

## **6. Plan Implementation**

### **6.1 Introduction**

This chapter describes the details of how management of the Sonny Bono Salton Sea NWR and Coachella Valley NWR will be implemented over the next 15 years. Implementation will begin upon approval of the CCP; and from that point, the CCP will serve as the primary reference document for all Refuge planning, operations, and management until it is formally revised. The Service will implement the final CCP with assistance from existing and new partners, including public agencies, tribes, non-governmental organizations, and the public. Consistent public outreach and continued coordination with Refuge constituents are essential components of this implementation process.

This CCP not only provides long-term guidance for Refuge management decisions, but it also addresses the role these Refuges and the management undertaken on these Refuges play in the larger conservation landscape. The Sonny Bono Salton Sea NWR is just one component of the much larger Salton Sea landscape and as that landscape changes, the role of the Refuge also may need to adapt. The same is true for the role that preservation of the habitats within the Coachella Valley NWR plays in the long-term preservation of the habitats and species covered by the Coachella Valley MSHCP.

An important component of the CCP process is the development and/or refinement of a Refuge's vision and goals. It is through this process that we establish the desired future conditions of the Refuge and define its management direction. To provide more specific direction for how Refuge goals are to be achieved, the CCP process also includes the development of objectives and strategies. The goals and objectives are the unifying element of Refuge management, intended to identify and focus management priorities and provide a link between management actions, Refuge purposes, and NWR mission and goals.

Refuge goals and objectives, as well as the specific strategies for achieving the goals and objectives, have been developed for each Refuge in the Sonny Bono Salton Sea NWRC. Activities required to accomplish the management strategies are referred to as projects. Although it is our intent to implement the proposed projects by the dates presented in this chapter, the timing of implementation may vary depending upon a variety of factors, including funding, staffing, compliance with Federal regulations, partnerships, and the results of monitoring and evaluation.

### **6.2 Management Direction: Goals, Objectives, and Strategies**

Goals are broad statements of desired future conditions, while objectives are concise statements of what will be achieved to meet a particular goal. The objectives are derived from the goals and provide the basis for determining strategies and monitoring Refuge accomplishments. Whenever possible, objectives should consist of quantified statements of a standard to be achieved or work to be accomplished. They should be specific, measurable, achievable, results oriented, and time fixed; and they should be feasible within the 15-year lifespan of the CCP. Refuge strategies describe specific actions, tools, and techniques that can be used to meet Refuge objectives. In some cases, strategies describe specific projects in enough detail to assess funding and staffing needs. In other cases, further site-specific detail is required to implement a strategy. This additional detail can take the form of a step-down plan, restoration plan, or site plan.

The goals presented in this CCP will not change until they are reevaluated as part of a formal CCP revision process; however, objectives and strategies may be revised to better address changing environmental conditions and/or resource needs, or to take advantage of increased knowledge of Refuge resources.

## **6.2.1 Refuge Goals**

The goals that follow provide the context for the management actions that will be implemented on the Sonny Bono Salton Sea NWR and the Coachella Valley NWR.

### **6.2.1.1 Sonny Bono Salton Sea NWR**

The goals for the Sonny Bono Salton Sea NWR include:

- Goal 1: Protect, manage, enhance, and restore foraging, loafing, and nesting habitats on the Refuge to support migratory birds.
- Goal 2: Protect, manage, and, where appropriate, enhance or restore habitat to support the recovery of federally and State listed threatened and endangered species and other species of concern known to occur on the Refuge.
- Goal 3: Manage and protect remnant native desert scrub habitat, tree rows, and riparian areas on the Refuge to support resident bird and other wildlife species, as well as nesting habitat for Neotropical bird species.
- Goal 4: Work in partnership with other Federal, State, and local agencies and tribes to restore, enhance, and adaptively manage habitat functions that support fish and bird life, as well as to protect other resources of region-wide significance, in and around the Salton Sea.
- Goal 5: Enhance the public's awareness, appreciation, and enjoyment of the Refuge's biological resources by providing opportunities for compatible wildlife-dependent recreational uses.

### **6.2.1.2 Coachella Valley NWR**

The goals for the Coachella Valley NWR include:

- Goal 1: Protect, restore, and enhance Refuge lands to contribute to the recovery of the federally threatened Coachella Valley fringe-toed lizard and endangered Coachella Valley milk-vetch, as well as to conserve other species of concern supported on the Refuge.
- Goal 2: Through participation in a coordinated management effort involving all of the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) partners, sustain the ecological and evolutionary processes necessary to maintain the viability of the natural communities and habitats that support the species identified in the CVMSHCP and manage these communities and habitats adaptively to be responsive to short- and long-term environmental change.

Goal 3: Enhance the public's awareness, appreciation, and support for the Refuge's listed and sensitive species, as well as the ecological functions and geological processes that sustain these species, through compatible opportunities of environmental interpretation.

## **6.2.2 Objectives and Strategies**

### **6.2.2.1 Sonny Bono Salton Sea NWR**

Objectives and strategies for the proposed action (Alternative B - Restore and Enhance Habitat Quality; Expand Opportunities for Wildlife Observation, Environmental Education, and Interpretation), which would be implemented to achieve the vision and goals for the Sonny Bono Salton Sea NWR, are presented here.

**Goal 1: Protect, manage, enhance, and restore foraging, loafing, and nesting habitats on the Refuge to support migratory birds.**

***Objective 1.1: Managed Agricultural Lands***

*Throughout the 15-year life of the CCP, continue to provide approximately 2,650 tons of green forage on approximately 870 acres of agricultural lands within the Refuge to support approximately 30,000 geese annually.*

**Rationale:**

Managing a portion of the Refuge to provide forage for wintering waterfowl, primarily geese, addresses two of the Refuge purposes (i.e., protecting wildlife, reducing crop depredations by wintering waterfowl by providing adequate foraging opportunities within the boundaries of the Refuge). To accomplish the latter purpose, the Service has grown crops on the Refuge to provide food for wintering waterfowl since the 1940s (USDOI 1972). In addition, other lands on the Refuge are managed to provide freshwater areas where waterfowl can rest, loaf, and forage. A number of different crops have been cultivated for this purpose over the years, but today, the primary forage crop provided in the managed agricultural fields is rye grass.

Although the diversity and abundance of migratory waterfowl present on the Refuge has changed over the years, the need to reduce crop depredation has not. In the 1960s, supplemental food was provided for both ducks and geese. Today, the managed agricultural fields on the Refuge are intended to support primarily geese, including lesser snow geese, Ross' geese, white-fronted geese, and some Great Basin Canada geese. Individuals that make up the Lower Colorado population of greater sandhill cranes also frequent these managed fields in the winter.

During the winter of 2011/2012, an estimated 25,000 geese (primarily lesser snow geese and Ross' geese) overwintered on the Refuge (Ducks Unlimited at <http://in.ducks.org/conservation/where-we-work/sonoran-and-mohave-deserts/more-information>, accessed on 5/10/12) and foraged on approximately 870 acres of managed agricultural lands. Little information is available regarding the consumption of agriculturally grown grass (e.g., rye, wheat, barley) by lesser snow goose. However, a study by Hupp et al. (1996) provides some basis for determining how much green forage is required to support the current numbers of geese that winter in the vicinity of the Refuge. The Hupp et al. study determined that lesser snow geese consumed between about 662 grams per day of wet mass cotton-grass while staging at the Arctic NWR during autumn staging.

In another study conducted in Texas by Alisauskas et al. (1988), lesser snow geese wintering in a harvested rice field consumed approximately 919 grams per day of forage, which consisted mainly of germinated green vegetation (i.e., 28 percent graminoids, 70 percent forbs).

Extrapolated out, a snow goose at the Sonny Bono Salton Sea NWR likely consumes between about 80 to 111 kilograms (662 grams per day x 121 foraging days foraging and 919 grams per day x 121 foraging days, respectively) of grass forage during the winter season, which extends from about November 1 to February 28. As a result, if the Refuge hosts 25,000 geese during the winter season, between 2,002,500 and 2,780,000 kilograms (2,207 to 3,064 tons) of green forage would be needed to adequately support the current numbers of snow geese that winter at the Refuge.

In a study at the University of California Imperial Valley Field Station, rye grass growth was monitored to determine total production of fields supplemented with fertilizer (Worker 1978). In this case, standard rates of ammonium nitrate fertilizer (120 pounds of nitrogen per acre pre plant with 40 pounds per acre applied after each cutting) were applied to the site. Between early October, when the crop was planted, and March 1, the total production was nearly 3 tons per acre dry weight. If the Refuge produced an average crop of rye grass with fertilization similar to the above referenced study on 870 acres, the anticipated production for the season would be approximately 2,610 tons of dry matter goose forage. Dry matter in rye grass normally is only about 16 percent of the total wet weight, therefore, the total yield of rye grass expected within the Refuge's managed fields would exceed the tonnage required to support snow geese on the site throughout the winter. Additionally, the Refuge's managed wetland areas produce watergrass, swamp-timothy, alkali bulrush, cattail, and other seed, vegetative and tuberous plants to help waterfowl meet their nutritional and caloric requirements throughout the winter.

#### *Managed Agricultural Lands Strategies*

- Continue to implement no till methods on approximately half of the managed agricultural fields.
- Continue to inspect and maintain the tile drain system within the managed agricultural fields to provide optimum soil conditions for forage crops.
- Laser level the managed agricultural fields to improve water distribution throughout the fields, with the intent of increasing total crop yields.
- Explore methods and potential new crops to optimize forage opportunities for geese.
- Explore the use of soil microbes and/or soil amendments to enhance crop productivity.
- Control invasive weeds to improve forage crop productivity for geese in managed fields by implementing an integrated approach to pest management that includes a combination of mechanical and chemical control, and occasional use of prescribed fire.
- Investigate using cooperative farming agreements on the Refuge that are compatible with Refuge purposes to reduce costs and labor.

#### ***Objective 1.2: Seasonal Shallow Wetlands***

*Throughout the 15-year life of the CCP, annually produce wetland plants (e.g., watergrass [Echinochloa crus-galli], swamp timothy [Crypsis schoenoides], alkali bulrush [Scirpus robustus]) to provide green forage and seeds for migrating waterfowl on approximately 700 acres of seasonally flooded managed ponds using moist soil management techniques to achieve at least 80 percent coverage of the desired green forage plants.*

**Rationale:**

Migratory birds are Federal trust species under the jurisdiction of the Service, and their conservation and management are among the purposes for which the Sonny Bono Salton Sea NWR was established. Waterbird surveys conducted at the Salton Sea and adjacent areas in 1999 identified a total of 107 species of native birds, including 19 species of waterfowl and more than 25 species of shorebirds (Shuford et al. 2002). As the Salton Sea continues to recede, the shallow seasonal wetlands managed on the Refuge will serve a continuously greater role in supporting migrating and wintering waterfowl and shorebirds that travel along the Pacific Flyway.

The seasonal shallow wetlands managed on the Refuge are provided to supplement the foraging opportunities for migratory waterfowl that are provided within the Refuge's managed agricultural fields. The foliage and seeds of wetland plants such as watergrass, swamp timothy, and alkali bulrush, as well as aquatic invertebrates, that thrive in the moist soil areas of these seasonal wetlands provide waterfowl with the additional nutrients needed for a balanced diet (Smith et al. no date). Providing wetland forage for wintering waterfowl requires that seasonal wetland areas be flooded annually in October to a depth of between four and 10 inches and maintained until about March, when the fields are drained. Shorebirds also benefit from these wet areas, particularly in the spring when the water in the ponds is drawn down.

Providing seasonal wetlands to meet the needs of the species that travel along the Pacific Flyway supports the general principle of the North American Waterfowl Management Plan (North American Waterfowl Management Plan, Plan Committee 2004), which is "to maintain or restore traditional distributions of waterfowl in North America, consistent with long-standing patterns of waterfowl utilization." Providing these wetlands is also consistent with the Intermountain West Regional Shorebird Plan (Oring et al. 2000) goal of maintaining and enhancing diverse landscapes that sustain thriving shorebird populations.

Although the system-wide mission of the NWRS highlights the importance of maintaining the biological integrity, diversity, and environmental health of a refuge for future generations, it also recognizes that individual refuges may at times find it necessary to compromise elements of biological integrity, diversity, and environmental health at the refuge scale in support of those components at larger landscape scales (FWS Manual 601 FW3). In the case of the Sonny Bono Salton Sea NWR, restoring the biological integrity (which at the highest measure is viewed as those intact and self-sustaining habitats and wildlife populations that existed during historic conditions) of the lands within the Refuge would not achieve Refuge purposes, nor would it address the loss of migratory bird habitat that is presently occurring within the Salton Sea. In evaluating an adaptive framework for the NWRS that addresses refuge vulnerability to climate change, in conjunction with other anthropogenic drivers, Magness et al. (2011) recognized the need for an adaptive management approach that allows for flexibility at various landscape scales throughout the reserve network in an effort to moderate harm to trust resources, as well as exploit beneficial opportunities. The strategies for this Refuge that involve highly managed habitat areas are intended to support a diversity of species that have been compromised by the extensive loss of wetland habitat at an international (Pacific Flyway) landscape scale.

*Managed Seasonal Shallow Wetlands Strategies*

- Continue to maintain shallow wetland areas between October and March when the highest numbers of migratory waterfowl are present on the Refuge.
- Work with the IID to secure long-term agreements for an adequate supply of water of appropriate quality to continue to provide seasonal wetland areas on the Refuge.

- Direct spill water from seasonal wetland areas to managed agricultural lands and/or areas that support tree rows in an effort to optimize water use on the Refuge.
- Hire a full-time position (WG 6) responsible for irrigation and water movement throughout the Refuge that is necessary to achieve the objectives for seasonal shallow wetlands, as well as managed agricultural lands, managed cattail marsh, and permanent open water wetlands.
- Continue to develop the soils within the ponds to achieve optimum vegetative productivity.
- Using an integrated approach to pest management, continue to control salt cedar in and around the perimeter of these wetlands.
- Continue the practice of delaying drawdown in some ponds to provide shallow wetland habitat for migratory shorebirds that spend part or all of the spring and summer months on the Refuge.

***Objective 1.3: Permanent Open Water Wetlands***

*Throughout the life of the CCP, continue to manage approximately 110 acres of existing permanent, unvegetated, brackish open water areas with water depths ranging from one to three feet within Units 1 and 2 and maintain at least 10 unvegetated islands of various sizes within these permanent open water areas to provide nesting and roosting habitat for gull-billed terns, black skimmers, and other nesting seabirds.*

**Rationale:**

The results of the comprehensive waterbird surveys conducted in 1999 (Shuford et al. 2002) in and around the Salton Sea demonstrate the importance of open water wetlands in this area to more than 100 species of birds, including pelecaniformes (i.e., pelicans, cormorants), wading birds (e.g., herons, egrets, ibis, storks), shorebirds, and larids (e.g., gulls, terns). Providing open water habitat to support these birds is consistent with North American Waterbird Conservation Plan (Kushlan et al. 2002) goal of protecting, restoring, and managing sufficient high quality habitat and key sites for waterbirds throughout the year to meet species and population goals.

These permanent open water areas, which receive a continuous flow of freshwater from IID supplied water, as well as water that is drained into these areas from other wetlands on the Refuge, are maintained at depths of from one to three feet to support rafting and foraging waterbirds and deter access by mammals to nesting islands. The salinity levels within these areas are not managed, but due to evaporation and existing salts in the soil, salinity levels are generally high enough (brackish) to minimize the potential for invasion by freshwater wetland vegetation.

Minimal disturbance and lack of predators are important determinants of successful seabird breeding (USFWS 2005); therefore, the small islands provided within the Refuge's permanent open water wetlands provide greater protection for these ground nesting birds than would unvegetated areas around the perimeter of open water areas. Protected roosting sites are also important for seabirds and other waterbirds. The maintenance of unvegetated nesting islands within these open water wetlands supports the habitat management goal of the Pacific Region Regional Seabird Conservation Plan to "maintain, protect, and enhance seabird habitats (breeding, roosting, foraging, migrating and wintering) in sufficient quantity and quality to meet seabird needs" (USFWS 2005).

*Permanent Open Water Wetlands Strategies*

- Continue to manage and maintain the existing permanent open water wetland areas within Units 1 and 2 by providing a continuous flow of freshwater water into these wetland areas.
- Continue to implement maintenance actions (e.g., erosion control around island perimeters, vegetation control, nesting substrate enhancement), as necessary, on the existing islands within the permanent open water areas to provide quality nesting habitat for seabirds.
- To minimize the growth of freshwater emergent vegetation, particularly cattails, and maintain open water areas, sustain slightly elevated salinity levels within these wetlands.
- Using an integrated approach to pest management, continue to control salt cedar and other invasive plants in and around the perimeter of these wetlands.
- Work with the IID to secure long-term agreements for an adequate supply of water of appropriate quality to continue to support permanent open water wetlands on the Refuge.

***Objective 1.4: Restored Salton Sea Wetlands***

*By 2015, actively begin the phased restoration of Red Hill Bay to provide a total of 420 acres of shallow (six inches to one foot in depth), unvegetated wetlands with salinity levels ranging from 20 to 30 ppt to support foraging and loafing habitat for shorebirds, long-legged wading birds, waterfowl, and seabirds; and continue to work cooperatively with the USACOE and California Resources Agency on efforts to restore up to 1,600 acres of unvegetated, saline (typically 20 to 40 ppt, occasionally up to 50 ppt) wetlands on the Refuge (part of a larger restoration effort in Bruchard Bay involving the construction of independent pond and cascading pond units totaling approximately 3,770 acres) with water depths generally ranging from 0 and 6 feet, but also including excavated holes of greater depths (up to 12 feet) to accommodate a range of foraging needs for fish-eating birds and other migratory birds.*

**Rationale:**

The Sonny Bono Salton Sea NWR was established in 1930 “as a refuge and breeding ground for birds and wild animals,” and additional lands were acquired or leased for the management of migratory birds under the Migratory Bird Treaty Act and the Lea Act. As the Salton Sea recedes, the open water areas of the Salton Sea that are included within the Refuge - areas of the Refuge that support or have supported a range of migratory birds from fishing-eating birds to shorebirds and waterfowl - are being eliminated both by the direct loss of water due to evaporation and through the degradation of water quality (e.g., increased salinity levels, temperature extremes, eutrophication, anoxia, and increase algal productivity) (USACOE and California Natural Resources Agency 2011).

Despite its origins, the Salton Sea has for many years been considered one of the most important wetlands to wintering, migratory, and breeding waterbirds in North America (Jehl 1994, Shuford et al. 2002), in part because the Sea provides habitat for species displaced by the loss of wetlands elsewhere within the Pacific Flyway, including within California where approximately 91 percent of the historic wetland habitat has been lost to agriculture and other forms of development (Yuhas 1996).

As the salinities within the Salton Sea continue to rise, the availability of adequate forage species to sustain fish-eating birds has declined sharply. The variety of marine sport fish once available for pelicans, double-crested cormorants, and black skimmers are no longer present in the Salton Sea and the remaining populations of tilapia and several smaller nonsport fish species are dwindling (USACOE and California Natural Resources Agency 2011). In addition, pileworms and barnacles, primary components of the Salton Sea food web, also appear to be impacted by deteriorating water quality (USACOE and California Natural Resources Agency 2011).

The State of the Birds report for 2011 (North American Bird Conservation Initiative 2011) identifies continued investment in wetland conservation and management as an important component in meeting the conservation challenges of maintaining healthy populations of birds. To address the changing conditions at the Salton Sea, which pose a threat to tens of thousands of migratory and wintering shorebirds and waterfowl, as well as breeding seabirds and other waterbirds, a range of Federal, State, local, and tribal governments are designing projects in and around the Salton Sea to reestablish habitat needed to support the diversity of waterbirds (e.g., pelicans, shorebirds, seabirds, waterfowl) that rely on the Salton Sea as a migratory stop-over, wintering ground, breeding area, or year-round foraging site.

Consistent with the purposes for which the Sonny Bono Salton Sea NWR was established, the Refuge proposes to participate in a variety of Salton Sea restoration efforts, including the restoration of permanent open saline water areas.

#### *Restored Salton Sea Wetlands Strategies*

- Restore approximately 420 acres of shallow, saline water habitat in Red Hill Bay in an effort to maintain recent historical Salton Sea wetland values on this part of the Refuge.
- Coordinate with IID to divert water from the Alamo River to blend with Salton Sea water for the restoration of Red Hill Bay.
- To protect the health of the avian species supported by restored open saline water habitat, partner with USGS to monitor selenium levels within the restored habitat areas, and develop measures that can be implemented to reduce selenium levels should monitoring indicate the need for such measures.
- Incorporate measures into the design of the water delivery and pumping systems needed to maintain managed saline water habitat that will avoid loss and injury to desert pupfish.
- Include habitat features within proposed saline water habitats to support desert pupfish should they enter these managed habitat areas.
- Create and maintain islands within these managed habitats to support gull-billed tern and black skimmer nesting.
- As part of the Red Hill Bay restoration project, implement a multiple year monitoring program to monitor selenium and pesticide levels and the effect, if any, of these constituents on the biotic and abiotic functions of the created habitat.
- Encourage research projects that can help guide the future management of currently proposed and future managed habitat systems in the Salton Sea basin.
- Continue to partner with others in the planning and implementation of the Salton Sea SCH Project, which proposes to restore habitat values within some 3,770 acres of permanent ponded wetlands (potentially including 1,600 acres within the Refuge boundary) at the southern edge of the Salton Sea.

**Goal 2: Protect, manage, and, where appropriate, enhance or restore habitat to support the recovery of federally and State listed threatened and endangered species and other species of concern known to occur on the Refuge.**

***Objective 2.1: Managed Cattail Marsh***

*By 2016, work with partners to secure a source of water of sufficient quantity and quality to provide for the long-term (i.e., minimum 25 years) continued active management of at least 180 acres of cattail marsh habitat - consisting of a mosaic of emergent vegetation averaging greater than six feet (2 meters) high (Anderson and Ohmart 1985, Eddleman 1989) with varying stem densities (Smith 1975, Bennett and Ohmart 1978, Conway et al. 1993), shallow open water areas with minimal daily water fluctuation, and open dry ground (slightly higher than the water level) (Gould 1975, Anderson and Ohmart 1985, Eddleman 1989, Conway et al. 1993) to support the endangered Yuma clapper rail at a density of 0.50 rails or more per acre.*

**Rationale:**

Natural cattail/bulrush marshes in the Colorado River Delta are thought to be the primary habitat that historically supported the federally listed endangered Yuma clapper rail. Unfortunately, diversion of water from the lower Colorado River has all but eliminated freshwater flows down into the Delta, and as a result, this native habitat has been lost (USFWS 2009a). Today, the Yuma clapper rail exists primarily in managed cattail ponds, such as those on the Refuge, or other similar habitat areas created as a result of human activity (e.g., effluent-supported marshes, behind dams and diversion structures).

Generally, low stem densities and low residual vegetation coverage are indicative of suitable Yuma clapper rail habitat (Conway et al. 1993), with lower stem densities (less than 75 to 80 stems per square meter) supporting significantly more rails during the breeding seasons (Smith 1975, Bennett and Ohmart 1978). The rails use areas with slightly higher stem densities during the late summer and fall (Anderson and Ohmart 1985, Eddleman 1989). Other features with significant changes in seasonal use included distance to the adjacent uplands and vegetative edge and percent residual vegetation (the accumulation of fallen cattails) from previous years. The presence of too much residual vegetation adversely affects habitat quality and overall rail use (Conway and Nadeau 2005). Active management actions, largely through use of prescribed burning, eliminate the residual vegetation and restore the appropriate stem densities (Conway and Nadeau 2005); however, additional research is needed to define the proper cycle of burns.

The draft revised recovery plan for this species states that “to achieve recovery, the Yuma clapper rail must reach and maintain a viable population level and have sufficient protected and managed marsh habitat [including movement corridors that connect these habitats] to provide for long-term persistence of populations in the three major core areas” (i.e., the lower Colorado River, Salton Sea, Cienega de Santa Clara) (USFWS 2009a). The draft recovery plan also stresses the importance of water and ongoing habitat management in maintaining suitable conditions for rails (USFWS 2009a). The strategies presented below would assist in achieving these stated recovery goals.

Management of the Refuge’s freshwater cattail marsh habitat to support the Yuma clapper rail also provides benefits to other secretive marsh birds, including the California black rail, a State-listed species (CDFG 2008) and a Service-recognized Bird of Conservation Concern (USFWS 2008), and the least bittern, a California Bird Species of Special Concern (CDFG 2008) and a Service-recognized Bird of Conservation Concern (USFWS 2008).

*Managed Cattail Marsh Strategies*

- Continue to manage at least 180 acres of cattail marsh in a manner that will provide suitable habitat conditions to support the Yuma clapper rail.
- Continue to conduct annual spring surveys of the Refuge's cattail marsh habitat to monitor the Refuge's Yuma clapper rail population size and review current and past survey data to identify any changes in population status that may warrant reevaluation of current management practices.
- Control the establishment of common reed within managed cattail marsh habitat and salt cedar around the perimeter of the marsh through the implementation of an integrated approach to pest management.
- Work with the IID to secure long-term agreements for an adequate supply of water of appropriate quality to continue to provide managed cattail marsh habitat to support the current population of Yuma clapper rails on the Refuge.
- By 2016, prepare a Yuma clapper rail habitat management plan, per the direction provided in the draft Yuma Clapper Rail Recovery Plan (USFWS 2009a), to address the long-term management needs of the Refuge's Yuma clapper rail population.
- Seek funding to support research projects that can provide data necessary to: 1) refine suitable habitat parameters for this species in various seasons; 2) assist in identifying appropriate management techniques for maintaining suitable rail habitat over the long-term; 3) maintain adequate water quality within managed areas; 4) evaluate potential threats related to selenium accumulation; 5) evaluate the role of prescribed fire in offsetting vegetation maturity and other habitat degradation; 6) understand rail response and dispersal into new habitat areas as a result of the use of prescribed fire; and safely and effectively controlling invasive plant species in managed habitat areas.

***Objective 2.2: Desert Pupfish (Cyprinodon macularius)***

*In coordination with CDFW and the Palm Springs Fish and Wildlife Office, develop and by 2015 begin to implement a desert pupfish management strategy for the Refuge that includes annual monitoring for the presence of desert pupfish within Refuge wetlands and identifies conservation measures to be implemented to avoid adverse effects to desert pupfish as a result of Refuge management actions implemented to achieve Refuge purposes.*

**Rationale:**

The desert pupfish, which was first documented in the vicinity of the Salton Sea in 1859, currently occurs in two streams tributary to, and in shoreline pools and irrigation drains of, the Salton Sea (Lau and Boehm 1991). Desert pupfish are not currently managed on the Sonny Bono Salton Sea NWR and until recently, this species was not known to occur in the managed habitats on the Refuge. Inadvertent connections to managed habitat areas from adjacent irrigation drains can result in the establishment of desert pupfish within one or more of the Refuge's managed wetland areas. To avoid the unintentional take of desert pupfish during habitat maintenance, it is important to know if pupfish are present in an area that may be drained or otherwise significantly disturbed prior to taking any action. In addition, conservation measures should be in place that can be implemented to avoid adverse effects if the species is present.

According to the Service's 5-year review of the desert pupfish, "the desert pupfish population as a whole is presently stable, though still small, disjunct, and vulnerable to stochastic events that could result in local extirpations. Local populations may be far more variable due to a variety of factors such as amount of habitat, presence of nonnative species, and other threats"

(USFWS 2010). Critical habitat has been established for this species; however, it does not include any areas within the Sonny Bono Salton Sea NWR.

Lau and Boehm (1991) found desert pupfish to be widely distributed in drains that gravity flow into the Salton Sea. Pupfish also have been documented in at least one of the managed habitat areas on the Refuge, where they could be at risk due to the high level of management activity that occurs within these habitats. Examples of such management activities include removing accumulated silt from irrigation drains to facilitate proper drainage and drawing down permanent open water areas to implement repairs on nesting islands. These activities, which are necessary to achieve Refuge purposes, can result in adverse effects to desert pupfish, if they are present. A potential conservation measure may involve the relocation of pupfish found to be occupying highly managed areas of the Refuge to appropriate habitat in the Salton Sea, adjacent drainage ditches, or other parts of the Refuge. By implementing this measure, the potential harm to pupfish would be minimized and the Refuge could continue to manage habitats in accordance with its migratory bird purposes.

#### *Desert Pupfish Strategies*

- Work with CDFW and others to monitor water areas within the Refuge, including proposed Salton Sea and Red Hill Bay restoration areas, for the presence of desert pupfish.
- Develop a desert pupfish strategy in coordination with CDFW and the Palm Springs Fish and Wildlife Office that would set forth conservation measures for protecting desert pupfish from adverse effects as a result of ongoing Refuge management actions, including the potential for relocation of desert pupfish from highly managed areas to appropriate habitat within or in the vicinity of the Refuge.
- Incorporate appropriate habitat features to support desert pupfish within the Red Hill Bay restoration site.
- To support the genetic diversity of the desert pupfish population, partner with CDFW to relocate desert pupfish to appropriate locations on or off the Refuge.

#### ***Objective 2.3: Western Gull-billed Tern (*Gelochelidon nilotica vanrossemei*)***

*Throughout the life of the CCP, continue to maintain approximately 0.5 acres of unvegetated, fine gravel-surfaced islands of variable sizes surrounded by water depths ranging from one to three feet within the permanent open water areas in Units 1 and 2 to provide nesting habitat for the western gull-billed tern; and by 2018 provide at least eight similarly designed and maintained islands (totally approximately two acres) as part of the Red Hill Bay restoration project.*

#### **Rationale:**

The western gull-billed tern, designated as a Bird of Conservation Concern by the Service (USFWS 2008) and identified as a Bird Species of Special Concern by the State of California, has nested in the vicinity of the Salton Sea since at least the 1920s (Molina 2008). Until 1986, this was the only breeding site for western gull-billed terns in the U.S. Today, western gull-billed terns also breed within southern California, primarily within the South San Diego Bay Unit of the San Diego Bay NWR (USFWS 2006).

For many years, the Sonny Bono Salton Sea NWR supported large numbers of nesting western gull-billed terns; however, recently, the total number of nesting birds and birds fledged on the Refuge has been decreasing. Potential causes include depredation by raccoons and coyotes, over-crowding due to the presence of Caspian terns and California gulls, decreasing foraging opportunities due to changes in water availability and salinity levels in the

Salton Sea, and limited nesting areas. Because the gull-billed terns that breed on the coast include in their prey base young California least tern and western snowy plover chicks, there is a strong desire by the land managers along the Southern California coast to see gull-billed tern nesting success increase at the Salton Sea. Opportunities for providing additional nesting sites on the Refuge are limited by water availability, however, some additional nesting islands are proposed as part of the Red Hill Bay and Salton Sea SCH projects.

#### *Gull-billed Tern Strategies*

- Improve nesting conditions in Unit 1 by augmenting silty nesting substrates on the nesting islands with barnacle shells and depositing rock around the island perimeters to minimize erosion.
- Annually remove vegetation on and near all nesting islands.
- To minimize take of gull-billed tern eggs and chicks, implement an integrated predator management program using non-lethal (e.g., electric fencing) and, where necessary, targeted lethal predator control measures in accordance with the Predator Management Plan prepared for the Refuge (Appendix C).
- Construct and maintain new nesting islands in appropriate locations within the Red Hill Bay restoration project.
- Working with Federal and State partners, incorporate the creation of new nesting islands within the Salton Sea SCH project.
- Annually monitor use and productivity within potential western gull-billed tern nesting areas.
- Ensure the adequate availability of water around nesting islands to protect the health and survival of nesting gull-billed terns.

#### ***Objective 2.4: Monitoring Waterbird Abundance and Diversity***

*To facilitate the ongoing assessment of trends in abundance, diversity, and distribution of migratory and resident waterbirds at the Salton Sea and within the managed areas of the Refuge, as well as to provide information necessary to address flyway management needs now and into the future, continue to participate in aerial waterfowl surveys monthly between November and February; sandhill crane surveys monthly between October and March; Yuma clapper rail surveys three times a year (March through May); annual western gull-billed tern nesting surveys between April and August; and partner with CDFW to conduct monthly waterbird surveys on the Salton Sea.*

#### **Rationale:**

Currently, the wetland habitats present at the Salton Sea and within the Sonny Bono Salton Sea NWR support a number of waterbird species that are of regional or continental importance, including at least 16 species identified by the Service as Birds of Conservation Concern (USFWS 2008) and 14 species of waterfowl of high or moderately high continental priority per the Sonoran Joint Venture Bird Conservation Plan Waterfowl Management Supplement (Beardmore 2007). These habitats provide wintering, stop-over, and breeding areas for a range of waterbirds, and although the species present in the area varies with the seasons, the number of birds and diversity of species present remain high throughout the year (Shuford et al. 2002).

The combination of a receding Salton Sea with continually rising salinity levels and uncertainty regarding the long-term availability of water to support the Refuge's managed habitat areas has raised concerns regarding future waterbird abundance and diversity at the Salton Sea. To better understand how changes at the Salton Sea are affecting past and present bird abundance and diversity, it is necessary to continue on-going monitoring efforts.

The U.S. Shorebird Conservation Plan (Brown et al. 2001), Sonoran Joint Venture Bird Conservation Plan Waterfowl Management Supplement (Beardmore 2007), and Intermountain West Regional Shorebird Plan (Oring et al. 2000) all address population and habitat objectives for healthy waterbird populations. Sharing the information obtained as a result of these ongoing waterbird surveys and monitoring efforts will allow the Refuge, other agencies, and flyway partners to assess any changes in diversity and/or abundance at the Salton Sea, to evaluate how these changes relate to current population objectives, to make predictions for how trends could progress over time, and to begin to develop proposals for offsetting the effects of any adverse trends associated with the changing environment at the Salton Sea.

*Migratory and Resident Waterbird Strategies*

- Continue to conduct gull-billed tern breeding surveys that also include incidental counts of associated breeding seabirds, annually between April and August.
- Continue to conduct annual aerial waterfowl surveys monthly between November and February.
- Continue to conduct annual sandhill crane surveys monthly between October and March.
- Continue to conduct annual secretive marsh bird surveys, with particular focus on the Yuma clapper rail, three times a year between March and May.
- Continue to partner with CDFW to conduct monthly Salton Sea waterbird surveys.
- Continue to monitor for evidence of avian disease on the Salton Sea throughout the year.
- Consistently disseminate survey and monitoring data to interested agencies, flyway partners, and other partners in bird conservation, encouraging assessment of the trends occurring at the Salton Sea on regional and/or flyway populations.
- Support management-oriented research related to waterbirds.
- Manage areas of seasonal wetlands and permanent shallow open water wetlands to support a range of waterbirds, including shorebirds, wading birds, gulls/terns, and waterfowl, as described under Objectives 1.2 and 1.3.
- Restore shallow, open water habitat in Red Hill Bay, as described under Objective 1.4.
- Partner with others to restore deep water habitat in the Salton Sea to support fish-eating birds, as described under Objective 1.4.
- Manage areas of cattail marsh habitat to support secretive waterbirds and migratory and resident songbirds, as described under Objective 2.1.

**Goal 3: Manage and protect remnant native desert scrub habitat, tree rows, and riparian areas on the Refuge to support resident bird and other wildlife species, as well as nesting habitat for Neotropical bird species.**

***Objective 3.1: Native Trees and Shrubs***

*To support a range of native upland birds and other native wildlife: by 2018, restore native riparian habitat on 80 acres of refuge land near Bruchard Bay by removing invasive salt cedar and replacing the salt cedar with plantings of black willow, screwbean mesquite and blue palo verde; over the life of the CCP as funding permits, restore native riparian habitat in the Hazard Tract, incrementally replacing areas dominated by non-native vegetation with screwbean mesquite and black willow; and over the life of the CCP maintain approximately 60 acres of existing native tree rows consisting of honey mesquite, blue palo verde, Mexican palo verde, and ironwood.*

**Rationale:**

Desert wash habitat has broad positive effects on bird species diversity, abundance, and nesting success (CalPIF 2009), and microhabitat characteristics can influence nest-site selection by breeding birds. Desert wash habitat, which occupies less than five percent of the Colorado Desert, supports 90 percent of the Colorado Desert's bird life (Dimmitt 2000), as well as various wildlife species. This habitat, as well as the tree rows present on the Refuge provide habitat for a range of resident birds, as well as a number of migratory songbirds.

Region-specific conservation actions for the Colorado Desert Region included within the California Wildlife Action Plan (CDFG 2007) include development and investment in restoration and protection efforts for regional wildlife habitats and identification and protection of critical avian habitats. The Desert Bird Conservation Plan (CalPIF 2009) also addresses the need in some areas to design and implement cultivated restoration projects that mimic the diversity and structure of a natural desert plant community. The Partners in Flight North American Landbird Conservation Plan (Rich et al. 2004) and the Desert Bird Conservation Plan (CalPIF 2009) also include objectives related to the need to remove and replace invasive species with native species to increase habitat value for avian species. The Refuge management strategies for supporting native upland birds and animal species address these objectives and conservation actions.

*Native Trees and Shrubs Strategies*

- Replace approximately 80 acres of invasive salt cedar near Bruchard Bay with native desert riparian species, including black willow, screwbean mesquite, and blue palo verde.
- Continue to maintain the existing tree rows (i.e., honey mesquite, blue palo verde, Mexican palo verde, and ironwood) in Unit 1 along existing fields, as well as in the vicinity of the Refuge headquarters and at the south end of the Hazard Tract in Unit 2.
- Implement incremental control and removal of invasive non-native woody species, particularly salt cedar, from the Hazard Tract, per available funding, and revegetate these areas with native trees and shrubs (e.g., black willow, screwbean mesquite, blue palo verde).
- Optimize water use on the Refuge by irrigating tree rows and desert wash habitat with spill water from the managed agricultural fields whenever possible.

**Objective 3.2: Burrowing Owls**

*Throughout the life of the CCP, maintain approximately 45 burrowing owl nest boxes in appropriate locations throughout the Refuge and provide information regarding burrowing owl conservation at the Refuge visitor contact station to annually reach 10,000 visitors.*

**Rationale:**

The burrowing owl is protected by the Migratory Bird Treaty Act, is considered by the Service to be a Bird of Conservation Concern (USFWS 2008), and is listed as a Bird Species of Special Concern by the State of California. Bird count data compiled between the late 1980s and early 2000s suggest that the burrowing owl has been extirpated as a breeding species from approximately eight percent of its former range in California (Klute et al. 2003). Nevertheless, California continues to support one of the largest year-round populations of burrowing owls, including both resident and wintering migrants, in the U.S. In the late 1990s, an estimated 71 percent of the burrowing owls in California occurred in the Imperial Valley (Klute et al. 2003).

Based on data from burrowing owl surveys conducted in 1992 and 1993, an estimated 5,600 pairs of burrowing owls (95 percent confidence interval: 3405-7795) were present in the early 1990s in the Imperial Valley (DeSante et al. 2004). In recent years, population estimates have varied. In 2007, the number of burrowing owl pairs was estimated at 4,879 (95 percent confidence interval: 4,692-5,065), and in 2008, the number was 3,557 territories (95 percent confidence interval: 3,370-3,743) (Manning 2009). In 2011, the number was estimated at between 4,589 (95 percent confidence interval: 4,019-5158) and 5,058 (95 percent confidence interval: 4,450-5,666) (Harbin-Ireland 2011). It is unclear from the available data if the variability in population estimates is the result of changes in the actual number of burrowing owl pairs present in the Valley or on differences in the model detection probabilities used to estimate population size. Even with these annual variations, the Imperial Valley continues to support the largest population of burrowing owls in the State.

The primary threats to burrowing owls across its range relate to: habitat loss due to land conversion associated with agriculture and urban development; habitat degradation; and reductions in burrowing mammal populations. Of these threats, the loss of burrowing mammal populations has been identified as the primary factor responsible for the decline in the overall burrowing owl population (Klute et al. 2003). With the extent of agricultural activity occurring in the Imperial Valley, opportunities for mammals to establish burrows are limited and often focus on disturbed areas associated with irrigation drains, canals, and ditches (Manning 2009). It is within these burrows that burrowing owls often establish nests. Unfortunately, these areas can be unstable and are subject to disturbance from ongoing activities associated with irrigation maintenance, overhead utility maintenance, and adjacent crop production.

To reduce the potential for the loss of burrowing owl nests due to inadvertent or intentional disturbance along existing roads and irrigation drainages, artificial burrows have been established in various locations throughout the Imperial Valley, including on the Refuge. Studies conducted in California indicate that burrowing owls readily occupy these artificial burrows and initial nesting success is followed by successful nesting in subsequent years (Trulio 1995). According to the CDFW, the best available science indicates that along with suitable foraging, wintering, and dispersal habitat, including an abundant and available prey base, essential habitat for the burrowing owl in California must include the presence of burrows, burrow surrogates, or presence of fossorial mammal dens (CDFG 2012). The artificial nesting burrows provided on the Refuge therefore address one of the important components needed to maintain a self-sustaining population of burrowing owls within the Imperial Valley.

#### *Burrowing Owls Strategies*

- Work with partners to annually inspect, clean, and maintain, as necessary, the existing nesting boxes on the Refuge.
- Prior to replacing an existing nesting box, conduct a literature search of current research related to nesting box design and maintenance needs in order to optimize nesting success and to reduce the need for annual maintenance.
- Continue to provide signage in the vicinity of nesting boxes to alert construction and utility workers of the presence of a nesting box.
- Periodically monitor the condition of the area around nesting box sites and if unauthorized disturbance has occurred, make any necessary repairs and implement measures to minimize the potential for any further disturbance.
- Continue to provide information at the visitor contact station about burrowing owls and the need to avoid disturbance to their burrows, particularly during the breeding season, expand public outreach about burrowing owls elsewhere in the community, and

develop at least one interpretive sign for the interpretive trail in Unit 1 that addresses the importance of conserving areas to support burrowing owls.

***Objective 3.3: Invasive Non-native Species***

*Over the 15-year life of the CCP, implement an integrated approach to pest management to annually: control 95 percent of the non-native weedy species in managed agricultural lands; remove sufficient coverage of non-native, invasive vegetation in the water distribution system (e.g., water conveyance channels, irrigation ditches) to optimize water delivery and distribution on the Refuge throughout the year; and control at least 50 percent of the non-native woody species (e.g., salt cedar, common reed) present around the perimeters of the Refuge's managed wetland habitats.*

**Rationale:**

The annual costs associated with invasive species, including environmental damage, agricultural impacts, and invasive species control are estimated at almost \$120 billion per year in U.S. and approximately 42 percent of all threatened and endangered species are at risk primarily because of non-native species (Pimentel et al. 2005). Economic effects are easier to calculate than ecological consequences which are sometimes difficult to perceive, let alone quantify (Hanson and Sytsma 2001). According to the Service, invasive species have become the single greatest threat to the Refuge System. Rare species with limited ranges, small numbers, and restricted habitat requirements, such as the Yuma clapper rail, are often particularly vulnerable. Invasive species can alter ecosystem structure and function, disrupt food chains and other ecosystem characteristics vital to wildlife, and alter key ecosystem processes such as hydrology, productivity, nutrient cycling, and fire regime (Randall 1996, Brooks and Pyke 2001).

A National Strategy for Management of Invasive Species (USFWS NWRS 2003) has been developed for the NWRS within the context of the National Invasive Species Management Plan, as called for by Presidential Executive Order 13112. This plan functions as the internal guidance document for invasive species management throughout the Refuge System. The plan has four goals: 1) increase the awareness of invasive species issues, both internally and externally; 2) reduce the impacts of invasive species to allow the Refuge System to more effectively meet its fish and wildlife conservation mission and purpose; 3) reduce invasive species impacts on the Refuge System's neighbors and communities; and 4) promote and support the development and use of safe and effective integrated management techniques to deal with invasive species. The proposal to address the problem of invasive species within the Refuge Complex will support these goals, and assist in achieving Statewide Conservation Action F in the California Wildlife Action Plan (CDFG 2007).

*Invasive Non-Native Species Strategies*

- Continue to control non-native weedy species in managed agricultural areas to optimize green forage production to support wintering geese.
- Continue no till practices in a portion of the managed agricultural areas to reduce the need for chemical control of invasive species.
- Control the emergence of cattails in seasonal wetland areas by temporarily increasing salinity levels.
- Implement an integrated approach to pest management that includes the use of physical, mechanical, and chemical controls, including the aerial application of herbicides in agricultural fields and dense salt cedar stands to improve overall coverage and effectiveness of control.

- Implement mechanical and chemical control of non-native woody species (e.g., salt cedar, common reed) in accordance with the Refuge IPM Plan to reduce the percent coverage of these species within the water distribution system.
- Implement best management practices, such as cleaning boots, tires, mower decks, and truck undercarriages following completion of activities in weed infested areas and mow weedy areas prior to seed set, to reduce the distribution of weed seeds into other areas of the Refuge.
- Opportunistically monitor Refuge areas for the presence of new invasive plant species in an effort to facilitate early eradication, avoiding the need for significant long-term control of the species on the Refuge, and share this information with other agencies in the region.

**Goal 4: Work in partnership with other Federal, State, and local agencies and tribes to restore, enhance, and adaptively manage habitat functions that support fish and bird life, as well as to protect other resources of region-wide significance, in and around the Salton Sea.**

***Objective 4.1: Salton Sea Restoration Partnerships***

*Over the next 15 years, continue to support existing partnerships and form new partnerships with Federal, State, local, tribal, non-profit, and other land managers to restore habitat functions in the Salton Sea that are being lost due to receding water levels and degradation of water quality.*

**Rationale:**

Although it has only existed for about 100 years, the Salton Sea has become a critical resource for many species of resident and migratory birds due to the extensive loss of historic wetland habitat along the Pacific Flyway. Lower water levels and increasing salinities are reducing the habitat values within the Sea for these birds. Primary components of the Salton Sea food web, including pileworms and barnacles, have already been impacted by deteriorating water quality (USACOE and California Natural Resources Agency 2011), and the last remaining significant fish prey species, tilapia, is expected to be eliminated as early as 2018, when salinity levels in the Sea are predicted to exceed 60 ppt (USACOE and California Natural Resources Agency 2011). The loss of this fish population from the open water area of the Sea will likely eliminate use of the Salton Sea by fishing eating birds, such as pelicans, double-crested cormorants, and black skimmers.

Various proposals to restore open water habitat in areas where the Salton Sea has recently receded are currently under consideration and two of these proposals involve areas included within the Refuge boundary. Both projects represent multiple agency partnerships. As these projects move forward, they will provide important information about the benefits and constraints of implementing additional future projects around the Sea. The Service's involvement in these projects will enable the Refuge to continue to achieve those Refuge purposes related to the protection of habitat to support breeding and migratory birds.

*Salton Sea Restoration Partnership Strategies*

- Continue to work with partners, including the IID, to restore up to 420 acres of shallow (approximately 6 inches to a foot in depth), saline (20 to 30 ppt), unvegetated, open water habitat in the Red Hill Bay portion of the Salton Sea.

- Continue to work with partners, including USACOE, CDFW, and the California Resources Agency (State Department of Water Resources), on a proposal to restore deeper (generally 0 to 6 feet in depth with excavated holes up to 12 feet in depth), saline (typically 20 to 40 ppt, occasionally up to 50 ppt) water habitat in the Salton Sea that could potential result in the restoration of up to 1,600 acres within the Bruchard Bay portion of the Refuge.
- Once these restoration projects have been implemented, assist in the implementation of a monitoring program that evaluates issues related to bird use, prey base, water quality, and ease of water blending to achieve desired salinity levels.
- Encourage research that can benefit future management actions related to Salton Sea restoration.
- Participate with other partners in the dissemination of monitoring results and lessons learned.

***Objective 4.2: Other Partnerships***

*Over the next 15 years, work with a variety of partners to address regional resource issues related to habitat and species conservation, avian disease, air quality, and optimization of water use for a range of purposes including habitat restoration.*

**Rationale:**

Coordination and communication among Federal, State, regional, and local agencies, tribes, water districts, air quality agencies, other municipalities, the geothermal industry, and private landowners with respect to the changes occurring in and around the Salton Sea is essential to meet the goals and objectives of the range of interests affected by these changes. Management efforts on the Sonny Bono Salton Sea NWR can benefit in a variety of ways through Refuge participation in region-wide issues related to resource protection, habitat restoration, water quality and availability, air quality, invasive species, and avian disease. Through the sharing of information, common issues can be addressed via joint projects, sharing of personnel, equipment, and/or volunteers, and partnering to secure grant funding needed to address area-wide problems. Participation by the Refuge and others will strengthen relationships, facilitate ongoing communication, and ensure long-term coordination on matters of regional importance.

*Partnerships Strategies*

- Coordinate with Imperial County APCD to address potential air quality issues related to prescribed burns within the Refuge's managed habitat areas, as well as exposed seabed, should any areas of currently submerged fee-title Refuge land be exposed as the Salton Sea continues to recede.
- Partner with others to optimize water use for agricultural and wildlife habitat purposes.
- Continue to partner with CDFW and others to monitor for avian diseases on the Salton Sea.
- Partner with USGS and the Service's Environmental Contaminants Division to monitor contaminants and potential bio-accumulation associated with habitat restoration in the Salton Sea.
- Work with partners in the region to develop and implement an Invasive Species Rapid Response Program to assist in addressing potential new invasive species threats.

***Objective 4.3: Cultural and Paleontological Resources***

*Over the next fifteen years, implement proactive management of cultural resources that focus on meeting the requirements of the National Historic Preservation Act and other cultural resource legislation, as well as manage paleontological resources using scientific principals and expertise, to address the protection, identification, inventory, evaluation, consultation and, when appropriate, interpretation of the Refuge's historical, archaeological, and paleontological resources.*

**Rationale:**

It is the policy of the Service to identify, protect, and manage cultural resources located on Service lands and affected by Service undertakings. A number of cultural resources are known to be present in the vicinity of the Sonny Bono Salton Sea NWR, and it is likely that other sites may be present that have not yet been discovered or recorded. Cultural resources are not renewable, making protection an essential component of cultural resource management. To realize the full scientific and education value, or better understand the spiritual value of a cultural resource, it is important to preserve and/or record the context of the setting in which a cultural resource is discovered. This requires proactive management in which access is restricted in areas identified as having a high potential for undiscovered cultural resources.

Cultural resources possess scientific and educational value to tribes, archaeologists, historians, and many members of the public. Many cultural resources also have a spiritual connection to one or more tribes, providing important elements of individual and group identity. Cultural resources can connect us to our past, providing the means to study and reflect upon the events and processes that have shaped our nation, our communities, and ourselves.

The Paleontological Resources Preservation Act (PRPA) was enacted in 2009 as part of the Omnibus Public Land Management Act of 2009, (P.L. 111-011). It requires Federal agencies to manage and protect paleontological resources on Federal lands and to develop plans for the inventory, monitoring, and scientific and educational use of paleontological resources. To protect paleontological resources, the Society of Vertebrate Paleontology (SVP) has established standard guidelines (SVP 1995) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 1991, 1996).

*Cultural and Paleontological Resources Strategies*

- Comply with all applicable cultural and paleontological resource regulations and policies prior to implementing projects that would disturb any surface or subsurface cultural or paleontological resources.
- Work with local tribes to develop a Memorandum of Understanding for implementing the inadvertent discovery clause of the Native American Graves Protection and Repatriation Act (NAGPRA).
- Following the guidelines established by SVP for identifying, protecting, and where necessary recovering fossils present on Federal lands.
- As necessary, seek funding to identify, evaluate, and protect important cultural and paleontological resources that may be identified on the Refuge.
- Any fossils identified on the Refuge would be preserved and made available for research and public education.
- Ensure that refuge staff receives training in cultural and paleontological resource preservation requirements, as well as NHPA, ARPA, NAGPRA, and PRPA.

***Objective 4.4: Changing Conditions***

*Within ten years of CCP approval, complete in partnership with others a general assessment of the anticipated changes over the next 25 years in the current abundance and diversity of birds and other wildlife within the Refuge as a result of reductions in water levels and overall water quality in the Salton Sea, as well as climate change, and following completion of the assessment evaluate how Refuge management might be modified to better achieve Refuge purposes.*

**Rationale:**

As described elsewhere in this chapter, the Salton Sea is receding and water quality within the Sea is expected to reach a point at which it will provide little benefit to the resident and migratory birds it historically supported over the last hundred years (USACOE and California Natural Resources Agency 2011). In addition, the world climate is changing (Bierbaum et al. 2007) as indicated by increases in global surface temperature, altered precipitation patterns, warming of the oceans, rising ocean levels, increases in storm intensity, and changes in ocean pH. This is significant because “climate is a dominant factor influencing the distributions, structures, functions and services of ecosystems” (CCSP 2008). The potential effect of climate change (defined as any change in climate over time, whether due to natural variability or as a result of human activity (CCSP 2008) on the Imperial Valley is not fully understood, but what changes do occur will interact with other environmental changes occurring in the area, primarily the changes occurring within the Salton Sea, to affect biodiversity and the future condition of ecosystems around the Sea. It is, therefore, essential to understand how these changes are and will continue to impact existing resources, and to develop strategies for protecting affected resources. The extent to which these resources are affected will depend on how and at what rate conditions change over time and the availability of adaptation options for effective management responses.

***Changing Conditions Strategies***

- By 2016, as part of a step-down Inventory and Monitoring Plan, identify the suite of species on the Refuge that are managed to achieve Refuge purposes or other Service mandates (i.e., federally listed species); evaluate the effectiveness of the actions currently being implemented to benefit these species and identify the desired future state of these conservation targets; and finally, through the development of an adaptive management framework determine if additional strategies are necessary to achieve the desired future state of the conservation targets, including designing an approach that focuses on monitoring the effectiveness of the alternative strategies.
- By 2022, in partnership with others, complete an assessment of anticipated future conditions in and around the Salton Sea over the next 25 years taking into consideration water quality and quantity issues in the Sea, water availability on the Refuge to support managed habitats, and the local and regional effects of climate change on species distribution. The assessment should also include the development of methods for monitoring and recording measurable change over time.
- By 2022, or sooner if warranted, prepare a step-down plan to evaluate the status of the lands currently being managed as part of the Refuge, including identification of any potential opportunities to: 1) exchange lands owned in fee title by the Service for other lands, including existing leased lands managed by the Service, to meet Refuge purposes; 2) dispose of any fee title lands or discontinue leasing any lands that are no longer needed to meet Refuge purposes; and/or 4) seek long-term lease agreements for those lands that are needed to meet Refuge purposes, goals, and objectives.

***Objective 4.5: Environmentally Conscientious Refuge Operations***

*Continue to implement energy conservation measures that will result in a 28 percent reduction in the Refuge's total energy consumption by 2020 (based on energy consumption rates for the Refuge beginning in FY 2008); by 2015, incorporate water conservation measures into existing and new facilities; strive to reduce the total amount of manufactured goods and materials used on the Refuge; and by 2015, develop an outreach program that will inform the public of these efforts and encourage them to implement similar practices.*

**Rationale:**

Human activity and resource consumption are root causes of declines in abundance and diversity of wildlife and habitat. Consumption and the output of that consumption (e.g., garbage, air and water pollution, noise, night lighting) are detrimental to the abundance, diversity, and distribution of native wildlife, and reason for National Wildlife Refuges and other conserved lands. Our impacts on wildlife resources can be reduced by reducing the Refuge's own consumption of resources, and by choosing materials and practices that lessen impacts to wildlife and habitats worldwide.

Effects of climate change on vegetation and wildlife throughout California have already been documented (Kelly and Goulden 2008, Macmynowski et al. 2007, Barbour and Kueppers 2012) and these effects are expected to increase. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities, appears to be closely associated with changes in climate worldwide (California Office of Planning and Research 2008). By reducing our carbon footprint, we can assist in the efforts to address climate change.

To address GHG emissions at the Federal level, Executive Order 13514 was signed in 2009 that set measurable environmental performance goals for Federal Agencies, including reducing GHG emissions by 28 percent by 2020. There are many ways in which GHG emissions can be reduced, including reducing the amount of electricity and fuel consumed directly by refuge operations, as well as reducing the total consumption of goods and materials and purchasing locally produced products wherever possible.

The over consumption of potable water in southern California has far reaching effects on wildlife and wildlife habitat, such as impacts to listed species in northern California and the loss of wetland habitat at the Salton Sea (USFWS 1995, Salton Sea Authority 2006). By implementing practices that will reduce our consumption of potable water, as well as providing interpretation and environmental education regarding the need to conserve water, we can assist in reducing water consumption in the region.

*Environmentally Conscientious Refuge Operations Strategies*

- Continue to meet or exceed requirements for recycling and using recycled goods.
- Replace refuge vehicles with more fuel-efficient vehicles (e.g., hybrid, electric) as funding permits.
- Maintain existing solar panels to ensure maximum efficiency.
- As necessary, retrofit existing facilities and incorporate into new facilities, measures to increase energy efficiency (e.g., compact fluorescent bulbs, lighting timers, increased insulation, photovoltaic panels, energy efficient windows).
- Seek funding to incorporate effective water conservation measures into current and future Refuge facilities.

- Minimize the need for night lighting and where necessary install fixtures that are fully shielded.
- Reduce vehicle trips by using telephone or computer video conferencing whenever possible to reduce carbon emissions.
- Combine trips for refuge-related activities to reduce gas consumption.
- Whenever possible, purchase locally manufactured equipment/materials.

**Goal 5: Enhance the public’s awareness, appreciation, and enjoyment of the Refuge’s biological resources by providing opportunities for compatible wildlife-dependent recreational uses.**

***Objective 5.1: Hunting***

*Throughout the life of the CCP, continue to conduct a high quality waterfowl hunting program on the Refuge that provides opportunities for approximately 1,000 annual hunting visits (depending on season length and climatic conditions) on approximately 160 acres on the Union Tract and approximately 660 acres on the Hazard Tract.*

**Rationale:**

Enactment of the National Wildlife Refuge System Improvement Act established compatible wildlife-dependent recreational uses, including hunting, as the priority general public uses of the NWRs. The Improvement Act, which specifies that priority general public uses receive enhanced consideration over other general public uses in planning and management, states that increased opportunities for families to experience compatible wildlife-dependent recreation shall be provided, particularly opportunities for parents and their children to “safely engage in traditional outdoor activities, such as fishing and hunting.” Hunting is recognized by the Service as a healthy, traditional outdoor pastime, deeply rooted in the American heritage; an activity that can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs.

Opportunities for waterfowl hunting will continue to be provided on the Sonny Bono Salton Sea NWR. The hunting program will be conducted in a safe and cost-effective manner and will be carried out consistent with State regulations. The Hunt Plan (Appendix E) was developed to provide safe hunting opportunities while minimizing conflicts with other priority wildlife-dependent recreational uses. Other visitor uses occur on different areas or at different times of the year, thereby minimizing potential conflicts with hunters. The Refuge hunting program complies with the Code of Federal Regulations (CFR) Title 50, 32.1 and is managed in accordance with Service Manual 605 FW 2, Hunting.

*Hunting Strategies*

- Continue providing hunting opportunities on the Refuge via the existing Cooperative Agreement with CDFW, who is responsible for implementing the Refuge’s hunt program.
- Continue to provide opportunities for waterfowl hunting on the Hazard Tract and goose hunting opportunities on the Union Tract.
- Conduct an after season Junior Waterfowl Hunt on the Refuge.
- Work with the Refuge’s Hunting Program Working Group (e.g., Friends of Wister) to maintain the Refuge’s hunting program and associated facilities.
- Hire a dual function refuge manager/Federal wildlife officer to among other duties monitor activities associated with the Refuge’s hunt program.

- Work cooperatively with CDFW wardens to enforce CFRs, State Fish and Wildlife hunting regulations, and Refuge-specific regulations to provide a quality experience for all visitors.

**Objective 5.2: Wildlife Observation**

*By 2015, provide quality opportunities for 25,000 annual visits to the Refuge for the purpose of wildlife observation.*

**Rationale:**

The overarching goal of the Refuge System's wildlife-dependent recreation policy (605 FW 1) is to enhance wildlife-dependent recreation opportunities and access to quality visitor experiences on refuges while managing refuges to conserve fish, wildlife, plants, and their habitats. New and ongoing recreational uses provide us with opportunities to introduce visitors to wildlife and other natural resources and to make visitors aware of resource issues, management plans, and how the refuge contributes to the Refuge System and Service mission. Wildlife-dependent recreational uses are the priority public uses that should be allowed on Refuges when they are determined to be compatible with Refuge purposes. The Sonny Bono Salton Sea NWR was established to protect birds and other wildlife. Conservation of these resources requires that the public understand and appreciate the need for their protection. Achieving the objective of providing quality opportunities for wildlife observation will enable us to not only foster a connection between our visitors and the natural resources protected on the Refuge, but also to increase the public's appreciation for these resources.

*Wildlife Observation Strategies*

- Continue to support opportunities for wildlife observation from existing trails and observation platforms.
- Seek funding to improve the accessibility of Refuge trails which will increase the opportunities of all members of the public to observe the sights and sounds of the wintering, breeding, migratory, and resident bird life on the Refuge.
- Continue to provide opportunities for wildlife observation by conducting periodic guided birding walks on the Refuge.
- By 2017, develop a step-down visitor services plan for the Sonny Bono Salton Sea NWR.

**Objective 5.3: Wildlife Photography**

*By 2017, provide quality opportunities for 5,000 wildlife photography-related annual visits to the Refuge.*

**Rationale:**

The Improvement Act identifies wildlife photography as a priority public use that should be allowed on Refuges when determined to be compatible with the purposes for which a Refuge has been established. Encouraging photography of wildlife, plants, landscapes, and other natural features provides Refuge visitors with the opportunity to focus on the smallest of creatures or to take in the full breadth and depth of the landscape before them. Achieving that special picture often requires stillness, silence, and patience, but also provides the opportunity to become completely engrossed in the part of the natural world visible through the camera lens. By providing safe, enjoyable, and accessible wildlife photography opportunities and facilities, Refuge visitors will have the chance to capture and take home their memories and observations of the Refuge and the resources it was established to protect.

*Wildlife Photography Strategies*

- By 2017, construct an additional photo blind in Unit 1 that will provide opportunities to photograph wintering geese, sandhill crane, and resident and migratory songbirds.
- On the Refuge website, provide information about wildlife photography opportunities on the Refuge, the best times and locations for photographing birds and landscapes, and photographer etiquette that emphasizes respect for Refuge resources through the minimization of visitor impacts.

***Objective 5.4: Environmental Education***

*Continue to implement multi-disciplinary environmental education programs on the Refuge to reach approximately 600 students, grades 3 through 12, and 50 college students annually.*

**Rationale:**

Environmental education is a priority general public use of the Refuge System and should be provided when compatible with Refuge purposes. Environmental education programs teach awareness, understanding, and appreciation of our natural and cultural resources, as well as conservation history. Environmental education programs also allow program participants to demonstrate learning through refuge-specific stewardship tasks and projects that they can carry over into their everyday lives. Refuge environmental education programs are encouraged to offer educational assistance and work closely with local school districts and community partners. An interdisciplinary approach that relies on existing curricula or a course of study involving natural and social sciences, history, and the arts is encouraged. Environmental education can be conducted on the Refuge and/or in the classroom.

*Environmental Education Strategies*

- Working with partners, contact local teachers regarding their needs and interests in the opportunities available on the Refuge for supporting environmental education programs.
- Work with local educators to identify an interdisciplinary approach to environmental education that relies on existing curricula or develop a course of study involving natural and social sciences, history, and the arts that when implemented can incorporate and benefit from the resources present on the Refuge.
- Post environmental education program offerings on the Refuge website.

***Objective 5.5: Resource Interpretation***

*Within five years of the CCP being adopted, develop and begin to implement an expanded interpretative program to serve 20,000 visits to the Refuge annually by 2018. The program would focus on Unit 1 of the Refuge, where multiple topics would be addressed to appeal to a broad spectrum of interests, age groups, and learning styles and abilities*

**Rationale:**

The Improvement Act identifies interpretation as one of the six wildlife-dependent recreational uses of the Refuge System that should be allowed on Refuges when it is determined to be compatible with Refuge purposes. Interpretation provides opportunities for visitors to make their own connections to Refuge resources and in so doing can provoke participation in resource stewardship. Interpretation can help refuge visitors understand the importance of protecting the resources on the Refuge.

*Resource Interpretation Strategies*

- As part of the step-down visitor service plan, develop an updated interpretive program focusing on Unit 1 of the Refuge that includes a combination of stationary interpretive elements distributed throughout the Refuge and interactive programs that can be adjusted to meet the demands of the audience in terms of theme, age appropriateness, interest, and other factors.
- Design, fabricate, and install interpretive panels and bird identification signs along the Unit 1 interpretive trail to interpret past and anticipated future conditions within the Salton Sea, the importance of the Salton Sea to migratory birds traveling along the Pacific Flyway, and Refuge purposes related to wintering geese.
- By 2022, include interpretive materials in the kiosk proposed for the seasonal birding trail in the Hazard Tract, and conduct occasional guided bird walks along the trail.
- Continue to maintain the existing interpretive signage along the Rock Hill Trail outside the Refuge headquarters, and the interpretive displays located within the visitor contact area of the Refuge headquarters.
- Pursue the establishment of a docent program to lead bird walks in various locations on the Refuge.
- Working with other partners in the Imperial Valley, pursue the development of an auto tour within the area to the south of the Salton Sea that interprets a variety of topics including but not limited to agriculture, water management and conservation, geothermal power, the changing Salton Sea, fish and wildlife, and geology.

***Objective 5.6: Connecting People with Nature***

*By 2017, develop and implement a minimum of two events per year targeting nontraditional users that are focused on connecting families with nature.*

**Rationale:**

Research shows that children and parents are suffering from too much time inside, with children spending an average of 6.5 hours a day with electronics (e.g., television, computers, video games). If a child is raised with little or no connection to nature, they may miss out on the many health benefits of playing outdoors. Studies show that children's health is declining. Childhood obesity rates are increasing, as are the number of children taking prescription medications to treat Attention Deficit Hyperactivity Disorder (ADHD) and depression. Fortunately, research also shows that connecting children and families with nature can provide positive benefits leading to improved physical and mental health.

A connection with nature also helps children develop positive attitudes and behaviors towards the environment. Positive interactions with the environment can lead to a life-long interest in enjoying and preserving nature. People's interest in nature is so crucial to the Service mission of conserving, protecting, and enhancing fish, wildlife, plants, and their habitats, that in 2007, the Service declared that "connecting people with nature" is among the agency's highest national priorities.

Periodically conducting programs at the Refuge that focus on topics of interest to people who are less likely to come out to the Refuge initially to observe wildlife can result in an increased interest in the Refuge over time. Programs related to geological processes, cultural resources, history, agriculture, landscape painting, and many other topics can attract a range of first-time visitors who were previously unfamiliar with the opportunities available on the Refuge for enjoying the outdoors.

*Connecting People with Nature Strategies*

- Incorporate a connecting people with nature theme into at least two Refuge events per year, which could be conducted on or off the Refuge.
- Each year, host two activities, involving people who might not normally come to the Refuge, so they can experience their activity in a nature setting.

***Objective 5.7: Volunteers***

*By 2020, increase the number of volunteer hours provided on the Refuge to assist in various aspects of Refuge management such as resource surveys, Refuge clean-ups, trail maintenance, environmental education, interpretation, and visitor contact to approximately 90 volunteer eight-hour days per year.*

**Rationale:**

The National Wildlife Refuge System Volunteer and Partnership Enhancement Act of 1998 (P.L. 105-242) strengthens the Refuge System’s role in developing relationships with volunteers. Volunteers possess knowledge, skills, and abilities that can enhance the scope of refuge operations. Volunteers enrich Refuge staff with their gift of time, skills, and energy. Refuge staff will initiate, support, and nurture relationships with volunteers so that they may continue to be an integral part of Refuge programs and management. The volunteer program will be managed in accordance with the Fish and Wildlife Service Manual, Part 150, Chapters 1-3, “Volunteer Services Program”, and Part 240 Chapter 9 “Occupational Safety and Health, Volunteer and Youth Program.”

*Volunteers Strategies*

- Continue to implement a seasonal volunteer program that provides Refuge staff with assistance at the visitor contact desk and with guided walks during peak visitation months.
- By 2015, conduct at least one major volunteer work day event annually in an effort to recruit volunteers for other smaller events and/or projects.
- By 2017, conduct at least two opportunities annually for community organizations (e.g., youth groups, conservation organizations, nontraditional user groups) to assist in a volunteer project that would support Refuge management.

**6.2.2.2 Coachella Valley NWR**

Objectives and strategies for the proposed action (Alternative B - Expand Management Actions to Support Listed and Sensitive Species; Maintain Current Public Uses), which would be implemented to achieve Refuge purposes and goals are presented here.

**Goal 1: Protect, restore, and enhance Refuge lands to contribute to the recovery of the federally threatened Coachella Valley fringe-toed lizard and endangered Coachella Valley milk-vetch, as well as to conserve other species of concern supported on the Refuge.**

***Objective 1.1: Coachella Valley Fringe-toed Lizard (Uma inornata)***

*Throughout the life of the CCP, implement actions on the Refuge to maintain and protect high quality desert dune habitat over approximately 215 acres and an additional 2,290 acres of adjacent creosote bush scrub to support the long-term persistence of a self-sustaining population of the federally listed threatened Coachella Valley fringe-toed lizard on the Refuge, and by 2018, reduce the total coverage of Sahara mustard and other invasive, non-native plants within the active desert dune habitat to below 25 percent. At*

*the northwest and western edges of the Refuge, where source sand for the active desert dune habitat accumulates and is blown downwind over the Refuge, reduce the total coverage of Sahara mustard and other invasive, non-native species to below 50 percent in the worst infestation areas by 2018.*

**Rationale:**

Portions of the Coachella Valley NWR have been identified in the Coachella Valley MSHCP as core habitat areas for the Coachella Valley fringe-toed lizard, a highly specialized endemic lizard that inhabits wind-blown sand deposits (dunes) on the floor of the Coachella Valley. The Refuge's core habitat for this species is part of the largest remaining area of contiguous extant habitat for the Coachella Valley fringe-toed lizard. The lands within the Thousand Palms Conservation Area, of which the Refuge is a part, are also believed to support the most robust population of this species (USFWS 2010c); making protection of the Refuge lands a high priority for the conservation of this species.

Based on a model created by the CVAG for the Coachella Valley MSHCP, approximately 2,510 acres, including both desert dune and creosote bush scrub, have been identified for protection on the Refuge to support this species. The protection of these habitats on the Refuge will meet the Coachella Valley MSHCP objective of providing sufficient area and variety of habitat types to accommodate population fluctuations, allow for genetic diversity, and conserve the range of environmental conditions within which the lizard is known to occur (CVAG 2007b). The model includes areas that may not currently be occupied or are not particularly suitable for the species at the present time, but are expected to become periodically suitable as a result of the input of new aeolian sand following significant storm events that deposit sand upwind of the conservation area (USFWS 2010c).

In recent years, the occurrence of the invasive weed, Saharan mustard, has significantly increased within areas set aside within the Coachella Valley to support the fringe-toed lizard, including the Refuge. This is of particular concern because the fringe-toed lizard requires open areas where it can thermoregulate in the direct sunlight. The presence of the thick canopy created by Saharan mustard and similar invasive species reduces the habitat quality of the area to the point that the lizard will not occupy heavily infested areas, thereby reducing the total area available to support the lizard (Barrows et al. 2009).

*Coachella Valley Fringe-toed Lizard Strategies*

- In partnership with others, annually monitor the Coachella Valley fringe-toed lizard population on the Refuge in accordance with the monitoring protocols developed and approved for this species in the Coachella Valley MSHCP's Aeolian Sand Communities and Species Monitoring Protocols (updated on March 8, 2012 and subject to future revision as deemed necessary by the MSHCP's adaptive management process).
- In partnership with others, annually monitor the desert dune and creosote bush scrub habitat conditions, recording changes in habitat conditions and/or distribution, including the estimated percent cover and species mix of non-native invasive species. Based on these observations, evaluate and adapt as warranted current management practices.
- By 2015, prepare a step-down habitat management plan for the Refuge that includes a discussion of the management practices to be implemented to maintain high quality habitat for the Coachella Valley fringe-toed lizard, as well as the potential for restoration of additional areas within the Refuge to support this species.
- Through a coordinated area-wide effort, implement actions to ensure the long term control of Sahara mustard within the Thousand Palms Conservation Area.

- As part of an integrated approach to pest management, aggressively control small outbreaks of new invasive plants on the Refuge to avoid extensive control in the future.
- Coordinate with other MSHCP partners to provide and receive information about new invasive plant species detected in the region.
- Periodically survey the Refuge for the presence of feral dogs and cats and when present, implement actions in accordance with Service policy to remove them from the Refuge.
- Support research that addresses issues related to sand transport, invasive species control, climate change, and other issues that can benefit Refuge management and the species protected on the Refuge.
- Expand patrol and enforcement of illegal trespass onto the Refuge, particularly trespass involving off-road vehicle use.

***Objective 1.2: Coachella Valley Milk-vetch (*Astragalus lentiginosus* var. *coachellae*)***  
*Throughout the life of the CCP, manage approximately 215 acres of high-quality desert dune habitat to maximize areas of active sandy substrate that will continue to support a self-sustaining population of the federally listed endangered Coachella Valley milk-vetch, and by 2018, reduce the total coverage of invasive non-native weeds (e.g., Sahara mustard, Mediterranean grass) in this habitat to below 25 percent.*

**Rationale:**

Within the Refuge, Coachella Valley milk-vetch occurs exclusively within those areas mapped as desert dune habitat, and in surveys conducted in March 2011, of the approximately 530 individual plants present on the Refuge, 77 percent occurred on exposed or unstable dunes. To ensure the long term conservation of this plant, it is necessary to protect the existing areas of active sandy substrate on the Refuge. Sahara mustard is currently the most serious threat to this and other dune-dependent species not only because it successfully competes with native annual forbs and grasses for space and water, but also because its presence in desert dune habitat can over time result in dune stabilization and the loss of habitat for blow-sand species such as Coachella Valley milk-vetch (USFWS 2009b).

Although Coachella Valley milk-vetch is genetically self-compatible (i.e., capable of producing viable seeds from the union of pollen and ovules from the same plant), experiments conducted by Meinke et al. (2007) indicate that seed production for this species is highly dependent on pollinators. The Service's 5-year review for this species identifies the need to "incorporate management of native pollinators and their habitat into management strategies for the Coachella Valley milk-vetch as a recommendation for action over the next five years (USFWS 2009b).

*Coachella Valley Milk-vetch Strategies*

- Annually monitor the distribution of Coachella Valley milk-vetch on the Refuge, as well as the quality of the habitat supporting this plant, in accordance with the monitoring protocols developed and approved for this species in the Coachella Valley MSHCP's Aeolian Sand Communities and Species Monitoring Protocols (updated on March 8, 2012 and subject to future revision as deemed necessary by the MSHCP's adaptive management process).
- By 2015, prepare a habitat management plan for the Refuge that includes a discussion of future management actions to be implemented to maintain high quality habitat for Coachella Valley milk-vetch.

- Through a coordinated area-wide effort, implement actions to ensure the long term control of Sahara mustard within the Thousand Palms Conservation Area.
- As part of an integrated approach to pest management, aggressively control small outbreaks of new invasive plants on the Refuge to avoid the need for extensive control in the future.
- Cooperate with and support, as feasible, the Coachella Valley Conservation Commission's (CVCC) effort to conduct specific studies as part of the baseline monitoring for the Coachella Valley milk-vetch to assess: viability of seed bank, substrate affinities, micro-habitat requirements, seed dispersal, pollination ecology, and impacts of invasive species within core habitat areas to ensure that the appropriate measures to support long-term conservation of this species are identified.
- Support research that addresses issues related to sand transport, invasive species control, native pollinators and their ecology, climate change, and other issues that can benefit Refuge management and the species protected on the Refuge.
- Expand patrol and enforcement of illegal trespass onto the Refuge, particularly trespass involving off-road vehicle use in an effort to minimize soil compaction and vegetation destruction.
- Where appropriate, restore areas of disturbed habitat on the Refuge to native species in part to increase the presence of native pollinators in the area, which could benefit Coachella Valley milk-vetch.

***Objective 1.3: Conservation of Naturally Occurring Aeolian Sand Communities***

*Throughout the life of the CCP, implement management actions to conserve and enhance approximately 220 acres of naturally occurring aeolian sand communities on the Refuge including active and stabilized dunes, characterized by at least nine feet of aeolian sand atop aeolian sand substrate, with active dunes supporting a mean shrub density of less than 0.005 shrubs per square meter, while stabilized dunes (also referred to as mesquite hummocks) support a mean shrub density of greater than 0.048 shrubs per square meter; and ephemeral and stabilized sand fields, characterized by 0 to about 6 feet of aeolian sand atop gravel and rocks and supporting a mean shrub density of greater than 0.049 shrubs per square meter and silt or cemented sands, supporting a mean shrub density of greater than 0.01 shrubs per square meter, respectively.*

**Rationale:**

The aeolian sand communities of the Coachella Valley, particularly the active dune areas on the Refuge, are identified in the Coachella Valley MSHCP (CVAG 2007a) as core habitat for the federally listed Coachella Valley fringe-toed lizard and Coachella Valley milk-vetch. Other species of concern present in this area include the Coachella Valley giant sand-treader cricket, Coachella Valley Jerusalem cricket, flat-tailed horned lizard, Coachella Valley round-tailed ground squirrel, and Palm Springs pocket mouse. The MSHCP also states that by virtue of protecting these active dune areas as core habitat for listed and sensitive species, habitat to support burrowing owls would also be protected. The proposal to conserve and enhance the habitat quality of the desert dune habitat on the Refuge is consistent with the goals of the MSHCP, particularly the goals related to maintaining or restoring self-sustaining populations or metapopulations of the species addressed in the Coachella Valley MSHCP.

Various factors contribution to degradation of habitat quality within the Refuge's aeolian sand communities, these include illegal off-highway activity, particularly from illegal access off of 38<sup>th</sup> Avenue; the increasing presence of non-native annual forbs and grasses that can lead to stabilization of blowsand habitat; a depleted groundwater table that has resulted in the loss of honey mesquite hummocks, important to the protection of dune habitat; and changes to sand

transport processes that historically provided adequate sand to replenish sands blown further downwind of the Refuge. The Coachella Valley MSHCP presents the following actions to be implemented to achieve the conservation of the naturally occurring aeolian sand communities in the Coachella Valley: protection of the sand source/transport system to ensure sustainability of the sand dunes and sand fields; control activities that contribute to the loss, stabilization, or compaction of active dune habitat; control of invasive plant species; restoration of degraded habitat; and implementation of monitoring and adaptive management actions to ensure continued conservation of these natural communities (CVAG 2007a). In addition, the Service's 5-year review for the Coachella Valley fringe-toed lizard recommends the restoration of mesquite hummocks in the Thousand Palms Conservation Area to allow for the rejuvenation of dune habitat that supports the fringe-toed lizard (USFWS 2010). Ball et al. (2010) also postulates that mesquite hummocks may be the only vegetation community within the Valley's conserved areas that reliably supports reproducing Coachella Valley round-tailed ground squirrels and provides essential refugium for this species during drought years.

*Conservation of Naturally Occurring Aeolian Sand Communities Strategies*

- Increase management, monitoring, and enforcement of trespass and other refuge regulations by hiring a collateral duty refuge manager/Federal wildlife officer.
- Expand current management activities to include gathering baseline information for and subsequent annual monitoring of sensitive native species present on the Refuge; installing and maintaining signs and fencing, and conducting surveillance and public outreach to minimize disturbance to sensitive habitats.
- Plant and irrigate clumps of honey mesquite within active sand dune and sand field habitats to allow for the rejuvenation of mesquite hummocks that support dune development and provide habitat for sensitive species.
- Conduct public outreach on and off the Refuge to inform the public of the importance of the habitats and species conserved on the Refuge, as well as to reduce current levels of disturbance to sensitive aeolian sand communities.
- Participate in an area-wide invasive plant species rapid response program to remain informed about the potential for future infestations on the Refuge.
- Through an integrated approach to pest management, prioritize and treat infestations of invasive vegetation to optimize habitat value for species of concern.
- Schedule annual treatment of invasive vegetation well in advance of seed set.
- Install appropriate native vegetation in areas where invasive species control has been conducted to reduce the potential for reinvasion.
- Work in partnership with other Coachella Valley MSHCP partners to ensure the protection of essential ecological processes, including sand source/transport systems, throughout the MSHCP preserve area.
- Implement maintenance and monitoring in accordance with the Valley Floor Reserve Management Unit (Unit 1) Reserve Management Unit (RMU) Plan.
- Support research and area-wide monitoring to determine the effects of the presence of Sahara mustard and other invasive plants on fire frequency and/or intensity.
- Support research to identify effective treatment methods for the control of invasive plants (e.g., Sahara mustard) that will not adversely affect other native species.

***Objective 1.4: Climate Change***

*Within five years of CCP approval, complete and begin to implement in partnership with others a long-term (25 years or more) strategy for monitoring, assessing, and ultimately addressing the effects of changing climatic conditions, if any, on habitat quality, habitat distribution, and listed and sensitive species population size and distribution.*

**Rationale:**

Current climate change predictions for terrestrial areas in the Northern Hemisphere indicate warmer air temperatures, more intense precipitation events, and increased summer continental drying (Field et al. 1999, IPCC 2007b). However, predictions of climatic conditions for smaller sub-regions such as California remain uncertain (USFWS 2010b). If climate change results in extended drought conditions in the Coachella Valley, fluvial sand deposits could be affected. In the past, during periods of drought, fluvial sediment delivery to the Coachella Valley floor has declined, impacting the rejuvenation of decreasing dune systems (Griffiths et al. 2002). Drought conditions could also reduce forage for wildlife and moisture to support sensitive plant species (Durtsche 1995, Bolger et al. 2000). A wetter climate in this region could result in the proliferation of invasive plants, possibly leading to the stabilization of dune habitat (USFWS 1980), and/or the general degradation of habitat quality (Meinke et al. 2007, Barrows et al. 2009). To understand the effects of a changing climate on the habitats within the Refuge will require a long-term commitment to monitoring and adaptive management practices.

The RMU Plan for Unit 1 (CVCC 2012) of the Coachella Valley MSHCP planning area identifies climate change as an important issue within the entire Colorado Desert including the Coachella Valley. In an effort to address changing habitat conditions associated with climate change, the RMU Plan recommends actions that will facilitate the movement of species over time to areas of the Coachella Valley with more favorable conditions.

*Climate Change Strategies*

- Continue to coordinate with the Valley Floor Reserve Management Unit Committee to ensure that adequate monitoring and research is carried out on the Refuge and throughout the Management Unit to inform management actions that may be needed to address the potential effects of climate change and assess the efficacy of management actions that may be taken.
- Ensure that fencing installed on the Refuge in response disturbance from off-highway vehicle trespass, dumping, or other activities provides for the movement of wildlife.
- When designing restoration or enhancement plans for the Refuge, consider the needs of species to shift their range in response to the effects of climate change.
- By 2022, in partnership with the CVCC and others, complete an assessment of anticipated future conditions within the Valley Floor Reserve Management Unit, including anticipated changes associated with existing ecological and geological processes over the next 25 years. Based on this assessment, identify those species and habitats most vulnerable to these changes, design methods for measuring and documenting anticipated changes over time, and identify actions that can be implemented over time to support vulnerable species.

**Objective 1.5: Plant and Wildlife Surveys**

*By 2016, initiate a step-down Inventory and Monitoring Plan (I&M Plan) for the Refuge that includes a proposal to implement, within five years of the approval of the I&M Plan, a minimum of five surveys on the Refuge to gather, for the purpose of analysis and dissemination, scientifically rigorous biological data about the status, trends, and responses to management of the species and habitats within the Refuge; and annually conduct non-native invasive plant surveys for the purpose of updating existing mapping of infestation areas and identifying any new invasive species that may pose a threat to Refuge resources.*

**Rationale:**

Knowledge of the distribution and abundance of species, species' needs, and status is critical for the management of the Refuge. Biological surveys are necessary to establish baseline information needed to assess population trends over time. Subsequent monitoring efforts will then enable us to more fully understand how species respond to specific management actions. Management effectiveness of both native and non-native species can be evaluated and corrected, if needed, based on a monitoring program.

Monitoring of some species will be implemented in accordance with protocols established as part of the Coachella Valley MSHCP and may be conducted by refuge staff, partners, contractors, and other researchers. Other monitoring efforts will be conducted to meet Refuge data needs. The results of these monitoring efforts will assist in evaluating both refuge-initiated management efforts and regional management and conservation efforts associated with the Coachella Valley MSHCP (CVAG 2007a). Monitoring results, which will be retained by the Service, as well as submitted for entry into the GIS database for RMU 1 and the Coachella Valley MSHCP area, may also provide some insight into the effects of changing climatic conditions at a regional and landscape level.

*Plant and Wildlife Surveys Strategies*

- By 2016, initiate an I&M Plan for the Refuge per the Service's Inventory and Monitoring Initiative.
- As part of the I&M Plan and in association with the larger ongoing surveying efforts conducted for RMU 1 per the Coachella Valley MSHCP, identify and prioritize surveys to be conducted on the Refuge within five years of I&M Plan approval that will best assist in the management of Refuge resources.
- Conduct annual surveys of the Refuge to map significant invasive plant species infestations, evaluate the effectiveness of past control efforts, and identify the presence of any new invasive organisms that require immediate attention.
- As part of the required monitoring under the Coachella Valley MSHCP, monitor listed and sensitive species in accordance with approved protocols.
- Collect standardized data for dissemination to all appropriate entities, including the Valley Floor Reserve Management Unit Committee, to facilitate the evaluation of management efforts at the local, regional, and landscape level.
- Hire a dual function refuge manager/Federal wildlife officer to monitor listed and sensitive species, conduct biological surveys, enforce access control, and assist in invasive species mapping and control.

**Goal 2: Through participation in a coordinated management effort involving all of the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) partners, sustain the ecological and evolutionary processes necessary to maintain the viability of the natural communities and habitats that support the species identified in the CVMSHCP and manage these communities and habitats adaptively to be responsive to short- and long-term environmental change.**

***Objective 2.1: Coordinated Land Management***

*Over the next 15 years, continue Refuge involvement in the coordinated management of the conserved lands within the Valley Floor Reserve Management Unit of the Coachella Valley MSHCP planning area, meeting at least quarterly to review ongoing management efforts and issues, identify common information gaps, explore joint funding*

*opportunities, develop coordinated monitoring and adaptive management strategies, and generally foster cooperation across jurisdictional and ownership boundaries.*

**Rationale:**

Coordination among land managers has been shown to improve monitoring and management efficiencies for all participants. Through regular coordination and communication, land managers can identify gaps in knowledge and funding resources, leverage funds to realize greater benefits, and develop cost-effective cross-agency management strategies.

As part of the Coachella Valley MSHCP, a structure for coordinating management among the various entities responsible for managing reserve lands within the Coachella Valley MSHCP planning area has been established. This structure includes the creation of the Coachella Valley Conservation Commission and six RMU Committees. The Refuge is included in RMU 1 (Valley Floor) (CVCC 2012). To provide guidance for coordinated management within RMU 1, a RMU Plan (CVCC 2012) has been prepared to guide and prioritize management direction, as well as address issues such as funding and partnership opportunities, data storage and analysis, and procedures for annual reporting of management activities. The Refuge's participation on the Valley Floor RMU Committee will strengthen relationships, facilitate ongoing communication, and ensure long-term coordination of regional management efforts.

*Coordinated Land Management Strategies*

- Continue to participate in quarterly Coachella Valley MSHCP Reserve Management Oversight Committee meetings, as well as in RMU 1 committee meetings.
- Provide input into the development of annual work plans for RMU 1.
- Continue to partner with the Center for Natural Lands Management on programs that build public support for the protection of the lands within the Thousand Palms Conservation Area.
- Hire a dual function refuge manager/Federal wildlife officer to among other duties coordinate patrol of the Refuge with other law enforcement agencies in RMU 1.

**Objective 2.2: Research**

*By 2015, in partnership with others identify research priorities relevant to the conservation and management of the species and habitats present within the Coachella Valley, as well as the ecological processes that support these species and habitats, and by 2017, develop and implement a strategy for facilitating research by USGS, graduate students, UC Riverside, CVCC, and others.*

**Rationale:**

The needs and opportunities for research both on the Refuge and throughout the Coachella Valley MSHCP area are vast and it is only through partnerships that these needs can even begin to be met. For example, expanded partnerships with academic institutions, USGS, and others managers within RMU 1 and the larger Coachella Valley MSHP planning area could provide valuable data related to the life history of little-known species protected on the Refuge, while other research could answer questions related to which herbicides can be used safely in areas supporting rare plants or insects. Once research priorities have been identified, land managers and other partners can more effectively seek funding and research partners.

*Research Strategies:*

- Work with members of the Valley Floor RMU Committee, CVCC, and others to develop research topics relevant to the conservation and management of the species and habitats present within the Coachella Valley, including research suggested in

- relevant species recovery plans and research related to the control of non-native invasive plants.
- Develop and implement strategies among the entities participating in the Coachella Valley MSHCP and others to facilitate needed research to the extent that plan funding and leveraged outside funding sources allow.
  - Continue to support and facilitate management-oriented research on wildlife and habitat, including monitoring the impacts of climate change.
  - Continue to support and facilitate research focused on identifying habitat features important to the species that occupy the Refuge's aeolian sand communities.

***Objective 2.3: Cultural Resources***

*Over the next 15 years, implement proactive management of cultural resources that focuses on meeting the requirements of the National Historic Preservation Act and other cultural resource legislation, to address the protection, identification, inventory, evaluation, consultation and, when appropriate, interpretation of the Refuge's historical and archaeological resources.*

**Rationale:**

It is the policy of the Service to identify, protect, and manage cultural resources located on Service lands and affected by Service undertakings. Limited information is available regarding the presence of cultural resources on the Coachella Valley NWR, however, there is the potential for one or more sites to be present that have not yet been discovered or recorded. Cultural resources are not renewable, making protection an essential component of cultural resource management. To realize the full scientific and education value, or better understand the spiritual value of a cultural resource, it is also important to preserve and/or record the context of the setting in which a cultural resource is discovered. This requires proactive management in which access is restricted or minimized in areas identified as having a high potential for undiscovered cultural resources.

Cultural resources possess scientific and educational value to tribes, archaeologists, historians, and many members of the public. Many cultural resources also have a spiritual connection to one or more tribes, providing important elements of individual and group identity. Cultural resources can connect us to our past, providing the means to study and reflect upon the events and processes that have shaped our nation, our communities, and ourselves.

*Cultural Resources Strategies*

- Comply with all applicable cultural resource regulations and policies prior to implementing projects that would disturb any surface or subsurface cultural resources.
- Work with local tribes to develop a Memorandum of Understanding for implementing the inadvertent discovery clause of NAGPRA.
- As necessary, seek funding to identify, evaluate, and protect important cultural resources on the Refuge.
- Ensure that refuge staff receives training in historic preservation requirements and of NHPA, ARPA, and NAGPRA.

**Goal 3: Enhance the public's awareness, appreciation, and support for the Refuge's listed and sensitive species, as well as the ecological functions and geological processes that sustain these species, through compatible opportunities of environmental interpretation.**

***Objective 3.1: Environmental Interpretation***

*By 2018, develop a visitor services plan that includes innovative approaches for interpreting the plant and wildlife species present on the Coachella Valley NWR and fostering public support for the continued preservation of these species and the ecosystems in which they live that will reach some 10,000 individuals annually without the need for access onto the Refuge.*

**Rationale:**

The Improvement Act identifies interpretation as one of the six wildlife-dependent recreational uses of the Refuge System that should be allowed on Refuges when determined to be compatible with the purposes for which a Refuge was established. Interpretation provides opportunities for people to make their own connections to Refuge resources and in so doing can provoke participation in resource stewardship. Interpretation can help people understand why and how to minimize their impact on sensitive resources.

As part of the larger Thousand Palms Conservation Area under the Coachella Valley MSHCP, the Coachella Valley NWR protects substantial acreage of core habitat for several listed and sensitive species covered by the MSHCP. To protect these species and the sensitive habitat on which they depend, general access to the area is limited. As a result, interpretation of the Refuge's resources is proposed to occur primarily at an off-site location within the Thousand Palms Conservation Area that receives significant visitation and is more easily accessed by the general public. The Refuge proposes working in partnership with the Center for Natural Lands Management to provide interpretation of the Coachella Valley NWR at the Coachella Valley Preserve Visitor Center. At this location, a variety of interpretive elements could be provided that would assist the public in developing an understanding of why it is important to protect the plants, insects, reptiles, and birds supported within the dune habitat on the Refuge and elsewhere within the MSHCP planning area. Interpretive themes and content would incorporate innovative activities intended to reach new and non-traditional audiences. An additional traveling interpretive program is also proposed to further expand public outreach.

*Environmental Interpretation Strategies*

- By 2018, develop a step-down visitor services plan for the Coachella Valley NWR.
- Working with the Center for Natural Lands Management, the Valley Floor RMU Committee, and others, develop innovative interpretation of the resources on the Coachella Valley NWR for display off the Refuge.
- Design, fabricate, and install interpretive elements to foster public awareness and support for the protection of the habitats on the Refuge.
- Develop literature (e.g., flyers, booklets, coloring books) and a movable interpretive exhibit of sensitive Coachella Valley species and habitats that can be displayed at different locations throughout the community (e.g., libraries, schools, city halls).
- Provide opportunities for periodic special tours of the Refuge lead by qualified interpreters who can ensure minimal impact to sensitive species and habitats.

***Objective 3.2: Equestrian/Hiking Trail***

*Over the next 15 years, accommodate equestrian and hiking use within the designated route of travel approved as part of the Coachella Valley Preserve in 1990, including 1.86 miles along the northwest boundary of the Refuge and 1.5 miles across the northern portion of the Refuge that is compatible with Refuge purposes, does not result in any observable disturbance to habitat due to unauthorized off-trail activity by equestrians or*

*hikers, and results in minimal (less than five annually) violations of trail restrictions, including no dogs on the trail.*

**Rationale:**

In 1988, at the request of the Ivey Ranch Equestrian Center and CVAG, the BLM prepared a draft environmental assessment to analyze the potential environmental impacts of a proposed trail system on lands within the area then referred to as the Coachella Valley Preserve. The 1986 Coachella Valley Preserve Management Plan included the establishment of hiking and equestrian trail systems outside of sensitive habitats as a long term goal of the plan. After a number of public meetings, a preferred alternative was developed that designated a trail along the northwest boundary of the Refuge, as well as an east/west oriented trail that crossed the northern portion of the Refuge. The trail system was intended to provide the public with an opportunity to experience the native habitats in the area, as well as to increase public support for the preservation goals of the Preserve. The Service issued a biological opinion in 1990 that outlined reasonable and prudent measures to be implemented to eliminate and reduce incidental take of listed species.

*Equestrian/Hiking Trail Strategies*

- Continue to allow compatible equestrian and hiking use on the approved trail that extends along the Refuge's northeast boundary and east/west across the northern portion of the Refuge.
- Enforce the reasonable and prudent measures outlined in the biological opinion for this trail including restricting all trail use to the designated corridor, clearly marking the trail corridor by posting signs every 250 feet, prohibiting dogs and other pets within the Refuge boundary, and periodically monitoring trail use for compliance of these regulations.
- Maintain bollards or other barriers, as well as fencing, when necessary, to prohibit off-road vehicle access onto the Refuge from the trail.
- Periodically patrol the trail and assess the area around the trail to determine if unauthorized activity is occurring off trail; if so, implement appropriate measures (e.g., signage, fencing, trail closure) to minimize off trail impacts from hikers and equestrians.
- Periodically survey the areas bordering the trail to identify any increase in invasive weed species along the trail; if necessary, take appropriate actions to reduce the introduction of weed species related to trail use.

### **6.3 Funding and Personnel**

The CCP will serve as the primary management reference document for Refuge operations, management, and step-down planning for the next 15 years or until the CCP is formally revised or amended. The Service will implement the final CCP with assistance from existing and new partner agencies and organizations and from the public. The timing and achievement of the management strategies proposed in this document is contingent upon a variety of factors, including funding and staffing, completion of step-down plans, accomplishing the compliance requirements, and monitoring outcomes.

Each of these factors is discussed as it applies to the CCP. The CCP provides long-term guidance for management decisions and identifies the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes.

Accordingly, the plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

**6.3.1 Project Funding**

For fiscal year (FY) 2012, the general operating costs (excluding staff costs which are discussed below) for the Sonny Bono Salton Sea NWRC were approximately \$827,160. Base funding available to Refuges varies annually. In addition, specific funding may be provided in a given year to address deferred maintenance needs, to fund a specific Refuge construction project, or to address specific management actions. For instance, in FY 2012, \$10,000 in additional funding was provided to the Complex for avian disease monitoring on the Salton Sea. Special funding may be available from time to time through a competitive process initiated to fund special projects, such as visitor services projects that implement the Service’s initiative for connecting people with nature. The annual budget for the Refuge System is not always adequate to address the replacement and maintenance needs on individual Refuges; therefore, a database of deferred maintenance projects is retained as part of the Service Asset Maintenance Management System (SAMMS). (SAMMS is the database of record for documented real property deferred maintenance needs, existing equipment replacement requests, and project proposals that will result in the construction of additional new real property assets or the expansion/alteration of existing assets.)

New construction projects proposed for inclusion in the SAMMS database for the Sonny Bono Salton Sea NWRC address a range of Refuge responsibilities including wildlife and habitat management, visitor service, and general Refuge operations. With the completion of the CCP, the existing SAMMS database will be updated to reflect the proposals included in the preferred management alternative for the Sonny Bono Salton Sea NWR and Coachella Valley NWR.

Table 6-1 outlines the SAMMS projects for the Sonny Bono Salton Sea NWR and Table 6-2 includes the SAMMS project proposed for the Coachella Valley NWR. These lists include both new projects and projects that meet the definition of a deferred maintenance project. The projects are listed for each Refuge in order of priority. In addition, visitor services projects on both Refuges are prioritized for the complex. The ranking of the visitor services projects are provided at the end of the construction project description and are identified by the “VS” Priority number.

<b>Table 6-1 Proposed SAMMS Database - Sonny Bono Salton Sea NWR (Based on the Construction Proposals Described for the Proposed Action)</b>		
<b>Construction Project (presented in order of priority)</b>	<b>Corresponding CCP Objective(s)</b>	<b>Estimated Project Cost</b>
<b>Restore Salton Sea Wetlands at Red Hill Bay</b> – To address the adverse effects of a receding Salton Sea, implement the phased restoration of Red Hill Bay by creating 420 acres of shallow saline wetland habitat to support wading birds and shorebirds and minimize the potential for dust. Berms, waters pumps, and other components of the water delivery system would be maintained for the life of the project. A trail would be constructed along the project’s eastern berm and two interpretative signs would address the project purpose and the species it benefits.	Sonny Bono Salton Sea NWR – 1.4, 2.3, 2.4, 4.1, 4.2, 5.2, 5.3, 5.5, 5.6	\$3,500,000

**Table 6-1  
Proposed SAMMS Database - Sonny Bono Salton Sea NWR  
(Based on the Construction Proposals Described for the Proposed Action)**

<b>Construction Project (presented in order of priority)</b>	<b>Corresponding CCP Objective(s)</b>	<b>Estimated Project Cost</b>
<b>Install Shaded Visitor Parking</b> – Design, purchase, and install a shade structure to cover five visitor parking spaces, improving visitor comfort and safety at the Refuge headquarters’ parking lot where the average high summer temperature is 100°F or greater. (VS Priority 1)	Sonny Bono Salton Sea NWR – 5.2, 5.3	\$50,000
<b>Replace Existing Carport</b> – Replace the existing carport located behind the Complex headquarters to improve protection for station vehicles from high winds, direct sunlight, and extreme temperatures.	Sonny Bono Salton Sea NWR – 2.4, 4.5	\$225,000
<b>Expand and Refurbish Existing Public Restroom</b> – Remodel or replace the existing unisex bathroom to provide two restrooms that can better accommodate visitors. The design should improve accessibility and reduce water use. (VS Priority 2)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4	\$20,000
<b>Replace/Repair Existing Concrete Sidewalk Around the Visitor Contact Area of the Complex Headquarters’</b> – Replace or repair approximately 2,265 square feet of damaged and degraded sidewalk to protect visitor safety and ensure continued accessibility to the visitor contact desk and public restroom. (VS Priority 3)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4	\$26,600
<b>Improve the Surface of the Interpretive Trail at the Complex Headquarters</b> – Resurface the existing interpretive trail that leads from the Complex headquarters to the base of Rock Hill (approximately 3,800 linear feet) to provide a firm and stable surface to improve access for all members of the public. (VS Priority 4)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5	\$40,000
<b>Extend Existing Trail in Unit 1</b> – Extend the existing interpretive trail in Unit 1 for approximately 1,400 linear feet to the east of Vendel Road. This trail, which will include a firm and stable surface to ensure good accessibility, will provide additional opportunities for viewing wintering geese and sandhill cranes. (VS Priority 5)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5, 5.6	\$7,500
<b>Update Interpretive Signage in Unit 1</b> – Design, fabricate, and install, where appropriate, six interpretive panels and two bird identification signs along the existing trail and on the new observation deck in Unit 1 to interpret the habitat needs of the Yuma clapper rail, the need to provide a sanctuary for wildlife (i.e., why you can’t walk out to the Salton Sea), different birds for different seasons, what attracts birds to this area, and how the Refuge’s farming practices support wildlife. (VS Priority 6)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5, 5.6	\$29,500
<b>Improve Interpretive Trail Accessibility</b> – In Unit 1, upgrade about 4,000 linear feet of an existing trail, as well as the access routes to and from the parking lot and observation deck to provide a year-round firm and stable trail surface that can accommodate all users. (VS Priority 7)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.6	\$25,000
<b>Construct a Parking Lot for Birdwatchers in Unit 1</b> – Design and construct a four-car parking area in Unit 1 along Vendel Road to support birdwatching and photography near three acres of restored willow scrub habitat. (VS Priority 9)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5, 5.6	\$75,000
<b>Construct New Photoblind in Unit 1</b> – Design and construct an accessible photoblind adjacent to restored willow scrub habitat to support viewing and photographing of birds utilizing the willow habitat, as well as geese and cranes foraging in the adjacent farm fields.(VS Priority 10)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5, 5.6	\$10,000

<b>Table 6-1 Proposed SAMMS Database - Sonny Bono Salton Sea NWR (Based on the Construction Proposals Described for the Proposed Action)</b>		
<b>Construction Project (presented in order of priority)</b>	<b>Corresponding CCP Objective(s)</b>	<b>Estimated Project Cost</b>
<b>Construct a Seasonal Birding Trail, Kiosk, and Parking Area in the Hazard Tract</b> – Design and construct a 1.5-mile-long loop trail and four to six-car parking lot and design, fabricate, and install a two-panel kiosk with site information and interpretation, in the northwest corner of the Hazard Tract to accommodate seasonal (March 1 through September 30) opportunities for wildlife observation, photography, environmental education, and interpretation. (VS Priority 11)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.6	\$60,000
<b>Control Public Access to Protect Sensitive Habitats</b> – Install six new gates and associated signage at various locations within the Refuge where elimination of unauthorized public access is necessary to protect sensitive species and habitat. (VS Priority 12)	Sonny Bono Salton Sea NWR – 2.4	\$10,000
<b>New Chemical and Flammable Liquid Storage Buildings</b> – Purchase and install new prefabricated, stand-alone, steel chemical and flammable liquids storage buildings, replacing the existing old buildings, where products such as herbicides, oils, paints, and fuel cans are currently stored. The new structures will improve storage conditions and ensure continued compliance with health, safety and environmental regulations.	Sonny Bono Salton Sea NWR – 3.3, 4.5	\$40,000 (\$20,000 per building)
<b>Update Interpretive Signage in Unit 2</b> – Design, fabricate, and install six to eight interpretive panels along the Red Hill Trail. The interpretive messages should be coordinated with the curriculum and lesson plans used by teachers in association with the Refuge’s environmental education program. (VS Priority 13)	Sonny Bono Salton Sea NWR – 5.2, 5.3, 5.4, 5.5, 5.6	\$28,000
<b>Develop and Publish a Naturalist Activity Guide</b> – In partnership with others, develop and publish an activity pamphlet that will enable students and their families, teachers, and other visitors, to conduct and enjoy self-guided walks on the Refuge. Design the pamphlet to improve the field trip experience by providing new activities that explore the Refuges’ natural history, conservation values and challenges, and stewardship opportunities. (VS Priority 14)	Sonny Bono Salton Sea NWR – 5.4, 5.5, 5.6	\$10,000
<b>Total Estimated Cost for the Refuge</b>		<b>\$ 4,156,600</b>

<b>Table 6-2 Proposed SAMMS Database – Coachella Valley NWR</b>		
<b>Construction Project</b>	<b>Corresponding CCP Objective(s)</b>	<b>Estimated Project Cost</b>
<b>Interpretive Elements for Off-Site Display</b> – In partnership with others, develop a concept for, design, and fabricate both a permanent interpretive display to be placed at an appropriate off-site location and a traveling interpretive display to be used at schools, libraries, and other locations, to interpret the rare and unique resources of the Coachella Valley NWR. (Visitor Services Complex Priority 8)	Coachella Valley NWR – 2.1, 3.1	\$25,000
<b>Total Estimated Cost for the Refuge</b>		<b>\$ 25,000</b>

Another database relevant to Refuge operations is the Refuge Operating Needs System (RONS), a database that houses a Refuge's desired habitat improvement projects, studies, and new equipment needs, as well as the place where staffing needs (predicated on the nationally-agreed upon staffing model) are expressed. Data within RONS are used regularly in budget justifications presented to the Department of the Interior, the Office of Management and Budget, and Congress. All of the RONS projects within the Sonny Bono Salton Sea NWRC are prioritized to identify the most important projects within the Complex. Each year RONS projects are submitted for consideration and compete with similar projects throughout the nation for Refuge funds.

Following the completion of the CCP for the Sonny Bono Salton Sea NWRC, the RONS database will be updated to reflect the proposals included in the preferred management alternatives for the Sonny Bono Salton Sea NWR and the Coachella Valley NWR. Table 6-3 presents the proposals include in the proposed actions, and if these become the preferred alternatives, these are the projects that would be included in the updated RONS database. For each project, the corresponding CCP objective, as described in Section 6.2, is also provided.

<b>Table 6-3 Proposed Update to the RONS Database for the Sonny Bono Salton Sea NWRC (Based on the Projects Described for the Proposed Actions)</b>				
<b>Proposed Action</b>	<b>Complex Ranking</b>	<b>Corresponding CCP Objective</b>	<b>Operating Costs</b>	
			<b>First Year Cost</b>	<b>Recurring Annual Cost</b>
<b>Sonny Bono Salton Sea NWR Projects (presented in order of priority for the Refuge)</b>				
<b>Laser-level Agricultural Fields</b> – Enter into a contract to laser-level approximately 360 acres of managed agricultural fields to provide more uniform irrigation coverage. Better coverage will improve plant forage production to support 30,000 wintering snow geese and other waterfowl, result in better utilization of water, and lower annual water costs.	5	1.1, 3.3, 4.5	\$100,000	\$15,000
<b>Increase Irrigation Efficiency</b> – Purchase and install a new sprinkler irrigation pipe in the Flamang fields to more efficiently distribute water across the site, and install a water storage container and pipe to collect and distribute tail water to other fields.	8	1.1, 1.2, 4.5	\$100,000	\$15,000
<b>Sonny Bono Salton Sea NWR Staffing Needs (presented in order of priority for the Refuge)</b>				
<b>Improve Water Delivery to Managed Fields and Wetland Areas</b> – Hire a full-time Irrigator (GS 5/6) to operate and maintain the Refuge's water delivery and distribution system, including at new restoration sites.	1	1.1, 1.2, 4.5	\$45,000	\$45,000
<b>Expand Interpretive, Volunteer, and Public Outreach Programs</b> – Hire a full-time Outdoor Recreation Planner (GS 7/9/11) to oversee these programs.	3	4.5, 5.3, 5.5, 5.6, 5.7, 5.8	\$95,000	\$95,000

<b>Table 6-3 Proposed Update to the RONS Database for the Sonny Bono Salton Sea NWR Based on the Projects Described for the Proposed Actions</b>				
<b>Proposed Action</b>	<b>Complex Ranking</b>	<b>Corresponding CCP Objective</b>	<b>Operating Costs</b>	
			<b>First Year Cost</b>	<b>Recurring Annual Cost</b>
<b>Management of Refuge Facilities</b> – Hire a full time Facilities Manager (GS 7/9/11) who would be responsible for upkeep of Refuge structures and facilities organization.	4	2.4, 4.1, 4.5	\$95,000	\$95,000
<b>Implement Biological Activities</b> – Hire a Fish and Wildlife Biological Technician (GS 5/7/9) to monitor and respond to Salton Sea wildlife disease outbreaks; assist in bird surveys; and conduct invasive plant control.	6	2.4, 4.1, 4.4	\$37,500	\$37,500
<b>Sonny Bono Salton Sea NWR Subtotal for Projects and Staffing</b>			<b>\$472,500</b>	<b>\$302,500</b>
<b>Coachella Valley NWR Projects (presented in order of priority for the Refuge)</b>				
<b>Control Invasive Plants to Protect Endemic Dune Species</b> – Design and implement a multi-year enhancement plan for about 200 acres of previously cultivated land that will focus on invasive plant control followed by seeding of appropriate native plant species.	7	1.1, 1.2, 1.3, 2.1	\$200,000	\$5,000
<b>Reestablish Mesquite Hummocks to Benefit Sensitive Species</b> – To retain sand on the Refuge, install and irrigate honey mesquite along the downwind end of the Refuge. Once established, the loss of blowsand from the Refuge will be slowed and accumulated sand will be available for redistribution onto the site. Actions include purchasing and planting honey mesquite, and providing irrigation or an alternative form of water.	9	1.1, 1.2, 1.3, 2.1	\$150,000	\$10,000
<b>Coachella Valley NWR Staffing Needs (presented in order of priority for the Refuge)</b>				
<b>Protect and Manage Refuge Resources</b> – Hire a dual function refuge manager/Federal wildlife officer (GS 7/9/11), who would dedicate a minimum of 25 percent of the time to law enforcement on both the Coachella Valley and Sonny Bono Salton Sea NWRs and spend the remaining time managing the Coachella Valley NWR (e.g., habitat and species management, species monitoring, general site maintenance, managing partnerships, and coordinating with the Valley Floor RMC and Coachella Valley Conservation Commission).	2 (Complex position)	1.1, 1.2, 1.3, 2.1, 3.2	\$150,000	\$95,000
<b>Coachella Valley NWR Subtotal for Projects and Staffing</b>			<b>\$500,000</b>	<b>\$110,000</b>
<b>Total Estimated Cost for the Refuge Complex</b>			<b>\$972,500</b>	<b>\$412,500</b>

The costs presented in Table 6-3 are rough estimates and will be refined as more details are available. The projects listed in Table 6-3 are presented in order of priority (from highest to lowest) within the Refuge. To fully implement the proposed actions and achieve the goals and objectives of the CCP, additional staff position will be required as reflected in Table 6-4. The estimated cost for implementing the proposals in the SAMMS and RONS database, as outlined in Tables 6-1, 6-2, and 6-3 is \$5,154,100 and the anticipated reoccurring annual cost for these new proposals is estimated at \$412,500.

### 6.3.2. Current and Future Staffing Needs

The current staffing levels for the Refuge Complex, per the approved (4/30/12) organization chart, are presented in Table 6-4, along with those positions that are identified in the CCP as necessary to achieve Refuge purposes. Based on the actions proposed in the CCP, there is a need to add and fill three new permanent full time staff positions and fill, as permanent full time, two currently unfilled term full time positions. If all of these positions were to be filled, and funding was available for project implementation, the Refuge would be able to carry out all aspects of CCP to a reasonable standard. If one or more of the positions are not filled, some aspects of the Plan may not be completed within the timeframe presented in the CCP. The estimated cost of providing the staff needed to maintain and operate the Sonny Bono Salton Sea NWRC as proposed under the CCP is approximately \$1,350,000, which includes all current and proposed positions at their full performance level plus benefits.

<b>Table 6-4 Current and Proposed Future Staff Positions for the Sonny Bono Salton Sea NWRC</b>			
<b>Position (grade)</b>	<b>Quantity</b>	<b>Current Unit</b>	<b>Proposed Unit</b>
Project Leader (GS-13/14)	1.0 <sup>1*</sup>	PFT <sup>2</sup>	PFT
Deputy Project Leader (GS-12/13)	1.0 <sup>1*</sup>	PFT	PFT
Senior Wildlife Biologist (GS-11/12)	1.0 <sup>1*</sup>	PFT	PFT
Wildlife Refuge Specialist (GS 7/9/11)	1.0 <sup>1*</sup>	PFT	PFT
Administrative Support Assistant (GS-6/7)	1.0 <sup>1*</sup>	PFT	PFT
Biological Technician (GS-5/7)	1.0 <sup>1#,6</sup>	TFT <sup>3</sup>	PFT
Biological Technician (GS-5)	2.0 <sup>1*</sup>	TFT	TFT
Biological Technician (GS-4/5)	1.0 <sup>1*</sup>	STEP <sup>4</sup>	STEP
YCC Youth Leader (GS-5)	1.0 <sup>1#</sup>	Temp <sup>5</sup>	Temp
Computer Assistant (GS-4/5)	1.0 <sup>1*</sup>	PFT	PFT
Park Ranger (GS-5/7)	1.0 <sup>1#</sup>	TFT	TFT
Engineering Equipment Operator (WG-10)	1.0 <sup>1*</sup>	PFT	PFT
Mobile Equipment Mechanic (WG-10)	1.0 <sup>1*</sup>	PFT	PFT
Tractor Operator (WG-6)	2.0 <sup>1*</sup>	PFT	PFT
Tractor Operator (WG-6)	1.0 <sup>1#</sup>	TFT	TFT
Maintenance Worker (WG-6)	1.0 <sup>1*</sup>	PFT	PFT
Irrigation System Operator (GS-5/6)	1.0 <sup>1#,6</sup>	TFT	PFT
Dual Function Refuge Manager/Federal Wildlife Officer (7/9/11)	1.0 <sup>7</sup>	PFT	PFT
Outdoor Recreation Planner/Interpretive Specialist (GS 7/9/11)	1.0 <sup>7</sup>	PFT	PFT
Facilities Manager (GS 7/9/11)	1.0 <sup>7</sup>	PFT	PFT

<sup>1</sup>Position currently included on the Complex organization chart (<sup>1\*</sup> filled position, <sup>1#</sup> unfilled position), <sup>2</sup>PTE = Permanent Full Time, <sup>3</sup>TFT = Term Full Time, <sup>4</sup>STEP = Student Temporary Employment Program, <sup>5</sup>Temp = Seasonal, <sup>6</sup>Identified in the CCP as a position that should be filled as PFT to meet Refuge purposes, <sup>7</sup>Identified in the CCP as a new position that should be filled to meet Refuge purposes

### **6.3.3 Potential Funding Sources for Implementing CCP Projects**

Some of the projects included in the CCP may be implemented in full or in part by sources other than the Refuge annual budget. These projects could be funded through partnerships with other local, State, or Federal agencies, special legislative appropriations, or grants (e.g., North American Wetlands Conservation Act Grant, National Fish and Wildlife Foundation, Service Cost Share Grants, Federal Highway Administration Refuge Roads Program, Salton Sea Financial Assistance Program). Other potential sources of funding for species monitoring, habitat restoration, listed species conservation and recovery, and research include: the Cooperative Endangered Species Conservation Fund, California Landscape Conservation Cooperative funding, funds available for implementing the Coachella Valley MSHCP, and grants that support community-based restoration through partnerships with land management agencies.

## **6.4 Land Tenure**

Approximately 2,500 acres of the Refuge to the south of the Salton Sea were leased to the Service by the IID in the 1940s and 1950s. The original leases expired some time ago and to date, the IID has chosen not to enter into any new long term leases with the Service. Instead, the Service has been leasing IID lands needed to achieve Refuge purposes on a year to year basis. To provide assurance that Refuge purposes can continue to be met into the future, the Service will continue to work with the IID to establish longer term leases for lands managed to support migratory birds and species of concern, such as the Yuma clapper rail. Factors such as the receding Salton Sea and changes in land use to support geothermal development in the vicinity of Unit 2 of the Refuge could result in changes in the configuration of the lands currently leased from the IID. Any such changes would be implemented to ensure that the Refuge purposes, goals, and objectives outlined in the CCP would continue to be met and that activities occurring within the lands managed for Refuge purposes are compatible with those purposes.

As the conditions at the Salton Sea continue to change, it will be necessary to evaluate how the current configuration of lands managed by the Service are or are not assisting in the achievement of Refuge purposes. Therefore, the preparation of a step-down plan is proposed to review the current status of the lands managed as a part of the Refuge. This step-down plan may identify opportunities to exchange area owned in fee title for areas currently managed to meet Refuge purposes. Some lands currently leased from IID may no longer be needed to meet Refuge purposes and/or long-term lease agreements for some areas could be pursued to ensure the ability to meet Refuge purposes, goals, and objectives.

## **6.5 Step-down Plans**

In some cases, achieving the management objectives presented in the CCP for public use and wildlife and habitat management will require more in-depth planning than is currently provided in the CCP. For these projects, the Service prepares step-down plans. Step-down plans provide additional planning and design details necessary to implement the strategies (projects or programs) identified in the CCP. Three draft step-down plans have been prepared for review as part of this CCP, a Predator Management Plan (Appendix C), Integrated Pest Management Plan (Appendix D), and Hunting Plan (Appendix E). The environmental consequences of implementing these plans are addressed in Chapter 5.

## 6.5.1 Draft Step-Down Plan

### **Predator Management Plan**

A draft Predator Management Plan, provided in Appendix C, has also been prepared for the Sonny Bono Salton Sea NWR to reduce the effects of mammalian predation on nesting gull-billed terns and black skimmers, both identified as Birds of Conservation Concern by the Service. Predator management along with proposals to expand and improve nesting opportunities for these ground nesting seabirds is intended to restore conditions that support the successful reproduction of these species on the Refuge. As proposed, predator management would involve the use of both lethal and nonlethal control methods, with the use of lethal control limited to those individual predators that pose a threat to gull-billed tern and black skimmer chicks, eggs, and adults.

### **Integrated Pest Management Plan**

A draft Integrated Pest Management (IPM) Plan has been developed for the Sonny Bono Salton Sea NWR Complex in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136r-1) and Part 517 DM 1 of the Department of the Interior's Departmental Manual. The complete document is provided for review in Appendix D.

The purpose of preparing an IPM Plan is to provide a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. The Service is mandated to manage pests and use IPM principles in a manner that reduces risks from both the pests and associated pest management activities. IPM is a science-based, decision-making process that incorporates management goals, consensus building, research, pest biology, environmental factors, pest detection, monitoring, and the selection of the best available technology to prevent unacceptable levels of pest damage. In developing the IPM Plan, full consideration has been given to the safety and protection of humans and other non-target organisms and resources.

Along with a detailed discussion of IPM techniques, the IPM Plan for the Sonny Bono Salton Sea NWR Complex describes the selective use of pesticides, primarily herbicides, on the Refuge. A variety of herbicides are proposed for use in combination with other pest management activities to ensure the availability of quality habitat to support migratory and resident birds and other wildlife. The IPM Plan also addresses application techniques, including aerial application of herbicides within the Refuge's managed agricultural fields and areas of the Refuge that currently support extensive monocultures of salt cedar.

The IPM Plan describes the approval process to be followed when pesticides are proposed for use within the Complex. Depending on the product, Pesticide Use Proposals (PUPs) are submitted for review and approval at the Project Leader, Regional Office, or Washington Office level. Unless an IPM Plan is in place, all PUPs must be submitted for review and approval at the appropriate level on an annual basis. With an approved IPM Plan in place, a Chemical Profile is developed for the proposed pesticide and a PUP is then reviewed at the appropriate level. If approved, for the next four years following approval, the PUP need only be reviewed and approved at the field level. If however the Refuge is proposing a substantial change in the use pattern of an approved PUP, review by the Regional or Washington Office, depending upon the product, would be required before this change could be implemented on the Refuge.

The primary focus of the IPM Plan for the Sonny Bono Salton Sea NWR Complex is on controlling invasive plants. The approved IPM Plan will continue to be reviewed and updated as needed throughout the life of the CCP to address new information and policy changes.

**Hunt Plan**

A hunt plan (Appendix E) for the Sonny Bono Salton Sea NWR has been prepared in accordance with 605 FW2 (Hunting) of the Service Manual and Title 50, Part 32 of the Code of Federal Regulations. The hunt plan describes the details of the Refuge’s hunting program, which is managed by CDFW. The hunt plan, as presented in Appendix E, will not result in any changes to how the hunting program was implemented prior to the development of the CCP.

**6.5.2 Future Step-Down Plans**

Several additional step-down plans are proposed for completion following the approval of the CCP. Table 6-5 lists these step-down plans along with target dates for completion.

<b>Table 6-5                      Future Step-down Plans Proposed                      for the Sonny Bono Salton Sea National Wildlife Refuge Complex</b>		
<i>Plan</i>	<i>Description</i>	<i>Target for Completion</i>
Habitat Management Plan (HMP), Coachella Valley NWR	Consistent with Service Manual Section 620 FW 1 (Habitat Management Plans), the HMP will include an inventory and description of the habitats on the Coachella Valley NWR, as well as identification and discussion of refuge resources of concern, habitat goals and objectives, and habitat management strategies. This HMP will likely be a subset of the larger Reserve Management Unit Plan adopted for Unit 1 of the Coachella Valley MSHCP in 2012.	FY2015
Inventory and Monitoring Plan (IMP), Coachella Valley NWR	Consistent with the Inventory and Monitoring Initiative, the IMP, to be prepared in a concise, user-friendly format, will prioritize surveys based on input provided in the HMP and Reserve Management Unit Plan and provide guidance for improving the quality, consistency, utility, and long-term storage of monitoring data. Consistent with the Reserve Management Unit Plan, data collected for this effort will also be submitted for entry into the GIS database for the Reserve Management Unit and the Coachella Valley MSHCP area.	FY 2016
Yuma Clapper Rail Management Plan, Sonny Bono Salton Sea NWR	Per the draft revised Yuma Clapper Rail Recovery Plan ( <i>USFW 2009</i> ), this plan will address: the long-term protection and management of Refuge core rail habitat areas; long-term monitoring requirements; rail population goals; measures to ensure successful maintenance of rails and their habitats; an evaluation of potential movement within and to and from the Refuge; the need to secure a long-term water source of a quantity and quality sufficient to manage the Refuge’s rail habitat; and management actions needed to control the threat to the rail population of current and future selenium levels.	FY2016
Visitor Services Plan, Sonny Bono Salton Sea NWR	This plan will provide an integrated analysis of all applicable aspects of the visitor service programs on the Refuges within the Sonny Bono Salton Sea NWR Complex. Specific strategies needed to achieve the visitor services goals and objectives included in the Refuge Complex’s CCP will be addressed, and detailed information and future plans for compatible wildlife-dependent recreational uses and their supporting recreational activities and facilities will be provided.	FY2017

<b>Table 6-5 Future Step-down Plans Proposed for the Sonny Bono Salton Sea National Wildlife Refuge Complex</b>		
<b><i>Plan</i></b>	<b><i>Description</i></b>	<b><i>Target for Completion</i></b>
HMP, Sonny Bono Salton Sea NWR	The HMP will include an inventory and description of the habitats on the Sonny Bono Salton Sea NWR, as well as identification and discussion of refuge resources of concern, habitat goals and objectives, and habitat management strategies.	FY2018
Visitor Services Plan, Coachella Valley NWR	This plan will focus on providing appropriate public outreach and interpretation of the resources protected on the Refuge by working in partnerships with others to provide this information primarily at off-refuge locations.	FY2018
IMP, Sonny Bono Salton Sea NWR	The IMP will prioritize surveys based on input provided in the HMP, and provide guidance for improving the quality, consistency, utility, and long-term storage of monitoring data.	FY 2019
Land Status Review, Sonny Bono Salton Sea NWR	Prepare a step-down plan to evaluate the status of the lands currently being managed as part of the Refuge in light of the changing circumstances at the Salton Sea; consider the management needs of the Refuge and identify any lands owned in fee title by the Service and/or managed by the Service under an agreement with another landowner that are no longer needed to meet Refuge purposes, as well as any lands not currently managed by the Service that may provide opportunities to better achieve Refuge purposes.	FY 2022

## 6.6 Fire Management Plan

Per the Department of the Interior fire management policy, all refuges with vegetation that can sustain fire must have a Fire Management Plan (FMP) that details fire management guidelines for operational procedures and values to be protected and enhanced. Fire management plans outline the fire management objectives for a Refuge such as appropriate suppression and/or prescribed fire strategies.

Values considered in a FMP include protection of Refuge resources and neighboring private properties, effects of burning on refuge habitats/biota, and firefighter safety. Refuge resources include properties, structures, cultural resources, trust species including endangered, threatened, and species of special concern, and their associated habitats. FMPs are reviewed periodically to ensure that the fire program is conducted in accordance and evolves with the Service mission and the goals and objectives of the Refuges covered by the plan.

The currently approved FMP for the Sonny Bono Salton Sea NWR (USFWS 2001) addresses fire management strategies that focus on preparedness, wildland fire operations, prevention, detection, and full suppression of wildfire. Within the currently approved plan, prescribed and wildlife fire use are included as a strategy for achieving management objectives within the Sonny Bono Salton Sea NWR.

In 2003, the Coachella Valley NWR was determined to be exempt from developing a FMP because the Refuge contained essentially no burnable vegetation due to weather and fuels conditions that

prevent ignition and fire spread. In addition, there were no plans to conduct prescribed burning. If conditions change in the future, a FMP would be prepared for the Coachella Valley NWR.

## **6.7 Cultural Resource Management**

To avoid adverse effects to cultural resources, the following procedures would be implemented for all proposals that require subsurface disturbance in previously undisturbed areas or require ground disturbance at depths that extend beyond the depths of previous ground disturbing activities within the proposed project area:

- a. Prepare and submit a Request for Cultural Resource Compliance (Appendix K) to the Regional Cultural Resources Program as early in the planning process as possible, and include a map, indicating the full extent of the area of potential effect along with a detailed project description;
- b. Implement any measures deemed necessary by the Cultural Resource staff to protect cultural resources (in an area of sensitivity for an archaeological resource, measures may include having an archaeological monitor present during activities affecting subsurface materials), or if the action falls under the terms of the Service's Programmatic Agreements with SHPO and the Advisory Council for Historic Preservation, retain this documentation in the project file;
- c. If during the course of ground disturbing activities, any cultural resources are discovered, all earthwork on the site would be stopped and the Service's Regional Historic Preservation Officer would be contacted to review the materials and recommend a treatment that is consistent with applicable laws and policies, the site would be recorded and evaluated for eligibility to the NRHP, and all measures required to protect or otherwise mitigate impacts to the site would be implemented (if the site is determined to be eligible to the NRHP, the Service, through the Regional Historic Preservation Officer, would consult with SHPO, federally recognized tribes, and interested parties).

To identify and preserve traditional cultural properties and sacred sites on the Refuge and to determine the level of confidentiality necessary to protect them, the Refuge will work with interested tribal groups to establish government-to-government relationships that will ensure meaningful consultation with tribal governments during the planning phase of projects. The Refuge Complex will initiate discussions with interested tribal groups to create a MOU to implement the inadvertent discovery clause of NAGPRA. Development of this MOU will involve identifying the Native American tribes, groups, and direct lineal descendants that may be affiliated with these Refuge lands, initiating consultation with the affiliated parties, developing procedures to follow for intentional and inadvertent discoveries, and identifying the persons to contact for the purposes of NAGPRA.

## **6.8 Compatibility and Appropriate Use Determinations**

As described in Chapter 1, the Improvement Act requires that all uses permitted on a NWR must be compatible with Refuge purposes and the mission of the NWRS and shall not be inconsistent with public safety. Before activities or uses are allowed on a Refuge, uses must be found to be both appropriate and compatible. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a Refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes for which a Refuge was established. A determination of whether or not a

use is appropriate is required for all but wildlife-dependent recreational uses, which are identified in the Improvement Act as hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

Compatibility determinations have been prepared for hunting, fishing, wildlife observation, interpretation, and environmental education, and research. Both an appropriate use evaluation and compatibility determination have been prepared for research. These documents are provided for public review and comment in Appendix A.

## **6.9 Inventory, Monitoring, and Evaluation**

The core mission of the Refuge System is to conserve, manage and restore fish, wildlife and plant resources and their habitats. To evaluate progress toward meeting the Refuge System's conservation, management and restoration objectives, Refuges are tasked with monitoring the status and trends of their priority biological resources. Accomplishing this requires that all phases of the data management cycle be addressed, including identifying priority resources of concern and appropriate monitoring attributes, developing appropriate study designs, selecting protocols, collecting data, entering and analyzing data, reporting results, and archiving significant documents and data for future generations. Additionally, effective stewardship of Refuge System lands depends on the availability of relevant and accurate data to guide management decision making. This information will be developed for the Refuge Complex as part of future step-down plans, including habitat management plans (HMPs) and inventory and monitoring plans (IMPs).

In 2012, Inventory and Monitoring Initiative staff (I&M staff) from Region 8 conducted an Inventory and Monitoring Needs Assessment at various refuges throughout the region, including the Sonny Bono Salton Sea NWR. This assessment was conducted to identify and summarize inventory and monitoring needs of individual stations. As part of the assessment, I&M staff populated the Planning and Review of Inventory and Monitoring on Refuges (PRIMR) Access database of natural resource surveys with available current, historical and planned surveys of abiotic features, biological resources and natural resource stressors on stations. Details such as survey type, timing, duration, lead organization, and protocol were included. Collection of baseline data will continue at both Refuges. These data will be used to update existing species lists, wildlife habitat requirements, and seasonal use patterns, and will be utilized and expanded upon during the development of HMPs and IMPs for the Sonny Bono Salton Sea and Coachella Valley NWRs.

Monitoring the effects of management actions on Refuge trust resources is an important component of the CCP, as is the documentation of Refuge baseline conditions. By completing baseline inventories and monitoring specific management actions, Refuge staff can better understand the species, habitats, and physical processes that occur on the Refuge and the ecological interactions that occur between species. With this information, Refuge staff can also identify changes in populations or population trends that may be occurring on the Refuge as a result of factors including, but certainly not limited to disturbance, competition from invasive species, changes in water quality and quantity, and climate change.

Monitoring of federally listed species and other special status species is an ongoing management activity within the Refuge Complex. As described in Chapter 4, monitoring is implemented by Refuge staff, other public, private, academic, and nonprofit partners, and researchers and is expected to be funded through a variety of funding sources from both within and outside the Service. These monitoring programs will provide valuable information needed to assess the quality of the habitats, as well as to provide Refuge-specific data needed to evaluate the effectiveness of

the various wildlife and habitat management strategies proposed and to determine if changes in management are necessary to achieve Refuge purposes and goals.

Monitoring of public use programs will involve the continued collection of visitor use statistics and an assessment of how public use activities are affecting wildlife and habitat quality. The data obtained will then be used to evaluate the overall effects of public use on Refuge resources, as well as to determine if the public use opportunities provided by the Refuge Complex are achieving proposed objectives for improving visitor understanding of Refuge resources, connecting people with nature, and providing a positive visitor experience.

## **6.10 Adaptive Management**

The Service acknowledges that much remains to be learned about the species, habitats, and physical processes that occur on refuge lands, and about the ecological interactions between them. Developing a better understanding of these processes and interactions is further complicated by ongoing changes associated with climate change, receding water levels in the Salton Sea, increased fire frequency in the Coachella Valley, and presence of non-native species within native habitats. Uncertainty is an unavoidable component of managing natural systems because of their complexity, inherent variability, and gaps in our knowledge of their functions. Adaptive management involves sequential decision making, integrating project design, management, and monitoring to systematically test assumptions. It strives to reduce some of that uncertainty and improve management over time by allowing us to evaluate and refine management based on the results of management activities and the status of the managed resource. The Service has been practicing adaptive management on the Refuge since its establishment and plans to continue the practice. Accordingly, the proposed management scenarios for the two refuges within the Sonny Bono Salton Sea NWRC provide for ongoing adaptive management.

In designing and implementing an adaptive management strategy, it may be necessary at some point during the next 15 years to amend the CCP in response to changing conditions. Adequate baseline data, clearly defined and measurable project objectives, a monitoring plan focused on measurable results, and a process for refining and improving current and future management actions are all essential components of a successful adaptive management approach. For proposed restoration projects, the details of the adaptive management approach would be integrated into final restoration plans.

The adaptive management process would be used to evaluate our success in achieving our public use goals and objectives. These periodic evaluations would be used over time to adapt both our public use objectives and strategies to better achieve our goals. Such a system embraces uncertainty, reduces option foreclosure, and provides new information for future decision-making.

## **6.11 Partnership Opportunities**

Partnerships will continue to play an important role in implementing the various strategies presented in the CCP. Achieving many of the objectives presented above will require various degrees of interaction and support from outside partners (e.g., other public and private land managers, USGS, IID, Valley Floor Reserve Unit Management Committee, CVCC). Through ongoing partnerships with other land managers in the region, staff and funding can be leveraged to implement management and monitoring strategies that benefit multiple ownerships. Such an example is active participation in the Valley Floor Reserve Unit Management Committee and

coordination of activities on the Coachella Valley NWR with the recommended actions within the RMU Plan for Unit 1 (CVCC 2012).

Restoration efforts will also involve partnerships with other Federal, State, and/or local agencies, researchers, and non-governmental organizations. Protection of cultural resources will require partnerships with the region's Native American community on issues such as resource protection, interpretation, and repatriation.

The needs and opportunities for research within the Refuge Complex are vast and it is only through partnerships that these needs can even begin to be met. For example, expanded partnerships with academic institutions, USGS, and others could provide valuable data related to the life history of little-known species protected on the Coachella Valley NWR, while other research could answer questions related to the threats to waterbirds from rising selenium levels in the Salton Sea, as well as how best to manage limited sand resources to protect endemic dune species.

Implementing public use programs and public outreach will also require the continuation of existing partnerships, as well as the development of new partnerships.

## **6.12 Compliance Requirements**

### **6.12.1 Federal Regulations, Executive Orders, and Legislative Acts**

All projects and step-down plans described in the CCP are required to comply with NEPA and the Improvement Act, as well as a variety of other Federal regulations, executive orders, and legislative acts. Such requirements address issues such as human rights, cultural resources, biological resources, land and water use, Tribal coordination, and wilderness. Federal regulations, executive orders, or legislative acts applicable to projects proposed for implementation on the Sonny Bono Salton Sea NWR and Coachella Valley NWR are presented in Appendix F along with a summary of how the CCP will comply with these requirements. With respect to wilderness, the lands within both the Sonny Bono Salton Sea NWR and the Coachella Valley NWR have been inventoried and no areas were found that meet the eligibility criteria for a Wilderness Study Area as defined by the Wilderness Act. Therefore, potential wilderness designation of lands within the Sonny Bono Salton Sea NWR Complex is not analyzed further in the CCP. The results of the wilderness inventory are documented in Appendix G.

### **6.12.2 Potential Future Permit, Approval, and/or Review Requirements**

The implementation of some actions described in this CCP may require additional analysis and review under NEPA, particularly those actions associated with future step-down plans or individual projects that are to be described in greater detail in the future. Additionally, prior to implementation of the various management actions, the Service may be required to obtain local, state, or federal permits or approvals. Permits, approvals, or reviews that may be required for projects within the Sonny Bono Salton Sea NWR Complex include, but are not limited to:

- **U.S. Fish and Wildlife Service, Refuges** - Project level internal Section 7 consultation, as appropriate under the authorities of the Endangered Species Act, prior to implementing any actions that may affect federally listed endangered or threatened species.
- **U.S. Fish and Wildlife Service, Regional Cultural Resources Team** - Project level internal review of actions that could have an adverse effect on cultural resources pursuant to the National Historic Preservation Act and/or other regulations related to the protection

of cultural resources. Compliance involves submitting a Request for Cultural Resource Compliance Form (Appendix K) to the Regional Cultural Resources Team, which will assist in notification to the Tribes and determine if consultation with the California State Historic Preservation Officer is required.

- **U.S. Army Corps of Engineers** - Clean Water Act Section 404 for projects, including restoration projects, that could discharge dredged or fill material into waters of the U.S.
- **California State Water Resources Control Board** - Clean Water Act Section 401 certification for discharges into waters of the U.S. and/or a General Permit for Discharges of Storm Water Associated with Construction Activity.
- **California State Historic Preservation Office** - Section 106 consultations under the authorities of the National Historic Preservation Act for any actions that may affect historic properties or cultural resources associated with listed properties (or those eligible for listing) on the National Register of Historic Places.

### **6.13 Conservation Measures to be incorporated into Future Projects**

To ensure that proposed projects and other actions described in this CCP do not result in significant adverse effects to the environment, conservation measures would be implemented, as appropriate, in association with the development and/or carrying out of proposed projects and/or actions. Project specific measures are provided in Chapter 5 (Environmental Consequences), and stipulations necessary to ensure compatibility are outlined in the Compatibility Determinations provided in Appendix A. An overview of the conservation measures to be considered is provided below.

#### **General Conservation Measure for all Project Categories**

- Follow all terms and conditions provided in regulatory permits and other official project authorizations or approvals.

#### **Habitat and Species Protection Conservation Measures**

- Avoid any disturbance within and provide adequate no disturbance buffers around habitat that supports sensitive nesting bird species during the breeding season;
- Minimize disturbance (e.g., noise, lighting, human presence) in sensitive habitat areas year round;
- Implement appropriate BMPs to minimize the potential for impacts to air and water quality related to soil exposure and erosion.
- To the extent feasible, use existing roadways or travel paths for access related to both project implementation and ongoing refuge activities;
- Adhere to the specific BMPs included on pesticide product Chemical Profiles to avoid impacts to Refuge trust species (refer to Appendix D for more details);
- Routinely evaluate the results of on-going species and habitat monitoring to determine if modifications in Refuge operations and/or management practices are necessary to address changes in population trends or habitat quality; and
- Survey proposed construction sites to identify and map the locations of all listed or sensitive species and/or sensitive habitats that could be affected by a project and then design the proposed facility to avoid to the extent practicable any impacts to these resources; where impacts cannot be avoided, implement measures to mitigate these impacts to below a level of significance (e.g., habitat restoration).

### **Water Quality Conservation Measures**

- Obtain a Construction General Permit (2009-0009-DWQ) from the California State Water Resources Control Board and prepare a Storm Water Pollution Prevention Plan for construction activities involving grading and/or major brush removal;
- Implement appropriate erosion control measures (e.g., fiber rolls, filter fabric, silt fencing) during and after land disturbance to minimize short and long-term erosion into wetlands;
- Carry out the appropriate BMPs, including those outlined in the IPM Plan, when applying pesticides on the Refuge; and
- Implement the following BMPs when construction vehicles or equipment are being used to implement a project:
  - Specify and follow vehicle and equipment fueling procedures and practices that are designed to minimize or eliminate the discharge of fuel spills and leaks, particularly when operating in or around wetlands;
  - To the extent practicable, do not allow vehicle/equipment fueling within 50 feet of a wetland or downstream drainage facility and use berms and/or dikes around fueling areas to prevent run-on, runoff, and to contain spills;
  - Inspect construction vehicles and equipment for leaks prior to each day of use and if a leak is discovered, immediately implement repairs; and
  - Maintain a spill kit on the construction site at all times when construction equipment is present.

### **Air Quality Conservation Measures**

- Effectively stabilize graded or disturbed areas during construction to minimize dust generation by:
  - watering prior to and during any earth movement, when necessary;
  - installing wind fencing, if deemed necessary; and
  - stopping work during high wind conditions;
- Cover temporary stockpiles of excavated material with a suitable cover such as a tarp when dry, windy conditions are predicted in the area;
- Cover the load of all haul vehicles during the transport of dirt or other dust generating materials;
- Wash or sweep all construction vehicles and equipment prior to leaving the project site to avoid tracking dirt and dust onto public roads;
- Ensure that all construction equipment meets APCD air quality standards; and
- Carry out the appropriate BMPs, as outlined in the IPM Plan (Appendix D), when applying herbicides.

### **Cultural and Paleontological Resource Protection Measures**

- To protect cultural resources, follow the measures outlined in section 6.7.
- To protect paleontological resources,
  - identify the paleontological sensitivity of the project area (i.e., the potential for a stratigraphic or bed unit to yield significant paleontological resources); and
  - in areas of high paleontological sensitivity, work with the Regional Cultural Resources Program to determine if a paleontological monitoring plan is required based on a review of the proposed project.

- If the preparation of a paleontological monitoring plan is deemed necessary, develop the plan in consultation with the Regional Cultural Resources Program and enter into a formal agreement with a recognized museum repository for the curation of any fossils that may be uncovered.
- Prior to commencing construction activity in an area of high paleontological sensitivity, retain a certified paleontologist to supervise the monitoring of construction excavations (involving inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present), and to produce a Paleontological Resource Management Recovery Plan, should one be required.
- For construction activities to be implemented in an area of high paleontological sensitivity, the construction supervisors and crew would receive training from a certified paleontologist on the procedures for identifying and protecting paleontological resources, as well as the procedures to be implemented in the event fossil remains are encountered during ground-disturbing activities.
- The paleontological monitor, who would have authority to temporarily divert grading away from exposed fossils to recover the fossil specimens, would document the results of the construction monitoring program.
- Should fossils be encountered, field data forms would be completed for each fossil locality. The locality would be recorded, the stratigraphic columns measured, and appropriate scientific samples submitted for analysis.

## **6.14 Plan Amendment and Revision**

CCPs are intended to evolve with each Refuge, and the Improvement Act specifically requires that these plans be formally revised and updated at least every 15 years. The formal revision process will follow the same steps as those implemented for the initial CCP development process, with a major emphasis placed on public involvement. Until a formal revision is initiated, the Service will periodically review and update the CCP (at least as often as every five years) to address needs identified as a result of monitoring or in response to adaptive management procedures. This CCP will also be informally reviewed by Refuge staff while preparing annual work plans and updating the Refuge databases. It may also be reviewed during routine inspections or programmatic evaluations. Results of any or all of these reviews may indicate a need to modify the plan. The goals described in this CCP will not change until they are reevaluated as part of the formal CCP revision process. However, the objectives and strategies may be revised to better address changing circumstances or to take advantage of increased knowledge of Refuge resources. If revisions to the CCP are required prior to the initiation of formal revisions, the level of public involvement and associated NEPA documentation will be determined by the Refuge Manager.

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