United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-IMP-12B0018-13F0058

MAR 5 2013

Ms. Therese O. Bradford
Chief, South Coast Branch
U.S. Army Corps of Engineers
6010 Hidden Valley Road, Suite 105
Carlsbad, California 92011

Attention: Lanika Cervantes, Regulatory Branch (File No. SPL-2010-00142-LLC)

Subject: Formal and Informal Section 7 Consultation for the Authorization to Discharge Fill Material into Waters of the United States in Association with the Salton Sea Species Conservation Habitat Project, Imperial County, California

Dear Ms. Bradford:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Salton Sea Species Conservation Habitat Project (Project) and its effects on the federally endangered desert pupfish (*Cyprinodon macularius*), Yuma clapper rail (*Rallus longirostris yumanensis*), California least tern (*Sternula antillarum browni* [old name = *Sterna antillarum browni*]), southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus*) in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). The California Natural Resources Agency (CNRA or Applicant) is the non-Federal Applicant.

Your agency has determined the Project will have no effect on the California least tern as the species does not currently inhabit the Project site. In addition, as part of the ongoing monitoring of the created habitat areas, species within the Project site will be recorded on an annual/or biannual basis, therefore, if California least terns begin to inhabit the area in the future, the U.S. Army Corps of Engineers (Corps) will initiate informal or formal consultation as necessary.

Your agency has determined the Project may affect, but is not likely to adversely affect Yuma clapper rail, least Bell's vireo, and southwestern willow flycatcher. Your determination is based on the following information. Yuma clapper rail occupies habitat directly adjacent to the Project site, no suitable habitat occurs within the Project boundaries, therefore no direct impacts will occur. Because of the proximity of the occupied habitat to the Project site, indirect impacts due to noise during construction and maintenance activities may affect Yuma clapper rail. To avoid

and minimize potential indirect effects, the Applicant will prepare and implement a long-term monitoring plan to survey for bird species that occur in and around the Project area, conduct a noise analysis and implement noise attenuation measures, design interception ditches to avoid alteration of water levels in adjacent marshes, avoid impacts to sensitive and riparian habitats to the greatest extent feasible, and implement best management practices to minimize the introduction of invasive species (see Mitigation Measures BIO-2 through BIO-6 in the Biological Assessment [BA]). Additionally, pre-construction surveys for Yuma clapper rail will be conducted prior to any ground disturbing activities.

Low numbers of southwestern willow flycatcher seasonally occupy the tamarisk woodland and tamarisk scrub habitats within the Project area; least Bell's vireo does not currently occupy the Project area but could occupy the site in the future. To avoid and minimize adverse impacts to these species, vegetation removal will be conducted outside of the breeding season, which is defined as March 15 to September 15, when feasible. If vegetation removal occurs during the breeding season, the applicant will conduct pre-construction breeding and nest surveys and implement noise attenuation measures to ensure breeding and nesting activities are not adversely affected. Also, to avoid and minimize potential indirect effects, the Applicant will prepare and implement a long-term monitoring plan to survey for bird species that occur in and around the Project area, conduct a noise analysis and implement noise attenuation measures, design interception ditches to avoid alteration of water levels in adjacent marshes, avoid impacts to sensitive and riparian habitats to the greatest extent feasible, and implement best management practices to minimize the introduction of invasive species.

We do not anticipate adverse impacts to Yuma clapper rail, least Bell's vireo, or southwestern willow flycatcher with implementation of the proposed Project based on lack of species occurrence within the Project area and the aforementioned avoidance and minimization measures. Therefore, we concur with the Corps determination that the proposed Project is not likely to adversely affect Yuma clapper rail, least Bell's vireo, or southwestern willow flycatcher. Designated critical habitat for these species does not occur in the Project area; therefore, no effects to designated critical habitat are anticipated.

This biological opinion is based on information provided in the following documents: (1) *Biological Assessment for the Salton Sea Species Conservation Habitat(SCH) Project, April 2102*; (2) response to Service comments on the BA for the SCH Project, dated July 24, 2012; (3) *Draft Salton Sea Species Conservation Habitat Project Environmental Impact Statement/Environmental Impact Report* (EIR/EIS), dated August 2011; (4) various communications between the Corps, Applicant and their consulting biologists, California Department of Fish and Wildlife (CDFW), and the Service; and (5) other information available in our files.

CONSULTATION HISTORY

Between May 2012 and January 2013, staff from the Palm Springs Fish and Wildlife Office (PSFWO) worked with the Corps, Applicant, U.S. Geological Survey (USGS) Salton Sea Science Office representatives, and the CDFW to clarify the Project Description, Project build-out scenarios, effects to desert pupfish, effects to listed birds, and avoidance and minimization measures. Efforts to clarify these issues included conducting site visits and meetings, assessing baseline conditions, providing comments on the BA, providing comments on additional information received regarding effects to desert pupfish and providing a draft biological opinion to the Corps.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Species Conservation Habitat (SCH) Project is located on the southern shore of the Salton Sea (Sea), north of Westmorland in Imperial County, California. The Project site is bounded by Poe Road to the west and Hoskins Road to the east on approximately 4,098 acres of open water, exposed playa, shallow shoreline, and agricultural irrigation ditches and canals, of which 1,750 acres are managed by the Service as part of the Sonny Bono Salton Sea (SBSS) National Wildlife Refuge (NWR).

The Corps proposes to issue a Clean Water Act section 404 permit authorizing the Applicant to impact Waters of the United States associated with the SCH Project, which entails the creation, maintenance, and long-term monitoring of up to 3,770 acres of shallow saline ponds along the existing southern shoreline of the Sea near the mouth of the New River (refer to Figure 1-2 in the BA) to provide habitat for fish and wildlife dependent on the Sea, primarily piscivorous (fish-eating) bird species, and mitigate for predicted ecological hazards from a decline in the Sea's water level and related increases in salinity (Miles et al. 2009). The Project will result in a net increase in the extent of Corps jurisdictional aquatic resources by up to 1,986 acres because the created pond habitat will restore aquatic resources located between elevation -228 feet and -231 feet that have been or will be converted to uplands because of the Sea's receding shoreline.

The Sea is currently maintained by inflows of agricultural return water but has been shrinking in size as inflows are reduced as a result of water conservation and other water management actions. A rapid and substantial increase in salinity and reduction in the size of the Sea is expected as a result of inflow reductions associated with Imperial Irrigation District's (IID) Water Conservation and Transfer Project (Water Transfer Project), which entails water conservation and transfer transactions pursuant to the Agreement for Transfer of Conserved Water executed by IID and the San Diego County Water Authority in 1998, and supplemented by the 2003 Quantification Settlement Agreement and related agreements (QSA). Declining water inflows will hasten the collapse of the Sea's fish population due to increasing salinity (expected to exceed

60 parts per thousand [ppt] by 2018) and other water quality stresses, such as temperature extremes, eutrophication, and related anoxia and algal productivity. The most serious and immediate threat to the Sea's ecosystem is the loss of fishery resources that support piscivorous birds.

The creation, maintenance, and long-term monitoring of 3,770 acres of shallow saline ponds is an attempt to reduce the scientific uncertainty of identified long-term Sea restoration plans and partially reduce the aforementioned ecological hazards by providing a range of aquatic habitats, over a 75-year period, that will continue to support fish and wildlife species that are dependent on the Sea. The constructed ponds will be designed to provide habitat that will support piscivorous bird species and sustainable aquatic communities, provide suitable water quality for fish species, minimize the risk of the bioaccumulation of selenium, and minimize the risk of disease and toxicity to wildlife and plants. Likely fish candidates to be established in the ponds include one or more varieties of tilapia, which are an important forage species for fish-eating birds. Other fishes that could become established in the SCH ponds include sailfin mollies (*Poecilia latipinna*) and threadfin shad (*Dorosoma petenense*).

The Applicant will also develop an adaptive management and monitoring plan to obtain and refine information to inform future restoration efforts and define optimal parameters to support a sustainable, productive aquatic community. The main parameters subject to change include salinity, residence time[1], and depth. The parameters will be controlled by changing the amount and salinity of water delivered to the constructed ponds, the outflow to the Sea, and the total storage in the ponds.

Construction

Three independent pond units, Far West New, West New, and East New (refer to Figure 1-3 in the BA) will be constructed and supplied with a combination of water from the New River and the Sea and blended to maintain an optimal salinity range. The SCH ponds will average 2-6 feet deep and have the following approximate maximum areas and volumes:

- Far West New Pond: 514 acres, 2,305 acre-feet
- West New Pond: 1,731 acres, 6,783 acre-feet
- East New Pond: 1,139 acres, 2,870 acre-feet

[1] Residence time is the amount of time water entering the ponds from the New River and Salton Sea would reside in the ponds before being released back to the Salton Sea.

Key Project components include: pond berms, pump stations, inflow and outflow structures, water control structures, a sedimentation basin, in-pond habitat features, and an irrigation drain interception ditch. These Project features are shown on Figure 2-8 of EIR/EIS and described in Appendix D of the EIR/EIS. Berms will be constructed to create the necessary pond size, shape, and bottom configuration to provide a range of in-pond aquatic habitats. Interior berms will form smaller impoundments within the ponds and exterior berms will be constructed to separate the ponds from the Sea. Exterior berms will be aligned to not interrupt the flowpath of occasional stormflows from the watersheds that drain into the Sea. Berm construction located within the exposed playa is considered "in the dry," while berm construction within the Sea is termed "in the wet." In the wet construction will require implementing protective measures to ensure the Sea, and associated wave activity, will not erode the berm. Protective measures will involve the placement of a barrier on the Sea side of the construction area to intercept the wave action. A full description of each barrier can be found in section 2.4 of the EIR/EIS. Habitat features that may be constructed in the ponds include swales or channels, hard substrate on berms, bottom hard substrate, nesting islands, and submerged aquatic vegetation.

The ponds will be connected by and receive water from a series of gravity fed and pumped pipes. A low-lift pump station will be constructed to pump water from the New River to a sedimentation basin. A metal bridge structure will be used to support the diversion pipes across the river. The sedimentation basin will remove sediment from the New River prior to pumping the water into the ponds. The sediments will be excavated and used to maintain berms and construct new habitat features, or stockpiled for later use. The sedimentation basin will be constructed with steep slopes to prevent the establishment of emergent vegetation. The basin will total approximately 70 acres and will be fenced to prevent unauthorized access. Desert pupfish are not known to occur within this portion of the New River and therefore no desert pupfish exclusion measures or infrastructure is planned for the sedimentation basin.

A saline water pump will be located to the north of the East New pond on a structure in the Sea. Water from the Sea will be delivered to the pond intakes through a pressurized pipeline. A single inflow structure will be used to distribute the water to individual ponds. The outflow structure will consist of a concrete riser with removable flash boards and an outlet pipe (refer to Figure 2-4 in the EIR/EIS). The flash boards could be removed to adjust the water surface elevation of a pond or to reduce the water level elevation in an emergency. The top of the structure will be a weir that will maintain the maximum water surface at the -228 feet mean sea level elevation.

Water from adjacent irrigation drains that currently flow (or is pumped) directly into the Sea will be rerouted around the ponds via the interception ditches. These ditches allow for the continued connection of these drains to the Sea and not disturb the flow of agricultural drainwater from the adjacent fields. The IID will be responsible for the operation and maintenance of the interception ditch.

On-site borrow material will be needed to construct the berms and habitat features such as nesting islands. The amount of excavated material will be balanced with the amount of fill

needed for constructing the berms and other features, thus eliminating the need for importing embankment material, with the exception of imported riprap and gravel. Construction vehicles, including personal vehicles driven by workers, will use the established public roads.

Three-phase power will be required to operate the river or saline pumps. In both instances, power will have to be extended from 1 to 2 miles from the current locations to supply the pumps (refer to Figure 2-5 in the EIR/EIS). Aboveground electrical power lines extended as a result of the SCH Project will be modified with bird deterrents to prevent bird collisions and electrocutions.

Section 2.4.1 and Appendix D of the DEIS/EIR provides a more detailed description of key project features.

Operations and Maintenance

The ponds will be operated to allow for different combinations of storage, salinity, and residence times to investigate how these factors could be adjusted to provide the best conditions for fish and birds. Different operational scenarios will be tested during the first 10 years of the Project. Water will be diverted from the New River and the Sea and blended to achieve the optimal salinity within the ponds. Water from the Sea will be pumped to the ponds via an approximately 36-inch pipe. Water from the New River will be pumped via an estimated 36-inch pipe to the sedimentation basin and via an estimated 60-inch pipe to the ponds. Water from the ponds will return to the Sea via a weir outflow structure (described above).

Ongoing maintenance will include periodic dredging of the sedimentation basin; maintenance of interior and exterior berms, protective riprap, and pumps; and vegetation, erosion, and vector control. Material excavated from the sedimentation basin will be used to construct habitat features or add to the berms. The pumped diversion from the New River will be maintained to keep the diversion facilities free of sediment and also monitor the river bed elevation to be aware of any downcutting that may occur as the Sea's water level drops. The Sea pumping facilities will be maintained to reduce fouling caused by the hypersaline water flowing through the pumps. Draining the ponds will not be a routine maintenance activity, but may be required if a berm were damaged or under another type of emergency situation.

Maintenance will typically involve construction equipment such as an excavator at the New River pump and suction dredging equipment at the Sea pump. The sedimentation basin will be constructed and operated in a manner that is unsuitable for desert pupfish. Additionally, as discussed above, desert pupfish do not occur in the New River where a water pump is proposed. Therefore no impacts to desert pupfish are expected at the New River pump intake or sedimentation basin.

Long-term Monitoring

The adaptive management and monitoring plan will measure key indicators of SCH Project performance. Examples include measures of habitat (e.g., area, depth, physical structure, aquatic plant species/cover, and water quality), target species (e.g., richness, diversity, abundance, habitat use), trophic function (e.g., composition and density of forage species), and stressors (e.g., water quality and selenium concentrations). Long-term monitoring activities will include sampling of water quality, sediments, aquatic invertebrates, and avian and fish communities. Technics for sampling will include nest searches conducted by walking or kayaking in the ponds, placement of temperature data loggers within pond sediment and/or water columns that requires kayaking or walking in the ponds, and anchoring real-time water quality stations in the sediment. Key monitoring elements will include the following:

- Physical Habitat – flow rate, depth, wetted area, islands, snags, submerged vegetation, and other habitat elements;
- Water Quality – salinity, temperature, dissolved oxygen, nutrients;
- Aquatic Biota – algae, plankton, invertebrates, fish community (species, distribution, abundance);
- Birds – species, abundance and distribution, use of habitat features, breeding and nesting, sick or dead birds; and
- Contaminants – selenium concentrations in water, sediment, bird eggs, and other biota (invertebrates, fish).

For detailed information on the adaptive management and monitoring plan, see Appendix E of the EIR/EIS.

Project Implementation and Timing

Initial construction will likely focus on building the East New pond, water delivery infrastructure, and electrical utility lines. The initial construction (which may consist of the entire project or an initial phase) will begin in 2013 and take approximately 2 years to complete. The adaptive management and monitoring program will be implemented once the first pond(s) are in operation. If only a portion of the Project is constructed initially, subsequent pond construction will be based on available funding; therefore the dates and timing of build-out of entire project are unknown. Project operation, maintenance, and monitoring will occur over a 75-year period assuming continued funding is provided by the State Legislature.

Conservation Measures

The Corps and Applicant will implement the following conservation measures as part of the proposed action.

1. Monitor the depth of water during maintenance of the Sea pump station. If the water depth is 6 feet or less, the dredging footprint will be surrounded by netting, and desert pupfish will be trapped out of this enclosed space before suction dredging is performed. If salinity levels are beyond the tolerance of desert pupfish (approximately 68 ppt), avoidance and minimization measures would not be required as desert pupfish would not be present.

2. Prepare and implement a desert pupfish inoculation plan if pupfish do not naturally repopulate the ponds 1 year after ponds are filled with water. This plan will be submitted to the Service for review and approval prior to any ground disturbing activities. This plan will include, at a minimum:

    - A list of criteria to evaluate whether ponds will support desert pupfish (e.g., water quality targets, food resources, habitat features [e.g., percent cover of wigeon grass (*Ruppia maritima*)], etc.);

    - Identification of possible desert pupfish source population(s) and quantity of fish collected from each source population;

    - Capture and transport methods to minimize handling and stress as well as exposure to heat, low dissolved oxygen (DO), and crowding;

    - Desert pupfish population assessment protocol to evaluate population trends in ponds over time;

    - Annual reporting requirements; and

    - Contingency plan should the ponds not support viable populations of desert pupfish.

3. Prepare and implement an adaptive management and monitoring plan to provide for the monitoring of desert pupfish relative abundance and distribution in the SCH ponds and desert pupfish connectivity from drains around the ponds. Triggers, performance measures, and threat indicators will be identified to provide recommendations to SCH managers for maintaining or adjusting operations to ensure desert pupfish persistence in the SCH ponds and drains around the ponds (EIR/EIS, Appendix E). This plan will be submitted to the Service for review and comment prior to the SCH ponds being filled with water.

4. Prepare and implement a desert pupfish protection and relocation plan. This plan will be submitted to the Service for review and approval prior to any ground disturbing activities. This plan will include:

    - Protocols for pre-construction or pre-maintenance surveys to assess species presence and spawning within or immediately adjacent to work areas (e.g., in the drains/drain channels, along the shoreline if construction is in the "wet," and around the pond margins for maintenance);

    - Capture (e.g., trapping in the drains for construction and maintenance; or trapping, dip netting, and seining in the ponds if drained or if the water level is dropped) and transport methods to minimize handling and stress as well as exposure to heat, low DO, and crowding;

    - Identification of locations for release of captured desert pupfish;

    - Timing windows when construction or maintenance in shallow shoreline areas and in the drain mouths/channels may be conducted with minimal effects on desert pupfish spawning;

    - Maintenance protocol for the 1/4-inch mesh screen on the Sea water intake until salinity reaches 68 ppt; and

    - Adaptive management procedures that include assessment of conservation measure effectiveness, development of revised measures to improve effectiveness, and similar assessment of revised measures to verify effectiveness.

Action Area

According to 50 CFR § 402.02 pursuant to section 7 of the Act, the "action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The action area includes the lower reaches of the New River within approximately 5 miles of their confluence with the Sea, adjacent upland areas (primarily agricultural) that could be disturbed during construction, and operation of water conveyance systems from the diversion locations to the created habitats and irrigation drains and 2 miles of new transmission corridor along existing roads in the area. Additionally, the action area includes the potential sources of desert pupfish populations for the initial and ongoing stocking of the SCH ponds. These populations would include Tier 1 populations, that is, those naturally occurring in the Sea, associated irrigation drains, and shoreline pools, as well as those in Salt Creek, San Felipe Creek, and a wash located just south of Bombay Beach.

STATUS OF THE SPECIES

Desert Pupfish

The desert pupfish, listed as endangered in 1986, is a small fish, less than 3 inches long, belonging to the Cyprinodontidae family of fishes (Moyle 2002). The desert pupfish has a tolerance for high temperatures, high salinities, and low dissolved oxygen concentrations that exceed the levels known for other freshwater fishes (Service 1993). Although desert pupfish are extremely hardy in many respects, they prefer quiet water with aquatic vegetation (Schoenherr 1992), and they are vulnerable to competition or predation and thus can be displaced by nonnative fishes (Martin and Saiki 2009). Desert pupfish populations also experience significant temporal fluctuations in distribution and abundance (Varela-Romero et al. 2002). Habitats include clear, shallow waters with soft substrates associated with cienegas, springs, streams, margins of larger lakes and rivers, shoreline pools, and irrigation drains and ditches.

Critical habitat was designated in 1986 along portions of the San Felipe Creek, and two of its tributaries, Carrizo Wash and Fish Creek Wash, in Imperial County, California (Service 1986). The areas designated as critical habitat include approximately 11 miles of a channel along San Felipe Creek and all of its tributaries and a riparian buffer zone of 100 feet on both sides of the stream channel. A total of approximately 770 acres of critical habitat were designated. The desert pupfish reproduces successfully in the San Felipe Creek. These stretches provide adequate food and cover. They are at least partially isolated from predatory and exotic fishes.

Please refer to our desert pupfish 5-year review for more specific information on the species description, habitat affinities, life history, status and distribution, threats, and conservation needs across its current range (Service 2010). The 5-year review is available at: http://ecos.fws.gov/docs/five_year_review/doc3573.pdf.

Recovery

The desert pupfish recovery plan was finalized in 1993. A three-tiered approach was developed to maintain the genetic diversity in remaining naturally occurring wild desert pupfish populations (i.e., Tier 1), establish second tier populations from wild stock where individuals could be exchanged to maintain genetic variability, and establish third tier populations in "quasi-natural" refugia to ensure the long-term persistence of desert pupfish (Service 1993).

The objectives of the recovery plan are to preserve extant naturally occurring populations, establish additional populations in protected habitats within the probable historic range, and describe actions necessary to eliminate threats to extant populations to downlist the species, as delisting the species is not considered feasible in the foreseeable future because of insoluble threats and limited habitat. To attain these objectives, the following actions are necessary:

protect natural populations (Tier 1[2]), reestablish new populations (Tier 2), establish and maintain refugia populations (Tier 3), develop protocols for the exchange of genetic material between stocked desert pupfish populations, determine factors affecting population persistence, and develop information and education to foster recovery efforts (Service 1993).

Collectively, there are 11 extant Tier 1 populations of desert pupfish known in the wild in the United States and Mexico; 5 in California, 1 in Arizona, and 5 in Mexico. Although many re-introductions have been attempted, approximately 16 transplanted Tier 2 populations of the desert pupfish exist in the wild at present, all in Arizona. There is a total of 46 captive or refuge desert pupfish populations (that do not qualify for the Tier 3 category), comprised of 27 in Arizona, 15 in California, and 4 in Sonora, Mexico. The rangewide status of desert pupfish is poor but stable. The fate of the species depends heavily upon future developments in water management of the Sea and Santa de Clara Cienega in Mexico (Service 2010).

Much of the research on desert pupfish since the 1993 recovery plan addresses genetics issues, the taxonomy of the *C. macularius* group, and effects of selenium. Since the isolated nature of desert pupfish populations reduces the flow of genes between sites, inbreeding and genetic drift can be reasonably expected to occur without intervention and captive populations of desert pupfish have diverged significantly from wild fish (Turner 1983, Echelle et al. 2007, Koike et al. 2008, Loftis et al. 2009).

More information on the recovery of desert pupfish can be found in our desert pupfish 5-year review and recovery plan (Service 1993).

ENVIRONMENTAL BASELINE

The regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have previously undergone section 7 consultation, and the impacts of State or private actions that are contemporaneous with the consultation in progress.

As described above, the action area is located on the southern end of the Sea, near the mouth of the New River, in Imperial County, California, and is partially located within the SBSS NWR. The Sea is a large shallow saline lake formed by an accidental and temporary diversion of Colorado River water in the early 1900s (Walker 1961) and is currently maintained largely by runoff from agricultural irrigation in the Salton Basin. Land cover within the action area includes agriculture, common reed marsh, drainage ditch, mudflat, open water, shoreline pools, exposed

[2] Definitions for Tier 1, 2, and 3 populations; wild or captive populations; and viable populations are all found in the recovery plan (Service 1993).

playa, tamarisk scrub and tamarisk woodland, and disturbed and developed areas (refer to Table 4-1 in the BA).

The NWR was established in 1930 as a sanctuary and breeding ground for birds and other wildlife. Over time, agricultural runoff into the Sea increased, gradually inundating the land that had been set aside for the NWR. Today, most of the NWR is submerged beneath the Sea, and 2,500 acres are managed as part of the NWR. Of the 2,500 acres, 920 acres are managed as wetlands to support resident shorebirds, seabirds, and other water-dependent bird species; the remaining acreage is included in dikes, shoreline, nesting islands, and saltflats/mudflats. The managed areas are split into two units approximately 18 miles apart. Each unit contains managed wetland habitat to support shorebirds, seabirds, and other water dependent bird species, as well as areas of intensely managed crop fields.

Within the action area, critical habitat occurs along portions of San Felipe Creek, as described in the status of the species section above. Primary constituent elements include clean unpolluted water that is relatively free of exotic organisms, especially exotic fishes, and small slow-moving desert streams spring pools with marshy backwater areas (Service 1986).

Section 7 consultations within the action area affecting the desert pupfish include the Bureau of Reclamation (BOR) Voluntary Fish and Wildlife Conservation Measures and Associated Conservation Agreements with the California Water Agencies (i.e., Water Transfer Project; Service 2002), Coachella Canal lining (Service 2005), BOR's Shallow Water Habitat Pilot Project (Service 2008b), and the Coachella Valley Multiple Species Habitat Conservation Plan (Service 2008a). These consultations concluded these projects would not jeopardize the continued existence of desert pupfish with implementation of conservation measures and the terms and conditions of those consultations. Factors affecting the species in the action area as a result of the aforementioned projects are discussed below.

Factors Affecting Desert Pupfish within the Action Area

Factors affecting desert pupfish within the action area include water conservation and transfer projects, water quality degradation, predation/competition, climate change, and population monitoring and relocation activities.

As a result of the completion of the QSA, which incorporated the Water Transfer Project, a decrease in agricultural return water will result in water reductions to IID irrigation drains supporting desert pupfish that flow into the Sea; this will likely result in a loss of desert pupfish habitat and increases in selenium concentrations in those drains. To offset adverse effects to desert pupfish from reductions in water and increases in selenium, conservation measures were developed to maintain viable populations of desert pupfish in the action area by maintaining or increasing desert pupfish habitat in IID's irrigation drains relative to current levels (i.e., no net loss) and maintaining desert pupfish connectivity among drain populations (Service 2002). The

BOR and IID are responsible for maintaining habitat within the drains that support desert pupfish and to ensure the drains remain connected to the Sea until the Sea becomes too saline to support desert pupfish (i.e., when salinity reaches approximately 68 ppt). They are also responsible for conducting studies and developing a plan to ensure genetic interchange continues among the desert pupfish populations in the drains once the Sea becomes too saline (Service 2002).

The Coachella Canal was lined in 2006 to conserve water and help California reduce its use of Colorado River water. A result of the lining project was a reduction in the amount of water seeping in the groundwater aquifer and Salt Creek, leading to a decline in desert pupfish populations inhabiting Salt Creek. As part of the environmental commitment plan for the Coachella Canal lining project, the lead agencies (Coachella Valley Water District and BOR) have committed to maintaining the existing baseline flows (623 acre-feet per year) in Salt Creek as measured at the USGS gauge near the Sea. This commitment, in combination with ongoing salt cedar removal and restoration in the Salt Creek watershed, is intended to ensure that impacts from the lining-associated reductions in seepage to the existing aquatic habitats used by desert pupfish in Salt Creek are avoided.

In 2006, BOR and USGS constructed a 123-acre experimental pond complex that consisted of four inter-connected, shallow saline habitat ponds at the southeastern shoreline of the Sea that were filled with blended waters from the Alamo River and the Sea (Miles et al. 2009). While an attempt was made to exclude fish, surveys in 2007 yielded 3,620 fish representing five fish species. Desert pupfish, the only native species encountered, was the most numerous, and comprised approximately 93 percent of the catch (Saiki et al. 2011). In 2010, the project was decommissioned and an estimated 1 million desert pupfish were rescued and relocated to a dozen irrigation drain habitats surrounding the Sea and to refugia ponds at Anza Borrego, Dos Palmas, Oasis Springs, Salton Sea State Recreation Area, and the Living Desert. Additionally, hundreds of thousands of desert pupfish were released to the Sea via the S Drain and its direct connection to Morton Bay (Service 2010).

The Sea is listed as an impaired water body due to elements leached and concentrated by agricultural irrigation, with selenium being the most problematic of the elements (Miles et al. 2009). While selenium is essential for metabolic function, it is toxic at elevated doses (Ohlendorf 1998). Because of the Water Transfer Project described above, selenium concentrations in IID drains could increase in the action area and harm the desert pupfish. Published selenium toxicity studies (DeForest and Adams 2011, Janz et al. 2010, Lemly 1993) suggest that levels of selenium contamination detected in the action area may pose a risk of chronic toxicity to selenium-sensitive fish (Besser et al. 2012). In laboratory studies exposing desert pupfish to selenium, results suggest that desert pupfish reproduction may be reduced in selenium contaminated habitats, but also demonstrate that juvenile and adult desert pupfish can tolerate high levels of selenium exposure (Besser et al. 2012). Additionally, Saiki et al. (2012) concluded that ambient concentrations of selenium in the action area may not be sufficiently

elevated to adversely affect reproductive success and survival of desert pupfish but that toxic thresholds for selenium in fishes from the Sea remain poorly understood.

Nonnative fish, such as tilapia, longjaw mudsuckers, and sailfin mollies, are potential predators of and/or competitors with desert pupfish (Martin and Saiki 2005) and predation and competition with these nonnative fish contributes to the decline of desert pupfish in the Sea (Martin and Saiki 2009; Service 2010). These nonnative fish species are present in the action area and the SCH ponds will be stocked with tilapia to support the piscivorous bird species.

Changes in weather patterns associated with global climate change, particularly the timing and amount of rainfall in the Sonoran Desert, has the potential to adversely affect desert pupfish in the action area. Assessments for the Sonoran Desert are few, but since the 1970s, the region appears to have experienced widespread warming trends in winter and spring, increased minimum winter temperatures, and more variable precipitation (Weiss and Overpeck 2005). Localized projections suggest the southwest may experience the greatest temperature increase of any area in the lower 48 States (IPCC 2007), with warming in southwestern States greatest in the summer (IPCC 2007). The IPCC also predicts hot extremes, heat waves, and heavy precipitation will increase in frequency (IPCC 2007). There is also high confidence that many semi-arid areas like the western United States will suffer a decrease in water resources due to climate change (IPCC 2007), as a result of less annual mean precipitation and reduced length of snow season and snow depth (IPCC 2007). Therefore, the effects of water depletion associated with global climate change may adversely affect desert pupfish in the action area due to a reduction and degradation of habitat and habitat fragmentation; however, at this time the level of uncertainty in climate predictions is high. So while we recognize that climate change is an important issue with potential effects to desert pupfish and their habitats, we lack adequate local information to make accurate predictions regarding the magnitude of potential effects to the desert pupfish (Service 2010).

The CDFW has undertaken trap and release surveys for desert pupfish in the irrigation drains and refugia habitat within the action area on multiple occasions over the last 25 years. Although intermittent during the 1980s and 1990s, they have undertaken a quarterly sampling of most sites over the last 10 years. As a result of the expertise of their staff, mortality incidents associated with trapping for surveys have been extremely limited (S. Keeney, CDFW, 2013a, pers. comm.).

Status of the Species in the Action Area

Desert pupfish were abundant along the Sea's shoreline through the 1950s (Barlow 1961). During the 1960s, the numbers declined, and by 1978 they were noted as scarce and sporadic (Black 1980). Declines are thought to have resulted from the introduction and establishment of several exotic tropical fish species into the Sea (Bolster 1990, Black 1980). These introduced species prey on juveniles (Martin and Saiki 2005) and eggs (Schoenherr 1988), compete with desert pupfish for food and space (Moyle 2002), and disrupt breeding (Schoenherr 1988). Other

factors responsible for declines in desert pupfish populations in the action area include habitat modification due to water diversions and groundwater pumping for agriculture (Black 1980). There is also concern that introduced saltcedar (tamarisk) near desert pupfish habitat may cause a lack of water at critical times due to evapotranspiration (Service 1993). Aerial pesticide application is a common practice around the Sea that may also affect desert pupfish populations (Service 1993).

Currently, desert pupfish numbers in the Sea are relatively low and patchily distributed in Salt Creek and San Felipe Creek, within the mouths of irrigation drains that discharge directly to the Sea, and along the southern shoreline of the Sea in shoreline pools (Service 2010; S. Keeney, CDFW, 2013b, pers. comm.). There are 36 irrigation drains within the action area that have been monitored by CDFW over the last decade, these desert pupfish populations fluctuate seasonally, but have persisted. These drains allow connectivity to shoreline pools, at least seasonally, and may be necessary to prevent desert pupfish from becoming stranded within drain habitats that periodically dry out (Sutton 2002; S. Keeney, CDFW, 2013c, pers. comm.). Maintaining these populations and connections in the long-term has been determined to be necessary for the recovery of the species (Service 1993). Based on our current understanding, this includes maintaining the drain populations and providing for desert pupfish movement between individual drains (Service 2010). Desert pupfish are not known to occur nor are they expected to occur in the New River because of the high sediment loads, excessive velocities, and presence of predators (J. Crayon, CDFW, 2013a, pers. comm.).

In addition to the aforementioned naturally occurring desert pupfish populations, this species also occurs in several refugia locations (i.e., Tier 3 populations) within the action area. There are four viable desert pupfish populations at Dos Palmas and two desert pupfish refugia populations at Oasis Springs, one is stable and one is declining. There was a desert pupfish refugia population at Salton Sea State Recreation Area, but desert pupfish no longer occur there for unknown reasons. CDFW monitors and maintains these refugia populations.

Surveys for the desert pupfish were not conducted as part of the SCH Project, but past occurrences of the species are documented in the California Natural Diversity Database ([CNDDB]; refer to Figure 4-1in the BA), and based on ongoing monitoring by CDFW, desert pupfish are presumed extant in these locations. However, because desert pupfish move between the irrigation drains and the Sea (Sutton 2002), desert pupfish could be present anywhere within the edge of the Sea containing suitable habitat and within drains that are tributary to the Sea. Therefore, to provide an estimate of suitable habitat within the Project area, a desert pupfish habitat model, based on shoreline habitat (using elevation gradients and open water), marsh areas, and irrigation drains, was developed (Dudek 2013). The compilation of parameters resulted in a model that contains approximately 1,359 acres of suitable desert pupfish habitat (see Figure 1) within the direct SCH Project impact area.

EFFECTS OF THE ACTION

The regulations implementing the Act (50 CFR §402.02) define effects of the action as the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

Direct Effects

Construction

Construction of the project will result in destruction of desert pupfish habitat, desert pupfish mortality, and loss of connectivity between irrigation drain desert pupfish populations and shoreline pools. Destruction of habitat was determined by overlaying the Project footprint with the model described above. The proposed Project will permanently impact 26.1 acres and temporarily impact 22.3 acres of modeled habitat (Table 1), most of which is modeled as shoreline habitat. Permanent impacts are primarily the result of berm construction (22.8 acres), but also include construction of the interception ditch (3 acres) and the sedimentation basin (0.3 acre). All temporary construction impacts will occur within the interstitial areas (areas between the berms and Project boundary, between the berms and the interception ditch, and between the Project boundary and interception ditch).

Table 1. Permanent and Temporary Impacts within each Pond Area.

Pond Area/Pupfish Habitat Type	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)
East New			
Agriculture Drain	0.0	0.1	0.2
Shoreline	9.2	6.0	15.2
West New			
Agriculture Drain	0.3	0.4	0.7
Shoreline	8.9	4.7	13.6
Far West New			
Cattail Marsh	0.5	0.7	1.2
Shoreline	7.2	10.3	17.5
Total*	**26.1**	**22.3**	**48.5**

* Numbers may not total due to rounding.

Destruction of desert pupfish habitat will be offset by providing suitable habitat within the SCH ponds and interception ditch. Although the SCH ponds are not specifically designed to provide

desert pupfish habitat, the shallow water within them will contain features similar to those of the existing shoreline pools. These features include an extensive shallow (2-3 feet) area; establishment of wigeon grass (*Ruppia maritima*) that would provide substantial food, cover, and structure for desert pupfish and invertebrates they prey upon; and a range of salinities (S. Keeney, CDFW, 2013d, pers. comm.). These variables are similar to those found in the BOR/USGS experimental pond complex that supported hundreds of thousands of desert pupfish (Saiki et al. 2011). However, because these ponds will not provide connectivity between the irrigation drains and are quasi-natural (e.g., man-made) habitats, we consider them Tier 3, refugia habitat. We anticipate the SCH ponds will support up to 1,693 acres of refugia habitat over the life of the project (Table 2). The Project will also support up to 10 acres of channel (i.e., interception ditch) habitat. However, this channel habitat will need to be monitored and maintained to ensure desert pupfish occupy and move within the channel. This will ensure connectivity between the channel and drains is maintained so the naturally occurring desert pupfish populations within the drains will be able to move between the channel and drains should dewatering or contamination of the irrigation drain occur (Sutton 2002, Service 2010).

Table 2. Estimated Suitable Desert Pupfish Habitat within each Pond Area.

Pond Area/Pupfish Habitat Type	Estimated Acres
East New	
Suitable Pond Related Habitat	570
Channel Habitat	2
West New	
Suitable Pond Related Habitat	866
Channel Habitat	5
Far West New	
Suitable Pond Related Habitat	257
Channel Habitat	3
Total	**1,703**

Because desert pupfish are or could be present in irrigation drains and in shallow water along the Sea's shoreline, construction activities for the SCH ponds and diversion of the drain outflows into the interception ditch around the Project area would result in mortality of individuals and could disrupt spawning, depending on time of year. Desert pupfish mortality in these direct impact areas will be difficult to quantify due to the small size of this species, individuals may be buried in the sediments (Sutton 1999), and numbers of pupfish fluctuate. However, per the desert pupfish protection and relocation plan (conservation measure 4), prior to construction activities, pupfish presence and spawning within, or immediately adjacent to, work areas will be assessed to determine optimal timing windows to remove pupfish from direct impact areas to reduce mortality. Therefore, we anticipate mortality associated with construction will be minimized. Additionally, once project construction is completed, we anticipate desert pupfish will recolonize irrigation drains and move between drains via the interception ditch.

Construction of the pump station and pipeline to provide Sea water to the ponds would be from a barge and the adjacent berm and would temporarily affect a small area of the Sea, primarily through underwater sound and turbidity. We anticipate a small number of desert pupfish would be injured and/or killed by this construction activity because construction would take place in deep, turbid water not occupied by desert pupfish (Black 1980). As the Sea recedes, the outer pump station would need to be moved, or another one built, and the pipeline extension placed on or within the exposed Seabed. By that time, salinity in the Sea would likely exceed the tolerance of desert pupfish and desert pupfish would not be present, so relocation of the pump station would have no effect on desert pupfish.

Irrigation drains occupied by desert pupfish that currently drain to shoreline pools would be diverted around the SCH ponds by an interception ditch (see Figure 2). Habitat used by desert pupfish in those drains would remain, but the individual drain connections that currently connect desert pupfish to shoreline pools would be combined into three connections (see Figure 2). Desert pupfish connectivity to shoreline pools should remain at these three drain extensions, assuming the habitat at the terminal end of these extensions is suitable, e.g., sand-silt substrate, relatively shallow water (3 feet or less in depth), and minimal surface flow (Moyle 2002). However, the Project would result in a reduction of existing shallow shoreline habitat compared to current conditions. We have no data to determine if desert pupfish will be able to move around (outside) the ponds via the Sea until salinity exceeds their tolerance in about 2020. However, water released to the Sea via the weir structure is generally expected to have only negligible, localized effects on desert pupfish through minor changes in salinity, turbidity, selenium, and nutrients (Crayon 2013a, pers. comm.). It is expected that desert pupfish will avoid discharge areas that may periodically have unsuitable water quality conditions and instead utilize adjacent portions of the Sea that have suitable conditions (Crayon 2013a, pers. comm.). Additionally, loss of connectivity of desert pupfish populations in the drains and shoreline habitat would occur in approximately 2020 once the Sea becomes too saline to support desert pupfish, making the Project's effects on connectivity temporary compared to future conditions (i.e., the No Action Alternative analyzed in the EIR/EIS).

The magnitude of the near term loss of connectivity on desert pupfish is uncertain considering the lack of information that specifically addresses desert pupfish dispersal within the drains and shallow shoreline of the SCH Project area (Sutton 2002). However, the proposed Project will likely impair the dispersal of desert pupfish, compared to current conditions, and could result in mortality because desert pupfish could be stranded in habitats that cannot sustain them for prolonged periods (Sutton 2002). The interception ditch is designed to allow for drain connectivity and may help to avoid isolation of desert pupfish populations and reduce mortality. IID will be responsible for operating the interception ditches after project construction (IID 2013) to ensure pupfish populations persist and drain populations remain connected.

Predation/Competition

The addition of other fish species in the SCH ponds will likely result in competition, and possibly predation, of desert pupfish. Research on the relationship of desert pupfish abundance to selected environmental variables indicate that desert pupfish numbers were high when mosquitofish were numerous, but desert pupfish numbers were low when porthole livebearers, tilapias, mollies, and longjaw mudsuckers were numerous (Martin and Saiki 2005). Because the SCH ponds will be stocked with fish that limit desert pupfish numbers (e.g., tilapia, sailfin mollies), we anticipate some mortality due to predation and competition. However, CDFW biologists anticipate desert pupfish will persist in the ponds based on several decades of monitoring desert pupfish that persist in habitats where these other fish species are part of the community (J. Crayon, CDFW, 2013b, pers. comm.) and the success of desert pupfish in the BOR/USGS experimental ponds (Saiki et al. 2011). We anticipate some mortality of desert pupfish due to predation/competition; however, we do not have enough information to quantify this effect. The SCH adaptive management and monitoring program will provide information regarding persistence of desert pupfish in the SCH ponds and determine if additional management is necessary to ensure desert pupfish persist in the ponds (conservation measure 3).

Selenium

As stated above, selenium is present in the IID drains inhabited by desert pupfish and will likely accumulate because of water transfer projects. While a Project goal is to minimize selenium accumulations in the ponds, dredging during construction has the possibility of stirring up sequestered selenium and releasing it back into the water column. However, the general consensus among selenium researchers is that fish accumulate most of their selenium burdens by eating contaminated foods (Stewart et al. 2010); recent laboratory and field research indicates juvenile and adult desert pupfish can tolerate high levels of selenium exposure (Besser et al. 2012) and current ambient concentrations are not sufficiently elevated to adversely affect reproductive success and survival of desert pupfish (Saiki et al. 2012). Therefore, we anticipate no mortality to desert pupfish due to selenium exposure. Additionally, the adaptive management and monitoring program will be developed to monitor and manage selenium levels to minimize effects to desert pupfish (conservation measure 3).

Operations, Maintenance, and Monitoring

Operations, maintenance, and monitoring will include: sedimentation basin operations; infrastructure maintenance; erosion control structure maintenance; vegetation control; and vector control. These activities have the potential to directly affect desert pupfish that are present in these areas by increased turbidity, disturbance of feeding and spawning areas, and direct mortality. As stated in the project description above, desert pupfish are not expected to occur in the New River near the proposed sedimentation basin and New River pump station, therefore adverse effects from sedimentation basin and New River pump station maintenance and operations are not anticipated.

Operation and maintenance of the pump station to bring saline water to the ponds has the potential to entrain desert pupfish until the Sea becomes too saline for their survival. The intake will be screened until that time to exclude adult size desert pupfish from entering the system. However, the mesh would allow larval desert pupfish and eggs to enter the pumps. If larval fish and/or eggs are entering the system through the intakes, some mortality is likely to result from the pumping process. However, due to the proposed location of the pump station (adjacent to the outer berm and offshore from the ponds), few desert pupfish are likely to killed or injured by pump operations and maintenance activities. Additionally, conservation measure 1 would help to reduce the number of desert pupfish that become entrained by pump station maintenance.

Under certain situations it may become necessary to rapidly reduce water elevations in a pond, such as emergency repair of water control structures or berms, sudden change in pond water quality, or noxious species control. Draining of the ponds could occur as a result of these situations, but complete draining would not be utilized as a typical pond management action. Therefore, low areas of the ponds would retain water and act as temporary refugia for desert pupfish, by allowing either the salvage of the remaining fish or leaving fish in place as recruitment stocks for re-establishing fish populations in the ponds. We anticipate mortality to desert pupfish in the event ponds are drained, however we cannot quantify the magnitude of mortality associated with this event because we do not know the number of fish the ponds will support and desert pupfish populations fluctuate over time. However, we anticipate these events to be temporary and complete extirpation of desert pupfish in the ponds would not occur during these water level reduction or draining events.

Vector control would be modeled after the Mosquito Monitoring Program for the SBSS NWR to reduce impacts to desert pupfish. A study of the impacts of pyrethrin on aquatic invertebrates in wetlands on Sutter NWR indicated no decrease in total abundance of invertebrates (Jensen et al. 1999). Therefore, use of bacterial larvicides in desert pupfish habitat is expected to have minimal effects on invertebrate prey used by this species and no direct toxicity effects on desert pupfish are expected. Cumulative effects of larviciding and adulticiding on desert pupfish are difficult to estimate, but it is probable that they would have a negligible impact because of the expected short duration of applications, the short life time of the treatment agents in the environment, and the normal quick response of insects to reinvade habitats.

Most monitoring activities are associated with bird operations and are not expected to be intrusive or harmful to desert pupfish. The direct effects of monitoring activities, such as kayaking or walking across the ponds, are minimal but may include water and sediment disturbance, but the effect of this disturbance is small and localized. Sampling for water, sediments, and aquatic invertebrates may result in minor disruptions to the desert pupfish. Neither of these activities is likely to result in injury or mortality given their nature and scale and the water disturbance associated with monitoring will flush fish from the area. Direct monitoring of desert pupfish using minnow traps, gill nets, and/or seines could result in injury or mortality,

but because the monitoring will be conducted by CDFW staff experienced with this activity, desert pupfish injury and mortality is expected to be low.

During the purposeful capture, transport, and release of desert pupfish associated with construction, operation, maintenance, and monitoring of SCH ponds, individual desert pupfish may be injured or killed. However, conservation measure 4 would avoid and/or minimize the likelihood of injury or mortality from capture, transport, and release activities and these activities will be conducted by CDFW staff experienced in these activities. Therefore, desert pupfish injury and mortality is expected to be low.

We anticipate adverse impacts from operations, maintenance, and monitoring would be offset by the conditions conducive to survival and reproduction of desert pupfish in the SCH Ponds and interception ditches, specifically we anticipate large numbers of desert pupfish will be supported by the 1,693 acres of suitable pond related habitat and 10 acres of channel habitat (Table 2) that would be constructed.

While we anticipate the 10 acres of drain interception ditches (channel habitat) will provide habitat for desert pupfish, maintenance and monitoring of these ditches could cause periodic disturbance within that habitat and could result in disturbance to spawning or mortality of some individuals. IID will be responsible for operations and maintenance of the interception ditches after project construction (IID 2013).

IID is currently maintaining the irrigation drains shown on Figure 2 to support persistent populations of desert pupfish. Once the interception ditches associated with the SCH project are built, IID will continue to maintain those drains pursuant to the conservation measures identified in the 2002 Water Transfer Project biological opinion (IID 2013). Therefore, we anticipate desert pupfish populations will persist in these drains once the SCH project is constructed and operated.

Indirect effects

Inoculation of SCH Ponds

The SCH Ponds, once constructed, will be inoculated with desert pupfish if the species does not naturally recolonize. Potential sources of desert pupfish for the initial stocking of the SCH ponds would include Tier 1 populations, that is, those occurring in the Sea, associated irrigation drains, and shoreline pools, as well as those in Salt Creek and a wash located just south of Bombay Beach. Because of the remote location, the San Felipe Creek population will likely not be used as a source for the initial stocking but would be considered for subsequent inoculations of one or two fish per year. The determination of the source populations will depend on a number of factors, primarily the status of the desert pupfish populations as well as the environmental conditions in a given habitat at the time of desert pupfish capture and translocation. The number

of desert pupfish collected from any single site will not exceed 10 percent of the total number of desert pupfish captured and desert pupfish will not be collected if less than ten desert pupfish are captured from any one source site. Staff from CDFW experienced with collection, monitoring, and relocation of desert pupfish will conduct the collection and inoculation activity and an inoculation plan will be developed in coordination with the Service (conservation measure 2). Because CDFW has extensive experience collecting and relocating desert pupfish, this activity is not likely to result in injury or mortality to source populations.

Bird Predation

The purpose of the SCH Project is to study bird use of the shallow habitat. The area attracts various bird species throughout the year. Desert pupfish may become a food source for the fish eating birds inhabiting the project area. For example, brown pelicans and great egrets were observed foraging successfully on desert pupfish in the BOR/USGS experimental ponds (Service 2008b). However, birds that forage for small fish would prey on sailfin mollies and mosquitofish as well; and surface gleaners and skimmers would find sailfin mollies and mosquitofish more accessible, since these fishes are usually active higher in the water column than are desert pupfish (Corps/CNRA 2011). If the numbers of desert pupfish that occupy the SCH ponds are similar to the numbers supported by the BOR/USGS ponds, predation impacts would be offset by the conditions conducive to survival and reproduction of desert pupfish in the SCH ponds.

Critical Habitat

Designated critical habitat occurs along portions of the San Felipe Creek, as described in the status of the species section above. However, we do not anticipate any modification to designated critical habitat or adverse effects to primary constituent elements because activities associated with the proposed Project within designated critical habitat are limited to small numbers of desert pupfish collection to be used as a source for inoculation of the SCH ponds as described above. Therefore, desert pupfish designated critical habitat will remain functional to serve its intended conservation role for the species.

Effects on Recovery

The final recovery plan for the desert pupfish (Service 1993) contains the following recovery (downlisting) criteria: protect natural populations (Tier 1), reestablish new populations (Tier 2), establish and maintain refuge populations (Tier 3), develop protocols for the exchange of genetic material between stocked desert pupfish populations, determine factors affecting population persistence, and develop information and education to foster recovery efforts (Service 1993). The project will result in a permanent loss of 25.3 acres of shoreline habitat that either currently supports or could support natural populations of desert pupfish. However, the sea side of the ponds could provide shoreline habitat that would offset this loss but we have no data to determine if desert pupfish will be able to move around (outside) the ponds, which would

maintain connectivity. This loss of shoreline areas supporting natural populations of desert pupfish could limit recovery but once the Sea exceeds desert pupfish salinity tolerance, in about 2020, these areas will be lost with or without implementation of the Project. The addition of 1,693 acres of pond habitat will increase the reproduction and dispersal of the species in the action area, assuming the ponds support viable, reproducing desert pupfish populations.

The Project will ensure the natural populations of desert pupfish that occur in the drains are interconnected and remain viable as desert pupfish habitat for the 75-year term of the project, assuming IID maintains these drains to support desert pupfish. Also, SCH desert pupfish populations will serve as refugia populations (i.e., Tier 3) for the species and as source populations for other efforts to reestablish these species into suitable habitats to help achieve the aforementioned recovery goals. Therefore, the Project is consistent with desert pupfish recovery and should not preclude recovery.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is unaware of any future State, Tribal, local or private actions reasonably certain to occur in the action area (that will not undergo a section 7 consultation) that will adversely affect desert pupfish.

CONCLUSION

After reviewing the status of the desert pupfish, the environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the Project, as proposed, is not likely to jeopardize the continued existence of the desert pupfish and is not likely to result in the destruction or adverse modification of desert pupfish designated critical habitat.

The proposed action is not likely to appreciably reduce the likelihood of survival and recovery of desert pupfish by appreciably reducing the reproduction, numbers, or distribution of the species because:

1. Connectivity between drains will be maintained via the interception ditch to allow for movement from dewatered or contaminated areas and genetic exchange.

2. Approximately 1,703 acres will be monitored and managed to ensure desert pupfish persist in the interception ditch and constructed SCH ponds.

3. The SCH ponds will provide approximately 1,693 acres of additional refugia habitat (suitable pond related habitat) for the species and support source populations for other efforts to reestablish desert pupfish into suitable habitats throughout its range to achieve recovery goals.

4. Based on current models, the Sea would become too saline for desert pupfish in approximately seven years; therefore, the loss of shoreline habitat would occur with or without the proposed Project.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the Applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the Applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Because of the variability in desert pupfish populations anticipated over time for the occupied and potentially occupied areas likely to be affected by SCH activities over the 75-year term of the project, it is not possible to specify a number of desert pupfish anticipated to be taken as a result of construction associated with the SCH Project.

Construction

We anticipate that all desert pupfish occurring in the irrigation drains and along the shoreline in the 48.5 acres of modeled habitat will be killed or injured by Project construction activities. Should Project construction destroy more than 48.5 acres of modeled habitat (not including modeled habitat converted to SCH ponds), authorized incidental take would be exceeded.

Operations and Maintenance

We expect that a small proportion of larval fish and/or eggs will be killed or injured by entering the system through the water intake pipes. Also, injury or mortality of desert pupfish will occur when ponds are deliberately drained or water levels are reduced in response to emergency situations. For the reasons stated above, it is not possible to specify a number of desert pupfish anticipated to be taken as a result of operations and maintenance associated with the SCH Project. However, we anticipate incidental take associated with these activities would not result in extirpation of desert pupfish from the SCH ponds. If monitoring determines that these activities have extirpated desert pupfish from any of the ponds then authorized incidental take would be exceeded. Criteria to determine if pupfish populations have been extirpated due to these activities will be developed by the Service, in coordination with CDFW, and included in the adaptive management and monitoring plan.

Take of desert pupfish in association with operations and maintenance of the interception ditches is not exempted under this consultation.

Capture, Transport, Release, and Monitoring

Desert pupfish clearance and relocation activities necessary to implement the desert pupfish protection and relocation plan and adaptive management and monitoring plan would require capture of desert pupfish using minnow traps, gill nets, and/or seines as appropriate to the circumstances. CDFW staff or other qualified individuals contracted to complete the work would use CDFW methods to trap and remove desert pupfish from the areas to be impacted. In some limited cases there may be mortality associated with the trapping activities as a result of unanticipated changes in water quality or difficulty handling seines on unstable substrates. However, we anticipate that any take that occurs will be at levels below those that would result in extirpation of desert pupfish from the SCH ponds or release sites. If monitoring determines that these activities have extirpated desert pupfish from any of the ponds or release sites then authorized incidental take would be exceeded. Criteria to determine if pupfish populations have been extirpated due to this activity will be developed by the Service, in coordination with CDFW, and included in the adaptive management and monitoring plan.

Inoculation of ponds

If necessary, the SCH ponds will be initially inoculated with 250 individuals. Subsequent inoculations will include one or two fish per year from source populations identified in the effects section. Because we anticipate low mortality associated with this event, we anticipate a loss of not more than 5 percent of the individuals collected. If more than 13 individual desert pupfish are killed in the initial stocking, authorized take would be exceeded.

Mortality incidents associated with subsequent stockings shall not exceed 5 percent of the individuals collected. If more than 5 percent of the individuals collected are killed in subsequent SCH ponds stocking, authorized take would be exceeded.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined this impact of the anticipated taking is not likely to result in jeopardy to the desert pupfish.

REASONABLE AND PRUDENT MEASURES

The Service considers the following reasonable and prudent measures necessary and appropriate to minimize the impact of the taking of desert pupfish:

1. The Corps and the Applicant will ensure the conservation measures and assurances as described in the Project description are fully implemented.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are non-discretionary.

1.1 The Corps and the Applicant, including all of their agents/contractors, shall implement all biological conservation measures and/or assurances, as described in the Project description summarized in this biological opinion, and ensure they are fully implemented. The Corps and the Applicant shall report in writing to the Service, within 6 months of Project construction, noting compliance with each of the measures included in the Description of the Proposed Action, including the amount of acreage impacted and the number of desert pupfish captured, relocated, and incidentally killed from Project construction activities.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

The PSFWO is to be notified immediately at 760-322-2070 if any desert pupfish are found sick, injured, or dead in the Project area. Immediate notification means verbal (if possible) and written notice within 1 workday, and must include the date, time, and location of the carcass, and any other pertinent information. Care must be taken in handling sick or injured individuals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.

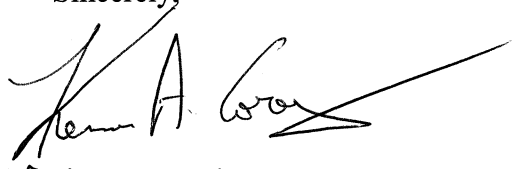
The PSFWO should also be notified immediately at 760-322-2070 if any endangered or threatened species not addressed in this biological opinion is found dead or injured within the action area during the life of the project. The same reporting requirements also shall pertain to any healthy individual(s) of any threatened or endangered species found on the action area and handled to remove the animal to a more secure location.

REINITIATION NOTICE

This concludes formal consultation on the proposed Project for desert pupfish. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions regarding this document, please contact Felicia Sirchia of the PSFWO, 777 East Tahquitz Canyon Way, Suite 208, Palm Springs, California at 760-322-2070, extension 205.

Sincerely,



FOR Jim A. Bartel
Field Supervisor

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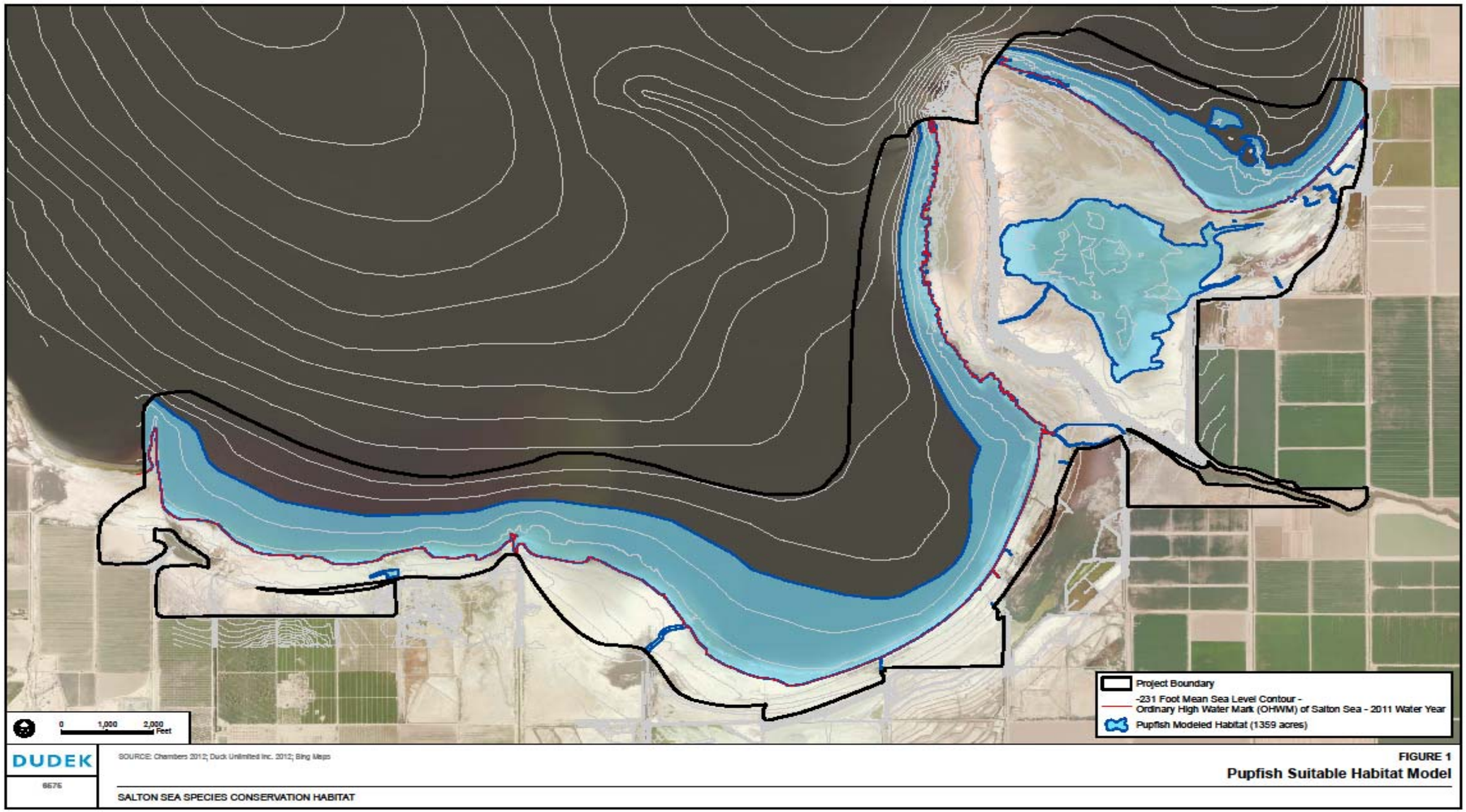

Figure 1. Pupfish Suitable Habitat Model, Salton Sea Species Conservation Habitat Project.

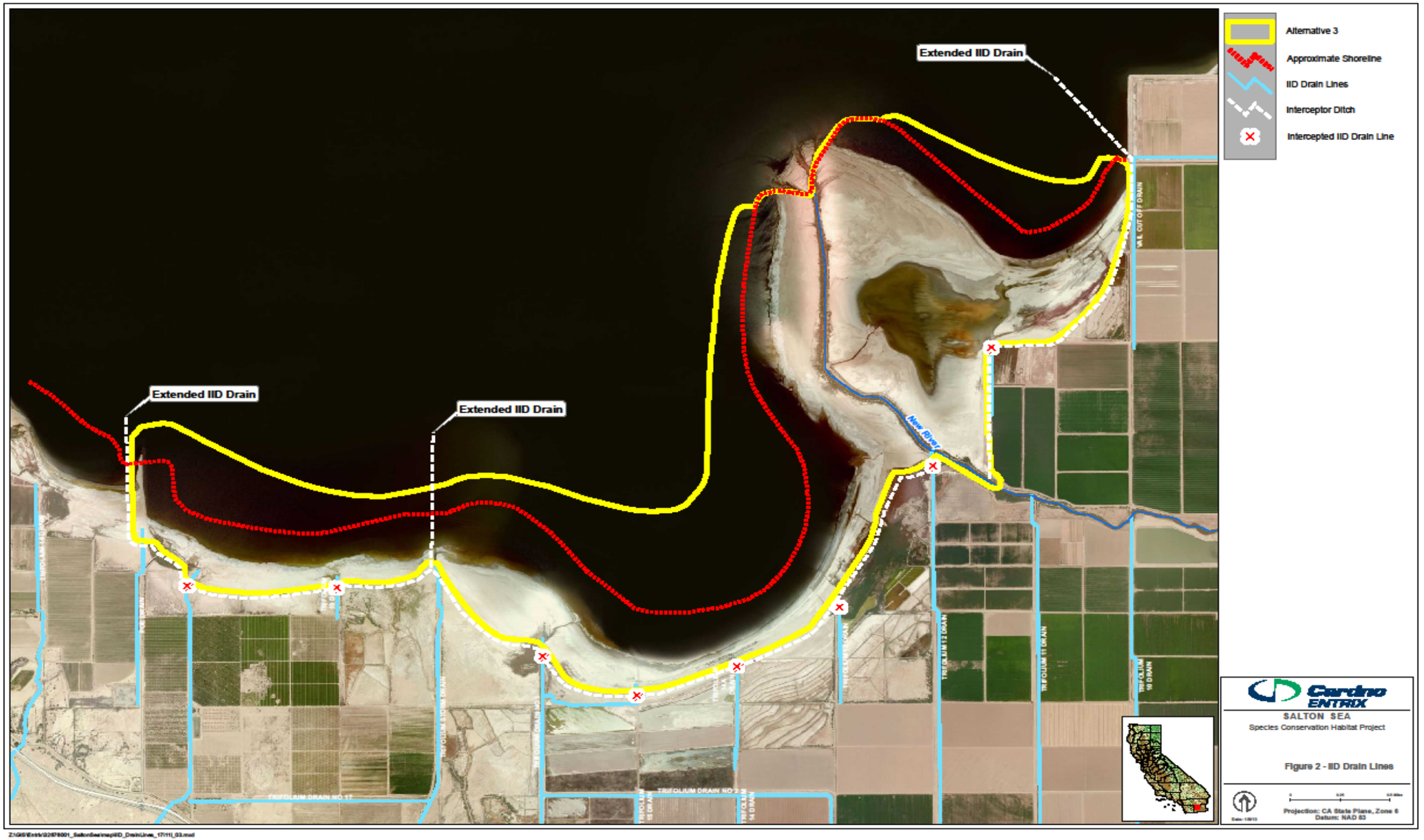

Figure 2. IID Drain Lines, Salton Sea Species Conservation Habitat Project.