

4.7 AVIAN RESOURCES

4.7.1 Summary of Environmental Consequences

Significant and unmitigable avian resource impacts would occur under the No Action Alternative as a result of increases in salinity and large-scale changes in habitats. These changes would affect most all avian resources associated with the Salton Sea, both resident and migratory. A significant beneficial impact would occur under alternatives 1 through 5 to aquatic avian species dependent on the aquatic resources of the Salton Sea due to improved water quality conditions and protection of aquatic prey species. However, there would be localized significant unmitigable impacts under alternatives 1, 2, 3, 4, and 5 due to direct loss of habitat.

4.7.2 Significance Criteria

Significant avian resource impacts would occur if one of the alternatives would substantially alter the current bird usage patterns of the Salton Sea and surrounding areas for foraging, roosting, and nesting resulting in reduced bird numbers or increased health problems. Criteria used to evaluate the significance of impacts to avian resources are derived from the legal (federal and state) requirements to protect special status species and sensitive habitats, as described in Chapter 3. Specific criteria also may take into account issues identified during public scoping of the EIS/EIR, discussions with USFWS and CDFG, in other reports addressing potential impacts of various land uses at Salton Sea on avian resources.

An alternative could have a significant avian resource impact if its implementation would result in any of the following:

- Harm to, harassment of, or destruction of individuals of any avian species listed as endangered, threatened, or rare under federal or California law. In addition, such impacts are considered significant to other avian species under the following conditions:
 - survival and reproduction of a species in the wild are in immediate jeopardy;
 - the species exists in such small numbers throughout all of or a significant portion of its range that it may become endangered if its environment worsens due to the project;
 - the species is likely to become endangered in the foreseeable future and may be categorized as threatened under federal law;
- Modification or destruction of the habitat, migration corridors, or breeding areas of endangered, threatened, rare, or other avian species, as defined in the preceding paragraphs; or
- Loss of a substantial number of any avian species that could affect abundance or diversity of that species beyond normal variability; or
- Measurable degradation of sensitive habitats, such as wetlands and other legally protected habitats.

4.7.3 Assessment Methods

Potential impacts to avian resources are assessed by comparing proposed changes in habitat use under each of the alternatives to the no action conditions. Existing avian resource status, as described in Chapter 3, form the basis for assessing the significance of changes to avian resources under each of the alternatives.

4.7.4 No Action Alternative

Under the No Action Alternative, significant and unmitigable impacts to avian resources would occur due to several factors. The continued increase in salinity to 52,896 mg/L in 30 years would have a significant impact on those avian species that depend on the aquatic ecosystem of the Sea. Concentration of minerals and contaminants could cause direct mortality in those avian species that spend large amounts of time in or exposed to the waters. Fluctuations in the water levels of the Sea would affect birds that use the shores for nesting and those that rely on certain shoreline habitats for food, refuge, or roosting as high salinity levels would preclude revegetation. Because of the important linkage that exists between environmental quality and disease, it is reasonable to assume increases in bird losses from disease under the No Action Alternative. As avian species are concentrated into decreasing areas of suitable habitats both in and around the Sea, avian diseases that spread readily in dense population conditions could further affect birds using the Sea. In addition the aquatic prey base would be lost as the salinity level increases, further stressing those species that depend on that resource. These combined effects would reduce populations of most species using the Sea, particularly the fish-eating and shoreline-nesting species.

Effect of No Action Alternative with Continuation of Current Inflow Conditions

Significant and unmitigable avian resource impacts would occur under the No Action Alternative in conjunction with continuation of the current flow conditions. Salinity in the Salton Sea is expected to continue to rise under this scenario, reaching 52,896 mg/L in 30 years. Most fish and invertebrate populations would be severely affected at salinity levels above 50,000 mg/L, significantly reducing food for many of the avian species. Although most of the fish and invertebrate species would be affected, a few would increase for a number of years. For example, as salinity levels approach 80,000 mg/L, which would be reached in about 100 years, brine shrimp (*Artemia franciscana*) and brine flies (*Ephydra* sp.) would dominate the zoobenthic community but eventually would decline as salinity levels continue to rise. Avian species, such as eared grebes and phalaropes, which feed on brine shrimp and brine flies, also may benefit temporarily but eventually would decline as their prey species decline.

The Salton Sea serves as an important breeding or wintering area for many species, such as ruddy ducks, eared grebes, white pelicans, and gull-billed terns (a federal species of concern). More than 30 percent of the population of these species depend on the Salton Sea. Because the aquatic resource they depend on would be drastically reduced, it is likely that the survival of these species and others may be jeopardized. Only resident upland species or those migratory species that feed in the agricultural areas would not be significantly affected.

Effect of No Action Alternative with Reduced Inflows (1.06 MAFY)

Significant and unmitigable impacts would be expected under the No Action Alternative with reduced inflows. Under these conditions, Sea level would drop by 10 feet. Effects of this drop would be widespread. The negative effects described above would be made far more severe as salinity would increase at a faster rate, reaching 80,050 mg/L in 30 years and accelerating the impacts to avian resources. The drop in water level would dry out some of the remaining nearshore wetland and marsh areas that provide valuable nesting and feeding areas, reducing this habitat by up to 600 acres. Reduction of wetland and marsh habitat would adversely affect breeding sites for white-faced ibises and black terns, while the loss of cattails would affect the least bitterns. In addition, a land bridge would be formed between Mullet Island and the mainland, putting severe pressure on nesting birds by predators. Those avian species that seek refuge and roosting in marsh areas would be forced to leave the region. With no nearby replacement habitat, the overall populations of many of these species in the Pacific Flyway would likely decrease. The impacts to those species, 30 percent or more of which depend on the aquatic resources of the Sea, would be similar to those described above.

4.7.5 Alternative 1 with Continuation of Current Inflow Conditions***Effect of Alternative 1 with Continuation of Current Inflow Conditions***

North and South Evaporation Ponds (98kaf/y). Construction and operation of the concentration ponds under Alternative 1 would result in significant and unmitigable impacts to upland avian species, the result of direct loss of habitat. Beneficial impacts would occur to aquatic species, as the operation of the ponds would reduce the salinity levels of the Salton Sea to 36,824 mg/L compared to 52896 mg/L under no action conditions.

Construction activities would temporarily disturb some areas along the shoreline affecting shorebird use in the area and would take approximately 48 months to complete and would involve a maximum of 440 to 480 workers. Construction resources are included on Table 2.4-3; the location of the evaporation ponds is shown on Figure 2.4-4.

The construction of containment dikes, although placed completely in the Sea, would remove 140 acres of nearshore habitat. Many shorebirds use these areas for feeding year-round. Additional short-term effects of the concentration ponds on the southwest shore would result from their attractiveness to many avian species. Initially these ponds would provide habitat for brine shrimp and avian species that would feed on them. Ultimately the ponds would become so salty that no invertebrates could survive in them. However these pond would still appear to be suitable habitats for species searching for a feeding or resting sites. Such species as the state-listed species of concern black skimmers (*Rynchops niger*) and the federal species of concern elegant terns (*Sterna elegans*) would attempt to feed in the waters even though fish could not survive in the ponds. In addition to the high salinity levels many metals of concern, such as lead, zinc, copper and cadmium may precipitate from the brine as chlorides and could become concentrated in the brine and may have detrimental and unmitigable effects, especially

for young birds and those not acquiring fish at more suitable locations. Birds feeding from the shore of these ponds, such as snowy egrets (*Egretta thula*) and great egrets (*Ardea alba*), would be exposed in a similar manner, if not more severely, as their foraging ranges tend to be smaller than those of black skimmers and elegant terns. However, operation of the ponds would result in a reduction in salinity in the Salton Sea proper, preventing the loss of the prey base for these species that would occur under no action conditions. The Sea level would drop by 5 feet under this scenario, further impacting nearshore habitat.

Construction and use of a haul road would affect upland avian species by direct loss of habitat and by noise that would be introduced into areas where upland species feed, nest, and roost. These effects would be mitigable if destruction of habitat is minimized and the road is removed and the footprint is restored to current conditions as quickly as possible.

Pupfish Pond. To maintain this habitat and connectivity between the drains in this area, sheet pile driven dikes would be constructed from the north and south ends of the southwest evaporation pond extending to the shoreline, effectively creating a nearshore habitat protection pond between the shore and the evaporation pond. Significant snag habitat on the west side of the New River and the habitat around the mouth of San Felipe Creek would also be protected within this pond. Salinity levels appropriate to maintain conditions suitable for pupfish habitat would be attained by using a pump system, bringing in Salton Sea water to mix with a smaller portion of drain water.

Construction of these facilities would preserve critical nearshore habitat for shorebirds and birds requiring snags for nesting and roosting. Maintaining the water quality conditions suitable for pupfish would insure suitable water for continued nearshore vegetation growth. However, it is likely that the pond and associated waterway would become highly eutrophic with high solar gain. The less saline ponds would likely concentrate water birds, such as grebes, white pelicans, and ducks in an area where transmission of avian diseases is likely, promoting the continued die-offs currently occurring.

North Wetland Habitat. The impacts of these features would be much the same as those described for the Pupfish Pond.

4.7.6 Alternative 1 with Reduced Inflow Conditions (1.06 MAFY)

Facilities associated with this alternative include those described under current inflow conditions plus the displacement dike and the North Wetland Habitat. Impacts would be the same as those described above in the current inflow scenario, except that salinity levels would be reduced to 45,862 mg/L. Although most aquatic prey species can survive at this level, their populations would be stressed. However, there still would be an overall beneficial impact to avian species that depend on the aquatic ecosystem. The Sea level would be only three feet lower than it would be under the No Action Alternative at the end of 30 years, having minimal impacts on nearshore habitat.

Displacement Dike. This dike would be constructed in the southern portion of the Sea as shown on Figure 2.4-4. It is designed to essentially reduce the total area of the Sea, effectively displacing enough water to maintain elevations if annual inflows are reduced to 1.06 maf per year. Construction activities for the displacement dike would temporarily disturb approximately 360 on-shore acres, would take approximately 48 months to complete, involving a maximum of 300 to 330 workers. This feature would have little long-term effects on avian resource using the Sea compared to the no action alternative.

4.7.7 Alternative 2

Effect of Alternative 2 with Continuation of Current Inflow Conditions EES Located North of Bombay Beach (1.50 kaf/year – Showerline Technology). Construction of the EES north of Bombay Beach could have significant and unmitigable impacts on upland and aquatic avian species. These impacts could affect a wide variety of species, particularly those that are migratory, leading to notable population declines in other locations along the migratory flyway. Approximately 13,000 acres of desert habitat would be lost which would affect a large number of avian species from loss of foraging and nesting habitat. The area is characterized as creosote bush scrub dominated by creosote bush, burro weed and brittle brush. This in turn could affect those species that prey on these birds.

The EES would decrease the salinity to 45,510 mg/l from 52,896 mg/l under the no action alternative. This would result in a beneficial impact to aquatic avian species and those upland species dependent on the Sea. The sea elevation would drop by an estimated 8 feet at the end of 30-years which would have a significant effect on nearshore habitat, reducing that habitat by an estimated 500 acres that would result in impacts similar to those discussed for Alternative 1 under reduced flow conditions.

The waters within the EES system could potentially be toxic to avian species due to the highly elevated salinity and any contaminants. Effects of this toxicity could affect reproductive success of species that breed in areas other than the Sea but stop at the Sea for feeding or resting enroute.

Other hazards could occur from bird exposure to the sprayed waters within the EES and collision with the spray towers. The extensive spray systems would create a curtain of highly saline water through which birds may fly. Birds flying through this spray would become coated with highly saline water and would ingest significant amounts of salt after preening salt soaked feathers. In addition birds that land in the ponds may become encrusted with salt.

Locally migrating birds would be killed from collisions with the evaporation towers and piping. According to McKenan (1982) there are significant migrations within the Salton Sea basin. Night movements are extensive. For example, 5,000 widgeon at Davis Road moved in the middle of the night to raft on the sea. In the regions of Bombay Beach

and Salton City 70,000 to 80,000 birds per hour flying below 90 meters were recorded past a one-mile radar line stationed at Del Rio Golf Course and at Mecca.

A review of the literature revealed an extensive body of data concerning bird collisions with towers and wires. Many of these collisions occurred at night in inclement weather or fog. Elkins (1988) reported that “Bird mortality caused by inclement weather and collision with power lines . . . happens most frequently to nocturnal migrants in dense fog or clouds accompanied by precipitation. The refraction and reflection of light by water droplets increase the sphere of illumination and confuse the migrants. Others have also reported bird deaths due to collisions that have occurred with fog and changes in weather (Kibbe 1975; Laskey 1971). Spray from the EES could mimic fog, causing the same problems for migrating birds.

Migration peaks also are associated with massive bird deaths from colliding with towers. From October 5 to 8, 1954, coinciding with an advancing cold front, 25 instances of mortality, totaling over 100,000 birds (88 species), were reported from ceilometers, towers, and buildings in the eastern US. The massive bird mortalities were associated primarily with nocturnal fall migration (Johnston and Haines 1957).

A report compiled by NUS Corp (1979) found factors that influence the frequency of collisions, as follows:

- Poor visibility due to weather or time of day;
- Weather (winds, rain) that causes birds to fly lower than normal;
- Disturbances and distractions (mating, pursuit of/by prey);
- Cable size (smaller wires cause greater frequency of collisions than larger ones);
- Age (young birds collide more often than adults); and
- Line location (those below treetops are less hazardous than more exposed flight lines).

Species with long legs and necks collide more often than species with shorter appendages. High wing loading, as in swans, reduces the ability to maneuver around lines. Weir (1976) stated that “Nocturnal bird kills are virtually certain wherever an obstacle extends into the air space where birds are flying in migration. The time of year, sitting, height, lighting and cross-sectional area of the obstacle and weather conditions would determine the magnitude of the kill.”

Placement of the EES system on the eastern edge of the Salton Sea would likely interfere with bird migration patterns and create the potential for large numbers of birds to be lost due to collisions. This impact is considered unmitigable, as methods for preventing collisions in other circumstances elsewhere have been highly ineffective.

North Wetland Habitat. The impacts of the North Wetland Habitat would be similar to those described under Alternative 1.

Effect of Alternative 2 with Reduced Inflow Conditions

This alternative includes all of the facilities described under the Current Inflow Conditions plus the displacement dike, the North Wetland Habitat and Imported Flood Flows.

Impacts of Alternative 2 with reduced inflow would have a significant and unmitigable impact to upland avian resources and beneficial impacts to avian species dependent on the aquatic resources of the Salton Sea and would be similar to those described above in the current inflow scenario, except that salinity levels would drop from 75,050 mg/l to 45,510 mg/l. Most aquatic prey species can survive at this level though their populations would be stressed, resulting in an overall beneficial impact to avian species dependent on the aquatic ecosystem. Sea elevations would drop by three feet which would have little impact on nearshore habitat compared to the no-action alternative.

Displacement Dike. The impacts of the displacement dike would be similar to those described under Alternative 1 under the low flow conditions.

Import Flood Flows. In addition to those actions described above, Alternative 2 with reduced inflows would include augmenting inflow to the Sea by using flood flows from the Colorado River. Colorado River flood flows are generally available approximately every three to seven years. The flood flows would eventually be released through the Alamo River and the Coachella Evacuation Channel. Up to 300,000 acre-feet or a total of 1250 cfs could be available during flood releases over a one to four month period. Release of these high flows over an extended period would cause increased erosion in the Alamo River causing a degradation or loss of wetland habitat impacting avian species dependent on that habitat.

4.7.8 Alternative 3

Effect of Alternative 3 with Continuation of Current Inflow Conditions EES located at the Salton Sea Test Base (150kaf/year) – Showerline technology).

Construction of the EES on the former Salton Sea Test Base would have a significant and unmitigable impact to upland avian resources and beneficial impacts to avian species dependent on the aquatic resources of the Salton Sea. These impacts would be similar to those described under Alternative 2.

North Wetland Habitat. Impacts for the North Wetland Habitat would be similar to those described under Alternative 1.

Effect of Alternative 3 with Reduced Inflow Conditions (1.06 MAFY)

Construction of the EES on the former Salton Sea Test Base would have a significant and unmitigable impact to upland avian resources and beneficial impacts to avian species dependent on the aquatic resources of the Salton Sea. These impacts would be similar to those described under Alternative 2.

Displacement Dike. Impacts for this facility would be similar to those described under Alternative 1 with reduced inflow conditions.

Import Flood Flows. The impacts of the import flood flow feature would be similar to those described under Alternative 2 with reduced inflow conditions.

4.7.9 Alternative 4

Effect of Alternative 4 with Continuation of Current Inflow Conditions

South Evaporation Pond (68 kaf/year) and an EES located at Salton Sea Test Base (100 kaf/year – Showerline Technology. Construction of the concentration ponds and the EES at the Salton Sea Test Base would result in significant and unmitigable impacts to upland avian species. Impacts would be the same as those described above under alternatives 1 and 3. The combined effects of impacts to avian resources from the EES and concentration ponds under Alternative 4 would be more severe than those under alternatives 1, 2, or 3. Significant beneficial impacts would occur as salinity levels are reduced to 39,566 mg/L, compared to 52,896 mg/L under no action conditions. Aquatic resources are expected to significantly benefit by this reduced salinity which would benefit those avian species dependent on the aquatic ecosystem of the Sea. However, the sea level would drop by 5 feet causing a loss of 300 acres of nearshore habitat.

Pupfish Pond. The impacts of pupfish pond would be similar to those described under Alternative 1 under the low flow conditions.

North Wetland Habitat. Impacts for the North Wetland Habitat would be similar to those described under Alternative 1.

Effect of Alternative 4 with Reduced Inflow Conditions

Construction of the concentration ponds and the EES at the Salton Sea Test Base would result in significant and unmitigable avian resource impacts. Impacts would be the same as those described above under alternatives 1 and 3. The combined effects of impacts to avian resources from the EES and concentration ponds under Alternative 4 would be more severe than those described under alternatives 1, 2, or 3. Significant beneficial impacts would occur as salinity levels are reduced to 47,467 mg/L, compared to 75,050 mg/L under no action conditions.

Displacement Dike. Impacts for this facility would be similar to those described under Alternative 1 with reduced inflow conditions.

Import Flood Flows. The impacts of the import flood flow feature would be similar to those described under Alternative 2 with reduced inflow conditions.

4.7.10 Alternative 5

EES Located Within the North Evaporation Pond (150 kaf/year EES – Ground Mounted Spray Technology. Under Alternative 5, EES would be constructed within the north evaporation pond and ground mounted spray units would replace the tower and showerline units proposed for Alternatives 2 and 3. Construction and operation of the EES would reduce the salinity levels of the Salton Sea to 40,841 mg/L compared to 52,896 mg/L under no action conditions. Aquatic resources are expected to significantly benefit by this reduced salinity which would benefit those avian species dependent on the aquatic ecosystem of the Sea.

Effect of Alternative 5 with Continuation of Current Inflow Conditions

The level of the Salton Sea would drop by approximately 9 feet significantly impacting nearshore habitat. Approximately 600 acres of this habitat would be lost and the impacts would be similar to those described under the No Action Alternative under low flow conditions.

The construction of containment dikes, although placed completely in the Sea, would remove 5 acres of nearshore habitat. Many shorebirds use these areas for feeding year-round. Additional short-term effects of the concentration ponds would result from their attractiveness to many avian species. The ponds would appear to be suitable habitats for species searching for a feeding or resting location. Such species as the state-listed species of concern black skimmers (*Rynchops niger*) and the federal species of concern elegant terns (*Sterna elegans*) would attempt to feed in the waters even though fish could not survive in the ponds. The extremely high salinity levels of the water may have detrimental and unmitigable effects, especially for young birds and those not acquiring fish at more suitable locations. Birds feeding from the shore of these ponds, such as snowy egrets (*Egretta thula*) and great egrets (*Ardea alba*), would be exposed in a similar manner, if not more severely, as their foraging ranges tend to be smaller than those of black skimmers and elegant terns. However, operation of the ponds would result in a reduction in salinity in the Salton Sea proper, preventing the loss of the prey base for these species that would occur under no action conditions. In addition the operation of the EES system could have significant and unmitigable impacts on avian species. The extensive spray systems would create a mist of highly saline water through which birds may fly. Birds flying through this spray would become coated with highly saline water and would ingest significant amounts of salt after preening salt soaked feathers. In addition birds that land in the ponds may become encrusted with salt.

Construction and use of a haul road would affect upland avian species by direct loss of habitat and by noise that would be introduced into areas where upland species feed, nest, and roost. These effects would be mitigable if destruction of habitat is minimized and the road is removed and the footprint is restored to current conditions as quickly as possible.

North Wetland Habitat. Impacts for the North Wetland Habitat would be similar to those described under Alternative 1 with reduced inflow conditions.

Alternative 5 with Reduced Inflow Conditions

Impacts would be the same as those described above in the current inflow scenario, except that salinity levels would be reduced to 46,175 mg/L from 75,050 under the no action alternative. Although most aquatic prey species can survive at this level, their populations would be stressed. However, there still would be an overall beneficial impact to avian species dependent on the aquatic ecosystem. The Sea level would be lowered by three feet over the 30-year period with little or no impacts to nearshore habitat.

Displacement Dikes. Impacts for the displacement dike would be similar to those described under Alternative 1 with reduced inflow conditions.

Import Flood Flows. The impacts of the import flood flow feature would be similar to those described under Alternative 2 with reduced inflow flow conditions.

4.7.11 Cumulative Effects

Although there would be site-specific impacts to avian species associated with the construction and operation of select project features, the overall effect of the project on avian resources of the Salton Sea would be beneficial. However, the significant effects on upland species associated with the construction of the concentration ponds and the EES facilities and the losses due to collisions with the EES towers would combine with the effects of other proposed developments in the basin as described in Section 2 of this EIS/SIR to put further pressure on these species.

4.7.12 Mitigation Measures

To mitigate for the impacts due to the haul and construction roads, they would be scarified, plowed, and replanted to native species once construction is completed. To reduce the potential for some species of migrating birds being exposed to salt spray at the EES site radar units would be installed north and south of the site to detect migrating birds so that the system could be shut down when large flocks of migrating birds are detected. In addition air cannons would also be set off when migrating birds are detected to further reduce losses due to collision. Although this would not fully mitigate for losses, for example individual birds or small flocks of migrating birds may not be detected, losses may be significantly reduced. A monitoring plan will be instituted to further refine these mitigation methods.

4.7.13 Significant Unavoidable Impacts

Significant unavoidable impacts to avian species are discussed under the No Action Alternative and alternatives 1, 2, 3, 4, and 5. Loss of upland habitat from the construction of the EES systems and the impacts to upland birds from the loss of feeding and nesting areas is unavoidable and unmitigable. Losses from the collision of migrating birds with the EES towers and pipes and the loss of birds that land in the EES evaporation ponds also cannot be avoided.