Appendix G. Compatibility Determinations for Existing and Proposed Uses

Appropriate Use Policy

This policy describes the initial decision process the refuge manager follows when first considering whether or not to allow a proposed use on a refuge. The refuge manager must find a use appropriate before undertaking a compatibility review of the use. An appropriate use, as defined by the Appropriate Use Policy (603 FW 1 of the Service Manual), is a proposed or existing use on a refuge that meets at least one of the following four conditions:

- The use is a wildlife-dependant recreational use as identified in the Improvement Act.
- The use contributes to the fulfilling of the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law.
- The use involves the take of fish and wildlife under State regulations.
- The use has been found to be appropriate as specified in section 1.11 (603 FW 1 of the Service Manual).

If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility. If a use is determined to be an appropriate refuge use, the refuge manager will then determine if the use is compatible (see Compatibility section below). Although a use may be both appropriate and compatible, the refuge manager retains the authority to not allow the use or modify the use. Uses that have been administratively determined to be appropriate are the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, environmental education, and interpretation) and take of fish and wildlife under State regulations. Table 1 summarizes the appropriateness findings for existing and proposed uses on each refuge.

Compatibility Policy

Lands within the NWRS are different from other multiple use public lands in that they are closed to all public uses unless specifically and legally opened. The Improvement Act states ". . . the Secretary shall not initiate or permit a new use of a Refuge or expand, renew, or extend an existing use of a Refuge, unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety." The Improvement Act also states that ". . . compatible wildlife-dependent recreational uses [hunting, fishing, wildlife observation and photography, or environmental education and interpretation] are the priority general public uses of the System and shall receive priority consideration in Refuge planning and management."

In accordance with the Improvement Act, the Service has adopted a Compatibility Policy (603 FW 2) that includes guidelines for determining if a use proposed on a National Wildlife Refuge is compatible with the purposes for which the refuge was established. A compatible use is defined in the policy as a proposed or existing wildlife-dependent recreational use or any other use of a National Wildlife Refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the NWRS mission or the purposes of the Refuge. The Policy also includes procedures for documentation and periodic review of existing refuge uses.

When a determination is made as to whether a proposed use is compatible or not, this determination is provided in writing and is referred to as a compatibility determination. An opportunity for public review and comment is required for all compatibility determinations. For compatibility determinations prepared concurrently with a CCP or step-down management plan, the opportunity for public review and comment is provided during the public review period for the draft plan and associated NEPA document. Table 1 summarizes the compatibility findings for each refuge. Draft compatibility determinations for the existing and proposed uses on each refuge follow Table 1.

Table 1. Summary of Appropriateness and Compatibility Findings, Desert NWR Complex

Existing/Proposed Use	*Use Appropriate?*	*Use Compatible?*[1]
Ash Meadows NWR		
Wildlife Observation & Photography	yes	yes
Environmental Education & Interpretation	yes	yes
Hunting; Waterfowl, Upland	yes	yes
Fishing	yes	yes
Boating	no	
Research	yes	yes
Virtual Geocacheing	yes	yes
Geocacheing	no	
Swimming	no	
Horseback riding	no	
Off-Road Vehicle Use	no	
Camping	no	
Use of incendiary devices	no	
Desert NWR		
Wildlife Observation & Photography	yes	yes
Environmental Education & Interpretation	yes	yes
Hunting; Sheep	yes	yes
Research	yes	yes
Geocacheing	no	
Pine Nut Gathering	yes	yes
Camping; Dispersed and at Mormon Wells	yes	yes
Hiking and Backpacking	yes	yes
Rock Climbing	no	
Horseback Riding	yes	yes
Fun Run	no	
Robotics Automotive Testing	no	
Dog Burials	no	
Group Camping/Festival	no	
Large Group Picnics	no	
Off-Road Vehicle Use	no	
Water Monitoring	yes	yes
Moapa NWR		
Wildlife Observation & Photography	yes	yes
Environmental Education & Interpretation	yes	yes
Research	yes	yes
Water Monitoring	yes	Yes

[1] Compatibility determinations are not prepared for uses found not appropriate.

Pahranagat NWR		
Wildlife Observation & Photography	yes	yes
Environmental Education & Interpretation	yes	yes
Hunting; Waterfowl, Upland	yes	yes
Fishing	yes	yes
Boating	yes	yes
Motorized Boating	no	
Research	yes	yes
Camping	no	
Swimming	no	
Horseback Riding	no	
Weddings	no	

COMPATIBILITY DETERMINATION

Use: Wildlife Observation and Photography

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as wildlife dependent public uses for NWR's. As two of the six priority public uses of the Refuge System, these uses are to be encouraged when compatible with the purposes of the Refuge. Wildlife observation and photography are considered simultaneously in this compatibility determination. Many elements of wildlife observation and photography program are also similar to opportunities provided in the environmental education and interpretation programs.

Ash Meadows Refuge is open to the public for wildlife observation and photography daily from sunrise to sunset. Currently, there are nearly 65,000 visits annually to the Refuge. Typical use is by individuals, family groups, school groups, and large groups during Refuge-sponsored special events. Year round hiking is permitted along designated roads and trails. Crystal Springs Interpretive Boardwalk (1/3 mile long) provides an up-close view of the springs, fish and plants of the Refuge without disturbing the fragile habitat.

All motorized vehicles must be properly licensed and restricted to designated roads and all off-highway vehicles are prohibited. Watercrafts are not allowed for use in Refuge waters.

Wildlife observation and photography are considered together in this compatibility determination because both are considered to be wildlife-dependent, non-consumptive uses and many elements of these programs are similar. Both of these public uses are dependent upon establishing access within the Refuge. An estimated 65,000 annual visitors participate in various wildlife-dependent activities on the Refuge.

Future access within the Refuge will be increased through the careful planning and construction of interpretive boardwalks and back country trails, photography/hunting blinds, and observation decks. These access points will be planning to potentially improve visitors' wildlife observation and photography opportunities. Interpretive panels will be designed for each of these access points so as to assist those unfamiliar with the area in determining what they may be able to observe and photograph there. Written materials will also be developed with wildlife checklists.

Availability of Resources:
The Refuge receives approximately 65,000 visitors each year. Most of those visitors are hoping to observe the unique set of wildlife found only at Ash Meadows NWR. Fewer attempt to capture Refuge inhabitants on film or in digital form but that sector seems to be growing. Once the infrastructure is in place, some of which will be completed (POR and Longstreet interpretive boardwalks) before the end of 2008, the maintenance of that infrastructure and the program should be easily managed.

The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	**Annual Costs**
Administration		$2,500
Interpretation/Education Materials Production	$10,000	$1,000
Law enforcement		$120,000
Construction of two interpretive boardwalks with panels, parking, restrooms, and habitat restoration	$1,200,000	
Maintenance of two boardwalks, etc.		$4,200
Construction of back country trail system with interpretive panels	$1,000,000	
Maintenance of back country trail system		$5,000
Construction of at least three photography/hunting blinds	$8,000	
Maintenance of photography/hunting blinds		$2,000
Construction of an observation deck at Peterson Reservoir area with interpretive panels	$50,000	
Maintenance of observation deck		$2,000
Improve refuge roads and construct/improve eight parking areas	$1,600,000	
Maintenance refuge roads and parking areas		$66,000
TOTAL	**$3,868,000**	**$202,700**

Refuge operational funds are currently available through the Service budget process to administer these uses. The majority of the one-time costs for these projects has been obtained or will be proposed for through the Southern Nevada Public Lands Management Act.

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

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

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

The construction and maintenance of trails, photography blinds, 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). However, by concentrating foot traffic onto the trails other habitats on the Refuge will remain undisturbed.

Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP for Ash Meadows NWR. Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination: This program as described is determined to be compatible. Potential impacts of research activities on Refuge resources will be minimized because sufficient stipulations and safeguards will be included in this Compatibility Determination and the required Special Use Permit and because research activities will be monitored by Refuge staff. The refuge manager and biologist would ensure that proposed monitoring and research investigations would contribute to the enhancement, protection, conservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established, the mission of the National Wildlife Refuge System, and the need to maintain ecological integrity, diversity, and environmental health.

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility. All Refuge rules and regulations must be followed unless alternatives are otherwise accepted in writing by Refuge management.

All information, reports, data, collections, or documented sightings and observations, that are obtained as a result of this permit are the property of the Service and can be accessed by the Service at any time from the permittee at no cost, unless specific written arrangements are made to the contrary. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria. Each SUP will also be evaluated individually to determine if a fee will be charged and for the length of the permit.

Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are less of a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and special use permits be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the stated conditions.

Justification: This program as described is determined to be compatible. Based upon impacts described in the Comprehensive Conservation Plan and Environmental Assessment (USFWS 2005), it is determined that research within the Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. Refuge monitoring and research will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the refuge. The wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation, fishing and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with monitoring and research investigations which address specific restoration and management questions.

Mandatory Re-Evaluation Date:

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

_____ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

_____ Environmental Assessment and Finding of No Significant Impact

__X_ Environmental Impact Statement and Record of Decision

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Refuge Determination

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

Concurrence

Refuge Supervisor:	_____	_____
	(Signature)	(Date)
Assistant Regional Director - Refuges:	_____	_____
	(Signature)	(Date

COMPATIBILITY DETERMINATION

Use: Environmental Education and Interpretation

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies environmental education and interpretation, as well as hunting, fishing, wildlife observation and photography as priority public uses for refuges, where compatible with the Refuge purposes. Environmental education is defined as a process designed to teach citizens and visitors the history and importance of conservation and the biological and the scientific knowledge of our Nation's natural resources (605 FW 6). Interpretation is defined as a communication process that forges emotional and intellectual connections between the audience and the resource (605 FW 7).

Ash Meadows Refuge is open to the public for environmental education as scheduled and provides interpretive materials throughout the Refuge, with interpretive programs being offered as scheduled. Currently, there are approximately 65,000 visits annually to the Refuge. Typical use is by individuals, family groups, school groups, and large groups during Refuge-sponsored special events. Crystal Springs Interpretive Boardwalk (1/3 mile long) provides an up-close view of one of the springs, and native fish and plants of the Refuge without disturbing the fragile habitat.

The Refuge is in the process of developing an Environmental Education Plan, Interpretation Plan, and programming for each. The Environmental Education Plan will assess visitor education needs and opportunities and incorporate the environmental education goals of Ash Meadows Recovery Plan, Clark County Multiple Species Habitat Conservation Plan, the RAMSAR Convention, and the state's education standards for grade levels on which focus will be given. An objective of the Recovery Plan is to minimize human disturbance. This objective will be met by focusing on public education in concert with rare species protection. The Service will work with the public, non-government entities, and private partners to develop an offsite refugium for pupfish, in order to promote awareness of the endangered pupfish and other endemic species at the refuge. The Service will also contact local schools and provide on-site programs for school children.

The Interpretation Plan will assess interpretation needs and opportunities. The Service will develop multi-lingual interpretative materials and construct new interpretive facilities at Longstreet Springs and Point of Rocks. Interpretive displays at Devils Hole will be improved with assistance of Death Valley National Park staff, and educational materials will be developed. A volunteer program is being developed to staff the visitor contact station on a year-round basis and provide other services. The

Service would also prepare plans to identify additional locations for interpretive facilities and identify locations for new signs and replace existing signs.

The Point of Rocks area, including proposed boardwalk, is an outstanding location for an outdoor classroom. Students can see first-hand examples of many environmental concepts including: endangered species, endemic species, wetlands, riparian corridors, habitat restoration, water issues in the west, Native American history, cultural resources, geology, and a diversity of wildlife.

The Service will also participate in annual events, which may include the Nye County Fair, Pahrump Fall Festival, and Earth Day and speak at monthly community events, as invited.

The Refuge will develop a comprehensive Visitor Services Management Plan to describe compatible recreation opportunities for the public and evaluate improvements to visitor services on the Refuge. The plan would discuss additional sites for environmental education and interpretation, compatibility of non-wildlife dependent public uses, implementation of a recreation-fee program, and identify public uses that are not allowed on the Refuge. A Sign Management Plan will also develop a consistent and comprehensive message for signs, waysides, visitor road use and parking on the Refuge.

Environmental education and interpretation are considered together in this compatibility determination because both are considered to be wildlife-dependent, non-consumptive uses and many elements of these programs are similar. Both of these public uses are dependent upon establishing trail systems and vehicle parking areas in the Refuge. Though the Refuge currently hosts 65,000 visitors annually, that number is expected to increase, especially due to the movement of Nevada and California metropolis dwellers outward, closer to the Refuge.

Availability of Resources: Refuge operational funds are currently available through the Service budget process to administer these uses. The majority of the one-time costs for these projects has been obtained through the Southern Nevada Public Lands Management Act.

Anticipated Impacts of Use: The Refuge provides habitat consisting of spring-fed wetlands and alkaline desert uplands for at least 24 plants and animals found nowhere else in the world. The Ash Meadows NWR has a greater concentration of endemic life than any other area in the United States and the second greatest concentration in all of North America.

Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Visitors participating in education or interpretive programming are asked to respect the environment they are visiting. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). A reduced number of shorebirds were found near people who were walking or jogging, and about 50 percent of flushed birds flew elsewhere (Burger 1981). In addition, the foraging time of sanderlings decreased and avoidance (e.g., running, flushing) increased as the number of humans within 100 meters increased (Burger and Gochfeld 1991). 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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education is critical for making visitors aware that their actions can have impacts on wildlife, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al 1987).

Environmental education and interpretation activities generally support Refuge 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 is associated with 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 is that it instills an 'ownership' or 'stewardship' ethic in visitors which could reduce vandalism, littering and poaching; it also strengthens service visibility in the local community.

The disturbance by environmental education activities is considered to be of minimal impact because: (1) the total number of students permitted through the reservation system will be limited to 100 per day; (2) students and teachers will be instructed in trail etiquette and the best ways to view wildlife with minimal disturbance; (3) education groups will be required to have a sufficient number of adults to supervise the group; (4) trail design will provide adequate cover for wildlife; and (5) observation areas and scopes are provided to view wildlife at a distance which reduces disturbance.

Education staff will coordinate with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by Refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur.

Anticipated Impacts of Uses on Future Lands within the Approved Boundary: The implementation of environmental education and interpretation programs will not threaten human health or safety. The programs and associated infrastructure not only will have minimal impacts on the natural and cultural resources of Ash Meadows NWR but, they will promote the messages of stewardship and awareness in order to further lessen the impacts in those areas. Implementing the environmental education and interpretation programs will be done in a manner that is consistent with current Refuge management goals. There are no anticipated conflicts with other priority uses on the Refuge.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Participants in the Refuge's environmental education program will be restricted to established trails, the visitor contact station, and other designated sites.

- All groups using the Refuge for environmental education will be encouraged to make reservations in advance through the Refuge office. This process, which takes the place of a Special Use Permit (SUP), allows refuge staff to manage the number and location of visitors for each unit. There is a current refuge policy that educational groups are not charged a fee or required to have a SUP. A daily limit of 100 students participating in the education program at any one site will be maintained through this reservation system. Efforts will be made to spread out use by large groups while reservations are made, reducing disturbance to wildlife and over-crowding of Refuge facilities during times of peak demand.

- Trail etiquette, including ways to reduce wildlife disturbance, will be discussed with teachers during orientation workshops and with students upon arrival during their welcome session. On the Refuge, the teacher(s) is(are) responsible for ensuring that students follow required trail etiquette.

- Refuge biologists and public use specialists will conduct regular surveys of public activities on the refuge. The data will be analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of environmental education programs.

- Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 8 students.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for environmental education and interpretation, would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Ash Meadows Refuge (Goal 3, Chapter 3, CCP). Environmental education and interpretation would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. The stipulations outlined above should minimize

potential impacts relative to wildlife/human interactions. Based upon impacts described in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that environmental education and interpretation within the Ash Meadows National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. These wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

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

Concurrence

Refuge Supervisor:	_____	_____
	(Signature)	(Date)
Assistant Regional Director - Refuges:	_____	_____
	(Signature)	(Date

COMPATIBILITY DETERMINATION

Use: Hunting

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. An Interim Hunting Plan was published for Ash Meadows NWR in 1986 in order to address the tradition of hunting during the establishment of the Refuge. That document allowed for the continuation of "small game, upland game, and waterfowl hunting as in the past on the Ash Meadows National Wildlife Refuge, Nye County, Nevada for a period of approximately three (3) years or until a master plan is completed."

With the writing of the CCP, Ash Meadows NWR has re-evaluated the hunt opportunities on the Refuge. As a result, Ash Meadows NWR is proposing to allow duck, coot, snipe, dove, and quail hunting on approximately 7,000 acres of land owned in fee-title by the USFWS or, 51% of the Refuge owned in fee-title by the USFWS. Maps and descriptions of the hunt units are included in the Ash Meadows Hunt Management Plan. The hunting program will provide high quality, safe hunting opportunities, and will be carried out consistently with State regulations and Refuge-specific regulations found in 50 CFR 32.47.

The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2.4) are to:

- Manage 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.

Though the Refuge does not manage for any of the hunted species specifically, their ability to utilize the Refuge resources is important. The Refuge must ensure that practices within the Refuge boundary do not put populations outside of 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.

The Refuge has approximately 3,100 annual hunting visits. Hunting success has been harder to determine as few hunters have participated in voluntary reporting of harvests, which has been requested the past two years.

Contact with staff is encouraged, as the Refuge visitor center/office is generally open seven days per week. Although a check station is not a feasible means of maintaining contact with area hunters, they are invited to stop by the visitor center/office for information, to report the success of/displeasure with their hunt experience, and to report illegal activity on the Refuge. Refuge staff also make contact with hunters in parking areas or on the way to hunt areas, when possible.

Attention has been given to where a majority of Refuge hunters go for the various types of allowed hunting. These observations were used in determining which parts of the Refuge are best for hunting, with the least amount of conflicts, allowing for the creation of hunt units. Areas not included in the hunt units either contain sub-prime habitat for hunted species, are in close proximity to private in-holdings with residents, or are high-use areas for non-hunting visitors during the same time periods as hunt seasons. Because endangered plants are managed for by the Refuge, attention had to be given to population distribution of endangered and threatened plant species. In addition, the Refuge is surrounded by Bureau of Land Management lands, all of which are open to hunting, according to State regulations.

Weapons allowed for these hunts include shotguns and non-toxic shot only. The number of hunters per hunt day will not be limited unless, through future evaluation, a carrying capacity has been documented and met. Hunters may use trained retrieving dogs, which must be under the hunter's voice control at all times. Watercraft may not be used in Refuge waters. With the threat of invasive aquatic species, watercraft are no longer allowed for use in Refuge waters.

Availability of Resources: Annual costs are currently maintainable through funding and staff resources available to the Refuge.

The following funding/annual costs (based on FY 2007 costs) would be required to administer and manage hunting activities as described above:

	One-Time Costs	Annual Costs
Printing (brochures, signs, posters, etc)		$5,000
Law Enforcement (permit compliance, access control, protection. Approx. 600		$30,000

hours.)		
Monitoring (bird pop. surveys)		$4,400
Maintenance (parking lot, trash cleanup, toilet. Approx. 150 hours.)		$5,100
Road Maintenance (grading)		$7,000
Administrative Services		$3,600
TOTAL		**$55,100**

Anticipated Impacts of Use: Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Madsen 1985, and Cole and Knight 1990). There also appears to be an inverse relationship between the numbers of birds using an area and hunting intensity (DeLong 2002). In Connecticut, lesser scaup were observed to forage less in areas that were heavily hunted (Cronan 1957). In California, the numbers of northern pintails on Sacramento Refuge non-hunt areas increased after the first week of hunting and remained high until the season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the hunting season began. Human disturbance associated with hunting includes loud noises and rapid movements, such as those produced by shotguns and boats powered by outboard motors. This disturbance, especially when repeated over a period of time, compels waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas (Madsen 1995, Wolder 1993).

These impacts can be reduced by the presence of adjacent sanctuary areas where hunting does not occur, and birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulus 1984). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased 4 to 20 fold within the sanctuary (Madsen 1995). Thus, sanctuary and non-hunt areas are very important to minimize disturbance to waterfowl populations to ensure their continued use of the Refuges.

Intermittent hunting can be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). It is common for Refuges to manage hunt programs with non-hunt days. At Sacramento National Wildlife Refuge, 3-16 percent of pintails were located on hunted units during non-hunt days, but were almost entirely absent in those same units on hunt days (Wolder 1993). In addition, northern pintails, American wigeon, and northern shovelers decreased time spent feeding on days when hunting occurred on public shooting areas, as compared to non-hunt days (Heitmeyer and Raveling 1988). The intermittent hunting program of three hunt days per week at Sacramento Refuge results in lower pintail densities on hunt areas during non-hunt days than non-hunt areas (Wolder 1993). However, intermittent hunting alone may not always significantly reduce hunting impacts.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons (fall and winter) when the game animals are less vulnerable, reducing the magnitude of disturbance to refuge wildlife. Managed and regulated hunting will not reduce species populations to levels where other wildlife-dependent uses will be affected.

The use of trained retrieving dogs would be permitted and encouraged in all areas open to bird hunting as a means of reducing waste. These dogs would be required to be under voice or physical control at all

times. Any hunter who allows his/her dog to disturb wildlife is not well received by other hunters who do not want waterfowl disturbed on the ponds that they are hunting.

Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance will occur during the hunting seasons. Proper zoning, regulations, and Refuge seasons will be designated to minimize any negative impacts to wildlife populations using the Refuges. Harvesting hunted species will not result in a substantial decrease in biological diversity on the Refuge.

Conflicts between hunting and other public uses will be minimized by the following:

- Physically separating non-hunting and hunting acres to spatially divide the activities.
- Limiting hunting to certain days of the week, based on input from Refuge Biologists, to allow for resting periods, season openers, and law enforcement availability. Generally, though, at least three (3) days per seven-day period will be available for hunting on the Refuge.
- Posting boundary and hunting areas and maintaining that signage to clearly define the designated hunting areas.
- Allowing vehicle traffic only on designated roads and parking areas. Only pedestrian access will be allowed beyond designated parking areas within a hunt unit.
- Regular field checks by refuge law enforcement officers in order to maintain compliance with regulations.
- Providing information about the refuge hunting program through staff in the visitor center/office, signs, and flyers.

Wildlife populations on the Refuge are able to sustain hunting and support other wildlife-dependent priority uses. To manage the populations to support hunting, the Refuge adopts harvest regulations set by the State within Federal framework guidelines. Regular surveys of hunted species will be maintained and harvest records kept, as possible, to determine if further restrictions on harvest limits need to be made.

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. If hunt programs are managed properly, though, the populations of the target species can benefit overall. Also, hunting can give people a deeper appreciation of wildlife and a better understanding of the importance of conserving wildlife habitat, which ultimately contributes to fulfilling the Refuge System mission.

Though hunting may not have a direct impact on the endangered and threatened fish, wildlife, and plant species on the Refuge, consideration was given to indirect impacts, such as the introduction of exotic and invasive species due to the regular presence of hunters. It has not been determined that hunting significantly impacts these populations, although direct study has not been done on the Refuge.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP for Ash Meadows NWR. Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Bag limits will be based on those set by Nevada Department of Wildlife unless statistically

sound surveys indicate a significant drop in target species populations, at which point, at the discretion of the Refuge Manager, more restrictive bag limits will be set, evaluated on an annual basis.

- Hunters are allowed onto the Refuge one (1) hour before sunrise and may stay until one (1) hour after sunset. Actual legal hunt hours are as determined by Nevada Department of Wildlife.
- Weapons must be unloaded and either dismantled or cased while traveling on/through the Refuge in a vehicle.
- Hunters requiring special assistance must contact the Refuge two business days before hunting to obtain any necessary permits or information.
- Hunting over spring pools is not allowed. Hunters must stay 100 feet off outer edge of a spring pool and cannot shoot across it.
- Hunters are not allowed to hunt across boundary lines of the Refuge or its hunt units. Hunters should keep their shots 100 feet inward from boundaries so as to not endanger private residents in or around the Refuge boundaries and to keep from having wounded birds outside of huntable areas.
- Longstreet Spring and Cabin is a popular jumping off point for hunters and a point of interest for non-hunting visitors. Access to hunting areas is encouraged from the Longstreet parking area but, hunters must stay beyond the signage indicating the area closed to hunting immediately around the spring and historic cabin, which are set aside for non-hunting visitors.
- All or any part of the Refuge may be closed to hunting by the Refuge Manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property.

Justification: Allowing the continuation of hunting on the Refuge does not materially interfere with or detract from fulfilling the Refuge purpose of protecting endangered and threatened fish, wildlife, or plants nor does it interfere with or detract from fulfilling the Refuge System mission. The interim hunt program has been evaluated and subsequent changes made to reflect the management goals of the Refuge, the availability of resources, and impacts of use on an endangered species refuge.

Mandatory Reevaluation Date (October 2023):

__X__ Mandatory 15-Year Reevaluation Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____Categorical Exclusion without Environmental Action Statement

_____Categorical Exclusion and Environmental Action Statement

_____Environmental Assessment and Finding of No Significant Impact

__X__Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Fishing (Bullfrogging)

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: Fishing for non-native bullfrogs (*Rana catesbeiana*) is usually done by gigging. The State of Nevada addresses the harvest of bullfrogs and crayfish under their sport fishing regulations, which must be followed for harvesting on the Refuge. General fishing for game fish has never been officially opened on the Refuge; however, game fishing has occurred on the Refuge, at Crystal Reservoir (a.k.a. Amargosa Lake) for many years, until 2001. Although some introduced game fish still exist on the refuge, habitat enhancement and restoration efforts are expected to reduce or eliminate these non-native, predatory fish from Refuge waters. Part of that habitat enhancement includes the removal of aquatic exotic species from the Refuge waters.

Availability of Resources:
As the number of visitors expected to perform this activity is relatively small, fishing for bullfrogs should not pose a problem and can be handled with existing Refuge staff. The U.S. Fish and Wildlife Service Law Enforcement Officer stationed at the Refuge patrols and enforces state and federal laws and regulations.

Anticipated Impacts of the Use(s): Shoreline activities, such as human noise, could cause some birds to flush and go elsewhere. Disturbance and destruction of riparian vegetation, bank stability, and water quality may result from high levels of bank fishing activities. Due to the limited number of people attempting this activity, these negative impacts are anticipated to be insignificant when compared to the positive impacts of exotic predator reduction.

These impacts will be minimized further by the following:

- Requiring anyone who wants to fish for bullfrog or crayfish to obtain a Special Use Permit, and any licensing required by the State of Nevada.
- Providing information about exotics and their impacts on the native resources to permittees.
- Monitor fishing activities to ensure facilities are adequate and wildlife disturbance is minimal.
- Law enforcement patrols will be conducted by refuge officers to enforce state and federal regulations.

- Limit fishing activities during the Migratory Bird Treaty Act critical period (March 15 – August 15) if nesting activity is recorded by Refuge staff. Nesting activity should be monitored at the beginning of this period by Refuge staff annually.
- Provide information about the Refuge fishing program by installing informational signs/kiosks, creating and distributing brochures, and utilizing the Refuge's website.
- Install public use ethics panel, including the importance of not littering and displaying the "pack it in and pack it out" message at appropriate access points.

The Refuge believes that there will be minimal conflicts between fishers for bullfrog and the other wildlife-dependent recreational users.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP for Desert NWRC. Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Refuge staff will submit for Refuge Specific Regulations: Recreational Fishing. We allow recreational fishing for bullfrogs by gigging only in Refuge waters in accordance with State regulations subject to the following conditions:
- All fishers must obtain a Special Use Permit from the Refuge staff prior to any fishing activity on the Refuge.
- Refuge staff will monitor fishing for bullfrog to ensure that facilities are adequate and disturbance to wildlife continues to be minimal.
- Users will park in signed parking areas, stay on designated roads, and recreate in a manner that prevents erosion or habitat damage.
- Refuge staff will provide information about fishing for bullfrog closures to each permitted user.
- Refuge staff will work to ensure proper signing and to distribute regulations in order to better inform the visiting public.
- Refuge Law Enforcement Officers will patrol regularly to enforce state and federal regulations.

Justification: Harvesting bullfrogs is an appropriate wildlife-dependent recreational activity for this Refuge. Based upon impacts described in the Comprehensive Conservation Plan, it is determined that harvesting bullfrogs within the Ash Meadows National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or mission of the National Wildlife Refuge System.

Fishing is a priority public use listed in the Improvement Act of 1997. Although regular sport fishing is not appropriate on this endangered species Refuge, by facilitating fishing for bullfrogs on the Refuge, the visitors' knowledge and appreciation of fish and wildlife is likely to increase. Harvesting bullfrogs is a form of public stewardship of wildlife and their habitats on the Refuge. Increased public stewardship supports and complements the Service's actions in achieving the Refuge's purposes and the mission of the National Wildlife Refuge System.

The harvesting bullfrogs is a component of the Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada (1990), under recovery action #232 that states "remove non-native competitive/predatory aquatic species." Additionally, a goal of Refuge management is to provide opportunities for wildlife-dependent recreation "that are compatible with, and foster an appreciation and understanding of, Ash Meadows NWR's wildlife and plant communities."

Mandatory Re-Evaluation Date:

__X___ Mandatory 15-year Re-Evaluation, Date will be provided in Final EA/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

References Cited

Knight, R.L. and D .N. Cole. 1995. Wildlife responses to recreationists. *in* Wildlife and Recreationists (R.L. Knight and K.J. Gutzwiller, eds.) Island Press, Covelo, California.

Nevada Revised Statutes. NRS 503.290. Manner and means of fishing; requirements for use of second combination of hook, line and rod; taking frogs.

Nevada Fishing Seasons and Regulations, Effective March 1, 2005 – February 28, 2006. Department of Wildlife, 1100 Valley Road, Reno, Nevada 89512-2817. 45pp.

U.S. Fish and Wildlife Service. 1990. Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada. U.S. Fish and Wildlife Service, Portland, Oregon. 123pp.

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Research

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: There is much that can be learned from field research within the Refuge. Baseline information in the biological, geophysical, hydrological and other fields is still in need of being collected. There are many opportunities for consultants, colleges and universities, and other agencies to obtain permission to conduct critical and noteworthy research on the Refuge.

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Monitoring and research are an integral part of National Wildlife Refuge management. Plans and actions based on thorough research and consistent monitoring provide an informed approach to management affects on wildlife and habitat.

Currently, research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff and conservation partners, as appropriate, for approval.

Evaluation criteria currently includes, but is not limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off-Refuge are less likely to be approved.
- Research which causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request.
- Refuge evaluation will determine if any effort has been made to minimize disturbance through

study design, including considering adjusting location, timing, scope, number of permittees, study methods, number of study sites, etc.

- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied, depending on the specific circumstances.

- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

These criteria will also apply to any properties acquired in the future within the approved boundary of the Refuge.

Availability of Resources:
The Refuge receives approximately 10-12 research requests per year. Some permit requests require 4-8 hours to process, others may take as long as 20 hours, depending on the complexity and whether pre-research surveys are required. Refuge operational funds are currently available through the Service budget process to administer this program.

Anticipated Impacts of Use: Use of the Refuge to conduct research will benefit Refuge fish, wildlife, plant populations, and their habitats. Monitoring and research investigations are an important component of adaptive management. Research investigations would be used, in part, to evaluate habitat restoration projects and ecosystem health. Specific restoration and habitat management questions could be addressed in most research investigations to improve habitat and benefit wildlife populations. Standardized monitoring would be used to insure data compatibility for comparisons from across the landscape so that natural resource bottleneck areas could be identified for habitat enhancement and restoration (Elzinga et al. 1998; Ralph et al. 1993).

An expected short-term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge as new and continued monitoring and new research compliments and expands upon previous investigations, as well as an expanded science-based body of data and information from which to draw upon to implement the best Refuge management practices possible. Natural resources inventory, monitoring and research are not only provisions of the Refuge Improvement Act, but they are necessary tools to maintain biological integrity and diversity and environmental health, which are also key provisions of the act.

Some direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sanctuaries. Researcher disturbance could include altering wildlife behavior, going off designated trails, collecting soil and plant samples or trapping and handling wildlife. Most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macro-invertebrates) are required for identification and/or experimentation Statistical analysis will be encouraged and and captured and marked wildlife will be released. Long-term effects would be eliminated/ reduced because refuge evaluation of research proposals would insure only proposals with adequate safeguards to avoid/minimize impacts would be accepted. Potential impacts associated with research activities would be minimized because sufficient restrictions would be included as part of the study design and researcher activities would be monitored by Refuge staff. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established, the mission of the National Wildlife Refuge System, and the need to maintain ecological integrity. Additionally, the special use permit would include conditions to further ensure that impacts to wildlife and habitats are avoided and minimized.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP for Ash Meadows NWR. Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination: This program as described is determined to be compatible. Potential impacts of research activities on Refuge resources will be minimized because sufficient stipulations and safeguards will be included in this Compatibility Determination and the required Special Use Permit and because research activities will be monitored by Refuge staff. The refuge manager and biologist would ensure that proposed monitoring and research investigations would contribute to the enhancement, protection, conservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established, the mission of the National Wildlife Refuge System, and the need to maintain ecological integrity, diversity, and environmental health.

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility. All Refuge rules and regulations must be followed unless alternatives are otherwise accepted in writing by Refuge management.

All information, reports, data, collections, or documented sightings and observations, that are obtained as a result of this permit are the property of the Service and can be accessed by the Service at any time from the permittee at no cost, unless specific written arrangements are made to the contrary. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria. Each SUP will also be evaluated individually to determine if a fee will be charged and for the length of the permit.

Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are less of a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and special use permits be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the stated conditions.

Justification: This program as described is determined to be compatible. Based upon impacts described in the Comprehensive Conservation Plan and Environmental Assessment (USFWS 2005), it is determined that research within the Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge

System. Refuge monitoring and research will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the refuge. The wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation, fishing and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with monitoring and research investigations which address specific restoration and management questions.

Mandatory Re-Evaluation Date:

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

_____ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and Monitoring Plant Populations. U.S. Bureau of Land Management, Denver, CO.

Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin and D.F. DeSante. 1993. Handbook of Field Methods for Monitoring Landbirds. U.S. Forest Service, Pacific Southwest Research Station, General Technical Report PSW-GTR-144. Albany, CA.

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Geocaching (Virtual Only)

Refuge Name: Ash Meadows National Wildlife Refuge, located in Nye County, Nevada.

Establishing and Acquisition Authority(ies): Ash Meadows National Wildlife Refuge (Refuge) was established on June 18, 1984 under authority of the Endangered Species Act of 1973.

Refuge Purpose(s): The purpose of Ash Meadows comes from the Endangered Species Act of 1973:

> *"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..."* (16 USC Sec. 1534).

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

Description of Use: Geocaching is a game of adventure using handheld Geographic Positioning System (GPS) devices. The handhelds are used to locate caches of "prizes", which are found using coordinates points only. Often a cache is a container of some sort filled with treasures and a log, among other things. The idea is that "cachers" obtain coordinates to a cache, use their GPS handheld to make their way to the cache, record their adventure, take a prize and leave a prize. The placement of these caches, depending on the location, can require digging into the ground, moving rocks or vegetation, or other alterations to the area in order to somewhat hide the cache. This is an aspect of the caching that gives federal land managers pause. An ideal alternative to the physical cache is a virtual cache, or waypoint cache.

A waypoint cache uses existing landmarks and the "cache" is held at a manned site. The "cachers" have to visit a starting landmark (determined by given coordinates). Then, the site manager can have the "cachers" follow somewhat of a scavenger hunt, going from landmark to landmark, using clues or additional coordinate points until a final clue is given, leading the "cachers" to the manned site (an office, or the like). "Cachers" can then pick up their prize from the manned site, leave a prize, if they like, and write in the virtual cache log. The challenge of using the GPS handheld can be just as great as, if not more than, that of looking for a physical cache and without the impact on areas outside of the normal public use areas.

Availability of Resources:
The Refuge does not receive many requests for geocaching, physical or virtual ones. Setting up a waypoint geocache may take 2-3 hours. Law enforcement may require some time to ensure waypoint geocaches are not followed up with physical ones. Refuge operational funds are currently available through the Service budget process to administer this program.

Anticipated Impacts of Use: Use of the Refuge for virtual geocaching will benefit Refuge fish, wildlife, plant populations, and their habitats because it will introduce a different audience to the National Wildlife Refuge System and its purpose.

Geocachers, as a community, are warned against establishing caches, physical or virtual, on federal public lands without permission of the land manager. That being said, there have been cases where

physical caches have been found on National Wildlife Refuges that were not authorized. The same could be true for waypoint caches but, the impact of that would be less so on the Refuge. Law enforcement would likely concentrate on unauthorized physical sites.

There could be an increased impact to the public use landmarks used in a waypoint cache. Damage could occur that would not otherwise be realized for a much longer period of time with regular use. This impact may be minimized with regular maintenance of the area. A regular presence of staff on the Refuge may minimize vandalism of landmark sites, as well.

The greatest impact of allowing a waypoint cache would be the staff time required to set up the landmark route and the cache.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP for Ash Meadows NWR. Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination: This program as described is determined to be compatible. Virtual geocaching would contribute to the enhancement, protection, conservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established, the mission of the National Wildlife Refuge System, and the need to maintain ecological integrity, diversity, and environmental health.

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Only virtual or waypoint geocaches will be authorized by use of a Special Use Permit or established by Refuge Staff.
- Physical geocaches will not be authorized under any circumstance and violators may be fined, at the discretion of the Refuge Law Enforcement Officer.
- Virtual or waypoint geocaches must be established in partnership with Refuge staff to ensure landmarks used are acceptable public use sites.
- The final cache should be maintained at the Refuge headquarters and information about the Refuge will accompany all cache prizes taken by participants.
- No other collecting from the Refuge will be authorized.

Justification: Waypoint geocaching will indirectly benefit and potentially create support for refuge goals, objectives, management plans and activities. It will offer added opportunities to introduce visitors to the Refuge, its purposes, and its mission. Waypoint geocaching will likely open resource-dependent connections between geocachers and Refuges. The impact on the resource and staff will be minimal with measurable returns. Virtual geocaching may also be used as an education tool, introducing local students to GPS technologies in a real-world environment while broadening their knowledge of the Refuge and their relation to it.

Mandatory Re-Evaluation Date:

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

__X__ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

_____ Environmental Assessment and Finding of No Significant Impact

__X_ Environmental Impact Statement and Record of Decision

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director - Refuges: _____ _____

COMPATIBILITY DETERMINATION

Use: Wildlife Observation and Photography

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as wildlife dependent public uses for NWR's. As two of the six priority public uses of the Refuge system, these uses are to be encouraged when compatible with the purposes of the Refuge.
Desert Refuge is open to the public year-round for wildlife observation and photography. Currently, there are nearly 70,000 visits to the Refuge annually. Typical use is by individuals, family groups, school groups, and large groups during Refuge-sponsored special events. The majority of this use

occurs at Corn Creek. Current facilities include a wildlife observation/interpretive trail and the Pahrump poolfish refugium viewing area.

Wildlife observation also occurs throughout the eastern portion of the Refuge, often in association with other uses, including: backpacking and hiking; camping; recreational use of pack and saddle stock; hunting; and pine nut gathering. See the compatibility determinations for these uses for more information.

All public access to the western portion of the Desert Refuge is prohibited by federal law. This area, part of the U.S. Air Force's Nevada Test and Training Range, is used as a bombing, gunnery and aerial warfare training facility.

Under alternative C of the CCP/EIS (the preferred alternative), the Service would continue to maintain visitor facilities that facilitate wildlife observation and photography, including roads, trails, and parking, camping, and picnic areas. In addition, the Service proposes to make several facility improvements to enhance opportunities for wildlife observation and photography, improve public safety, and minimize impacts on the Refuge's resources.

At Corn Creek, the Service proposes to construct an additional wheel-chair accessible interpretive trail which will tie in to the existing trail system and the new visitor's center and offices. A photography blind and new interpretive signs are also planned for this area. The Service also proposes to develop bighorn sheep web cam which will stream images to the new visitor center.

In addition, the Service proposes to improve Alamo, Mormon Well, and Gass Peak Roads to ensure the public has continued assess to the Refuge. Post and cable fencing would be installed at designated parking turnouts along these three roads to prevent resource damage. In addition, the Service would map existing trails on Gass Peak and the Sheep Range with GPS and develop and distribute a trail guide for the public.

With these improvements, the construction of the visitor center and population growth in the Las Vegas Area, visitation to the Refuge is expected to increase but not dramatically.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Managing current use		
Administration		500
Maintain visitor facilities		2,000
Maintain and replace regulatory, directional, and interpretive signs		1,000
Maintain roads		2,000
Improving/Enhancing Use		
Improve Mormon Well and Gass Peak Roads to "fair" condition	10,000,000	
Repair Alamo Road		
Plan and construct photography blinds		3,000
TOTAL		

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

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

wildlife and habitat, including trampling of plants. Klein (1993) recommended that refuges provide observation and photography blinds to reduce disturbance of waterbirds when approached by visitors.

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

The construction and maintenance of trails, photography blinds, 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). However, by concentrating foot traffic onto the trails other habitats on the Refuge will remain undisturbed.

Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Regulations and wildlife friendly behavior (e.g., requirements to stay on designated trails, dogs must be kept on a leash, etc.) will be described in brochures and posted at the Visitor Contact Station(s).
- Regulatory and directional signs will clearly mark areas closed to the public and designated routes of travel.
- Maps and public use information will be available at the visitor contact station and kiosks.
- Refuge staff will conduct regular surveys of public activities on the refuge. The data will be analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of the wildlife observation and photography programs.
- Use will be directed to public use facilities which are not in or near sensitive areas.
- Interpretive presentations and products will continue to include messages on minimizing disturbance to wildlife.

- Commercial photography would require a Special Use Permit.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for wildlife observation and photography would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Desert Refuge (Goal 4, Appendix E, CCP/EIS). Wildlife observation and photography would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Based upon impacts described in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that wildlife observation and photography within the Desert National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date (March 2023):

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Environmental Education and Interpretation

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s): Desert National Wildlife Refuge purposes include:

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as wildlife dependent public uses for NWRs. As two of the six priority public uses of the Refuge system, these uses are to be encouraged when compatible with the purposes of the Refuge. The public and communities desire more opportunities for these uses.
Environmental education and interpretation are considered together in this compatibility determination because they both are wildlife-dependent, non-consumptive uses and many elements of these programs are similar.

The Service allows the year-round access to designated open areas for environmental education and interpretation. Desert Refuge is open to the public for environmental education and interpretation daily from sunrise to sunset. Currently, there are nearly 70,000 visits to the Refuge annually. Most of these visits are to Corn Creek Field Station. Typical use is by individuals, family groups, school groups, and large groups during Refuge-sponsored special events.

Under alternative C of the CCP (the preferred alternative), the Refuge would continue to maintain visitor facilities, including parking, camping, and picnic areas, and they would replace regulatory, directional, and interpretive signs along designated roads and trails and at the refugium, as needed. Volunteers, including Southern Nevada Interpretive Association members, would continue to be utilized at the visitor contact station to provide interpretation and guidance for visitors.

In addition, the Service would expand and improve the refuge environmental education program. A new visitor center with interpretive and educational displays would be constructed at Corn Creek. Interpretive panels and signs would be replaced along trails and at the refugium and installed at the designated entry points. The Service would expand the volunteer program on the Refuge with a target of staffing the visitor center full-time during peak use periods and for 4 hours per day during lower-use periods.

Interpretation efforts would be expanded through the development of cultural resources materials in coordination with local Native American tribes. The Service would also develop a live "sheep cam" at water sources to educate the public on the bighorn sheep. The video would be streamed through the web site and at the visitor contact station for viewing by the public.

Both of these public uses are dependent upon establishing boardwalks and vehicle parking areas in the Refuge. An estimated 70,000 annual visits will be to participate in these activities. These uses are identified and discussed in detail in Chapter 3 of the CCP (USFWS 2008) and are incorporated by reference.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Administration		1,200
Maintain visitor center		83,000
Develop environmental education and interpretive materials		2,000
TOTAL		**86,200**

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that activities such as environmental education and interpretation 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;

5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al 1987).

The disturbance by environmental education activities is considered to be of minimal impact because: (1) the total number of students permitted through the reservation system is limited to 100 per day; (2) students and teachers will be instructed in trail etiquette and the best ways to view wildlife with minimal disturbance; (3) education groups will be required to have a sufficient number of adults to supervise the group; (4) trail design will provide adequate cover for wildlife; and (5) observation areas and scopes are provided to view wildlife at a distance which reduces disturbance.

Education staff will coordinate with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by Refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Participants in the Refuge's environmental education program will be restricted to established trails, the visitor contact station, and other designated sites.

- All groups using the Refuge for environmental education will be required to make reservations in advance through the Refuge office. This process, which takes the place of a Special Use Permit (SUP), allows refuge staff to manage the number and location of visitors for each unit. There is a current refuge policy that educational groups are not charged a fee or required to have a SUP. A daily limit of 100 students participating in the education program will be maintained through this reservation system. Efforts will be made to spread out use by large groups while reservations are made, reducing disturbance to wildlife and over-crowding of Refuge facilities during times of peak demand.

- Trail etiquette including ways to reduce wildlife disturbance will be discussed with teachers during orientation workshops and with students upon arrival during their welcome session. On the Refuge, the teacher(s) is responsible for ensuring that students follow required trail etiquette.

- Refuge biologists and public use specialists will conduct regular surveys of public activities on the refuge. The data will be analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of environmental education programs.

- Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 12 students.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for environmental education and interpretation would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Desert Refuge (Goal 4, Chapter 3, CCP). Environmental education and interpretation would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. Environmental education and interpretation activities generally support Refuge 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 is that it instills an 'ownership' or 'stewardship' ethic in visitors and most likely reduces vandalism, littering and poaching; it also strengthens service visibility in the local community.

The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Based upon impacts described in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that environmental education and interpretation within the Desert National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date :

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Rodgers, J. A., 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. Pp. 203-219 in Knight, R. L.; Gutzwiller, K. J. (Wildlife and recreationists: coexistence through management and research, eds.). Island Press, Washington, D. C.

USFWS. 2008. Desert National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Impact Statement. U.S. Fish and Wildlife Service, Region 8.

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Hunting (desert bighorn sheep)

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the Service is proposing to continue desert bighorn sheep hunting on approximately 1.37 million acres of Desert Refuge. Camping often occurs in association with hunting. See the compatibility determinations for camping for more information.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, 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:

- Manage 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's hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting and applicable State regulations.

The sheep hunt program on Desert NWR began in 1954 and has continued each season except one (1955). The hunt program is currently administered by Nevada Department of Wildlife (NDOW). Six hunting units comprising portions of six mountain ranges have been established by NDOW, within Desert NWR (Figure 1). A specific number if permits are issued each season based on the size and composition of the sheep population and the age structure of the ram segment in each unit. Two separate hunts are conducted each year on Desert NWR with the first starting mid-November and ending mid-December. This coincides with the annual state-wide desert bighorn sheep hunt. This hunt occurs in units 283, 284, and 286. The second hunt starts mid December and continues to the first of January within units 280, 281, and 282. These units lie within the Nevada Test and Training Range and as regulated by the Memorandum of Understanding between the Air Force and the Service; military use is suspended for the duration of the hunting period. Table 1 shows the opening and closing dates and quotas for each unit during the 2007 season.

Table 1. 2007 desert bighorn sheep hunt season dates and quotas.

Hunt Unit	2007 Season Dates	2007 Quotas
280	Dec 15 - Jan 1	3
281	Dec 15 - Jan 1	4
282	Dec 15 - Jan 1	2
283, 284	Nov 10 - Dec 10	4
286	Nov 10 - Dec 10	2

The number of permits issued each season for each hunt is equal to 8% of the ram population estimate. After coordination with the Service, Nevada Department of Wildlife issues the permits through random computer drawing and NDOW retains the fees derived from the permits to cover costs. All hunters who draw a bighorn sheep tag in Nevada are required to attend an NDOW indoctrination class prior to receiving their sheep tag. This course is designed to teach hunters ram recognition and aging techniques as well as some life history data and general hunting procedures. Both lecture and outdoor session are roughly four hours long with the outdoor portion used to instruct and test sheep aging techniques using a 15 power spotting scope, which is a mandatory item to carry into the field. Hunters

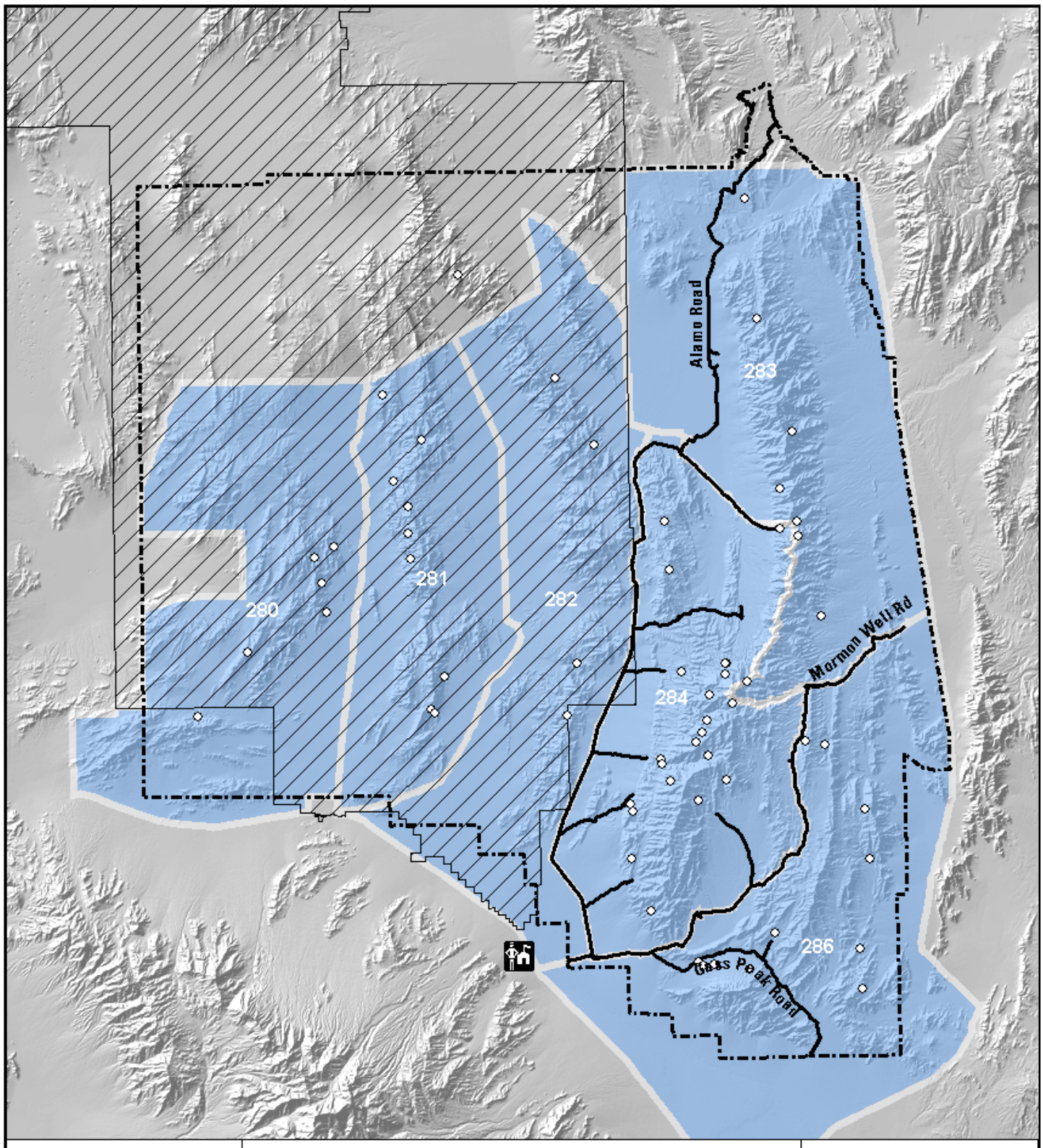

Figure 1

Nevada Department of Wildlife Hunt Units

Desert NWR

are instructed that bighorn sheep managers are interested in removing only older rams even though young lambs are legal to kill. Both State and Federal laws and regulations relating to sheep hunting and governing the use of Desert NWR are explained. Hunters within the portion of DNWR overlain by the Nevada Test and Training Range (units 280, 281, 282) are also required to attend a Department of Defense safety briefing and pass a background check prior to hunting.

Federal and State laws and regulations are enforced by Desert NWRC law enforcement personnel and NDOW game wardens, respectively..

In general, hunters travel in vehicles on established roads to the unit which they have drawn a tag for and then they travel on foot. However, hunters occasionally travel via horseback to their desired destination (C. McDermott pers. com.). Camping is allowed anywhere within the eastern portion of Desert NWR outside the NTTR (units 283, 284, and 286), except within ¼ mile of any water development. However, within the NTTR (Units 280, 281, and 282), hunters must camp at designated sites.

During the 15 year period between 1992 and 2006, a total of 196 tags were issued for the six Desert NWR units with an average of 13 per year. The average success over the same period was 59 percent. The tags issued on the Desert NWR hunt units represent about 11 percent of the 120 on average issued State-wide each year. Each tag holder spent an average of 8.5 days hunting within the Desert Refuge units. Table 2 summarizes the results by hunt unit from 1992 - 2006.

Table 2. Desert NWR Bighorn Sheep Hunt Results Summary: 1992 - 2006

Unit Group	# Tags Issued	Percent Success	Sheep Taken	Average Days Hunted	Average Age of Ram	Average B&C Score	Maximum B&C Score
280	7	57%	4	7	7.5	157 7/8	161 7/8
281	59	39%	23	8.6	6.8	153 3/8	177 3/8
282	33	58%	19	7.5	6.4	147 1/8	162 6/8
283, 284	55	60%	33	10.2	5.6	148 4/8	163 2/8
286	42	79%	33	9.1	5.8	151 7/8	171 6/8
SUM	196		112	42.4			
Average	13.1	57%	7.5	8.48	6.1		
State Average	120	83%		6.7	6.2	149 5/8	183 2/8

Source: NDOW 2007

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
General Administration		$500
Law Enforcement personnel		$1500
Annual aerial sheep surveys - personnel		$1500
-flight time		$15,000
Sheep harvest data collection and analysis and interpretation		$20,000
TOTAL		

Anticipated Impacts of Use:
Possible impacts of sheep hunting include: the direct take of bighorn sheep rams and its indirect effects on the remaining population; disturbance to sheep and other wildlife; and habitat modification. All these impacts are expected to be relatively minor and localized due to the low levels of use on the refuge.

Direct and Indirect Effects of Trophy Hunting
During the last 15 years (1992 to 2006), an average of 7.5 rams total were taken each year on Desert Refuge. The average age of the rams was 6.1 years (NDOW 2007

Hunters tend to target the oldest rams with the biggest horns in a given population. This can have a variety of indirect effects on the remaining sheep population. In a life history study on Desert NWR reviewing 20 years of data, Bradley and Baker (1967) found that mortality for hunting was not an important factor relative to the sex ratio of the Refuge bighorn sheep population. Singer and Zeigenfuss (2002) found that that young rams in trophy-hunted populations of mountain sheep were more involved in breeding activities and harassed ewes more frequently. However, the same study found no compelling evidence for any deleterious effects on ewe energetics or ewe reproductive success. Singer and Zeigenfuss (2002) also found that trophy hunting decreased competition between rams for obtaining copulations because rut groups in hunted populations had fewer rams than groups in unhunted populations. They also found compelling evidence for depressed survivorship of young rams in heavily hunted populations, but not in lightly trophy-hunted populations (<3 percent of the total population or <10 percent of standing ram population). By this standard, Desert NWR's sheep population would be considered lightly hunted since the number of tags issued is based on 8 percent of the ram population and about 60 percent of tags on average result in a successful hunt each year.

Disturbance-Related Impacts on Wildlife:
Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

According to Knight and Cole (1991), there are three wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

In otherwise suitable habitat, sheep have been observed to abandon an area, either temporarily or permanently, when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis et al. 2001, Thompson et al. 2007). If the resulting loss of habitat is significant, the population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive success (MacArthur et al. 1979). Papouchis et al. (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al. 1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would

respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Hunters can also have adverse impacts on vegetation and soil conditions. Hiking or walking can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Aerial surveys of each unit will be conducted each fall to develop population estimates and ram/ewe/lamb/ratios.
- The number of bighorn sheep tags issues each year will not exceed 8 percent of the current ram population estimate for each unit.
- Hunts will be scheduled in accordance with the NDOW in mid-November through December, which is after the breeding season when all animals are scattered and are not dependant on a water supply and yearling lambs are able to care for themselves if separated from the ewes.
- Hunters will be required to attend an NDOW indoctrination class prior to hunting which covers specific Federal and State wildlife regulations.
- Hunters within the portion of DNWR overlain by the Nevada Test and Training Range (units 280, 281, 282) are also required to attend a Department of Defense safety briefing prior to hunting.
- Bighorn sheep guides are required to obtain a Special Use Permit prior to taking clients onto the Refuge.
- Natural bighorn sheep mortality (pickup heads) found on the Refuge are government property and possession or removal of them from the Refuge is not permitted.
- Desert NWR law enforcement personnel will conduct random patrols throughout the hunt season.
- No camping is allowed within ¼ mile of springs and water developments.
- Each sheep taken on Desert NWR must be checked out by Refuge personnel at Corn Creek Field Station

Justification: Hunting is a priority public use of the National Wildlife Refuge System. Providing opportunities for desert bighorn sheep hunting would contribute toward fulfilling provisions of the

National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Desert Refuge (Goal 4, Chapter 3, CCP/EIS). The stipulations outlined above should minimize potential direct and indirect impacts of the hunt. Based upon impacts described here and in the Draft Comprehensive Conservation Plan/Environmental Impact Statement (USFWS 2008), it is determined that hunting of desert bighorn sheep within the Desert National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

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

Concurrence

Refuge Supervisor:	_____	_____
	(Signature)	(Date)
Assistant Regional Director - Refuges:	_____	_____
	(Signature)	(Date)

COMPATIBILITY DETERMINATION

Use: Research

Refuge Name: Desert National Wildlife Refuge, located in Clark and Lincoln Counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Monitoring and research are an integral part of National Wildlife Refuge management. Plans and actions based on research and monitoring provide an informed approach, which analyzes the management affects on refuge wildlife.

When the Refuge receives requests to conduct scientific research at the Refuge, Special Use Permits (SUPs) are required to be issued for research and monitoring. SUPs are only issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of

native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff and conservation partners, as appropriate. SUPs are issued by the refuge manager, if the proposal is approved.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off-Refuge are less likely to be approved.
- Research which causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request.
- Refuge evaluation will determine if any effort has been made to minimize disturbance through study design, including considering adjusting location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied, depending on the specific circumstances.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

These criteria will also apply to any properties acquired in the future within the approved boundary of the Refuge.

Availability of Resources:
The Refuge receives approximately 5 - 7 research requests per year. Some permit requests require up to one hour to process, others could take longer, depending on the complexity of the research request. On average, the program costs approximately $500.00/year. Refuge operational funds are currently available through the Service budget process to administer this program.

	One-time Costs	Annual Costs
General Administration		$500
TOTAL		$500

Anticipated Impacts of Use: Possible impacts of research include disturbance to wildlife and habitat modification. Potential impacts associated with research activities would be mitigated/minimized because sufficient restrictions would be included as part of the study design and researcher activities would be monitored by Refuge staff. Due to the small number of researchers that use the Refuge, the impacts on sheep and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

In otherwise suitable habitat, sheep have been observed to abandon an area, either temporarily or permanently, when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis *et al*. 2001, Thompson *et al*. 2007). If the resulting loss of habitat is significant, the population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive success (MacArthur et al. 1979). Papouchis *et al*. (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al. 1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Research activities could also have adverse impacts on vegetation and soil conditions. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, ect.) required for identification and/or experimentation and statistical analysis would be permitted. Off trail walking by researchers could have similar effects as hikers in general who can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al*. 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex. Comments received (including those regarding research) will be addressed in the Response to Comments.

Determination:

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility. All Refuge rules and regulations must be followed unless otherwise accepted in writing by Refuge management.

All information, reports, data, collections, or documented sightings and observations, that are obtained as a result of this permit are the property of the Service and can be accessed by the Service at any time from the permittee at no cost. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria. Each SUP will also be evaluated individually to determine if a fee will be charged and for the length of the permit.

Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification: Refuge monitoring and research will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the refuge. The wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation, fishing and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with monitoring and research investigations which address specific restoration and management questions.

Mandatory Re-Evaluation Date:

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

__X__ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

___ Environmental Assessment and Finding of No Significant Impact

__X_ Environmental Impact Statement and Record of Decision

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Papouchis, C. M., F. J. Singer and W. B. Sloan. 2001. Responses of desert bighorn sheep to increased human recreation. Journal of Wildlife Management 65:573-582.

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director - Refuges: _____ _____

(Signature) (Date)

COMPATIBILITY DETERMINATION

Use: Pine Nut Gathering

Refuge Name: Desert National Wildlife Range, located in Clark and Lincoln Counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Pine nut gathering is a tradition passed down in Native American and pioneer families. The gathering of pine nuts in and around Desert National Wildlife Refuge (Refuge) by Native Americans occurred historically and continues to be an ongoing use today. The amount of pine nuts being harvested is traditionally low and is not expected to increase. The use of refuge lands as a gathering site is considered to be of vital importance to the Southern Pauites and other tribes.

This use does not occur on an annual basis because pinyon tree production is linked to moisture cycles. The refuge contains approximately 185,000 acres of pinyon-juniper woodlands. The only trees accessible by car are those located along the upper reaches of Mormon Well Road and at the end of Pine Nut Road. The infrequent removal of pine cones and nuts in these areas has had no noticeable effect on the overall status of this vegetative type. Pinyon-juniper woodlands lack a well-developed understory because of the closed canopy, so trampling of vegetation is not expected to be significant.

As proposed, compatible wild food gathering would be allowed on those areas of the Refuge already open for other forms of public use. Based upon historical use, it is estimated that less than 100 users per year would directly pursue this activity. Other users may passively pursue this activity while visiting the refuge for another purpose.

Gathering of wild foods is not one of the 6 legislated uses of the National Wildlife Refuge System. However, the use of refuge lands as a gathering site is considered to be of vital importance to Native American cultural groups. Given the small number of users are not expected to significantly impact the amount of food available for wildlife, the Refuge proposes to allow pine nut gathering to continue by Special Use Permit. If the number of users increases, or adverse impacts to habitat or wildlife begin to occur, the Refuge will re-evaluate this use.

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

Anticipated Impacts of Use: Anticipated impacts from this use are minor damage to vegetation, littering, and disturbance to wildlife. No long-term or cumulative impacts are expected on wildlife or habitat.

Possible impacts pine nut gathering could have include disturbance to wildlife, and habitat modification. Wildlife can be affected by the sight and sound of recreationists (Boyle and Sampson 1985). Habitat can be affected through vegetation trampling, soil compaction, and erosion (Cole 1983, 1990). Due to the small number of pine nut gatherers that use the Refuge, the impacts on sheep and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

Though bighorn sheep do not consume pine nuts, they do utilize the grasses, shrubs, and forbs in the pinyon-juniper understory and will use the woodlands for thermoregulation (Zeller 2003). In otherwise suitable habitat, sheep have been observed to abandon an area, either temporarily or permanently, when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis *et al.* 2001, Thompson *et al.* 2007). If the resulting loss of habitat is significant, the population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive

success (MacArthur et al. 1979). Papouchis *et al.* (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

Other species, like the pinyon jay and pinyon mouse, that rely on pine nuts as a food source, or bird species that utilize the pinyon-juniper overstory (Scott's oriole, gray vireo, ash-throated flycatcher and ferruginous hawk) (NDOW 2005) could be more directly affected by pine nut gathering. However, the use has been, and will continue to be, confined to areas adjacent to access roads leaving the majority of the habitat relatively undisturbed. Though wildlife will certainly be disturbed when pine nut gathering is occurring, the use is expected to be very limited, less than 100 users per season, and thus the overall impact is considered to be low. The amount of plant material being harvested is small enough not to constitute any measurable impact on habitat or food sources. Since gathering activities are limited, disturbance to wildlife and impact on wild food supply is also expected to be limited.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al. 1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Pine nut gathering can also have adverse impacts on vegetation and soil conditions. Pine nut gatherers can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EA for the Desert National Wildlife Refuge. Comments received will be addressed in the Response to Comments.

Determination:

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: In order to allow public access to the Refuge for pine nut gathering, the following measurers will be taken.

1. Pine nut gathering activities will be reviewed at the annual meeting with tribal representatives. If impacts from gathering increase so that the activity is adversely affecting wildlife habitat or if disturbance to wildlife is occurring, then tribal representatives will be

asked to adjust pine nut gathering activities to reduce impacts. Adjustments may include reductions in harvest, changes in timing of gathering to reduce wildlife or management conflicts, or reductions in numbers of visitors or frequency of visitors.

2. Refuge staff will monitor the impact of the number of users and re-evaluate the compatibility of this use as necessary.

3. Commercial gathering of wild foods is prohibited.

4. Pine nuts will only be gathered from the ground.

5. Vehicles will stay on designated roads.

Justification: As proposed, wild food gathering would allow the small number of interested individuals to enjoy the refuge with little or no additional cost to the refuge. The goals of the National Wildlife Refuge System (System) include providing an understanding and appreciation of fish and wildlife ecology, wildlife habitat, and the human role in the environment. The Service strives to provide priority public uses when compatible with the purpose and goals of the Refuge and the mission of the System. The National Wildlife Refuge System Improvement Act of 1997 identifies environmental education and interpretation as priority public uses for National Wildlife Refuges, along with hunting, fishing, wildlife observation and photography. This use, while not wildlife dependent, is a traditional use that contributes to environmental education and awareness. An understanding of plant ecology and annual moisture cycles is essential to successful pine nut harvesting, thus this activity helps to educate participants about Desert Refuge habitats, while sustaining cultural practices.

Mandatory Re-Evaluation Date:

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

___X___ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

_____ Environmental Assessment and Finding of No Significant Impact

__X_ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Camping

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Currently, car camping is permitted year-round, within 50 feet of designated roads or existing pull-outs and parking areas, on the portion of Desert NWR outside the Nevada Test and Training Range (Figure 1). Back country camping is permitted virtually anywhere on the Refuge primarily east of the Alamo Road. The Refuge currently has over 180 miles of designated roads. Camping is also allowed at Desert Pass Campground (formerly Mormon Well Campground). This

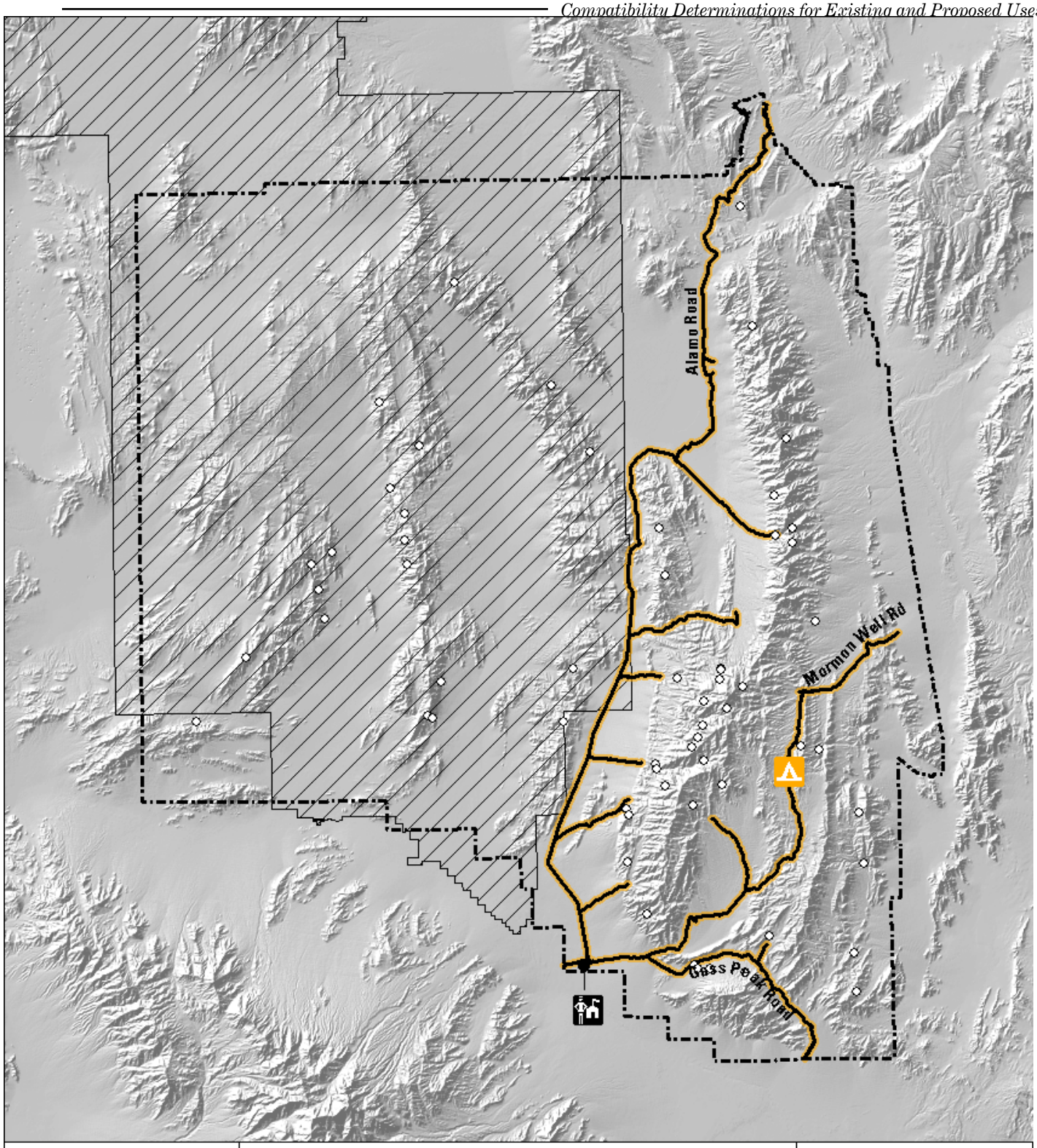

Figure 1

Area Open to Camping

Desert NWR

campground is located on the west side of Mormon Well Road in ponderosa pine woodland. It has eight designated sites with tables, fire rings, and vault toilets. Water is not available at the campground.

Camping is limited to 14 consecutive days. Campfires are permitted unless fire restrictions are in place. However, campers must bring their own wood and must use existing fire rings. Water is scarce and critical to wildlife, so campers must carry their own water. We propose to continuation of camping on Desert Refuge at or near current levels.

In general, use of Desert Pass Campground is heaviest on Memorial Day, Labor Day and holiday weekends. All eight sites are usually filled on these weekends (C. McDermott pers. com.). Use during other times of year is sporadic, with more use on weekends and less on weekdays and during winter.

Under the proposed action (Alternative C), the Service would recruit a seasonal volunteer resident host/docent at the Desert Pass Campground. Under the Alternative C, the Service would also use post and cable fencing to designate parking turnouts along Alamo, Mormon Well, and Gass Peak Roads. These improvements would help minimize impacts to desert habitat from car camping by limiting the tendency of pullouts to expand over time do to vehicular use.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Administration and management	$500	$500
Maintenance (road grading for access to pullouts, etc)	$1,000	$1000
Post and cable fencing to define pull outs.	$5,000	$1,000
TOTAL	**$6500**	**$2000**

Anticipated Impacts of Use: Anticipated Impacts of the Use

Possible impacts of camping include disturbance to wildlife and habitat modification. Wildlife can be affected by the sight and sound of recreationists (Boyle and Sampson 1985). Habitat can be affected through vegetation trampling, soil compaction, and erosion (Cole 1983, 1990). Due to the small number of campers that use the Refuge, the impacts on sheep and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

In otherwise suitable habitat, sheep have been observed to temporarily or permanently abandon an area when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis *et al.* 2001, Thompson *et al.* 2007). If the resulting loss of habitat is substantial, the

population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive success (MacArthur et al. 1979). Papouchis *et al.* (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al. 1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Campers can also have adverse impacts on vegetation and soil conditions. Hiking or walking can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Campers often spend more time at their campsite than anywhere else during their visit, which can potentially result in a source of pollution (Hendee *et al.* 1990). Bacterial contamination is a concern in wilderness settings and can be estimated by evaluating the densities of fecal coliforms (indicators of fecal contamination) and fecal streptococci (found in warm-blooded organisms, including humans).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Pets are allowed, but they must be on a leash and under camper's physical control at all times.
- Vehicle travel is only permitted on designated roads. All motor vehicles, including off-road vehicles, must be licensed and insured for highway use (i.e., street legal). All vehicle operators must have a valid operator's license in their possession.
- Back country camping is not permitted within 1/4 mile or within sight of any water development or spring.

- Car camping is only permitted within 50 feet of designated roads, and preferably within existing pull outs and parking areas.
- Restroom and other facilities at Desert Pass Campground will be maintained to minimize impacts on surrounding habitat.
- All campers are limited to a 14-consequetive day stay limit.
- All educational and interpretive materials for campers will emphasize Leave-No-Trace principles (www.lnt.org).
- Existing turnouts will be designated with post and cable fencing or other perimeter delineators, to prevent enlargement.
- Seasonal fire restrictions will be strictly enforced.
- Limitations on the number and size of groups may be implemented at more heavily used

Justification: While not one of the six priority wildlife dependent public uses listed or identified in the National Wildlife Refuge System Administration Act as amended (1997), camping is believed to be a compatible public use under the stipulations outlined in this compatibility determination. The primary reasons for this determination include:
1. Camping can facilitate priority public uses such as hunting, wildlife observation, and photography.
2. Due to its large size and remote nature, much of the refuge is very difficult to access. Camping facilitate this access.
2. Campers are a target audience not reached through other opportunities; they are potential partners and a potential source of support for the Refuges.
3. Impacts associated camping would be minimized through implementation of the stipulations noted above.
4. Camping impacts will be monitored and the use modified if necessary.

Based upon the information presented here and in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that hiking and backpacking within the Desert National Wildlife Refuge, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System.

Mandatory Re-Evaluation Date :

_____ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Thompson, D. K. Longshore, and C. Lowrey. 2007. The impact of human disturbance on desert bighorn sheep (*Ovis canadensis nelsoni*) in the Wonderland of Rocks / Queen Mountain region of Joshua Tree National Park, California: A final report prepared for Joshua Tree National Park, CA.

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Hiking and Backpacking

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s):

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Currently, hiking and backpacking are permitted year round on 747,000 acres of Desert NWR outside the Nevada Test and Training Range (Figure 1). Most of these lands are located on the eastern part of the Refuge generally east of Alamo Road. The area includes three mountain ranges (Las Vegas, Sheep, and East Desert Ranges). We propose the continuation of hiking and backpacking at the current levels on the Refuge.

The most popular backpacking area on the Refuge is Hidden Forest Canyon. Several groups use this area each weekend for most of the year (C. McDermott per. com). The 5.7-mile trail follows an old road through desert scrub and ponderosa pine forest to an old cabin. Most groups camp near the cabin. Wiregrass Spring is 0.15 miles past the cabin.

Other hiking/backpacking destinations on the Refuge include and Sawmill Canyon, Blackgate Canyon, Gass Peak, Hayford Peak, Joe May Canyon, Long Valley, Quartzite Mountain, and Yucca Peak. Some hikes follow abandoned roads and established trails. Others require strenuous off-trail hiking over steep, rugged terrain.

Camping associated with backpacking is permitted throughout this area except within 1/4 mile or within sight of any water development or spring. Backpackers must bring their own water. Spring water can be consumed, but should be treated first by filtration

Under the proposed action (Alternative C), the Service would map existing trails on Gass Peak and the Sheep Range using GPS and develop a trail guide for visitors. Trails would be managed to minimize impacts to sheep.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Managing current use		
Administration and management	1,500	$500
Improving/Enhancing Use		
Map trails / develop trail guide	1,000	
TOTAL	**$2,500**	**$500**

Anticipated Impacts of Use: Anticipated Impacts of the Use

Possible impacts of hiking and backpacking include disturbance to wildlife and habitat modification. Wildlife can be affected by the sight and sound of recreationists (Boyle and Samson 1985). Habitat can be affected through vegetation trampling, soil compaction, and erosion (Cole 1983, 1990). Due to the small number of hikers and backpackers that use the Refuge, the impacts on sheep and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

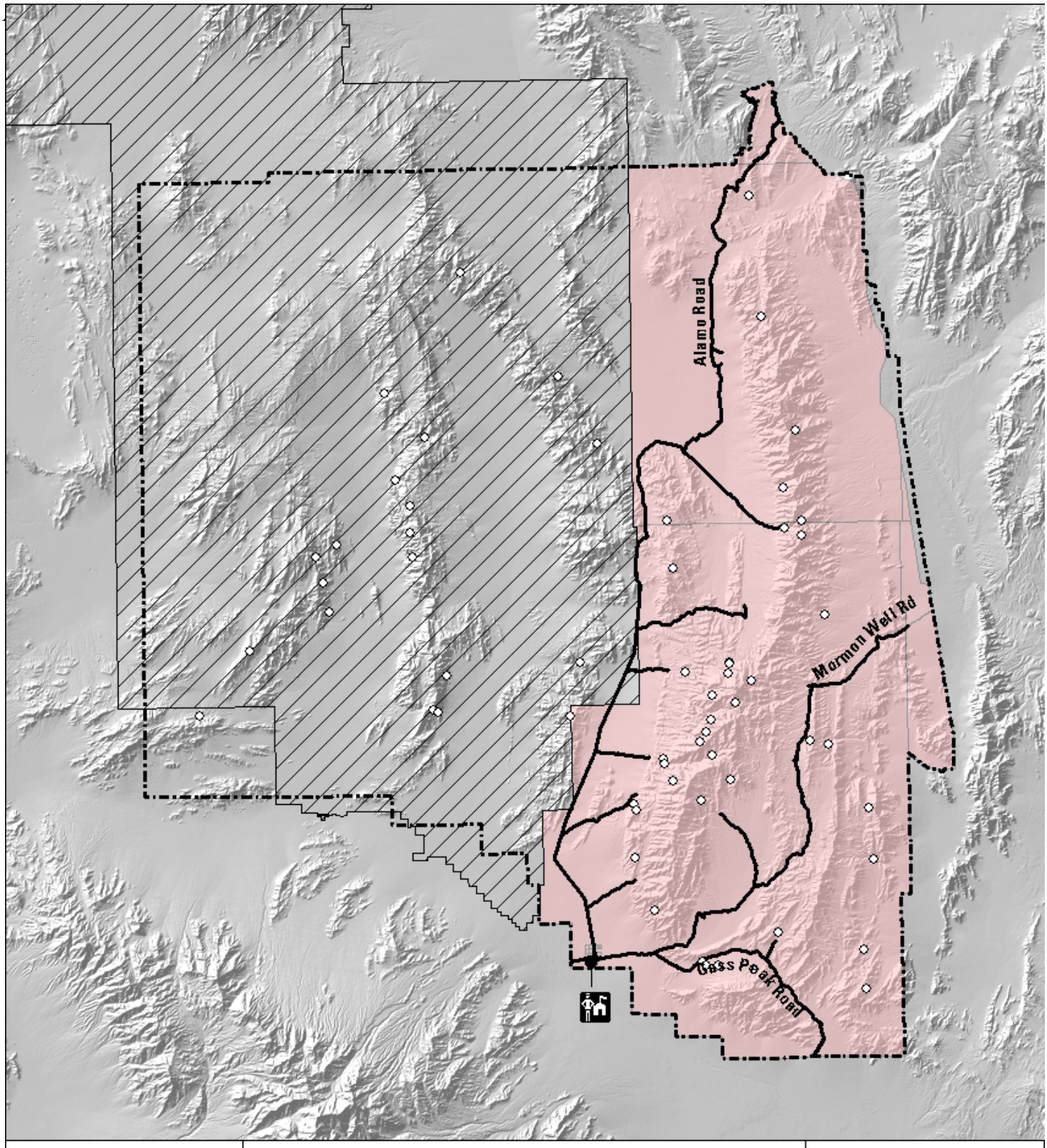

Figure 1

Area Open to Hiking and Backpacking

Desert NWR

According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

In otherwise suitable habitat, sheep have been observed to abandon an area, either temporarily or permanently, when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis *et al.* 2001, Thompson *et al.* 2007). If the resulting loss of habitat is significant, the population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive success (MacArthur et al. 1979). Papouchis *et al.* (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al. 1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Hiking and backpacking can also have adverse impacts on vegetation and soil conditions. Hiking or walking can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Backpackers often spend more time at their campsite than anywhere else during their visit, which can potentially result in a source of pollution (Hendee *et al.* 1990). Bacterial contamination is a concern in wilderness settings and can be estimated by evaluating the densities of fecal coliforms (indicators of fecal contamination) and fecal streptococci (found in warm-blooded organisms, including humans).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Pets are allowed, but they must be on a leash and under hiker/backpacker's physical control at all times.
- Vehicle travel is only permitted on designated roads. All motor vehicles, including off-road vehicles, must be licensed and insured for highway use (i.e., street legal). All vehicle operators must have a valid operator's license in their possession.
- Camping associated with backpacking is permitted throughout this area except within 1/4 mile or within sight of any water development or spring.
- Access to certain portions of the Refuge may be restricted during bighorn sheep lambing season and fall rut
- All educational and interpretive materials for hikers/backpackers will emphasize Leave-No-Trace principles (www.lnt.org).
- Seasonal fire restrictions will be strictly enforced.
- Open fires will not be permitted

Justification: While not one of the six priority wildlife dependent public uses listed or identified in the National Wildlife Refuge System Administration Act as amended (1997), hiking and backpacking is believed to be a compatible public use under the stipulations outlined in this compatibility determination. The primary reasons for this determination include:
1. Hiking and backpacking can facilitate priority public uses such as hunting, wildlife observation, and photography.
2. Due to its large size and remote nature, much of the refuge is very difficult to access. Hiking and backpacking help facilitate this access.
2. Hikers and backpackers are a target audience not reached through other opportunities; they are potential partners and a potential source of support for the Refuges.
3. Impacts associated with hiking and backpacking would be minimized through implementation of the stipulations noted above.
4. Hiking and backpacking impacts will be monitored and the use modified if necessary.

Based upon the information presented here and in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that hiking and backpacking within the Desert National Wildlife Refuge, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System.

Mandatory Re-Evaluation Date:

_____ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Welles, R.E. and F.B. Welles. 1961. The bighorn of Death Valley. U.S. Govt. Printing Office, Washington D.C. Fauna Series No. 6. 242 pp.

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Recreational Use of Pack and Saddle Stock

Refuge Name: Desert National Wildlife Refuge (Refuge), located in Clark and Lincoln counties, Nevada.

Establishing and Acquisition Authority(ies): Desert National Wildlife Range was established by Executive Order Number 7373 of President Franklin D. Roosevelt on May 20, 1936. Originally named the Desert Game Range and under the joint administration of the Fish and Wildlife Service and the Bureau of Land Management, it contained a total of 2,250,000 acres, including lands both north and south of U.S. Highway 95. Public Land Order 4079, issued on August 26, 1966 and corrected on September 23, 1966, revoked Executive Order 7373, changed the name to Desert National Wildlife Range, reduced its size to 1,588,000 acres, and transferred sole administration to the Fish and Wildlife Service. Between 1935 and 1989, an additional 760 acres in the vicinity of Corn Creek were acquired under various authorities, including the Migratory Bird Conservation Act, Endangered Species Act, and Refuge Recreation Act. The Military Lands Withdrawal Act of 1999 (Public Law 106-65) transferred primary jurisdiction of 110,000 acres of bombing impact areas on the Refuge from the Service to Department of Defense. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) transferred 26,433 acres of BLM land adjacent to Desert NWR's east boundary to the Service. In 2004, the Lincoln County Conservation, Recreation, and Development Act (Public Law 108-424) transferred approximately 8,382 acres the eastern boundary of Desert NWR to the BLM for use as a utility corridor. In addition, 8,503 acres of BLM-administered land adjacent to the northeast corner of the Refuge were transferred to the Service.

Refuge Purpose(s): Desert National Wildlife Refuge purposes include:

- For lands acquired under Public Land Order 4079, dated August 31, 1966, the purpose is "*. . . for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep.*"
- For lands acquired under 16 USC 715d (Migratory Bird Conservation Act): "*…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…*".
- For lands acquired under 16 U.S.C. § 1534 (Endangered Species Act of 1973) the purpose is "*. . . to conserve (a) fish or wildlife which are listed as endangered species or threatened species . . . or (b) plants.*"
- For lands acquired under 16 U.S.C. § 460k-460l (Refuge Recreation Act) the purpose is "*. . . suitable for - (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species . . .*"

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

Description of Use: Currently, the recreational use of pack and saddle stock is permitted on the eastern 747,000 acres of Desert NWR outside the Nevada Test and Training Range (Figure 1). These lands are located primarily east of Alamo Road, and include three mountain ranges (Las Vegas, Sheep, and East Desert Ranges).

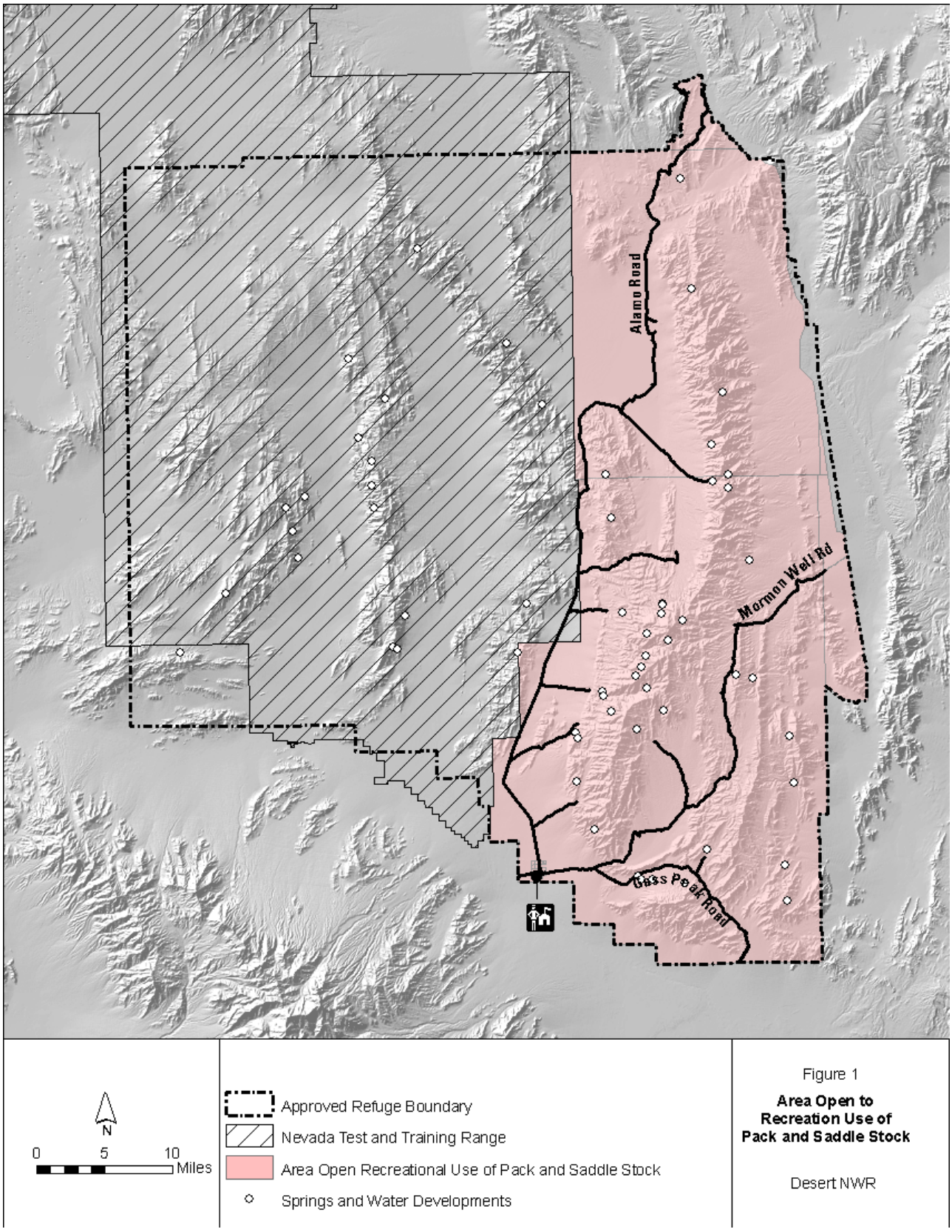

Figure 1

Area Open to Recreation Use of Pack and Saddle Stock

Desert NWR

Horses and other pack/saddle stock are used on the refuge for recreation and/or in support of other uses (e.g. hunting, wildlife observation, wildlife photography). Though the refuge lacks hard numbers about this use, annual observations from staff indicate that this use is infrequent with about one or two groups per month. About 80 percent are horseback riders originate from Corn Creek . The remaining 20 percent trailer their pack/saddle stock into the Refuge for trips in the backcountry (C. McDermott pers. com.). The majority of trips are short day rides. Multi-day trips in the backcountry are uncommon. We propose to continue to allow the recreational use of pack and saddle stock on the Refuge.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Administration and management	$400	$400
Maintenance (includes treatment for weeds as needed)	$400	$500
Special equipment (signs, trailhead establishment, etc)	$1000	$500
TOTAL	**$1,800**	**$1,400**

Refuge funds will be used to administer these uses.

Anticipated Impacts of Use: Anticipated Impacts of the Use

Possible impacts of the recreational use of pack and saddle stock include disturbance to wildlife and habitat modification. Wildlife can be affected by the sight and sound of recreationists (Boyle and Sampson 1985). Habitat can be affected through vegetation trampling, soil compaction, and erosion (Cole 1983, 1990). Due to the small number of recreational pack and saddle stock users on the Refuge, the impacts on sheep and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

According to Knight and Cole (1991), there are three wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

In otherwise suitable habitat, sheep have been observed to abandon an area, either temporarily or permanently, when their tolerance to disturbance is exceeded (Welles and Welles 1961, Light 1971, Wehausen 1980, Papouchis *et al.* 2001, Thompson *et al.* 2007). If the resulting loss of habitat is significant, the population's carrying capacity could be reduced (Light and Weaver 1973). Furthermore, when disturbance elicits a flight response in sheep, resulting energetic losses and loss of foraging time could negatively affect the physiology of individuals, potentially reduce their survival and reproductive success (MacArthur et al. 1979). Papouchis et al. (2001) found that response of female bighorn sheep to disturbance was greater during the spring lambing period and the response of male sheep was greatest during the fall rut.

In some circumstances, sheep may habituate to predictable human activity (Wehausen et al. 1977, Kovach 1979), including highway traffic (Horesji 1976), hiking (Hicks and Elder 1979, Hamilton et al.

1982, Holl and Bleich 1987), and aircraft (Krausman et al. 1998). Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path. Observations by Owen (1973) and others suggest that many species of wildlife are habituated to livestock and are less likely to flee when approached by an observer on horseback than by an observer on foot.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Public use activities can also have adverse impacts on vegetation and soil conditions. Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Impacts related to horseback riding include exotic plant seed dispersal (Beck 1993, Hammitt and Cole 1987), soil compaction and erosion (Bainbridge 1974, Hendee et a1. 1990, Hammitt and Cole 1987), trail widening (Whitaker 1978), vegetation trampling (Nagy and Scotter 1974, Weaver and Dale 1978, Whitaker 1978), aesthetic concerns relative to horse manure (Lee 1975), direct wildlife disturbance (Owen 1973), and direct and indirect conflicts with other recreationists.

Invasive plant species can be spread to new sites through forage (e.g., hay containing invasive weed seeds brought in to feed horses) and manure (Beck 1993, Benninger-Truax et al. 1992). Invasive weed establishment is further facilitated by increased trail disturbance, as many exotic plants gain a competitive advantage in highly disturbed sites. Additionally, hoof action tends to dig up and puncture the soil surface (McQuaid-Cook 1978), which causes greater sediment loss than any other form of recreational trail use (Seney and Wilson 1994), and increases the potential for disturbance-tolerant vegetation (e.g., invasive species) to establish. Trail widening is also a consideration, as horses tend to walk on the down slope sides of trails (Whitson 1974). Anticipated results include a wider trail, a much wider area of disturbance, and ongoing trail maintenance problems. Vegetation impacts can be much more pronounced considering that hikers tend to flatten vegetation while horses tend to churn up soil, thus, cutting plants off at the rootstalk (Whittaker 1978). This can increase spread of previously established invasives by providing loose disturbed soil for germination and spreading reproductive plant structures. This impact initially increases invasive plant species encroachment with light to moderate trail use, and eventually lowers (native) species richness values to near zero with heavy impacts (Hendee et al. 1990).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Vehicles and horse trailers will be restricted to designated roads and parking areas
- The use of certified weed-free hay is required to minimize weed spread.

- Recreational saddle/pack stock users will be required to carry their own water and food for their stock. Water from springs and water developments must not be used.
- Tying off pack/saddle stock to trees is discouraged. If no other tie offs are available, the lead ropes or tie lines must be attached to tree savers (wide straps with round rings attached that prevent damage to tree bark.) Hobbling of horses is strongly encouraged as an alternative.
- Access to certain portions of the Refuge may be restricted during bighorn sheep lambing season and fall rut
- All educational and interpretive materials for riders will emphasize principles of the Leave-No Trace backcountry horse use (www.lnt.org).
- Seasonal fire restrictions will be strictly enforced.
- Open fires will not be permitted

Justification: While not one of the six priority wildlife dependent public uses listed or identified in the National Wildlife Refuge System Administration Act as amended (1997), recreational use of pack and saddle stock is believed to be a compatible public use under the stipulations outlined in this compatibility determination. The primary reasons for this determination include:
1. The recreational use of pack and saddle stock can facilitate priority public uses such as hunting, wildlife observation, and photography.
2. Due to its large size and remote nature, much of the refuge is very difficult to access. Pack and saddle stock help facilitate this access.
2. Pack and saddle stock uses are a target audience not reached through other opportunities; they are potential partners and a potential source of support for the Refuges.
3. Impacts associated with the use of pack and saddle stock would be minimized through implementation of the stipulations noted above.
4. Pack/saddle stock use and impacts will be monitored and the use modified if necessary.

Based upon the information presented here and in the Draft Comprehensive Conservation Plan / Environmental Impact Statement (USFWS 2008), it is determined that recreational use of pack and saddle stock within the Desert National Wildlife Refuge, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System.

Mandatory Re-Evaluation Date:

_____ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Wildlife Observation and Photography

Refuge Name: Moapa Valley National Wildlife Refuge (Refuge), Clark County, Nevada.

Establishing and Acquisition Authority: Moapa Valley National Wildlife Refuge was established on September 10, 1979, to secure and protect habitat for the endangered Moapa dace (*Moapa coriacea*). This unique native fish lives out its life within the Warm Springs area of the Upper Muddy River headwaters. These headwaters are composed of up to 20 thermal springs which are essential to the Moapa dace's life cycle. Historic uses of the spring pools and the surrounding landscape for agricultural and recreational purposes have altered the habitat of the Moapa dace.

Refuge Purpose(s): Moapa Valley National Wildlife Refuge purpose includes:

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

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as wildlife dependent public uses for NWR's. As two of the six priority public uses of the Refuge system, these uses are to be encouraged when compatible with the purposes of the Refuge. The public and communities desire more opportunities for these uses. The Refuge will allow access to designated open areas for observing and photographing scenery and associated flora and fauna. The Refuge will also provide some facilities to support wildlife observation and photography.

Due to the Moapa Valley NWR's small size, fragile habitats, on-going restoration work, and the need to remove unsafe structures, the Refuge has been closed to the public since acquisition began. Agency scientists with the U.S. Geological Survey (USGS) and Nevada Department of Wildlife (NDOW), as well as local conservation and community organizations, are working with Service staff to restore the historical landscape and habitat on the Refuge, which is critical to the survival of the Moapa dace, other rare fish and invertebrates, and a variety of migratory birds.

Under alternative C of the CCP (the preferred alternative), the Service would open the Refuge to the public daily. Visitor services would be improved to target 1,000 visitors annually. Interpretive materials, such as brochures and fact sheets, would be developed to guide and enhance visitor experience and provide information on the Moapa dace, its habitat requirements and the history of the Refuge. To encourage schools to visit the Refuge, the Service would organize local school contacts and generate enthusiasm for visiting the Refuge and experiencing its endemic species.

Several new facilities would be constructed or installed for visitor use, including:

a) Potable water lines and public restrooms
b) Shade structures, parking areas, and a school bus/RV turnout
c) Self-guided trail system
d) An overlook trail on the top of the hill on the Plummer Unit,

e) A wheelchair-accessible trail along the spring heads, pools, and riparian corridor on the Plummer Unit.
f) Visitor contact station.

Signs would also be installed along Interstate 15, U.S. Highway 93 and NV 168 to promote and direct the public to the Refuge.

Wildlife observation and photography are considered together in this compatibility determination because all are considered to be wildlife-dependent, non-consumptive uses and many elements of these programs are similar. Both of these public uses are dependent upon the completion of the trail system, potable water lines, public restrooms, a visitor contact station, and parking areas on the Refuge. An estimated 1,000 annual visitors will participate in these activities.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Administration (Refuge Manager, utilities, vehicle, etc)	**$325,000**	**$250,000**
Maintain public restrooms, trails, parking lot, shade structure		**$5,000**
Maintenance worker	**$200,000**	**$150,000**
TOTAL	**$525,000**	**$405,000**

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

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 impacted 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).

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

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

The construction and maintenance of trails 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). However, by concentrating foot traffic onto the trails other habitats on the Refuge will remain undisturbed.

Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (walking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Anticipated Impacts of Uses on Future Lands within the Approved Boundary: The following conditions must be met before allowing existing uses to occur on newly acquired lands: (1) There is no indirect, direct, or cumulative threat anticipated to human health or safety; (2) There is no indirect, direct, or cumulative threat anticipated to natural or cultural resources; (3) The use is consistent with management of existing Moapa Valley NWR lands and would contribute to achieving Refuge goals. In particular, existing Refuge regulations would not be compromised; (4) The newly acquired lands represent a meaningful unit within which to manage the activity; and (5) There are no anticipated conflicts with priority public uses.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Regulations and wildlife friendly behavior (e.g., requirements to stay on designated trails, etc.) will be described in brochures and posted.
- Access to the Refuge will be allowed only between sunrise and sunset.
- Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).
- Regulatory and directional signs will clearly mark areas closed to the public and designated routes of travel.
- Maps and public use information will be available at the visitor contact station.
- Refuge staff will conduct regular monitoring of public activities on the Refuge. The data will be analyzed and used by the Refuge Manager to develop modifications, if necessary, to ensure compatibility of the wildlife observation and photography programs.
- Commercial photography would require a Special Use Permit.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for wildlife observation and photography, would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Moapa Valley National Wildlife Refuge (Goal 3, Chapter 3, CCP). Wildlife observation and photography would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Based upon impacts described in the Draft Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that wildlife observation and photography within the Moapa Valley National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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USFWS. 2008. Desert National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Impact Statement. U.S. Fish and Wildlife Service, Region 8.

Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional Director - Refuges: _____ _____

(Signature) (Date

COMPATIBILITY DETERMINATION

Use: Environmental Education and Interpretation

Refuge Name: Moapa Valley National Wildlife Refuge (Refuge), Clark County, Nevada.

Establishing and Acquisition Authority: Moapa Valley National Wildlife Refuge was established on September 10, 1979, to secure and protect habitat for the endangered Moapa dace (*Moapa coriacea*). This unique small fish lives out its life within the Warm Springs area of the Upper Muddy River headwaters. These headwaters are composed of up to 20 thermal springs which are essential to the Moapa dace's life cycle. Historic uses of the spring pools and the surrounding landscape for recreational purposes and agriculture have altered the habitat of the Moapa dace.

Refuge Purpose(s): Moapa Valley National Wildlife Refuge's purpose is:

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

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as wildlife dependent public uses for NWR's. As two of the six priority public uses of the Refuge system, these uses are to be encouraged when compatible with the purposes of the Refuge. The public and communities desire more opportunities for these uses. The Refuge will allow access to designated open areas for environmental education and interpretation. The Refuge will also provide some facilities to support environmental education and interpretation.

Due to Moapa Valley NWR's small size, fragile habitats, on-going restoration work, and the need to remove unsafe structures, the Refuge has been closed to the public since acquisition began. Agency scientists with the U.S. Geological Survey (USGS) and Nevada Department of Wildlife (NDOW), as well as local conservation and community organizations, are working with Service staff to restore the historical landscape and habitat on the Refuge, which is critical to the survival of the Moapa dace.

Wit funding form the Southern Nevada Public Lands Management Act, the Service has completed several facilities that are necessary for environmental education and interpretation to occur on the Refuge, including: parking for buses and cars; restrooms; shade structures; self-guided trail system; and a stream profile viewing chamber.

Under Alternative C of the CCP (the preferred alternative), the Service would open the Refuge to the public daily. Visitor services would be improved to target 1,000 visitors annually. Interpretive materials, such as brochures and fact sheets, would be developed to guide and enhance visitor experience and provide information on the Moapa dace, its habitat requirements, and the history of the Refuge. To encourage schools to visit the Refuge, the Service would organize local school contacts and generate enthusiasm for visiting the Refuge and experiencing its endemic species.

To improve outreach for the Refuge, the Service would conduct an annual public open house to encourage interactions and foster relationships between Refuge staff and local constituents, and they would explore opportunities for community-based outreach, such as participation in off-Refuge activities. Docents would be recruited to staff the Refuge on weekends and facilitate tours, and the Service would collect data on the number of visitors to modify their visitor services accordingly.

The Service would construct a permanent environmental education display at the Moapa Valley Community Center (Moapa, NV) or another public venue. Cultural resources interpretive efforts would be incorporated into Refuge interpretation materials through development of regionally-focused cultural resources materials for self-guided tours and incorporation of the history of the Moapa Band of the Paiutes, including their knowledge of native plant and animal species.

The Service would also work with NDOT to install signs along Interstate 15, U.S. Highway 93, and NV 168 to promote and direct the public to the Refuge.

Environmental education and interpretation are considered together in this compatibility determination because all are considered to be wildlife-dependent, non-consumptive uses and many elements of these programs are similar. Both of these public uses are dependent upon the completion of the trail system, potable water lines, public restrooms, a visitor contact station, and parking areas on the Refuge. An estimated 1,000 annual visitors will participate in these activities.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Administration and management	**$60,000**	**$60,000**
Develop interpretive materials	**$35,000**	**$2,500**
Education display at Moapa Valley Community Center	**$2,000**	**$200**
Maintain public use facilities and grounds		**$55,000**
TOTAL	**97,000**	**$117,700**

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that activities such as environmental education and interpretation 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 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 impacted 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).). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff (or volunteers) were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein and Temple 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al 1987).

The disturbance by environmental education activities is considered to be of minimal impact because: (1) students and teachers will be instructed in trail etiquette and the best ways to view wildlife with minimal disturbance; (2) education groups will be required to have a sufficient number of adults to supervise the group; (3) trail design will provide adequate cover for wildlife; and (4) observation areas and scopes are provided to view wildlife at a distance which reduces disturbance.

Education staff will coordinate with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by Refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur.

Anticipated Impacts of Uses on Future Lands within the Approved Boundary: The following conditions must be met before allowing existing uses to occur on newly acquired lands: (1) There is no indirect, direct, or cumulative threat anticipated to human health or safety; (2) There is no indirect, direct, or cumulative threat anticipated to natural or cultural resources; (3) The use is consistent with management of existing Moapa Valley NWR lands and would contribute to achieving Refuge goals. In particular, existing Refuge regulations would not be compromised; (4) The newly acquired lands represent a meaningful unit within which to manage the activity; and (5) There are no anticipated conflicts with priority public uses.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

_X_ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Participants in the Refuge's environmental education program will be restricted to established trails including the kiosk and parking areas, the visitor contact station, and other designated sites.

- All groups using the Refuge for environmental education will be required to make reservations in advance through the Refuge office. This process, which takes the place of a Special Use Permit (SUP), allows Refuge staff and volunteers to manage the number of Refuge visitors on a given day. There is a current refuge policy that educational groups are not charged a fee or required to have a SUP. A daily limit of 100 students participating in the education program will be maintained through this reservation system. Efforts will be made to spread out use by large groups while reservations are made, reducing disturbance to wildlife and over-crowding of Refuge facilities during times of peak demand.

- Trail etiquette including ways to reduce wildlife disturbance will be discussed with teachers during orientation workshops and with students upon arrival during their welcome session. On the Refuge, the teacher(s) is responsible for ensuring that students follow required trail etiquette.

- The Refuge manager will conduct regular surveys of public activities on the refuge. The data will be analyzed and used by the Refuge Manager to develop future modifications if necessary to ensure compatibility of environmental education programs.

- Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 12 students.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for environmental education and interpretation, would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Moapa Valley Refuge (Goal 3, Chapter 3, CCP). Environmental education and interpretation would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. Environmental education and interpretation activities generally support Refuge 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 is that it instills an 'ownership' or 'stewardship' ethic in visitors and most likely reduces vandalism, littering and poaching; it also strengthens service visibility in the local community.

The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Based upon impacts described above and in the Draft Comprehensive Conservation Plan /Environmental Impact Statement (USFWS 2008), it is determined that environmental education and interpretation within the Moapa Valley National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Research

Refuge Name: Moapa Valley National Wildlife Refuge (Refuge), Clark County, Nevada.

Establishing and Acquisition Authority: Moapa Valley National Wildlife Refuge was established on September 10, 1979, to secure and protect habitat for the endangered Moapa dace (*Moapa coriacea*). This unique small fish lives out its life within the Warm Springs area of the Upper Muddy River headwaters. These headwaters are composed of up to 20 thermal springs which are essential to the Moapa dace's life cycle. Historic uses of the spring pools and the surrounding landscape for recreational purposes and agriculture have altered the habitat of the Moapa dace.

Refuge Purpose(s): Moapa Valley National Wildlife Refuge's purpose is:

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

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

Description of Use: Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Monitoring and research are an integral part of National Wildlife Refuge management. Plans and actions based on research and monitoring provide an informed approach, which analyzes the management affects on refuge wildlife.

When the Refuge receives requests to conduct scientific research at the Refuge, Special Use Permits (SUPs) are required to be issued for research and monitoring. SUPs are only issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff and conservation partners, as appropriate. SUPs are issued by the refuge manager, if the proposal is approved.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off-Refuge are less likely to be approved.
- Research which causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request.

- Refuge evaluation will determine if any effort has been made to minimize disturbance through study design, including considering adjusting location, timing, scope, number of permittees, study methods, number of study sites, etc.

- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied, depending on the specific circumstances.

- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

These criteria will also apply to any properties acquired in the future within the approved boundary of the Refuge.

Availability of Resources: The Refuge receives approximately 1 - 3 research requests per year. Some permit requests require up to one hour to process, others could take longer, depending on the complexity of the research request. On average, the program costs approximately $500.00/year. Refuge operational funds are currently available through the Service budget process to administer this program.

	One-time Costs	Annual Costs
General Administration		$500
TOTAL		

Anticipated Impacts of Use: Possible impacts of research include disturbance to wildlife and habitat modification. Potential impacts associated with research activities would be mitigated/minimized because sufficient restrictions would be included as part of the study design and researcher activities would be monitored by Refuge staff. Due to the small number of researchers that use the Refuge and with the restrictions outlined in the stipulations section below, the impacts on migratory birds and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989). 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 impacted 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).

Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Research activities could also have impacts on vegetation, soil, and/or water. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted. Off trail walking by researchers could have similar effects as hikers in general who can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Anticipated Impacts of Uses on Future Lands within the Approved Boundary: The following conditions must be met before allowing existing uses to occur on newly acquired lands: (1) There is no indirect, direct, or cumulative threat anticipated to human health or safety; (2) There is no indirect, direct, or cumulative threat anticipated to natural or cultural resources; (3) The use is consistent with management of existing Moapa Valley NWR lands and would contribute to achieving Refuge goals. In particular, existing Refuge regulations would not be compromised; (4) The newly acquired lands represent a meaningful unit within which to manage the activity; and (5) There are no anticipated conflicts with priority public uses.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex. Comments received (including those regarding research) will be addressed in the Response to Comments.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity,

location, duration, seasonality, etc. to ensure continued compatibility. All Refuge rules and regulations must be followed unless otherwise accepted in writing by Refuge management.

All information, reports, data, collections, or documented sightings and observations, that are obtained as a result of this permit are the property of the Service and can be accessed by the Service at any time from the permittee at no cost. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria. Each SUP will also be evaluated individually to determine if a fee will be charged and for the length of the permit.

Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification: Refuge monitoring and research will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the refuge. The wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation, fishing and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with monitoring and research investigations which address specific restoration and management questions.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

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

Concurrence

Refuge Supervisor:	_____	_____
	(Signature)	(Date)
Assistant Regional Director - Refuges:	_____	_____
	(Signature)	(Date

COMPATIBILITY DETERMINATION

Use: Wildlife Observation and Photography

Refuge Name: Pahranagat National Wildlife Refuge (Refuge), located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge was established on August 16, 1963, to provide habitat for migratory birds, especially waterfowl. It encompasses 5,380 acres of marshes, open water, native grass meadows, cultivated croplands, and riparian habitat approximately 90 miles north of Las Vegas.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purpose includes:

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…" (16 USC 715d).

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation and photography as well as hunting, fishing, interpretation, and environmental education as priority public uses for the National Wildlife Refuge System. The uses are to be encouraged when compatible with the purposes of the refuge. This compatibility determination covers both wildlife observation and photography. Many elements of wildlife observation and photography are similar to opportunities provided in the environmental education and interpretation programs.

Pahranagat NWR allows the year-round access to designated open areas for observing and photographing scenery and associated flora and fauna. Wildlife observation is available throughout the Refuge, and bird watching is the most common activity. A bird list is available at the Refuge office or online. The large bodies of water and riparian habitat provide excellent opportunities for birders to view a variety of waterfowl and other migratory birds.

Pahranagat NWR receives visitors from the nearby communities as well as from other states and foreign countries. Visitation numbers are gathered in two ways on the Refuge: traffic counters at the entrances and a sign-in sheet at the Refuge headquarters. Visitation at the Refuge is expected to increase as the nearby communities grow. Based on current estimates, the Refuge accommodates approximately 30,000 visitors per year (USFWS 2008). The nature trails and fishing/observation pier are the most common facilities used by the public. In FY 2007, over 500 people visited the Refuge to fish, and more than 25,000 people hiked along the nature trails or participated in wildlife observation of some kind.

The Service provides several facilities to support wildlife observation and photography activities on the Refuge. The Refuge administrative office serves as a visitor contact station with brochures, maps, and fact sheets. The office is open Monday through Friday from 8:00 a.m. to 4:00 p.m., or as staff is available. An outside contact station and interpretive kiosk is located at the north end of the Refuge just east of the dike which separates North Marsh from Upper Pahranagat Lake. Vault toilets and dumpsters are also provided in this area. A fishing pier/observation platform is located at the south end of Upper Pahranagat Lake. In addition, a natural trail runs from this point and traverses the east side of Upper Pahranagat Lake. A hunting blind/observation platform is also available at Middle Marsh. Parking is available in several places along designated roads.

Principal public access to Pahranagat NWR is from Highway 93, about 60 miles north of the junction with Interstate 15. Two unpaved roads lead to Lower Lake and Middle Marsh from the highway. A sign along the highway marks the gravel road to the Refuge headquarters. This road connects to Alamo Road and continues through the Refuge and onto the Desert NWR. About four miles north of the headquarters road, an unpaved road leads to the North Marsh and Upper Pahranagat Lake and associated facilities. Vehicles must remain on the designated roads. All-terrain vehicles are prohibited on the Refuge. Boat launching is limited to car-top only (no ramps) and only non-motorized boats or boats with electric motors are permitted on Upper Pahranagat Lake, Middle Marsh, and Lower Lake. No boats, rafts or any other types of flotation devices are allowed at North Marsh.

The Refuge will continue to provide wildlife observation opportunities and photography opportunities. Under Alternative D of CCP (the preferred alternative), the Service would improve opportunities for these two uses on the Refuge. A wildlife observation trail system potentially along historic farming and ranching roads would be developed. Photography and observation blinds along the trail route would also be constructed. To improve public access and awareness of the Refuge, the Service would install directional signs along Highway 93 and Interstate 15 with assistance of Nevada Department of Transportation.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Manage Current Use		
Administration		$15,000
Law enforcement		$2,000
Volunteers		$4,000
Improve and Enhance Use		
Design and construct wildlife observation trail system	$5,000	$500
Construct photography/observation blinds along trail route.	$3,000	$500
TOTAL	$7,000	$22,000

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). A reduced number of shorebirds were found near people who were walking or jogging, and about 50 percent of flushed birds flew elsewhere (Burger 1981). In addition, the foraging time of sanderlings decreased and avoidance (e.g., running, flushing) increased as the number of humans within 100 meters increased (Burger and Gochfeld 1991). 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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

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

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

The construction and maintenance of trails, photography blinds, 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). However, by concentrating foot traffic onto the trails other habitats on the Refuge will remain undisturbed.

Disturbance of wildlife is the primary concern regarding wildlife observation and photography. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Anticipated Impacts of Uses on Future Lands within the Approved Boundary: The following conditions must be met before allowing existing uses to occur on newly acquired lands: (1) There is no indirect, direct, or cumulative threat anticipated to human health or safety; (2) There is no indirect, direct, or cumulative threat anticipated to natural or cultural resources; (3) The use is consistent with management of existing Pahranagat NWR lands and would contribute to achieving Refuge goals. In particular, existing Refuge regulations would not be compromised; (4) The newly acquired lands represent a meaningful unit within which to manage the activity; and (5) There are no anticipated conflicts with priority public uses.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Regulations and wildlife friendly behavior (e.g., requirements to stay on designated trails, dogs must be kept on a leash, etc.) will be described in brochures and posted at the Visitor Contact Station(s).
- Access to the Refuge will be allowed only between sunrise and sunset.
- Regulatory and directional signs will clearly mark areas closed to the public and designated routes of travel.
- Maps and public use information will be available at the Refuge Headquarters and kiosk.
- Refuge staff will conduct regular monitoring of public activities on the Refuge. The data will be analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of the wildlife observation and photography programs.
- Commercial photography would require a Special Use Permit.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for wildlife observation and photography, would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Pahranagat Refuge (Goal 3, Chapter 3, CCP). Wildlife observation and photography would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Therefore, it is determined that wildlife observation and photography within the Pahranagat National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Environmental Education and Interpretation

Refuge Name: Pahranagat National Wildlife Refuge (Refuge), located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge was established on August 16, 1963, to provide habitat for migratory birds, especially waterfowl. It encompasses 5,380 acres of marshes, open water, native grass meadows, cultivated croplands, and riparian habitat approximately 90 miles north of Las Vegas.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purpose includes:

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…" (16 USC 715d).

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

Description of Use: The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, photography well as hunting, fishing, interpretation, and environmental education as priority public uses for National Wildlife Refuge System. These wildlife-dependent uses are to be encouraged when compatible with the purposes of the refuge. This compatibility determination covers both environmental education and interpretation. Many elements of environmental education and interpretation programs are also similar to opportunities provided in the wildlife observation and photography programs.

Pahranagat NWR allows the year-round access to designated areas for environmental education and interpretation. Numerous recreational opportunities are available at Pahranagat NWR. Wildlife observation, fishing, and hunting are the more popular activities enjoyed by Refuge visitors (USFWS 2008).

Pahranagat NWR receives visitors from the nearby communities as well as from other states and foreign countries. Specific data on visitation are not available; however, visitation at the Refuge is expected to increase as the nearby communities grow. Based on current estimates, the Refuge accommodates approximately 30,000 visitors per year. Refuge staff estimate approximately 700 people travel to the refuge to participate in environmental education activities annually.

The Refuge provides limited facilities to support environmental education and interpretation. The Refuge administrative office currently serves as a visitor contact station with brochures, maps, and fact sheets. The office is open Monday through Friday from 8:00 a.m. to 4:00 p.m., or as staff is available. An outside contact station and interpretive kiosk is located at the north end of the Refuge just east of the dike between North Marsh and Upper Pahranagat Lake. Vault toilets and dumpsters are also provided in this area. Parking is available in several places along designated roads. Principal public access to Pahranagat NWR is from Highway 93, about 60 miles north of the junction with Interstate 15.

The Refuge will continue to provide environmental education and interpretation opportunities. Under Alternative D of CCP (the preferred alternative), the Service would enhance existing and provide new opportunities for environmental education and interpretation. A new visitor contact station and parking area would be constructed at the headquarters unit. Existing interpretive panels would be replaced and new panels would be developed. Environmental education and interpretive materials would also be developed including "wanted posters" for invasive plant species. Education and interpretive programs would incorporate information about traditional and/or sacred cultural resources to increase public awareness about these sensitive resources. The Service would also construct a new interpretive walking trail that connects Upper Pahranagat Lake with the Headquarters Unit. To improve public access and awareness of the Refuge, the Service would install directional signs along Highway 93 and Interstate 15 with assistance of Nevada Department of Transportation. In addition, an interpretive plan for the refuge would be developed.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage the activities as described above:

	One-time Costs	Annual Costs
Manage Existing Use		
Administration		**$15,000**
Develop environmental education and interpretive materials	**$12,000**	**$3,000**
Improve/Enhance Use		
Construct and maintain new visitor contact station	**$1,000,000**	**$15,000**
Develop kiosk and interpretive panels	**$5,000**	
Develop interpretive walking trail	**$5,000**	**$500**
Volunteers		**$4,000**
TOTAL	**$1,019,000**	**$37,500**

Anticipated Impacts of Use: Once considered "non-consumptive", it is now recognized that uses such as environmental education and interpretation 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. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (walking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased visitation and new facilities such as the interpretive trail and visitor contact station would cause some loss of habitat and increase disturbance to some wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into important wildlife habitat.

Individual animals may be disturbed by human contact to varying degrees. 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 impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). A reduced number of shorebirds were found near people who were walking or jogging, and about 50 percent of flushed birds flew elsewhere (Burger 1981). In addition, the foraging time of sanderlings decreased and avoidance (e.g., running, flushing) increased as the number of humans within 100 meters increased (Burger and Gochfeld 1991). 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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al 1987).

The disturbance by environmental education activities is considered to be of minimal impact because: (1) the total number of students permitted through the reservation system is limited to 100 per day; (2) students and teachers will be instructed in trail etiquette and the best ways to view wildlife with minimal disturbance; (3) education groups will be required to have a sufficient number of adults to

supervise the group; (4) trail design will provide adequate cover for wildlife; and (5) observation areas and scopes are provided to view wildlife at a distance which reduces disturbance.

Refuge staff will coordinate with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by Refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

- Participants in the Refuge's environmental education program will be restricted to established trails, the visitor contact station, and other designated sites.

- All groups using the Refuge for environmental education will be required to make reservations in advance through the Refuge office. This process, which takes the place of a Special Use Permit (SUP), allows refuge staff to manage the number and location of visitors for each unit. There is a current refuge policy that educational groups are not charged a fee or required to have a SUP. A daily limit of 100 students participating in the education program will be maintained through this reservation system. Efforts will be made to spread out use by large groups while reservations are made, reducing disturbance to wildlife and over-crowding of Refuge facilities during times of peak demand.

- Trail etiquette including ways to reduce wildlife disturbance will be discussed with teachers during orientation workshops and with students upon arrival during their welcome session. On the Refuge, the teacher(s) is responsible for ensuring that students follow required trail etiquette.

- Refuge staff will conduct regular monitoring of public activities on the refuge. The data will be analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of environmental education programs.

- Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 12 students.

- Regulations and wildlife friendly behavior (e.g., requirements to stay on designated trails, dogs must be kept on a leash, etc.) will be described in brochures and posted at the Visitor Contact Station(s).

- Access to the Refuge will be allowed only between sunrise and sunset.

- Regulatory and directional signs will clearly mark areas closed to the public and designated routes of travel.

Justification: These wildlife-dependent uses are priority public uses of the National Wildlife Refuge System. Providing opportunities for environmental education and interpretation, would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in

1997, and one of the goals of the Pahranagat Refuge (Goal 3, Chapter 3, CCP). Environmental education and interpretation would provide an excellent forum for allowing public access and increasing understanding of Refuge resources. Environmental education and interpretation activities generally support Refuge 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 is that it instills an 'ownership' or 'stewardship' ethic in visitors and most likely reduces vandalism, littering and poaching; it also strengthens service visibility in the local community.

The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Therefore, it is determined that environmental education and interpretation within the Pahranagat National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, these wildlife dependent uses will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EIS/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Hunting

Refuge Name: Pahranagat National Wildlife Refuge (Refuge), located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge was established on August 16, 1963, to provide habitat for migratory birds, especially waterfowl. It encompasses 5,380 acres of marshes, open water, native grass meadows, cultivated croplands, and riparian habitat approximately 90 miles north of Las Vegas.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purpose includes:

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…" (16 USC 715d).

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

Description of Use: Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the Service is proposing to continue to allow goose, duck, coot, moorhen, snipe, dove, quail, and rabbit hunting on approximately 900 acres of Pahranagat Refuge. The Proposed Action (Alternative D) analyzed in the Draft Comprehensive Conservation Plan (CCP/EIS) (USFWS 2008), which is incorporated by reference, contains maps and descriptions of where hunting will be allowed on the Refuge. The hunting program will provide high quality, safe, and cost-effective hunting opportunities, 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:

- Manage 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 Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting.

Hunting will be permitted in accordance with State and Federal regulations and seasons (Table 1 gives an example of annual State hunt seasons for areas within the Refuges) to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. Therefore, the sport hunting of migratory birds and upland game birds on the Refuges is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

Table 1. Pahranagat Refuge, Hunting Season Bag Limit Summary for 2006-2007

Species	Dates	Daily Bag Limits
Waterfowl – Ducks	October 14 – January 27	Up to 7 ducks; see below; possession double the bag limit*
Waterfowl – Geese	October 21 – January 28	Up to 4 geese any species; possession double the bag limit
American Coot and Common Moorhen	Concurrent with duck season	25/day, 25 in possession, either all of one species or a mixture of these species
Snipe	Concurrent with duck season	8/day; possession double the bag limit
Dove	September 1 - 30	10/day; possession double the bag limit
Quail	October 14 – January 31	10/day; possession double the bag limit
Rabbit	October 14 – February 28	10/day; possession double the bag limit

*Duck Bag Limits: 7 ducks/ but not more than 2 hen mallards, 1 pintail, 1 canvasback, 2 redhead, 3 scaup, throughout the season

Hunting is permitted on the designated portion of Pahranagat Refuge (Figure 4.5.3 in the CCP/EIS). Hunting of waterfowl, coot, common moorhen, snipe, quail and rabbit is permitted Tuesdays, Thursday, and Saturday during hunting seasons established by the Nevada Fish and Game Commission. Dove hunting is permitted every day during the hunt season.

The Refuge has approximately 600 annual waterfowl hunting visits and 100 upland game visits each year. Field checks by refuge law enforcement officers will be planned, conducted, and coordinated with staff and other agencies to maintain compliance with regulations and assess species and number harvested. Dogs will be required to be kept on a leash, except for hunting dogs engaged in authorized hunting activities and under the immediate control of a licensed hunter.

Availability of Resources: The following funding/annual costs (based on FY 2008 costs) would be required to administer and manage hunting activities as described above:

	One-Time Costs	Annual Costs
Printing (brochures, signs, posters, etc)		0
Law Enforcement (permit compliance, access control, protection) (approx. 20 days/season)		$5,500
Maintenance (parking lot, trash cleanup, toilet)		$3,000
Personnel Services (managerial)		$1,500
TOTAL		**$10,000**

Anticipated Impacts of Use: Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Madsen 1985, and Cole and Knight 1990). There also appears to be an inverse relationship between the numbers of birds using an area and hunting intensity (DeLong 2002). In Connecticut, lesser scaup were observed to forage less in areas that were heavily hunted (Cronan 1957). In California, the numbers of northern pintails on Sacramento Refuge non-hunt areas increased after the first week of hunting and remained high until the season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the hunting season began. Human disturbance associated with hunting includes loud noises and rapid movements, such as those produced by shotguns and boats powered by outboard motors. This disturbance, especially when repeated over a period of time, compels waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas (Madsen 1995, Wolder 1993).

These impacts can be reduced by the presence of adjacent sanctuary areas where hunting does not occur, and birds can feed and rest relatively undisturbed. At Pahranagat Refuge, Upper Pahranagat Lake and North Marsh are the sanctuary areas. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulus 1984). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased 4 to 20 fold within the sanctuary (Madsen 1995). Thus, sanctuary and non-hunt areas are very important to minimize disturbance to waterfowl populations to ensure their continued use of the Refuges.

Intermittent hunting can be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). It is common for Refuges to manage hunt programs with non-hunt days. At Sacramento Refuge, 3-16 percent of pintails were located on hunted units during non-hunt days, but were almost entirely absent in those same units on hunt days (Wolder 1993). In addition, northern pintails, American wigeon, and northern shovelers decreased time spent feeding on days when hunting occurred on public shooting areas, as compared to non-hunt days (Heitmeyer and Raveling 1988). The intermittent hunting program of three hunt days per week at Sacramento Refuge results in lower pintail densities on hunt areas during non-hunt days than non-hunt areas (Wolder 1993). However, intermittent hunting may not always greatly reduce hunting impacts.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons (fall and winter) when the game animals are less vulnerable, and other wildlife-dependent activities (e.g., wildlife observation, environmental education and interpretation) are less common, reducing the magnitude of disturbance to refuge wildlife. Managed and regulated hunting will not reduce species populations to levels where other wildlife-dependent uses will be affected.

The use of retrieving dogs would be permitted and encouraged in all areas open to waterfowl hunting. These dogs would be required to be under control at all times. Any hunter who allows his/her dog to disturb wildlife is not well received by other hunters who do not want waterfowl disturbed on the ponds that they are hunting. Law enforcement officers will enforce regulations requiring owners to maintain control over their dogs while on the Refuges. Although the use of dogs is not a form of wildlife-dependent recreation; they do in this case support a wildlife dependent use. Implementing the prescribed restrictions outlined in the Stipulations section should alleviate any substantial impacts.

Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance will occur during the hunting seasons. Proper zoning, regulations, and

Refuge seasons will be designated to minimize any negative impacts to wildlife populations using the Refuges. Harvesting these species, or any other hunted species, would not result in a substantial decrease in biological diversity on the Refuge.

Conflicts between hunting and other public uses will be minimized by the following:

Wildlife populations on the Refuge are able to sustain hunting and support other wildlife-dependent priority uses. To manage the populations to support hunting, the Refuge adopts harvest regulations set by the State within Federal framework guidelines.

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, hunting can give people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which ultimately contributes to fulfilling the Refuge System mission. Furthermore, despite the potential impacts of hunting, a goal of Pahranagat Refuge is to provide visitors of all ages an opportunity to enjoy wildlife-dependent recreation. Of key concern is to offer a safe and quality program and to ensure adverse impacts remain at an acceptable level.

Recreational hunting will remove individual animals, but does not negatively affect wildlife populations. To assure that populations are sustainable, the Nevada Fish and Game Commission, in consultation with the NDOW, annually review the population censuses to establish season lengths and harvest levels.

The Service believes that there will be minimal conflicts between hunters and the other wildlife-dependent recreational uses. The uses differ seasonally and are not occurring on the same area at the same time.

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert NWR Complex.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:

Refuge Specific Regulations:

A. Migratory Game Bird Hunting. We allow hunting of goose, duck, coot, moorhen, snipe, and dove on designated areas of the refuge in accordance with State regulations subject to the following conditions:
    1. We allow hunting only on designated days.
    2. We only allow motorless boats or boats with electric motors on the refuge hunting area during the migratory waterfowl hunting season.
    3. You may only possess approved nontoxic shot while in the field (see Sec. 32.2(k)).
B. Upland Game Hunting. We allow hunting of quail and rabbit on designated areas of the refuge in accordance with State regulations subject to the following conditions:
    1. We only allow hunting on designated days.
    2. Condition A3 applies.

- All hunting activities and operations will be reviewed annually to ensure compliance with all

applicable laws, regulations, and policies.

- Population censuses will be reviewed annually with the NDOW to ensure that harvest from hunting is not unacceptably impacting the targeted populations. The program will be modified accordingly.
- Refuge specific hunting information will be available via signs, information panels, and brochures
- Refuge officers will patrol, monitor, and collect data on hunting activities in the field to assure that it does not interfere with wildlife resources and other wildlife dependent uses on a weekly basis. The program will be modified accordingly.
- Non-hunting and hunting acres are physically separated.
- Hunting will be limited to occur only on Tuesday, Thursday, and Saturday during the hunt season. Exceptions are opening weekend. Dove hunting is allowed daily during the regular State season
- Boundary and hunting area signs will be maintained to clearly define the designated hunting areas.
- Allow vehicle traffic only on designated roads and parking areas.
- Parking areas will be signed and gated to allow only pedestrian access.
- The hunting program will be highly regulated and managed in strict accordance with all applicable Federal laws (Code of Federal Regulations, Title 50 subchapter C) and to the extent practicable, consistent with applicable State laws.
- Provide information about the refuge hunting program through signs, kiosks, and brochures
- No camping or tents are allowed on the Refuge

Justification: Hunting is a wildlife-dependent recreational use listed in the National Wildlife Refuge System Improvement Act. Providing a quality hunting program contributes to achieving one of the Refuge goals (Goal 3, Objective 3.1, Appendix E of the CCP). By facilitating this use on the Refuge, we will increase the visitors' knowledge and appreciation of fish and wildlife, which may lead to increased public stewardship of wildlife and their habitats on the Refuge. Increased public stewardship will support and complement the Service's actions in achieving the Refuge's purposes and the mission of the National Wildlife Refuge System.

Based upon impacts and stipulations described above, it is determined that hunting within Pahranagat National Wildlife Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge were established or the mission of the Refuge System.

Mandatory Re-Evaluation Date:

__X__ Mandatory 15-year Re-Evaluation, Date will be provided in Final EA/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X_ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Fishing

Refuge Name: Pahranagat National Wildlife Refuge, located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge (Refuge) was established in January 1964 under authority of the Migratory Bird Conservation Act. Additional lands were withdrawn from public domain for the Refuge by Public Land Order 3348 in March of 1964.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purposes include:

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 715d]) (Public Land Order 3348).

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

Description of Use: Fishing is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. The Service is proposing to continue to allow fishing on Pahranagat Refuge. The fishing program will be carried out consistent Code of Federal Regulations Title 50, 32.5 and 32.47 and be managed in accordance with Service Manual 605 FW3, Fishing, and State of Nevada regulations. The guiding principles of the Refuge System's fishing programs (Service Manual 605 FW 3) are to:

A. Effectively maintain healthy and diverse fish communities and aquatic ecosystems through the use of scientific management techniques;
B. Promote visitor understanding of, and increase visitor appreciation for, America's natural resources;
C. Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;
D. Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and
E. Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

Game fish species present in refuge waters include large-mouth bass, crappie, blue gill, catfish, and carp. The Upper Pahranagat Lake, Middle Pond, and Lower Pahranagat Lake will be open to fishing year-round. We allow both bank fishing and fishing from motorless boats or boats with electric motors in these Refuge waters. North Marsh will be open from February 2 to September 30 each year. We prohibit the use of boats, rubber rafts, or other flotation devices on the North Marsh.

In FY 2006, the Refuge received approximately 2,000 visits associated with fishing. The number of visitors is expected to increase if the populations of Alamo and the Coyote Springs Valley grow as expected.

Availability of Resources:
Limited funding and staffing would be required to manage the bank fishing on the Refuge. The U.S. Fish and Wildlife Service Nevada Zone law enforcement officer and game wardens from the Nevada Department of Wildlife (NDOW) both conduct law enforcement patrols and enforce state and federal

fishing and boating laws and regulations. Approximately $7,500 per year is spent administering the fishing program at the Refuge.

Funding would be sought through the Service budget process. Other sources include: strengthened partnerships, grants, additional coordination with other law enforcement agencies, and additional Refuge operations. This funding will support a safe, quality public use program as described above.

Anticipated Impacts of the Use(s):
Fishing activities may also influence the composition of bird communities, as well as distribution, abundance, and productivity of waterbirds (Tydeman 1977, Burger 1981, Bouffard 1982, Bell and Austin 1985, Bordignon 1985, Edwards and Bell 1985, and Cooke 1987). Shoreline activities, such as human noise, do cause some birds to flush and go elsewhere (Klein 1993). Disturbance and destruction of riparian vegetation, bank stability, and water quality may result from high levels of bank fishing activities. Boating associated with fishing can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995).

Cumulative impacts of increased use also have correlating effects on wildlife, habitat and the fisheries resource (Buckley and Buckley 1976; Glinski 1976; Miller et al. 1998; Reijnen and Foppen 1994; Smith and Hunt 1995).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EA for the Pahranagat National Wildlife Refuge, expected to be released in March 2008. Comments received (including those regarding fishing) will be addressed in the Response to Comments. NDOW has determined that fish resources found within the Refuge are healthy and robust enough to support regulated fishing, complimenting the other activities available to the public in their enjoyment of their public resources.

Determination:

_____ Use is Not Compatible

__X__ Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility:
- Refuge Specific Regulations: Sport Fishing. We allow sport fishing on designated areas of the refuge in accordance with State regulations subject to the following conditions:
- The North Marsh will be closed to all boating and floatation devices.
- The North Marsh will be closed to bank fishing at all times to diminish waterfowl disturbance and allow it to serve as a sanctuary for migratory waterfowl.
- Monitor fishing use to ensure that facilities are adequate and disturbance to wildlife continues to be minimal.
- Parking areas, roads, and related access facilities will be maintained as necessary to ensure public safety and to prevent erosion or habitat damage.
- Providing information in Refuge kiosks.
- Proper zoning and regulations will be designated.
- Law enforcement patrols by game wardens, and refuge officers to enforce state and federal regulations.
- Use Best Management Practices when maintaining parking areas, roads, and access facilities to prevent erosion or habitat damage.
- Providing educational information at Refuge kiosks.
- Monitor fishing activities to ensure facilities are adequate and wildlife disturbance is minimal.
- Law enforcement patrols will be conducted by game wardens, and refuge officers to enforce state and federal regulations.

- Some human disturbance of forest and shrub bird species may occur during nesting and spring/fall migration periods. Access to trails and fishing areas may be limiting during key nesting periods.
- Provide information about the Refuge fishing program by installing informational signs/kiosks, creating and distributing brochures, and utilizing the Refuge's website.
- Install public use ethics panel, including the importance of removing fishing line, not littering and displaying the "pack it in and pack it out" message at appropriate access points. .

Justification: Fishing is an appropriate wildlife-dependent recreational activity. Based upon impacts described in the Comprehensive Conservation Plan, it is determined that fishing within the Pahranagat National Wildlife Refuge will not materially interfere with or detract from the purposes for which the Refuge was established or mission of the National Wildlife Refuge System.

Fishing is a priority public use listed in the Improvement Act. By facilitating this use on the Refuge, the visitors' knowledge and appreciation of fish and wildlife will increase, which may lead to increased public stewardship of wildlife and their habitats on the Refuge. Increased public stewardship will support and complement the Service's actions in achieving the Refuge's purposes and the mission of the National Wildlife Refuge System.

Because of the number of visitors to the Refuge, this would not pose a problem and could be handled with existing staff. This program as described is determined to be compatible and will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge.

Mandatory Re-Evaluation Date:

_X___ Mandatory 15-year Re-Evaluation, Date will be provided in Final EA/CCP (for priority public uses)

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

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

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

_X__ Environmental Impact Statement and Record of Decision

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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. J. Appl. Ecol 31: 85-94.

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

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Boating

Refuge Name: Pahranagat National Wildlife Refuge, located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge (Refuge) was established in January 1964 under authority of the Migratory Bird Conservation Act. Additional lands were withdrawn from public domain for the Refuge by Public Land Order 3348 in March of 1964.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purposes include:

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

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

Description of Use: The Service plans to continue to offer recreational boating opportunities on Pahranagat Refuge as a means of facilitating the wildlife-dependent priority public uses: hunting, fishing, and wildlife observation/photography. Both Upper and Lower Pahranagat Lakes will be open to boating year round.

Boat ramps are currently located at the south end of Upper Pahranagat Lake Campground and at campsite #6. Under Alternative D of the Draft CCP/EIS (the preferred alternative), the campground would be converted to a walk-in day use area. In addition, the boat ramps would be closed and converted to a car-top boat launch or a separate car-top launch site would be designated. Aside from human powered craft, only electric powered motors will be permitted. No boats with gas powered motors on board will be allowed to launch on waters of the Refuge.

Approximately 30,000 people visit Pahranagat Refuge each year. Of those visitors, a very small percentage participates in some form of recreational boating on the Refuge. An estimated 20 boats per year are launched at Upper Pahranagat Lake (M. Maxwell, pers. com.). Almost all the recreational boating is done in association with fishing.

Availability of Resources: Limited funding and staffing would be required to manage the boating program and could be handled with existing Refuge staff and volunteers. The U.S. Fish and Wildlife Service Nevada Zone law enforcement officer and game wardens from the Nevada Department of Wildlife (NDOW) both conduct periodic law enforcement patrols and enforce state and federal fishing and boating laws and regulations. Approximately $7,500 per year is spent administering the boating program at the Refuge.

Anticipated Impacts of Use: Purdy et al. (1987) and Pomerantz et al. (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1) Direct mortality: immediate, on-site death of an animal;
2) Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3) Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4) Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;

5) Reduced use of preferred habitat on the refuge: wildlife use is relegated to less suitable habitat on the refuge due to visitor activity; and
6) Aberrant behavior/stress: wildlife demonstrating unusual behavior or signs of stress that are likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (Jahn and Hunt 1964, Huffman 1999, DeLong 2002) and disturbance to birds in general is reduced when boats travel at or below the 5 mph speed limit.

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). In the Ozark National Scenic Riverway, green heron activity declined on survey routes when canoes and boat use increased on the main river channel (Kaiser and Fritzell 1984). Canoes or slow moving boats have also been observed to disturb nesting great blue herons (Vos et al. 1985).

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 impacted 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 & Temple 1995; Madsen 1995; Fox & Madsen 1997). Rodgers & 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, 1986; Klein 1993; Bowles 1995; Burger & Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle & Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education is critical for making visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may help reduce visitor caused disturbance (Knight & Gutzwiller 1995). 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 to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for Desert NWRC.

Following the public review and comment period, comments and actions taken to address comments will be summarized here.

Determination:

_____Use is Not Compatible

___X__ Use is Compatible with the Following Stipulations

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

1. Only electric powered motors will be permitted throughout Refuge waters.

2. Seasonal closures may be implemented to reduce disturbance to wintering, nesting and breeding birds and other wildlife.

3. The use of boats, rubber rafts, or other floatation devices is not permitted on the North Marsh.

4. Signs will be installed and maintained to mark closed areas on the Refuge.

5. Periodic law enforcement will help ensure compliance with regulations and area closures. Regulations will be described in brochures and posted at Refuge headquarters and at boat launch sites. Recreational boaters are required to be in compliance with all applicable Refuge, U.S. Coast Guard, and State of Nevada laws.

6. Monitoring of boating activities and associated effects on waterfowl, shorebirds, raptors and other wildlife will be conducted. Monitoring data will be used by the Refuge Manager in the periodic re-evaluation of this Compatibility Determination.

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

Although boating has a potential to impact wildlife, implementing the prescribed measures listed in the stipulations section will reduce many of these impacts. An adequate amount of habitat will be available to wintering and breeding waterfowl, raptors and other wetland birds because high wildlife use areas will be closed to boating during critical periods. Boating regulations will be maintained and enforced in order to minimize the impact of visitor use on wildlife and wildlife habitat. Thus, we anticipate that birds will find sufficient food resources and resting places such that their abundance and use of the Refuge will not be measurably lessened, the physiological condition and production of waterfowl and other waterbirds will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall status will not be impaired. The Refuge will also implement a monitoring program to help assess disturbance effects on wildlife and habitat. Improved outreach and

educational information for Refuge visitors involved in activities associated with boating would also help to reduce the impacts associated with boating activities.

Mandatory Reevaluation Date:

_____ Mandatory 15-Year Reevaluation Date will be provided in Final EA/CCP (for priority public uses)

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

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

_____Categorical Exclusion without Environmental Action Statement

_____Categorical Exclusion and Environmental Action Statement

_____Environmental Assessment and Finding of No Significant Impact

__X__Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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

Concurrence

Refuge Supervisor: _____ _____
(Signature) (Date)

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

COMPATIBILITY DETERMINATION

Use: Research

Refuge Name: Pahranagat National Wildlife Refuge, located in Lincoln County, Nevada.

Establishing and Acquisition Authority(ies): Pahranagat National Wildlife Refuge (Refuge) was established in January 1964 under authority of the Migratory Bird Conservation Act. Additional lands were withdrawn from public domain for the Refuge by Public Land Order 3348 in March of 1964.

Refuge Purpose(s): Pahranagat National Wildlife Refuge purposes include:

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act) (Public Land Order 3348).

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

Description of Use: Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Monitoring and research are an integral part of National Wildlife Refuge management. Plans and actions based on research and monitoring provide an informed approach, which analyzes the management affects on refuge wildlife.

When the Service receives requests to conduct scientific research at the Refuge, Special Use Permits (SUPs) are required before the use can be allowed. SUPs are only issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff and conservation partners, as appropriate. SUPs are issued by the refuge manager, if the proposal is approved.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to Refuge management issues and ecosystem understanding will be given higher priority over other research requests.
- Research that can be accomplished off-Refuge will be less likely to be approved.
- Research which causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request.
- Refuge evaluation will determine if any effort has been made to minimize disturbance through study design, including considering adjusting location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied, depending on the specific circumstances.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

These criteria will also apply to any properties acquired in the future within the approved boundary of the Refuge.

Examples of types of research that have been permitted in the past include: nest and habitat investigations related to the productivity of southwest willow flycatchers, abundance of southwest willow flycatchers, the effects of brown-headed cowbird parasitism on southwestern willow Flycatchers, nest predation studies, spring inventory and monitoring, and yellow-billed cuckoo surveys. Use of the Refuge for research is not expected to increase substantially.

Availability of Resources: The Refuge receives approximately 2-5 research requests per year. Some special use permit requests require 4-8 hours to process, others may take as long as 20 hours, depending on the complexity of the request. Costs to administer this program average about $500 per request.

Anticipated Impacts of Use: Possible impacts of research include disturbance to wildlife and habitat modification. Potential impacts associated with research activities would be mitigated/minimized because sufficient restrictions would be included as part of the study design and researcher activities would be monitored by Refuge staff. Due to the small number of researchers that use the Refuge and with the restrictions outlined in the stipulations section below, the impacts on migratory birds and other wildlife and their habitat are expected to be relatively minor and localized. These potential impacts are described below.

Impacts on Wildlife:
According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielsen and Smith 1995).

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989). 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 impacted 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).

Habituation is defined as a form of learning in which individuals stop responding to stimuli that carry no reinforcing consequences for the individuals that are exposed to them (Alcock 1993). A key factor for predicting how wildlife would respond to disturbance is predictability. Gabrielsen and Smith (1995) suggest that most animals seem to have a greater defense response to humans moving unpredictably in the terrain than to humans following a distinct path.

Wildlife may also be attracted to human presence. For example, wildlife may be converted to "beggars" lured by handouts (Knight and Temple 1995), and scavengers are attracted to road kills (Rosen and Lowe 1994).

Impacts on Habitat:
Research activities could also have impacts on vegetation, soil, and/or water. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted. Off trail walking by researchers could have similar effects as hikers in general who can alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee *et al.* 1990). Soil compaction makes root penetration more difficult, making it difficult for seedlings to become established (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

Public Review and Comment: Public review and comments will be solicited in conjunction with distribution of the Draft CCP/EIS for the Desert National Wildlife Refuge Complex. Comments received (including those regarding research) will be addressed in the Response to Comments.

Determination:

_____Use is Not Compatible

__X__Use is Compatible with the Following Stipulations

Stipulations necessary to ensure compatibility: The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility. All Refuge rules and regulations must be followed unless otherwise accepted in writing by Refuge management.

All information, reports, data, collections, or documented sightings and observations, that are obtained as a result of this permit are the property of the Service and can be accessed by the Service at any time from the permittee at no cost. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria. Each SUP will also be evaluated individually to determine if a fee will be charged and for the length of the permit.

Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions outlined in the SUP.

Justification: This program as described is determined to be compatible. Based upon impacts described above and in the Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008), it is determined that research within the Refuge, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. Refuge monitoring and research will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuge. The wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation, fishing and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with monitoring and research investigations which address specific restoration and management questions.

Mandatory Re-Evaluation Date:

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

___X___ Mandatory 10-year Re-Evaluation, Date will be provided in Final EIS/CCP (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

_____ Environmental Assessment and Finding of No Significant Impact

_X__ Environmental Impact Statement and Record of Decision

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Refuge Determination

Refuge Manager: _____ _____
(Signature) (Date)

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Concurrence

Refuge Supervisor: _____ _____
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