturbance: Improving the quality and utility of disturbance research. Journal of Applied Ecology 34:275-288.

Hockin, D., M. Ounsted, M. Gorman, D. A. Hill, V. Keller, and M. A. Barker. 1992. Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. Journal of Environmental Management 36:253-286.

Huffman, Kathy. 1999. San Diego South Bay Survey Report – Effects of Human Activity and Water Craft on Wintering Birds in the South San Diego Bay.

Klein, M. L. 1993. Waterbird behavioral responses to human disturbances. Wildlife Society Bulletin 21:31-39.

Klein, M. L., S. R. Humphrey, and H. F. Percival. 1995. Effects of ecotourism on distribution of waterbirds in a wildlife refuge. Conservation Biology 9:1454-1465.

Knight, R. L. and D. N. Cole. 1991. Effects of recreational activity on wildlife in wildlands. In *Transactions of the 56th North American Wildlife & Natural Resources Conference*.

Knight, R. L. and K. J. Gutzwiller, eds. 1995. Wildlife and recreationists: Coexistence through management and research. Washington, D.C.: Island Press.

Lenth, B. E., R. L. Knight, and M. E. Brennan. 2008. The effects of dogs on wildlife communities. Natural Areas Journal 28(3):218-227.

Sime, C.A. 1999. Domestic dogs in wildlife habitats, p. 8.1–8.17 *in* Joslin, G., and Youmans, H., coordinators, Effects of recreation on Rocky Mountain wildlife–A review for Montana: Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society, 307 p.

Taylor, A.R. and K. L. Knight. 2003. Wildlife responses to recreation and associated visitor perceptions. Ecological Applications 13(4):951-963.

Trulio, Lynne and Jana Sokale. 2008. Foraging Shorebird Response to Trail Use around San Francisco Bay. *Journal of Wildlife Management* 72(8):1775-1780.

U.S. Fish and Wildlife Service (USFWS). 1995. Final Environmental Assessment for the Proposed Acquisition of Rancho San Diego, Sweetwater II, and Lot 707 Properties for the Resolution Trust Corporation for the Proposed San Diego National Wildlife Refuge, Otay Sweetwater Unit, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 1997. Environmental Assessment and Land Protection Plan. Otay-Sweetwater Unit, San Diego National Wildlife Refuge, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 2014. San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment.

Whittaker, D. and R. L. Knight. 1998. Understanding wildlife responses to humans. Wildlife Society Bulletin 26:312-317.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional Director, Refuges: _____ _____
(Signature) (Date)

FINDING OF APPROPRIATENESS OF A REFUGE USE

Written Justification

Refuge Name: San Diego National Wildlife Refuge

Use: Non-Motorized Recreational Trail Use

Justification for Determining that this Use is an Appropriate Use for the Refuge:

Although trail use is not identified as a wildlife-dependent recreational use, trails do provide opportunities for the public to participate in a number of wildlife-dependent recreational uses including wildlife observation, photography, interpretation, and environmental education. The Refuge's location within and adjacent to urban/suburban development makes it attractive to the members of the public interested in recreation. While we acknowledge some deleterious effects to wildlife from the presence of humans, closing all access to the Refuge would reduce public support for the Refuge's overall conservation program, including land acquisition, species monitoring, and habitat restoration and management. Establishing a designated trail system through a portion of the Refuge, while maintaining other large blocks of Refuge land as closed to public access, will provide the public with opportunities to experience the range of habitats and species conserved within the Refuge in a manner that does not compromise overall habitat quality or species recovery. In my professional judgment permitting non-motorized recreational trail use, including pedestrian, equestrian, and mountain bike use, is an appropriate use on the San Diego NWR.

Refuge Manager: _____ Date: _____

Refuge Supervisor: _____ Date: _____

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Diego National Wildlife Refuge

Use: Non-Motorized Recreational Trail Use

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager:_____ Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____ Date:_____

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Compatibility Determination
(Draft, May 2014)

Use: Scientific Research

Refuge Name: San Diego National Wildlife Refuge (San Diego County, California)

Establishing and Acquisition Authorities:
The San Diego NWR was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

Refuge Purposes:
The purposes for the initial acquisition for the San Diego NWR included:

> ". . . 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);
>
> ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . 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); and
>
> ". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge 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).

Descriptions of Use:
This Compatibility Determination addresses the continuation of scientific research on the Refuge. Scientific research has played an important role in the development of management actions on the San Diego NWR, particularly with respect to monitoring strategies, understanding the phenology and life cycle processes of listed and sensitive species, control of invasive species, species interactions, and the effects of fire on plants and wildlife.

The Refuge Manager receives periodic requests to conduct scientific research on the Refuge. Research is not identified as a wildlife-dependent recreational use by the National Wildlife Refuge System Improvement Act; however, scientific research can benefit Refuge resources through facilitation of informed management decisions. The knowledge gained through scientific research also contributes to environmental educational and interpretation. In so doing, scientific research conducted on the Refuge would support Refuge purposes and the mission of the National Wildlife Refuge System. Based on the Refuge purposes, priority would be given to scientific research that contributes to the enhancement, protection, and management of listed and sensitive species and their habitats. However, research that addresses migratory birds, fire management, invasive species, and other wildlife and habitat management issues, along with research directed at understanding the effects of recreational activities on Refuge resources, would all benefit the Refuge and support Refuge purposes.

Research applicants would be required to submit a proposal summarizing:

1) objectives of the study;
2) justification for the study;
3) detailed study methodology and schedule;
4) potential impacts to Refuge wildlife and/or habitats, including short- and long-term disturbance, injury, and mortality;
5) research personnel required and their qualifications and experience;
6) status of necessary permits (i.e., scientific collecting permits, endangered species permit);
7) costs to Refuge and Refuge staff time requested, if any; and
8) anticipated end products (i.e., reports, publications).

Research proposals would be reviewed by Refuge staff or others, as appropriate. The criteria listed here, and others as necessary, would be used to assess research proposals.

1) Research that would contribute to the enhancement, protection, and management of listed species and their habitats and research that could provide insight into current or future Refuge management would have higher priority than other requests.

2) Research that would conflict with other ongoing research, monitoring, or management programs would not be approved.

3) Research projects that can be carried out elsewhere (off-Refuge) would be less likely to be approved.

4) Research that causes undue disturbance or is intrusive would likely not be approved. The degree and type of disturbance would be carefully weighed when evaluating a research request. Many nesting birds, including the federally listed least Bell's vireo (*Vireo bellii*

pusillus) and the federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*), are sensitive to human disturbance (DeLong and Schmidt 2000, Kus 2002, Varanus Biological Services, Inc. and Campbell BioConsulting, Inc. 2003), and disturbance around nesting and foraging sites could have an adverse effect on reproductive success. Listed and sensitive plants are could be subject to trampling.

5) Evaluation of research requests would determine whether any effort has been made to minimize disturbance through study design (for example, by considering adjustments in the location, timing, or scope of the study; the number of participants, study methods; the number of study sites, etc.).

6) If it would be impossible for the Refuge to monitor researcher activities because of staffing or logistical constraints, requests for research may be denied, depending on the circumstances.

7) The duration of the project would be considered and agreed upon before approval.

Open-ended research projects would not be approved. All projects would be reviewed annually to assess whether they continue to meet these criteria (and others as necessary), continue to operate as originally proposed, and contribute to the objectives of the study.

Approved research projects would be conducted under a Refuge-issued Special Use Permit (SUP) with case-specific stipulations.

Availability of Resources:
Adequate funding and staff exist to manage some level of scientific research at the San Diego NWR. As always, discretionary use of staff time would be weighed through a cost-benefit analysis. Direct costs to administer research activities are primarily in the form of staff time. Table 1 describes the level of involvement by Refuge staff that will be required annually to manage and monitor research activities on the Refuge, as well as the associated funding and annual costs (based on FY 2011 costs).

Table 1
Annual Staff Involvement
Associated with Managing Scientific Research Conducted on the San Diego NWR

Position	Involvement	FTE	Cost
Refuge Manager	Periodic on-site oversight	0.04	$5,067
Wildlife Biologist	Review and oversight of research proposals; preparation of SUP; monitoring to ensure compatibility; report review; coordination of researcher access	0.20	$19,311
Total FTEs and Costs for Staffing		0.24	$24,378

*FTE (full time equivalent)

Anticipated Impacts of the Use:
Through the Special Use Permit process, project-specific conditions can be placed on individual research proposals to ensure that the potential for impacts to Refuge resources are minimized. Some level of disturbance is expected with all research activities since most researchers will be entering areas that are normally closed to the public and may be collecting samples or handling wildlife. Impacts related to the implementation of scientific research on the Refuge are discussed in greater detail in Chapter 5 of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) (USFWS 2014).

Endangered and Threatened Species:
Human activity can have adverse impacts on endangered and threatened species, particularly when it disrupts bird nesting or foraging activities for species such as least Bell's vireo (Kus 2002) and coastal California gnatcatcher, or when it results in trampling of listed plants, Quino checkerspot butterfly host plants, or butterfly larvae. The Refuge supports critical habitat for a number of listed species, as described in the CCP, and human disturbance associated with scientific research has the potential to directly affect habitat quality and individual plants or animals, as well as indirectly affect species and habitat due to physical disturbance to the site.

To minimize disturbance to wildlife and habitat resources, proposals for research activities would be evaluated and appropriate restrictions would be imposed to ensure that no significant adverse effects to such resources would occur. For example, restrictions would be imposed in spring in areas that support listed or sensitive butterfly larvae or nesting listed bird species, in October through July in the vicinity of eagle nests, or in winter in hibernating bat habitat. Such restrictions would be imposed whether research projects are or are not directly related to such species. All research would be evaluated to ensure that no adverse effects to listed species or their habitat would occur as a result of the study design and/or implementation, or to ensure that if adverse effects occur, they are minimal and are outweighed by the benefit to the management of the species.

Researchers working directly with federally listed species would be required to comply with section 10(a)(1)(A) of the Endangered Species Act and possess the appropriate permit.

Public Review and Comment:
The proposal to continue to accommodate compatible scientific research on the Refuge was discussed at the scoping meetings held on June 14 and 15, 2006, to initiate the CCP process. A Notice of Intent was published in the *Federal Register* on May 24, 2006 (71 FR 29973). At that time, written comments were solicited. At the scoping meetings, the public was encouraged to provide verbal comments or to send us written comments following the meetings. A CCP web page was established to provide the public with specific information regarding the CCP process and the comments provided during public scoping. Planning Updates have also been prepared to summarize the progress of the CCP and to discuss specific issues related to the planning process.

This draft Compatibility Determination is being made available for public review and comment as Appendix A of the San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment (USFWS 2014).

Determination:

__ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
Concerns about protecting listed species and the overall integrity of the habitats present on the Refuge require that Refuge staff closely review proposed research projects and that research activities and impacts be monitored. To minimize the potential for adverse effects to Refuge resources related to scientific research, the following measurers would be implemented:

- All research requests must include a detailed description of the study proposal (at a minimum, the description should address the purpose of the research, the potential benefits to Refuge management and/or Refuge resources, the number of participants, the times of the year in which field studies and/or data collection would occur, how the studies or data collection will be implemented, the areas on the Refuge that would be accessed, any potential adverse effects on Refuge resources that could occur and the measures that would be implemented to minimize such impacts, and when study results would be made available to the Refuge Manager);
- Highly intrusive or manipulative research will generally not be permitted;
- Proposed research methods that have the potential to adversely affect Refuge resources will generally not be permitted (however, if it can adequately demonstrated that the research will provide significant benefits in terms of achieving Refuge purposes despite the potential for some adverse effects, the Refuge Manager has the discretion to permit such research provided the researcher can identify potential impacts in advance of their occurrence, implement measures to minimize potential impacts, and agrees to all conditions presented in the Special Use Permit);
- Approval of research projects on the Refuge will be permitted at the discretion of the Refuge Manager, who will consider the compatibility of the proposed research with Refuge purposes, the proximity of research activities to sensitive habitat and known nesting areas, the potential for impacts to Refuge resources, and the availability of Refuge staff to manage and monitor the research activities;
- All research projects will be conducted under a Special Use Permit, which will have additional project-specific stipulations;
- Special Use Permits will be valid for one year only (renewals will be subject to review and approval by the Refuge Manager, who will consider the current status of the study, the researcher's compliance with the conditions outlined in the Special Use Permit, and the extent of anticipated or unanticipated impacts, if any, that occurred as a result of the specific research project);
- Refuge staff may accompany researchers at any time to assess study methods and the potential for impacts to Refuge resources;
- The Refuge Manager can suspend or modify conditions or terminate on-refuge research that is already permitted and in progress, should unacceptable impacts or issues arise or be noted;
- Researchers will be responsible for acquiring and/or renewing any necessary State and Federal permits prior to beginning or continuing their project;

- Research must adhere to current species protocols for data collection; and
- If the phenology of the phenomenon being studied allows, research will generally be conducted outside of the breeding season of the bird species using the Refuge.

Justification:
To be permitted on the Refuge, scientific research projects would be required to contribute to the enhancement, protection, use, preservation, and/or management of Refuge resources. The anticipated level of research to be conducted on the Refuge at any given time would be compatible because the Refuge would ensure that research proposals support the purpose of the Refuge and mission of the System. In view of the impacts research activities may have on the Service's ability to achieve the Refuge purpose, sufficient restrictions will be placed on the researcher to ensure that disturbance is kept to a minimum. This program as described is determined to be compatible.

Mandatory Re-Evaluation Date:

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

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

NEPA Compliance for Refuge Use Decision:

_ 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:

DeLong, Anita and Janet Schmidt. 2000. Literature Review: Effects of Human Disturbance on Wildlife with Emphasis on Wildlife-Dependent Recreation Relevant to Stillwater National Wildlife Refuge (Draft).

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). *In* The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

U.S. Fish and Wildlife Service (USFWS). 1995. Final Environmental Assessment for the Proposed Acquisition of Rancho San Diego, Sweetwater II, and Lot 707 Properties for the Resolution Trust Corporation for the Proposed San Diego National Wildlife Refuge, Otay Sweetwater Unit, San Diego County, California.

U.S. Fish and Wildlife Service (USFWS). 1997. Environmental Assessment and Land Protection Plan. Otay-Sweetwater Unit, San Diego National Wildlife Refuge, San Diego County, California.

U.S. Fish and Wildlife Service. 2014. San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment. San Diego National Wildlife Refuge Complex, Chula Vista, CA.

Varanus Biological Services, Inc. and Campbell BioConsulting, Inc. 2003. Report of Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California. Prepared for Department of Parks and Recreation, County of San Diego.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional Director, Refuges: _____ _____
(Signature) (Date)

FINDING OF APPROPRIATENESS OF A REFUGE USE

Written Justification

Refuge Name: San Diego National Wildlife Refuge

Use: Scientific Research

Justification for Determining that this Use is an Appropriate Use for the Refuge:

Although scientific research is not identified as a wildlife-dependent recreational use, the information provided as a result of selectively permitting such use on the Refuge can benefit Refuge resources and facilitate informed management decisions. Based on the Refuge proposes, priority would be given to scientific research that contributes to the enhancement, protection, and management of listed and MSCP-covered species and their habitats. All research applications would be reviewed to ensure that the research objectives and justification, study methodology, schedule, and anticipated end products would provide useful information to assist with resource management on the Refuge. Additionally, all proposals would be reviewed to ensure that implementation of the research proposal would not result in significant disturbance or other impacts to Refuge resources. Because sufficient restrictions can be placed on the researcher to ensure that disturbance and other potential impacts are kept to a minimum, in my professional judgment scientific research is an appropriate use on the Refuge.

Refuge Manager: _____ Date: _____

Refuge Supervisor: _____ Date: _____

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Diego National Wildlife Refuge

Use: Scientific Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager:_____ Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____ Date:_____

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06