

**Desert National Wildlife Refuge  
Visitor Facilities  
Draft Environmental Assessment**

Prepared for:

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## EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) manages the 1.6 million-acre Desert National Wildlife Refuge (Desert NWR or Refuge) in southern Nevada. The Desert NWR abuts the northern city limits of Las Vegas and North Las Vegas in Clark County and encompasses part of the Nevada Test and Training Range in Clark and Lincoln Counties. The Refuge headquarters and main entrance are located at Corn Creek Field Station, approximately 23 miles north of Las Vegas and 4 miles east of U.S. Highway 95.

The Service has prepared this Environmental Assessment (EA) to evaluate the environmental effects of constructing a proposed visitor center and associated facilities and rehabilitating habitat at Corn Creek Field Station. The visitor center is needed to accommodate a projected increase in visitors and provide a central location for the Refuge staff to interact with visitors. The purpose of the proposed visitor center and associated facilities is to accommodate up to 100,000 visitors to the Refuge per year; the visitor center is also being designed to meet Leadership in Energy and Environmental Design standards for environmental sensitivity. The purpose of and need for the habitat rehabilitation activities are to remove non-native and invasive vegetation, restore the stream channels to improve habitat conditions for wildlife, and improve wildlife-dependent activities for visitors to the Refuge.

The proposed visitor center would consist of a 10,500-square foot building in the current location of the visitor contact station, information kiosk, and restrooms at Corn Creek Field Station. The building would provide office space for Service staff and provide a wildlife observation area, multipurpose room, educational exhibits, bookstore, and other services for visitors. Additional new facilities include a parking area, trails, information kiosk, outdoor multipurpose area, and utilities to serve the building. The trails would lead away from the visitor center, either offering a shorter, shaded trail on the northern side of the upper pond or traveling to the desert loop overlooking the Corn Creek area and offering panoramic views of the surrounding mountain ranges. Interpretive signs at key locations along the trails would inform and educate visitors about the Service, Refuge, Corn Creek's cultural history, and surrounding desert ecosystem.

The habitat reconstruction activities would include restoring the outflow channels; enhancing the native vegetation around the springs, channels, and ponds; and removing the lower two ponds. Native riparian and wetland vegetation would be planted in the current location of the lower ponds, and surface water would be redirected toward a pasture to create a wet meadow habitat. Cattails in the upper pond would be removed, and liner would be installed to minimize cattail proliferation, increasing open water habitat for waterfowl and other migratory birds.

Implementation of the Proposed Action has the potential to affect soils, hydrology and water quality, air quality, biological resources, cultural resources, and public access. The Service would implement mitigation measures to ensure minimal impacts to these resources. The Proposed Action, together with the proposed Desert National Wildlife Refuge Complex's Comprehensive Conservation Plan, would improve management and operation of the Desert NWR and would cumulatively benefit visitors, wildlife, vegetation, and other resources on the Refuge.

The Service evaluated two alternatives to the Proposed Action: a Habitat Rehabilitation Alternative and the No Action Alternative. The Habitat Rehabilitation Alternative would include removal of only the lower pond and planting native vegetation in its place. The No Action Alternative would continue current management and may involve some improvements to visitor services and minor habitat rehabilitation projects. These alternatives would generally result in impacts similar to the Proposed Action; however, the impacts would be more localized to the specific area being affected by individual project activities (under the No Action Alternative) and would occur around the lower pond, instead of both lower ponds (under the Habitat Rehabilitation Alternative).

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## 1.0 INTRODUCTION

### 1.1 Introduction and Background

The U.S. Fish and Wildlife Service (Service) manages the 1.6 million-acre Desert National Wildlife Refuge (Desert NWR or Refuge) in southern Nevada. The Desert NWR abuts the northern city limits of Las Vegas and North Las Vegas in Clark County and encompasses part of the Nevada Test and Training Range in Clark and Lincoln Counties (Figure 1; all figures are provided at the end of the document). The Refuge consists of rugged mountain ranges and panoramic valleys with diverse habitats suited to a wide variety of flora and fauna.

The Refuge headquarters are located at Corn Creek Field Station, which is located approximately 23 miles north of Las Vegas and 4 miles east of U.S. Highway 95. Corn Creek serves as the main entrance to the Refuge and contains staff offices, a visitor contact station, and an information kiosk. Several springs surface near the visitor contact station and discharge to streams that wind through the field station and empty into three man-made ponds. The ponds and surrounding habitats provide an oasis for birds and other wildlife. Educational and interpretive information is available to visitors at the kiosk and contact station. Dirt footpaths meander through the field station and loop around the ponds and near a refugium for the endangered Pahrump poolfish (*Empetrichthys latos latos*) in the northern portion of the field station. The trails at Corn Creek provide some opportunities for visitors to view wildlife and the springs, but they provide minimal educational opportunities. The condition of the trails creates a potential safety hazard for the public, and none of the trails meet Americans with Disabilities Act (ADA) guidelines for accessibility. Trails are not regularly maintained, and erosion is a problem along portions of some trails.

The Service anticipates an increase in visitors to the Desert NWR as a result of the growing population in the Las Vegas Valley and the increased interest in visiting natural areas. The existing visitor contact station is staffed on weekends and holidays by one of the Service's partner organizations. They welcome visitors to the Refuge, but the building is too small to provide adequate educational opportunities.

The Desert NWR was established in 1936 as the Desert Game Range under Executive Order 7373. In October of 1940, some of the lands designated as the Desert Game Range were reserved for the use of the War Department (Department of Defense) as an aerial bombing and gunnery range (now known as the Nevada Test and Training Range). This order took precedence over, but did not revoke or rescind, Executive Order 7373, and the Service retained primary jurisdiction of the lands. The Air Force's use of approximately 846,000 acres of the Desert NWR is governed by a Memorandum of Understanding (MOU), which was first implemented in 1951 and was renewed in 1986. Between 1970 and 1985, 440 acres in the vicinity of Corn Creek springs were purchased from a variety of private landowners. These lands were added to the Refuge to protect wildlife habitat and provide opportunities for wildlife and ecological studies, environmental education, and wildlife interpretation.

The Service has prepared this Environmental Assessment (EA) to evaluate the environmental effects of constructing a proposed visitor center and associated facilities and rehabilitating habitat at Corn Creek Field Station. This chapter provides an overview of the document and background information on the Desert NWR. A description of the Proposed Action is provided in Chapter 2, along with a description of the Habitat Rehabilitation Alternative and the No Action Alternative. Chapter 3 provides a description of the affected environment, which is focused on the proposed footprint of the visitor center and facilities and the locations for habitat rehabilitation at Corn Creek. Chapters 4 and 5, respectively, provide an analysis of the environmental consequences of the Proposed Action, Habitat Rehabilitation Alternative, and No Project Alternative and describe mitigation measures to reduce or avoid impacts.

## **1.2 Purpose and Need**

The Service anticipates an increase in visitors to the Desert NWR as a result of the growing population in the Las Vegas Valley and the increased interest in visiting natural areas. The Desert NWR's existing visitor use facilities do not provide adequate capacity or opportunities to inform visitors about the Service and the Refuge and provide wildlife-dependent recreational opportunities. The Refuge is in need of a new, larger capacity visitor center to accommodate the increase in visitors and provide a central location for the Refuge staff to interact with visitors.

The visitor center and associated facilities would accommodate up to 100,000 visitors per year. The visitor center is also being designed to meet Leadership in Energy and Environmental Design (LEED) standards for environmental sensitivity. Aspects of the building's design demonstrate the Service's commitment to energy and natural resources conservation and to protecting wildlife and their habitats at Desert NWR.

The purpose of and need for the habitat rehabilitation activities are to remove non-native and invasive vegetation, restore the stream channels to improve habitat conditions for wildlife, and improve wildlife-dependent activities for visitors to the Refuge and Corn Creek Field Station.

## **2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION**

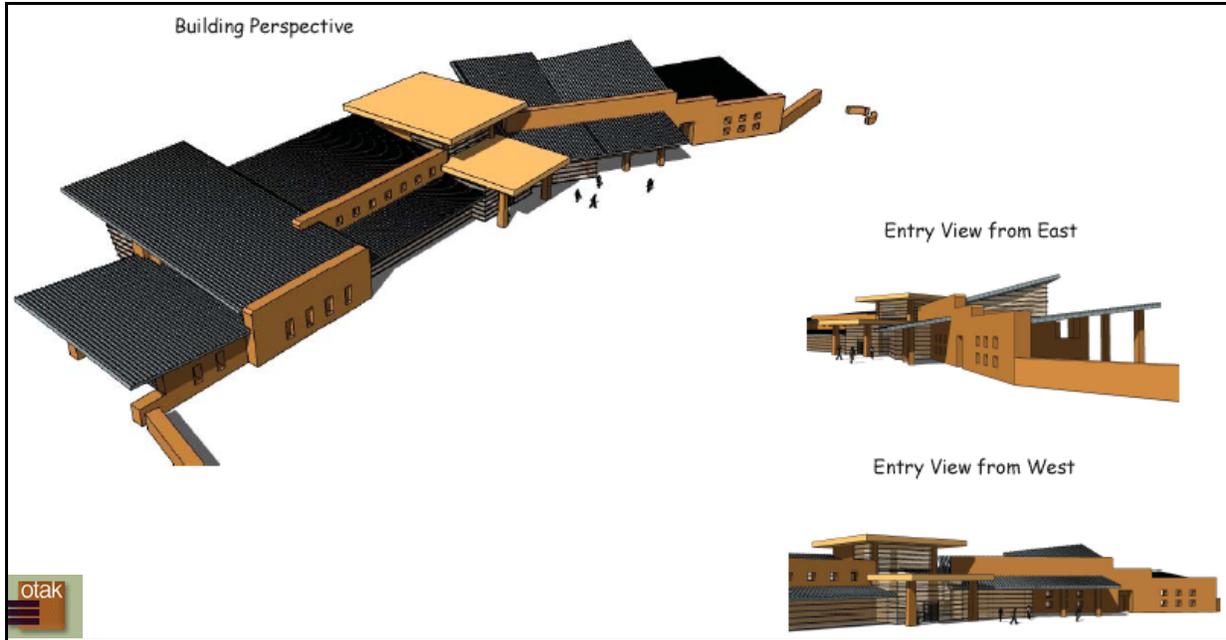
### **2.1 Proposed Action**

The Service is proposing to construct a new visitor center and administrative complex at the Corn Creek Field Station. Other facilities associated with the new building, such as parking areas, roads, utilities, and infrastructure, would also be improved or constructed. Additionally, the Service would expand and improve some of the trails through the Corn Creek springs area and provide new visitor service opportunities. The ponds and surrounding habitats would be modified to improve habitat conditions for resident wildlife and migratory birds.

The new visitor center would be constructed at the field station in the same location as the existing visitor contact station, kiosk, and restrooms. New parking areas and road improvements would occur to the south of the existing facilities in desert upland habitat. Habitat rehabilitation would occur throughout the Corn Creek springs area. Most of the existing administrative buildings would remain and continue to be used for various Refuge purposes. Two buildings near the proposed staff parking area would be removed, and a third facility at the corner of the pasture may be removed.

### **Visitor Center**

The visitor center would be constructed to minimize visual contrast across the desert landscape, provide sunlight and excellent viewing opportunities, and supply adequate heating and cooling systems for the winter and summer months (Exhibit 1). The visitor center would be approximately 10,500 square feet in size, including offices for Service employees in the western half and visitor facilities in the eastern half. Restrooms would be provided on both sides of the building. An entrance lobby would welcome visitors and provide a wildlife observation area for the habitat to the north. Other opportunities at the visitor center would include an exhibition hall, multipurpose room, and bookstore. A basement would be constructed for the electrical room, battery room, rain harvesting tanks and equipment, composting bins, water storage tank, fire sprinkler equipment, and geothermal equipment.



### Exhibit 1: Visitor Center Design

The visitor center would be constructed of thick rammed-earth walls, straw bales, colored concrete, and/or other materials to provide a natural look and assist with controlling the building's internal temperature. The building would have multilevel roof panels to provide daylight and maximize surface area for photovoltaic panels. The floor of the building would be constructed of concrete. The combination of the concrete floor and earthen and straw bale walls would allow heat to be absorbed during the day and vented at night, providing a means to regulate temperature during the day for visitors and Service employees. The northern side of the building would contain large panel windows to allow visitors and Service staff to view wildlife and habitats at Corn Creek. Shade structures would be provided along the southern side of the building to shade visitors as they enter the visitor center.

### Recreation Opportunities

A new set of walking trails would be established at Corn Creek Field Station (see Exhibit 2). The trails would meet ADA guidelines for accessibility and would include two loop trails and a shorter, shaded trail. The loop trails would allow visitors to traverse the desert upland habitat and loop around the refugium and habitat improvement areas. The trails would be designed to minimize future maintenance costs and would be constructed with a natural surface material, boardwalk, or pervious paving. Boardwalks would be used in sensitive areas, such as where cultural resources are present or where sensitive wetland habitat occurs. Some existing trails around the lower pond would be decommissioned and camouflaged by planting native vegetation.

Other facilities would also be constructed to provide the public with opportunities for wildlife observation and photography, environmental education, and interpretation. An outdoor multipurpose area, adjacent to the east side of the new visitor center, and indoor multipurpose room would provide a gathering area for educational and interpretive programs. The new visitor center and multipurpose space would facilitate environmental education programs. A new small information kiosk would be located just south of the parking area, providing educational and safety information to visitors traveling into the Refuge. Native desert vegetation would be planted in the parking area and around the visitor center, possibly with educational signs with the species' names.

Interpretive exhibits would inform visitors of the purposes of the Refuge and the Service and allow them to connect with the remote backcountry they may not physically get to experience. New interpretive signs and wayside exhibits would be constructed along the trail system to inform visitors of regulations and interpret the natural and cultural history of Corn Creek. Approximately six interpretive areas along the trails would create accessible learning opportunities through signs or outdoor interpretive interactive exhibits to connect visitors with this unique resource and its history. The format, layout, fonts, and colors of the signs would represent the specific topic being described. For example, a sign describing the Refuge springs might utilize shades of blue and have undulating patterns to represent water. Possible locations for interpretive signs, or stations, are portrayed in Figure 2.

### **Utilities and Infrastructure**

The main entrance road to the visitor center would be modified to provide a drop-off area, bus and large recreational vehicle parking, and visitor parking (Figure 2). This road would connect to Mormon Well and Alamo Roads and would provide loops to allow visitors to exit the same way they enter. Roads would be two-way for easy access. Bus traffic would be separated from car traffic, and buses would be allowed to drop off passengers at the entrance to the visitor center. The new roads and parking areas would be paved with a pervious surface. Native desert vegetation would be planted between roads and in parking areas to provide desert landscaping, thereby reducing the demand for spring water. The parking area is designed to accommodate a maximum of 40 vehicles.

The existing access road to the administrative buildings would be modified to terminate at a staff parking lot. It would be restricted to Service employees only.

Power and telephone lines would require reconfiguration to facilitate the needs of the new building. Photovoltaic panels would be installed on the visitor center roof to provide solar energy for power. A geothermal method would be used to cool and heat the building. Cool water from deep wells would be pumped to a tank in the basement of the building and would be used to cool the building from extreme temperatures during the summer. A heat pump would be used to heat the water and warm the building in the winter.

The visitor center would also require potable water, sewer service, and stormwater drainage facilities. Potable water would be provided by an existing groundwater well. Groundwater would be treated using chlorination or ultra-violet light and would comply with standards for a transient non-community. The demand for drinking water is estimated at 25 gallons per minute, and the existing well is capable of discharging 40 gallons per minute. Improvements to the groundwater well would include construction of a 500-gallon storage tank at the same location as the existing storage tank (between the refugium and railroad tie house, Figure 2) and possibly a wellhead pump. Non-potable water would also be provided by the groundwater well, but the water would not be treated and would be reserved for uses that do not result in physical contact.

Composting toilets may be installed to reduce the water demand and decrease the quantity of wastewater. The sewer system would include an onsite septic system with a 3,000-gallon concrete tank and a septic field with an area of approximately 7,100 square feet.

A stormwater drainage system would be constructed to collect and convey stormwater runoff. The system would include swales for treatment, a conveyance system, and catch basins. Vegetated swales would help manage runoff by detaining water that does not percolate into the ground. The swales would be planted with native desert riparian or wetland vegetation. Rainwater would be harvested from the roof of the building and used for irrigation purposes to reduce surface runoff.

**Habitat Reconstruction**

The Service would enhance the spring pools, outflow channels, and native vegetation at Corn Creek to enhance the wetland and riparian habitats around the springheads and stream channels, improve habitat conditions for wildlife, and improve recreational opportunities for visitors to the Refuge. These activities would not involve restoring the site to historic conditions because prior to the 1920s Corn Creek did not contain ponds or open water that now attracts a diversity of birds and other wildlife species. The reconstruction activities would include restoring the outflow channels; enhancing the native vegetation around the springs, channels, and upper pond; and removing the two lower ponds.

Two spring pools were restored in 2003, and a third spring mound would be excavated and similarly restored. The outflow channels would be modified to add meanders, pools, riffles, and substrate, as appropriate. Native riparian vegetation, such as willows (*Salix* spp.), mesquite (*Prosopis* spp.), and ash (*Fraxinus* spp.), would be planted along the outflow channels, particularly downstream of the upper pond.

The upper pond would be enhanced for waterfowl and other birds by increasing the amount of open water. Cattails (*Typha* spp.) would be removed from the interior of the pond and controlled to maintain open water habitat. Giant reed (*Phragmites* sp.) would also be controlled.

The lower and middle ponds would be removed (Figure 2) and native wetland and riparian vegetation would be planted in place of non-native plants where open water currently exists. Outflow from the poolfish refugium would also be directed to this site, and a meandering channel would be created to direct water to the pasture area. A portion of the pasture would be removed from production to collect water, creating a small wetland. Depending on the volume of water flows and soil permeability, a low berm may be constructed to retain water, thereby enhancing birding habitat.

Throughout the Corn Creek springs area, noxious weeds and non-native vegetation would be slowly replaced with native vegetation to increase the biological diversity and value of the area. This transition would occur in phases over several years to allow the native vegetation to properly establish. The understory vegetation would be planted with native species, such as those listed in Table 1. Understory shrubs would be planted with new tree plantings, and shade-tolerant shrubs would be planted in more shaded areas.

**Table 1. Suggested Native Plantings**

<b>Trees/Shrubs</b>	<b>Grasses/Forbs</b>
Catclaw ( <i>Acacia greggii</i> )	Yerba mansa ( <i>Anemopsis californica</i> )
White bursage ( <i>Ambrosia dumosa</i> )	Desert holly ( <i>Atriplex hymenelytra</i> )
Chaffbush ( <i>Amphipappus fremontii</i> )	Meadow paintbrush ( <i>Castilleja linariaefolia</i> )
Four-wing saltbush ( <i>Atriplex canescens</i> )	Saltgrass ( <i>Distichlis spicata</i> )
Desert baccharis ( <i>Baccharis sergiloides</i> )	Alkali goldenbush ( <i>Haplopappus acradenius</i> )
Velvet ash ( <i>Fraxinus velutina</i> )	Wormwood ( <i>Iva acerosa</i> )
Cottonwood ( <i>Populus fremontii</i> )	Desert plantain ( <i>Plantago insularis</i> )
Mesquite ( <i>Prosopis</i> spp.)	Marsh fleabane ( <i>Pluchea pupurascens</i> )
Willow ( <i>Salix</i> spp.)	Arrowweed ( <i>Pluchea sericea</i> )
	Blue-eye grass ( <i>Sisyrinchium</i> spp.)
	Alkali sacaton ( <i>Sporobolus airoides</i> )
	Prince's plume ( <i>Stanleya elata</i> )
	Wild grape ( <i>Vitis arizonica</i> )

Source: Otis Bay Ecological Consultants 2003

## 2.2 *Habitat Rehabilitation Alternative*

Under the Habitat Rehabilitation Alternative, the Service would implement the same actions described under the Proposed Action, but they would remove only the lower pond and modify the stream channel. As part of the lower pond's removal, the Service would modify the channel to discharge into the pasture below the middle pond. Outflow from the poolfish refugium would also be directed to the wetland in the pasture. Non-native vegetation in and around the lower pond would be removed and planted with native riparian and wetland vegetation.

This alternative is being considered to evaluate a reduced rehabilitation alternative and determine the benefits and effects of removing one pond as opposed to two ponds.

## 2.3 *No Action Alternative*

Under the No Action Alternative, the Service would continue to utilize the existing visitor contact station and administrative facilities at Corn Creek Field Station. The visitor contact station provides limited opportunities for visitors to interact with Refuge staff and learn about the Desert NWR. Due to the contact station's size, it can only accommodate a small number of visitors at one time and provides only a minimally informative visual interpretive experience. The administrative facilities provide offices for the Refuge Manager, law enforcement officers, and maintenance staff, but additional offices are not currently available for new Service staff. Also, the administrative buildings are old, and in some cases historic, so maintenance and upkeep can be costly.

Additional utilities and infrastructure would not be necessary for the existing facilities. They currently have power, potable water, and septic tanks in use.

Habitat rehabilitation activities would be implemented on a project-by-project basis and would include minimal activities to plant native vegetation and remove or control non-native and invasive species. The three ponds would remain, but they would not be regularly maintained to reduce cattails and create more open water habitat.

## 2.4 *Alternatives Considered But Eliminated*

The Service evaluated several alternative site locations for the visitor center. Each of these site locations was eliminated from further consideration due to economic feasibility, environmental concerns, or distance from other recreational opportunities on the Refuge. Each alternative site location and reasoning for its elimination are provided below.

### University of Nevada, Las Vegas (North Las Vegas Campus):

- Schedule for construction of campus and infrastructure is delayed and would not meet the Service's goal of beginning construction in 2007.
- The site is removed from the Refuge; it lacks the feel of the Refuge and quick access to recreational opportunities on the Refuge.
- The site is aesthetically unappealing.

### Bajada Site (at southern Refuge boundary on Losee Road):

- The site has a high potential for flooding and debris flows, which would create a safety concern for visitors.

- The facility would affect desert tortoise habitat.
- The site is too distant from Refuge hiking areas and other recreational opportunities within the Refuge.
- The site is aesthetically unappealing.
- The site is located in the proposed Desert NWR wilderness area.

North Slope Site (east of Gass Peak, access from N. Pecos Road):

- The site has a high potential for flooding and debris flows, which would create a safety concern for visitors.
- Construction would be expensive due to need for a 10-mile access road and new utilities in a remote area.
- The facility could affect bighorn sheep use of the area.
- The site is located in the proposed Desert NWR wilderness area.

Chute Site (north of Bajada Site on Losee Road):

- The site has a high potential for flooding and debris flows, which would create a safety concern for visitors.
- The facility could affect bighorn sheep use of the area.
- The site is located in the proposed Desert NWR wilderness area.

June Bug Site (east of Chute Site, access from Losee Road):

- The site has a high potential for flooding and debris flows, which would create a safety concern for visitors.
- Construction would be expensive due to need for a 5-mile access road that would cross the Las Vegas Wash.
- The facility could affect bighorn sheep use of the area.
- The site is located in the proposed Desert NWR wilderness area.

Castles Site (northeast of planned Clark County Shooting Facility, access from Decatur Road):

- The site is located in close proximity to the planned Clark County Shooting Facility, which would pose safety and noise concerns for visitors.
- The site has a high potential for flooding and debris flows, which would create a safety concern for visitors.
- The facility could affect bighorn sheep use of the area.
- The site has been disturbed by off-highway vehicle use and shooting.
- The site is located in the proposed Desert NWR wilderness area.

### **3.0 AFFECTED ENVIRONMENT**

This section describes the existing setting of Corn Creek Field Station, with a focus on the area that would be affected by the Proposed Action. The proposed visitor center and parking area would encompass approximately 12 acres in the eastern portion of the field station, just west of Alamo Road. Rehabilitation activities and recreational facilities (trails and signs) would be located throughout Corn Creek.

#### **3.1 *Geology and Soils***

Corn Creek Field Station is located in a basin on the Corn Creek Flat (Otis Bay Ecological Consultants 2003). The Spring Mountains border the basin to the southwest, and the Sheep and Las Vegas Ranges border the basin to the northeast. Corn Creek Fault, a mostly concealed fault, trends southeast to northwest, just north of the field station. Minor earthquakes (less than 4.0 in magnitude) have been documented in the Corn Creek springs area, but not specifically associated with the Corn Creek Fault (DePolo and DePolo 1999). The fine-grained sediments of the Corn Creek area are derived from spring and fluvial deposits as a result of water erosion. Soils at Corn Creek generally include light brown to gray sand, fine sandy silt, and mud.

#### **3.2 *Hydrology and Water Quality***

Corn Creek springs discharge near Corn Creek Fault and produce a stream, which flows into man-made ponds that support the wetland and riparian habitats at the field station. The springs are located on the east side of the field station, northeast of the existing visitor contact station. Three ponds, or reservoirs, were created by excavating the ponds in the 1970s and channeling water from the springs through man-made ditches and pipes (Otis Bay Ecological Consultants 2003). Currently, some of the ditches are lined with concrete and range in size from 8 to 15 inches wide. As part of ongoing restoration efforts at the Refuge, the springs are being restored to enhance physical and biological functions. Surface water was directed from the first pond to irrigate the orchard and pastures when the land was in private ownership. Water is still pumped from this pond for irrigation purposes, while spring water continues through the ditches to support wetland and riparian habitats.

Outflow from Corn Creek springs is typical of regional groundwater because the springs are relatively high yielding, have warmer temperatures, and do not display seasonal variability of flows. Spring flow probably comes largely from precipitation, falling in the Sheep Range on the eastern edge of the Refuge, and forced to the surface through faults at Corn Creek Field Station (Thomas et al. 1996). Corn Creek springs discharges about 200 acre-feet per year (Thomas et al. 1996) and the main springhead discharges 0.27 cubic feet per second (Otis Bay Ecological Consultants 2003). The springs receive little input from storms or surface flows and remain relatively constant year-round. Water temperatures of the springs range from below 4 degrees Celsius (39 degrees Fahrenheit) in the winter to more than 23 degrees Celsius (73 degrees Fahrenheit).

#### **3.3 *Air Quality***

Currently, ambient air quality is not measured at Desert NWR, and the nearest major sources of emissions are in the Las Vegas area. It is expected that low ambient concentrations of criteria pollutants would occur at Corn Creek Field Station. The nearest air quality sampling station is located less than 5 miles south of the Desert NWR boundary at Joe Neal School on Bemis Road and Craig Road. Ozone and particulate matter (PM10) are measured at this station on a daily basis. This station has exceeded pollutant concentrations of ozone in 2006 and particulate matter in 2003 (Clark County 2007). Although the concentrations within the Las Vegas area may be representative of the southern boundary of the Desert

NWR, the concentrations are expected to be significantly lower further north of the developed areas. Fugitive dust is likely the primary source of pollutants on the Refuge.

### 3.4 Biological Resources

Corn Creek Field Station supports a diversity of wildlife species in the moist wetland and riparian habitats and the adjacent desert scrub habitat. The habitats provide food and shelter for indigenous mammals, birds, reptiles, amphibians, and invertebrates. Federally listed species that may occur or are known to occur at the field station include the introduced Pahrump poolfish (endangered), bald eagle (*Haliaeetus leucocephalus*, threatened, proposed for delisting), and desert tortoise (*Gopherus agassizii*, threatened). The yellow-billed cuckoo (*Coccyzus americanus*), a candidate species, and southwestern willow flycatcher (*Empidonax trailii extimus*), an endangered species, have potential to utilize the riparian and wetland habitats, although they have not been recently documented on the Refuge.

#### Vegetation

The habitats in the Corn Creek springs area consist of a variety of native and non-native wetland and desert riparian plant species. Cattails (*Typha latifolia*) dominate the ponds, resulting in little open water habitat. Arrowweed (*Pluchea sericea*) and common reed (*Phragmites australis*) occur along the edges of the ponds and spring pools. Black locust (*Robinia pseudoacacia*), Russian olive (*Elaeagnus angustifolia*), Fremont cottonwood (*Populus fremontii*), willows, and honey mesquite (*Prosopis juliflora*) form the overstory around the ponds and along the banks of the stream channels. Non-native species within and surrounding the ponds were introduced to the area following excavation of the ponds in the 1970s. Pockets of screwbean mesquite (*Prosopis pubescens*) and honey mesquite also occur in patches within the surrounding upland habitat.

Desert scrub habitat dominates the areas surrounding the springs and ponds. Creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are the dominant plants in the desert scrub habitat. Other common species include saltbush (*Atriplex* spp.), Russian thistle (*Salsola tragus*), beavertail (*Opuntia basilaris*), Prince's plume (*Stanleya pinnata*), and alkali goldenbush (*Isocoma acradenia*). Spring mounds also occur in portions of the desert scrub habitat. These mounds were formed from past and current spring activity and contain reed, honey mesquite, and occasionally Russian olive trees.

A pasture lies to the west of the existing administrative offices. The pasture is irrigated and contains non-native grasses. It is currently used by the Refuge horse.

#### Wildlife

Over 300 different species of birds have been recorded on the Refuge. Many of these are migratory songbirds and waterfowl that are attracted to the wetland and riparian habitats at Corn Creek Field Station. The field station is an important migrant stopover site, hosting thousands of landbird migrants every spring and fall, which in turn attracts birders. Bald eagles, a threatened species, and peregrine falcons (*Falco peregrinus*), a former listed species, have been observed at Corn Creek, and several other rare species have been seen utilizing the habitats or passing through.

Non-native fish occur in the ponds and streams at Corn Creek, including carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), and mosquitofish (*Gambusia affinis*). A population of the endangered Pahrump poolfish was transplanted to Corn Creek ponds in 1971 from its indigenous habitat at Manse Spring in Pahrump Valley. The poolfish was extirpated from Corn Creek, due to predation by non-native crayfish (*Procambarus clarkii*) and bullfrogs (*Rana catesbiana*). In 2003, the Service established a refugium population at Corn Creek to provide a safe habitat for the fish. The poolfish population at the field station is one of only three populations extant globally (Sjoberg, pers. comm. 2006). The 2005 population

estimate for the Pahrump poolfish was 180 individuals, with approximately 90 in the refugium tanks (Sprunger-Allworth, pers. comm. 2006b). Poolfish have been carried out of the tank via the outflow, entering the middle pond and possibly other surface waters at Corn Creek. The number of poolfish outside the refugium is unknown.

In addition to the fish at the field station, a variety of endemic aquatic invertebrates, including mollusk species, are present in the permanent springs and seeps on the Refuge. The Corn Creek pyrg (*Pyrgulopsis fausta*) is an endemic snail present in the main outflow system at Corn Creek (Otis Bay Ecological Consultants 2003). Habitat modification and competition with non-native crayfish are potential threats to the survival of the species. Crayfish dominate the aquatic habitats at Corn Creek and prey on several of the fish and invertebrate species.

The springs, channels, and ponds at Corn Creek Field Station provide suitable habitat for amphibians, such as non-native bullfrogs and toads (*Bufo* spp.). Bullfrogs can be heard in the submergent vegetation around the ponds. They also compete with native fish and invertebrates at Corn Creek.

Reptiles found in the upland habitats include various species of lizards and snakes and the threatened desert tortoise. The desert tortoise occurs in creosote bush habitat throughout the Refuge at elevations below 4,200 feet. They utilize burrows during the hottest periods of the summer and coldest periods of the winter. Spring and fall are the most active periods of the year for the tortoise due to the availability of forage. No desert tortoises or their sign were encountered during surveys of the upland habitat in the vicinity of the visitor contact station (Sprunger-Allworth, pers. comm. 2006a). Non-native aquatic turtles have been observed in the ponds and most likely were once pets introduced by humans.

Many mammal species are found in the creosote bush scrub habitat, and several species of bats are common in the upland and riparian habitats on the Desert NWR. Bats are important to the Refuge because they help regulate insect and other invertebrate populations, and some help pollinate plants. Most bats are commonly observed during evening hours. Rodents are very common and often make their homes at the bases of shrubs. The six mountain ranges of Desert NWR provide habitat for desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), and some predatory mammals, but in recent times these species have not visited the Corn Creek springs area.

### **3.5 Visual Resources**

Corn Creek Field Station has been modified from its original landscape to include buildings, a pasture, man-made ponds and channels, and other disturbed areas associated with the former ranch site. Immediate views from the existing visitor contact station include desert uplands to the south and east, buildings to the west, and an oasis (wetland and riparian habitats associated with Corn Creek springs and the ponds) to the north. The buildings around the contact station include Refuge offices, a bunkhouse, two residences, service buildings, a historic building used as a carpenter's shop, a barn, restrooms, and a kiosk. Except for the kiosk and restrooms, these buildings are located to the west of the visitor contact station and are mostly masked by trees and other vegetation when viewed from the contact station. A historic railroad tie house, a pump house (for a groundwater well), a "blacksmith's shop" or shed, and the Pahrump poolfish refugium are located in the northern portion of the field station; these facilities cannot be seen from the visitor contact station. To the south and east, the land extends for several miles as undisturbed desert scrub habitat. The Las Vegas Valley can be seen beyond the Refuge border to the south. Background views from the field station are of the surrounding mountain ranges: Sheep Range, Las Vegas Range, and Spring Mountains.

### 3.6 Cultural Resources

The project area falls within the Corn Creek Campsite National Register District (26CK2605) that was listed on the National Register of Historic Places in 1975. Recent studies in 2002 entailed a detailed survey of this currently 1,000-acre site composed of over 50 separate loci, or concentrations of cultural material, with other artifacts dispersed in between (Roberts and Ahlstrom 2003). This study revealed that since the start of the Middle Archaic Period (5500 B.C.) there had been continuous American Indian permanent or temporary habitation at this site until Euro-Americans entered the area. The loci vary from large multicomponent villages and camps to temporary camps with extensive archaeological deposits, thermal features, and trails.

Within the southern portion of Corn Creek Campsite is Locus 1 (CL-242). Locus 1 is a major contributing element to the National Register listing, and it was occupied during the Middle Archaic, Late Archaic, Virgin Anasazi, Southern Paiute, and Euro-American Historic Periods. It is the largest documented locus in the National Register District, consisting of approximately 180 acres and containing a continuous scatter of artifacts, features, and structures that includes the Corn Creek Field Station. A “possible Virgin Anasazi Basketmaker habitation at the field station makes this locus one of the most important prehistoric sites in southern Nevada” (Roberts and Ahlstrom 2003).

Historic Period activities from the late 1800s reveal traces of travelers and development of the Corn Creek Ranch from 1916 to 1939. Euro-American occupation of the site is found in features such as roads, trash scatters, a mine, a dugout, a windmill, and a Civilian Conservation Corps camp. The Desert NWR was established in 1936, and the Service acquired the ranch property for use as the Refuge headquarters in 1939. Refuge personnel made many changes over the years to the field station, including removing most of the historic ranch structures and creating new buildings such as the refuge manager’s house and the maintenance shop in 1942 and 1943. Many of the remaining structures and features contribute to the integrity and setting of the National Register District.

Several Euro-American historic structures are identified within the Corn Creek Field Station as contributing elements to the Campsite’s National Register status (Roberts and Ahlstrom 2003). These include the railroad tie house, refuge manager’s house, and maintenance garage. The structure known as the “blacksmith shop” is currently being re-evaluated in regards to its age and significance. The remains of the Civilian Conservation Corps camp have not yet been evaluated.

The Corn Creek Field Station is within the ethnographic territory of the Southern Paiute, and the Corn Creek springs area is traditionally called *Pakonapanti*. Tribal representatives were actively consulted by the Service regarding the design and impact of the new visitor center and associated infrastructure (refer to Section 6.0).

### 3.7 Social and Economic Conditions

#### Population and Housing

Corn Creek Field Station contains the Refuge headquarters and offices in addition to the existing recreational facilities. The field station and immediate vicinity do not provide housing opportunities for the public. Three residences are located at the field station for Service staff, one of which has been converted to offices. A five-bedroom bunkhouse is used for both office space (three rooms) and housing for visiting researchers, volunteers, or Service personnel. Most Refuge staff live off-site in Las Vegas or other nearby communities. No minority or low-income populations occur at the field station or on the Refuge. The nearest population center is the Las Vegas Valley, approximately 23 miles to the south.

## **Recreation**

Corn Creek Field Station serves as the Desert NWR's visitor contact station and headquarters. The visitor contact station is open a few hours every Friday, Saturday, and Sunday from Labor Day through Memorial Day weekend. Several facilities are available to the public at the field station, including an interpretive kiosk, restrooms, shade structures, and potable water. A user-made footpath with limited interpretive signs allows for wildlife viewing at Corn Creek springs. Corn Creek Field Station provides the best opportunity to view the widest variety of birds on the Refuge. Public use near springs and other sources of water is closely regulated to avoid conflicts with wildlife.

The Desert NWR offers the opportunity for a unique and solitary desert experience. Primitive camping, backpacking, hiking, and horseback riding are some of the non-wildlife dependent recreational opportunities available on the Desert NWR. Wildlife-dependent recreational opportunities include limited wildlife observation, environmental education, interpretation, photography, and hunting. Fishing is not allowed on the Desert NWR.

A kiosk, nature trail, and the visitor contact station are the most important facilities available to visitors on the Desert NWR. In fiscal year 2002, 1,800 visitors stopped at the visitor contact station, more than 50,000 visits were recorded at the kiosk, and more than 45,000 hikes were recorded along nature trails.

The Service utilizes volunteers throughout all aspects of their operations. The Southern Nevada Agency Partnership between the National Park Service, the Service, Bureau of Land Management, and U.S. Forest Service established an Interagency Volunteer Program entitled Get Outdoors Nevada. The interagency program reduces competition between the agencies and increases efficiencies in recruitment, recognition, training, and resource support.

## **Refuge Management Economics**

The current Refuge staff consists of two permanent full-time employees (appropriated funds) and staff funded through the Southern Nevada Public Lands Management Act (SNPLMA). The total Desert Complex budget for fiscal year 2006 was \$1,591,127, including base and flexible funds.

The Refuge also receives funds from the SNPLMA program for capital improvement and conservation initiative projects and staffing. Examples of projects on the Desert NWR that have received funding include habitat restoration, construction of an equipment storage building and bunkhouse, boundary surveys and posting, campground improvements, restoration of the railroad tie house at Corn Creek, and boundary fencing. Funding has been approved for design, construction, and implementation of the visitor center and facilities. Nine employees are also funded through SNPLMA, including four law enforcement officers, an archaeologist, a visual information specialist, an administrative assistant, and two habitat restoration specialists.

### **3.8 Public Access and Visitation**

Principal public access to Corn Creek Field Station and the Refuge is from U.S. Highway 95 at a point approximately 23 miles northwest of Las Vegas. A sign on the east side of the highway marks the 4-mile gravel road to the field station. The gravel road leads to a small parking area near the visitor contact station and information kiosk. From Corn Creek, access to the eastern portion of the Desert NWR is via either Mormon Well Road or Alamo Road. Alamo Road travels from Corn Creek Field Station north to Pahranaagat NWR, while Mormon Well Road heads east to U.S. Highway 93, just south of its intersection with State Route (SR) 168 (Figure 1).

The Desert NWR receives visitors from the Las Vegas area as well as from numerous other states and foreign countries. Visitation information is gathered in two ways at Desert NWR: a traffic counter at the entrance and a sign-in sheet at Corn Creek Field Station. Between 1998 and 2000, visitation to the Desert NWR increased from 43,086 to 47,412 (CH2MHill 2002). From October 2000 to September 2003, records maintained by the Service show that visitation ranged from approximately 60,000 to 68,000 per year (Le'au Courtright, pers. comm. 2006).

#### **4.0 ENVIRONMENTAL CONSEQUENCES**

##### **4.1 *Geology and Soils***

###### **Proposed Action**

Most of the visitor center would be constructed in the same location as the existing visitor contact station, kiosk, and restrooms. These facilities would be removed to accommodate the new facilities. The basement for the visitor center would require the removal of a large amount of soil. Appropriate measures would be implemented to ensure minimal effects from wind and possibly water erosion associated with removing and stockpiling soils until the soil can be transported off-site or used for other activities (see Section 5.1).

Grading and vegetation removal would be necessary to construct the parking area. Some vegetation removal would also be necessary to establish the new trail segments. These activities would require disturbance of less than 3 acres, which would expose soils in upland areas to wind and water erosion. These impacts would be minimal with implementation of appropriate best management practices (BMPs) to control erosion (see Section 5.1). The parking area and the loop trails would be protected from erosion over the long term (from visitor use and rain) because they would be covered with a pervious surface.

Excavation of the spring mound and associated channel and creation of new channels in place of the lower ponds would expose soils to wind and water erosion and may result in discharge of sediment into surface waters. Non-native vegetation removal would also expose soils to erosion until native vegetation is established. Appropriate BMPs during channel modification and spring mound excavation would minimize short-term erosion (see Section 5.1). Establishment of native vegetation around the spring and along the channels would help stabilize the banks and minimize water erosion.

###### **Habitat Rehabilitation Alternative**

Compared to the Proposed Action, a smaller amount of soil would be exposed to erosion under the Habitat Rehabilitation Alternative because only one of the ponds would be removed and a smaller channel would be needed to divert flows to the pasture. The BMPs identified in Section 5.1 would minimize erosion under this alternative.

###### **No Action Alternative**

Under the No Action Alternative, individual projects would require small amounts of grading and vegetation removal, which could expose soils to erosion. Each project would implement appropriate BMPs to minimize erosion in the affected area. The existing footpaths would continue to be affected by visitor use because they are not paved, and erosion would occur along portions of some paths, discharging sediment into surface waters.

## **4.2 Hydrology and Water Quality**

### **Proposed Action**

Construction of the visitor center and associated facilities would have a negligible effect on hydrology and water quality. Runoff from the visitor center would be captured in gutters and recycled for irrigation of the desert gardens within the parking area. Permeable surfaces in the parking area would allow stormwater runoff to infiltrate the ground, resulting in a negligible amount of runoff. Water quality of the springs, ponds, and channels would not be affected because of the negligible amount of surface runoff from the visitor center area.

Surface disturbances along the channel, at the spring mound, at the two lower ponds, and along trails would result in soil erosion and sedimentation and could discharge other pollutants associated with construction equipment into surface waters, which could affect water quality of the springs, ponds, and channels. This could result in increased turbidity and total dissolved solids and changes in temperature. Implementation of appropriate BMPs to minimize erosion and discharge of pollutants would ensure minimal impacts to surface water quality (see Sections 5.1 and 5.2).

Surface hydrology of Corn Creek Field Station would be altered through the removal of the lower two ponds and diversion of surface flows into the pasture area. The springs and outflow channels would not be adversely affected by removal of the ponds. Hydrology would be modified, but the springs would continue to discharge flows into the streams and provide water for the wetland and riparian habitats.

### **Habitat Rehabilitation Alternative**

Compared to the Proposed Action, fewer changes in surface hydrology would occur through removal of only the lower pond and establishment of a new channel from the former pond site to the pasture. Construction activities would disturb a smaller area and result in fewer water quality effects, and BMPs would ensure these impacts are minimal.

### **No Action Alternative**

Under the No Action Alternative, hydrology and water quality would be affected on a project-by-project basis, and impacts would be localized around each project's area of impact. Minimal impacts would occur, and BMPs would ensure water quality is maintained.

## **4.3 Air Quality**

### **Proposed Action**

Equipment used during construction activities would generate air pollutant emissions and result in a short-term increase in pollutants. Fugitive dust from construction traffic and soil disturbances would increase pollutants during construction activities. Demolition of buildings would also generate pollutant emissions. Construction-related pollutants would be minimized by implementing appropriate BMPs and adhering to conditions in the dust control permit obtained from Clark County Department of Air Quality Management (see Section 5.3).

With construction of a new visitor center and facilities, visitor traffic is expected to increase. An increase in vehicles on the Refuge would increase emissions and fugitive dust. This increase in pollutants would result in a minor effect on air quality, which would be spread out over the year, and standards for criteria pollutants would not be exceeded.

### **Habitat Rehabilitation Alternative**

Under this alternative, impacts would be similar to those described for the Proposed Action. Because of the need for vegetation removal and construction activities to remove the lower pond and divert the channel, some minor construction-related pollutants would be expected. This impact would be minimized through implementation of BMPs.

### **No Action Alternative**

Under the No Action Alternative, construction-related pollutants would create a negligible effect on air quality as projects are implemented over time. Visitor traffic could increase on the Refuge as a result of increased populations in the nearby communities, but to a lesser extent than under the Proposed Action; air quality impacts would be negligible due to the small number of visitors on the Refuge at one time.

## **4.4 Biological Resources**

### **Proposed Action**

Construction of the visitor center and associated facilities would result in a minor loss of desert scrub habitat (about 2 acres), which would be compensated for through the planting of native vegetation within the desert garden around the parking area. A few non-native Russian olive trees would also be removed to accommodate the new facilities. The minor loss of habitat would not adversely affect wildlife species, although construction activities could result in temporary disturbances during the construction period. Construction during the breeding or nesting season could cause adverse wildlife impacts. No federally listed plant, fish, or wildlife species would be affected by construction of the visitor center and associated facilities. Implementation of mitigation measures would ensure minimal impacts to wildlife during construction (see Section 5.4).

Temporary disturbances to wildlife would occur during habitat rehabilitation. These activities would be most noticeable in the breeding or nesting season, when reproductive success and young may be affected. No federally listed plant species would be adversely affected by habitat rehabilitation, and these activities would benefit wildlife over the long-term. Temporary disturbances would occur to Pahrump poolfish in the middle pond when it is removed and as a result of indirect water quality impacts from upstream erosion or sedimentation. The new channels where the existing lower and middle ponds are located would provide habitat for the poolfish and provide connectivity with the upper pond and springs on the Refuge, benefiting the poolfish. Implementation of mitigation measures, including fish salvage efforts within the ponds prior to disturbance, would ensure minimal impacts to fish and wildlife during habitat rehabilitation (see Section 5.4).

Habitat rehabilitation at the field station would improve wetland and riparian habitat for migratory birds and other wildlife over the long term. Non-native vegetation and noxious weeds would be removed or eradicated, where possible, and native plants would be established in their place. Plantings would occur in phases to ensure availability of habitat for wildlife and to minimize impacts on migratory birds, which are dependent on habitat diversity. Removal of emergent vegetation to increase open water in the upper pond would improve habitat for waterfowl and other migratory birds. Removal of the lower and middle ponds would have a minor effect on wildlife because there would be a net gain in habitat through creation of a new wetland in the pasture and conversion of the pond sites into wetland and riparian habitats. The ponds currently provide minimal open water habitat due to the overgrown emergent vegetation.

### **Habitat Rehabilitation Alternative**

Removal of the lower pond under the Habitat Rehabilitation Alternative would result in a reduction in open water habitat to a lesser extent than the Proposed Action. There would be no net loss of wildlife habitat because the former lower pond site would be converted into wetland and riparian habitats with a small stream. The stream would provide aquatic habitat for invertebrates and would connect to the pasture wetland habitat, providing an interconnected network of channels, wetlands, and riparian habitat. This alternative would benefit fish and wildlife at Corn Creek Field Station over the long term, but to a lesser extent than the Proposed Action.

### **No Action Alternative**

Under the No Action Alternative, minor improvements to habitats would occur on a project-by-project basis. Individual projects would result in temporary disturbances during construction and would result in a longer term benefit for species, though benefits would be less than under the Proposed Action. Benefits would vary depending on the types of projects implemented and amount of rehabilitation that occurs.

## **4.5 Visual Resources**

### **Proposed Action**

Construction activities would result in temporary impacts to visual resources at Corn Creek Field Station. During construction, views of the proposed visitor center site and parking area would be changed from existing buildings to demolished buildings and vacant land; following construction, views would be of the new facilities. Other demolished building sites would also affect views temporarily until the sites can be restored.

The new visitor center would alter views of the field station from an open area with a few buildings to a single large building. Although the new visitor center would be large in comparison to other buildings in the area (see Exhibit 2), the walls would be constructed of earthen materials or straw bales and would blend into the surrounding environment. Native plantings around the building would also help mask views from a distance. Views from the proposed parking area toward the north would be obstructed by the new building; however, visitors would continue to be able to view the oasis from the large windows inside the building. The new visitor center would be visible from the entrance point to the field station, from the surrounding habitats to the south and east, and from various locations within the Corn Creek Campsite National Register District. Vegetation to the north of the visitor center would partially mask the building from views along the trails, but the facility would extend above most of the surrounding vegetation and could affect the setting of the National Register District. Native desert gardens in the parking area would improve views of the new paved parking area and create a natural feel for the area. Although the viewshed would be modified, the beneficial effects of the visitor center and improved recreational opportunities would enhance visitor experience and minimize adverse effects of a new, larger building at the field station. Additionally, mitigation measures would be implemented to help mask the views of the new building from historic buildings in the National Register District (see Section 5.5).

Habitat rehabilitation would improve visual resources at the field station by planting native species, increasing open water habitat at the upper pond, and creating new wetland habitat in the pasture. These improvements would expand native habitats on the Refuge and attract a diversity of wildlife.

### **Habitat Rehabilitation Alternative**

Under this alternative, impacts would be similar to those described for the Proposed Action. Conversion of the lower pond to wetland and riparian habitats would have a beneficial effect on views of the area.



**Exhibit 2: Aerial View of Visitor Center**

### **No Action Alternative**

Under the No Action Alternative, minor changes in the views of Corn Creek Field Station would occur as smaller habitat rehabilitation and visitor use projects are implemented. These projects would likely improve visual resources on the Refuge.

## **4.6 Cultural Resources**

### **Proposed Action**

The Proposed Action would affect portions of the Corn Creek National Register District within Locus 1. Actions proposed within this locus include the construction of a new visitor center, parking areas, roads, utilities, and infrastructure, and the demolition of two buildings (hay barn and law enforcement offices) and one contributing structure to the National Register listing (carpenter's shop). The barn and law enforcement offices are not considered historic or contributing elements; however, the demolition of the carpenter's shop would be an adverse effect to the site because it would eliminate a contributing element under National Register Criterion A (associated with events that made a significant contribution to the broad patterns of our history). This impact would be mitigated through mitigation measures to be identified during consultation under Section 106 of the National Historic Preservation Act (NHPA) prior to project implementation (see Section 5.6 for a list of potential mitigation measures).

The visitor center would be constructed in the same location as the current visitor contact station, restrooms, and kiosk, which would be removed to accommodate the new visitor center. The placement of the surface facilities is not expected to result in adverse impacts on any previously documented surface cultural resources; however, construction activities could affect buried cultural resources. This impact would be mitigated through mitigation measures to be identified during consultation under Section 106 of the NHPA prior to project implementation (see Section 5.6 for a list of potential mitigation measures).

Recreational opportunities would be provided by a set of walking trails north of the new visitor center. Development of the trail to the east of the visitor center would disturb a portion of the National Register site that is presently undeveloped, which could result in adverse direct and indirect effects to cultural resources. The segment of the trail through the site would be designed as a boardwalk instead of a paved trail to minimize impacts to surface resources. This impact would be mitigated through mitigation measures to be identified during consultation under Section 106 of the NHPA prior to project implementation (see Section 5.6 for a list of potential mitigation measures).

A trail would be located near the existing railroad tie house, pump house, and “blacksmith shop.” The proximity of the trail to these resources may result in indirect effects from visitor foot traffic and possibly vandalism. Because there have been informal foot trails near these buildings for years, the new trails are not expected to increase effects on the buildings. An established trail would likely be a positive benefit to the resources by encouraging visitors to remain on the trail.

The Proposed Action would require the removal of the two lower ponds and non-native plant species and planting of native species. Although there are no documented surface cultural resources identified around the ponds where soil was piled during pond excavation, part of the Locus 1 archaeological deposits are located within the proposed wetland/riparian area to be created, and these resources could be affected by construction activities. A minimum of 12 inches of the surface has been noted as already disturbed from historic pasture and farming activities, but subsurface cultural resources may be intact. Impacts associated with wetland creation would be mitigated through mitigation measures to be identified during consultation under Section 106 of the NHPA prior to project implementation (see Section 5.6 for a list of potential mitigation measures).

The Proposed Action would be limited to Locus 1 of the National Register listed Corn Creek Campsite. Construction and demolition activities would result in adverse effects to some of the prehistoric and historic features. Mitigation measures finalized during the Section 106 consultation process would be implemented prior to any construction activities.

### **Habitat Rehabilitation Alternative**

Under the Habitat Rehabilitation Alternative, the Service would remove the lower pond and modify the stream channel to discharge into the pasture, and remove non-native plant species. Impacts described under the Proposed Action would still occur, and mitigation measures finalized during the Section 106 consultation process would be implemented prior to any construction activities (see Section 5.6).

### **No Action Alternative**

Under the No Action Alternative, visitors use the existing paths north of the visitor contact station with minimal guidance or direction from Service staff or signs. Because of the lack of direction, visitors could wander off paths and disturb culturally sensitive areas. Additional signs, fences, and trail improvements could be provided on a case-by-case basis.

Cultural resources impacts of habitat rehabilitation projects would be evaluated on a case-by-case basis. Section 106 compliance would be required for each project prior to implementation.

## **4.7 Social and Economic Conditions**

### **Proposed Action**

The Proposed Action would not affect population and housing or result in disproportional adverse effects on low-income or minority populations because no residential populations occur on the Refuge or near the field station. Construction of the visitor center and habitat rehabilitation would not affect the Refuge

management budget because they would be entirely funded through SNPLMA. The Proposed Action would result in a temporary increase in construction employees, which could provide a minor benefit for employment in the area.

The Proposed Action would expand recreational facilities on the Refuge and improve wildlife-dependent opportunities for the public. The visitor center would offer a central meeting place for visitors to interact with one another and with Refuge staff. The improved trails and interpretive signs would add a new element of interpretation to Corn Creek Field Station that would benefit and educate the public. The habitat improvements would attract a diversity of wildlife and improve wildlife observation and photography as well as educational and interpretive opportunities. The public would become more aware of and more interested in the Refuge and the recreational opportunities available at the Desert NWR.

### **Habitat Rehabilitation Alternative**

Under this alternative, impacts would be similar to those described for the Proposed Action. Conversion of the lower pond to wetland and riparian habitats would improve habitat and visitor experience.

### **No Action Alternative**

Under the No Action Alternative, visitors would continue to be offered minimal wildlife-dependent recreational opportunities at the visitor contact station, kiosk, and unimproved footpaths. Some interpretive signs are present to educate the public, and additional signs would be constructed on a project-by-project basis as needed. The existing facilities would not be capable of supporting a large number of visitors at one time.

## **4.8 Public Access and Visitation**

### **Proposed Action**

Construction activities would temporarily restrict access to portions of Corn Creek. The visitor center would be unavailable to the public until it is completed, and trail construction would temporarily prevent visitors from hiking around Corn Creek springs. Implementation of mitigation measures (see Section 5.8) would ensure minimal impacts to public access during construction activities.

The visitor center would accommodate 100,000 visits per year. The parking area at the visitor center would accommodate a larger number of people than the area is currently capable of handling (approximately 40 vehicles as compared to roughly 10 vehicles now). Access to the Refuge would be improved through establishment of a convenient location for visitors to meet and begin their activities. Visitors would be encouraged to experience the Refuge and participate in a variety of recreational activities. Establishing a trail system through Corn Creek would improve access for all visitors and would meet Americans with Disabilities Act requirements. The new facilities would meet the demands associated with an increase in visitors.

### **Habitat Rehabilitation Alternative**

Under this alternative, impacts would be similar to those described for the Proposed Action. Conversion of the lower pond to wetland and riparian habitats would not affect public access and visitation.

### **No Action Alternative**

Under the No Action Alternative, Corn Creek Field Station would continue to serve as the main entrance to the Refuge and would provide minimal facilities for the public to access recreational opportunities (i.e., unimproved footpaths and minimal information on the Refuge). The parking area would not have capacity to serve more than a few cars at a time. Visitors would tend to spend minimal time at the field station and

instead, continue on to other parts of the Refuge or off-site to other recreation areas. Improvements to Refuge facilities would be improved on a project-by-project basis, as funding becomes available.

#### **4.9 Cumulative Impacts**

Cumulative impacts result “from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal), individual, or industry undertakes such action” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant, actions occurring over a period of time. These actions include onsite or offsite projects that contribute to impacts considered in this EA.

The Comprehensive Conservation Plan (CCP) being prepared for the Desert National Wildlife Refuge Complex is a major action that could affect management of the Refuge. The Service is currently developing a CCP/Environmental Impact Statement that examines alternatives for management of the Desert NWR. Management objectives include bighorn sheep management, plant and wildlife management and protection, improved recreational opportunities, increased public involvement, and cultural resources protection. Alternatives range from continuing the current management actions to greatly improving management efforts.

Implementation of the Proposed Action in combination with management strategies identified in the CCP would improve Refuge conditions for plants, wildlife, and visitors. Actions at Corn Creek Field Station would allow visitors to interact with Refuge staff and obtain valuable information on the Refuge and its resources. Actions that would be implemented in other areas of the Refuge would also improve visitor awareness of the resources and increase opportunities for visitors to experience the Refuge. Wildlife habitat would be improved at the field station and in select other locations targeted for bighorn sheep management. Adverse cumulative impacts from these actions would be short-term in nature and would be primarily a result of construction disturbances; both this EA and the CCP Environmental Impact Statement include mitigation measures to minimize these impacts. Long-term cumulative impacts would be beneficial and would improve Refuge conditions for a variety of resources.

### **5.0 MITIGATION MEASURES**

#### **5.1 Geology and Soils**

To control erosion and minimize sedimentation, construction crews would be required to implement BMPs during grading activities, vegetation removal, and other activities that would disturb soils. These measures include the following (additional erosion and sedimentation measures are listed in Section 5.2):

- Pre-water and maintain surface soils in stabilized conditions where support equipment and vehicles will operate.
- Apply water or dust palliative during clearing and grubbing or earthmoving activity to keep soils moist throughout the process.
- Water disturbed soils immediately following clearing and grubbing activities.
- Stabilize sloping surfaces using soil binders until vegetation or desert pavement (ground cover) can effectively stabilize the slope.

#### **5.2 Hydrology and Water Quality**

Many of the mitigation measures identified in Section 5.3 to minimize fugitive dust would also reduce windblown sediments that could settle in spring pools and stream channels. Other mitigation measures for

erosion and sedimentation are identified in Section 5.1. Construction and habitat restoration crews would be required to implement the following additional water quality mitigation measures:

- Construct small sediment collection pools downstream of work areas to trap sediment and reduce sediment movement through the aquatic system.
- Use turbidity barriers in areas where sediment collection pools cannot be used.
- Direct flows where feasible around the work area and temporarily detain flows to reduce potential entrainment of sediment.
- Limit the size of the area of disturbance where flows cannot be directed around the work area or detained, so that minimal sediment is added to stream flows.
- Collect, remove, and dispose of all trash, garbage, debris, waste fluids, and other waste materials in an approved licensed disposal area following construction.

### **5.3 Air Quality**

As part of the requirement of a dust control permit from Clark County Department of Air Quality Management, the following mitigation measures, in addition to those identified above for Geology and Soils, would typically be required to control fugitive dust during construction and habitat rehabilitation activities:

- Maintain effective cover over stockpiled fill or debris materials.
- Limit stockpile height to 8 feet.
- Limit vehicle speeds to 15 miles per hour in staging area and on all unpaved access routes.
- Clean mud, silt, and soil tracked out onto paved surfaces immediately.
- Apply water to demolition debris during handling and following demolition to stabilize the debris.

### **5.4 Biological Resources**

#### **Vegetation**

Mitigation to reduce impacts to vegetation would be implemented by construction crews, including:

- Prevent the spread of noxious weeds by cleaning vehicles and equipment used on the Refuge with high-pressure sprayers to dislodge seeds prior to accessing the area.
- Plant native riparian plants immediately after construction activities around springs, channels, and at former pond sites to minimize invasion of weeds and non-native species.
- Avoid unnecessary disturbances to vegetation by driving on existing roads and working only in the required area.

#### **Wildlife**

Many of the mitigation measures identified in Sections 5.2 and 5.3 would also reduce impacts to wildlife. Additional mitigation to reduce impacts to wildlife species includes:

- Phase in habitat rehabilitation by removing non-native vegetation and planting native vegetation over time (small amounts at any one time).

- Minimize construction activities and vegetation removal during the spring to minimize impacts to nesting birds.
- Remove pond(s) during the summer or winter, when the fewest migratory birds (particularly waterfowl) are present.
- Retain dead and dying trees for habitat diversity, unless they are a source of invasive seedlings and root sprouts.
- Minimize activities in channels and ponds to avoid disturbances to fish and invertebrates.

### **5.5 Visual Resources**

To minimize impacts on the setting of the Corn Creek Campsite District, the Service would plant native vegetation around the new visitor center and other new facilities to help mask views from historic buildings and other sensitive areas of the District.

### **5.6 Cultural Resources**

Based upon the results of the Section 106 consultation process, the Service will implement appropriate mitigation measures to reduce impacts to cultural resources.

Possible mitigation measures may include, but are not limited to, the following:

- Design trails and interpretive signs and use vegetation to minimize indirect effects, including avoiding artifact scatters that could be collected or trampled and buildings that could be vandalized.
- Conduct a Historic American Buildings Survey/Historic American Engineering Report study to fully record all information on the historic carpenter's shop.
- Implement archaeological data recovery, including excavating the prehistoric deposits to determine the integrity of the deposits and retrieving any potential data and cultural materials to be affected.
- Incorporate interpretive media in the visitor center and on the trails that explains the history, structures, and changes at Corn Creek.
- Provide interpretive programs regarding the history, structures, and features present at Corn Creek.

All construction or earth-disturbing activities would cease if human remains, funerary objects, sacred objects, or objects of cultural patrimony are inadvertently encountered during construction. These deposits shall be treated in accordance with the provisions of the Native American Graves Protection and Repatriation Act.

A qualified archaeological monitor and an American Indian monitor would be present during trail and basement construction, habitat rehabilitation (ponds and new wetlands), and any other subsurface project construction. An American Indian monitor would also be present during any Section 106-required excavation or testing. Any other earth-disturbing activities would require consultation with the Native American tribes to determine conditions for monitoring.

### **5.7 Social and Economic Conditions**

No mitigation measures are necessary for social and economic conditions.

### **5.8 *Public Access and Visitation***

To minimize impacts on visitors and access to Corn Creek during all construction activities, signs would be posted by construction crews or Refuge staff at Corn Creek to inform visitors of project activities. These would include what is being constructed, how long it will take, and what areas are off-limits and identify recreational opportunities that continue to be available during the construction period.

### **6.0 COORDINATION AND TECHNICAL SUPPORT**

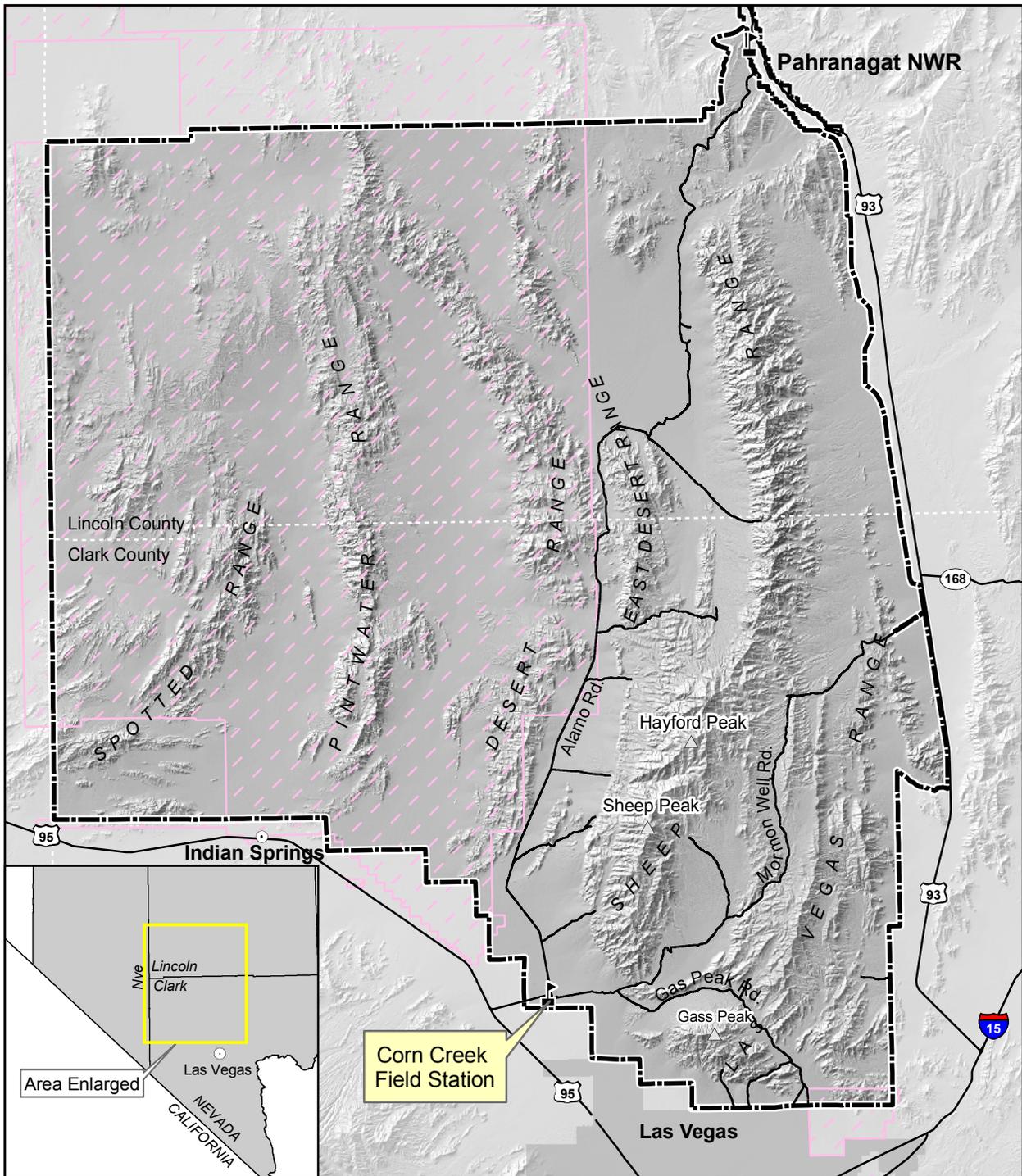
The Service had lead responsibility for preparing this Draft EA, with technical assistance provided by SWCA Environmental Consultants. The Refuge staff consulted with the Ecological Services Division of the Service, which surveyed the project area in 2006 to determine the presence of desert tortoise. HRA, Inc. conducted a 2003 archaeological inventory and survey of the Corn Creek Field Station (Roberts and Ahlstrom 2003), which was incorporated into the EA.

Consultation with the Nevada State Historic Preservation Office has begun and will continue as the archaeological testing, structural recordations and evaluations, and mitigation measures are undertaken to comply with Section 106 of the NHPA. Consultation with the Nevada State Historic Preservation Office for the appropriateness of the design of the visitor center/administrative office to ensure it blends with the historic setting of the Corn Creek Field Station buildings is also in progress.

The Draft EA will be available for public and agency review; comments on the Draft EA will be responded to and incorporated into the Final EA. A notice will be released informing the public of the availability of the Draft EA for review, including the locations of electronic and hard copies, contact information for the Refuge, and the schedule for the public review period.

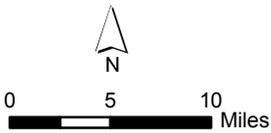
## 7.0 REFERENCES

- CH2MHill. 2002. Desert National Wildlife Refuge Complex Transportation Study. Prepared for Central Federal Lands Highway Division of the Federal Highway Administration. December.
- Clark County. 2007. History of air quality exceedances. Department of Air Quality and Environmental Management. Available on the Internet: <http://www.ccairquality.org/report/exceedances.html>.
- DePollo, Diane M. and Craig M. DePolo. 1999. Earthquakes in Nevada 1852 to 1998. Nevada Bureau of Mines and Geology, Map 119.
- Le'au Courtright, Callie. 2006. Visitor estimates for Desert National Wildlife Refuge Complex. U.S. Fish and Wildlife Service. Personal communication with SWCA. October 18, 2006.
- Otis Bay Ecological Consultants. 2003. Final Corn Creek Field Station Rehabilitation Alternatives Including Spring Restoration and Construction of a Poolfish Refugium at the Desert National Wildlife Range, Nevada. Prepared for U.S. Fish and Wildlife Service, Desert National Wildlife Range. June 10, 2003.
- Roberts, H.R. and R.V.N. Ahlstrom. 2003. Coyote Named This Place Pakonapanti: An Archaeological Survey of the Corn Creek Site in the Desert National Wildlife Refuge, Clark County, Nevada. HRA Inc., Conservation Archaeology Report No. 02-03.
- Sjoberg, Jon. 2006. Comments on Administrative Draft Environmental Impact Statement and Comprehensive Conservation Plan for Desert National Wildlife Refuge Complex. Nevada Department of Wildlife. Personal communication with SWCA. January 11, 2006.
- Sprunger-Allworth, Amy. 2006a. Endangered species issues in project area. Email communication with SWCA. October 26, 2006.
- Sprunger-Allworth, Amy. 2006b. Status of Pahrump Poolfish on Desert NWR. Desert NWR Refuge Manager, U.S. Fish and Wildlife Service. Personal communication with SWCA. March 14, 2006.
- Thomas, J. M., Welch, A. H., and Dettinger, M. D. 1996. Geochemistry and Isotope Hydrology of Representative Aquifers in the Great Basin Region of Nevada, Utah, and Adjacent States, USGS Professional Paper 1409-C, 100p.



**Figure 1. Vicinity Map**

-  Refuge Headquarters
-  Refuge Boundary
-  Road
-  Nevada Test and Training Range



## Figure 2. Proposed Action

