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Energy and Ocean Resources
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**STATUS REPORT ON SONGS MITIGATION PROGRAM
APRIL – JUNE 2004**

Following is a brief status report for the April-June 2004 period for the mitigation projects required in Southern California Edison Company's (SCE) coastal development permit for the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 (permit no. 6-81-330, formerly 183-73). The Commission originally adopted the conditions in 1991 to mitigate the adverse impacts of the power plant on the marine environment. The 1991 conditions (Condition D) also require SCE to provide the funds necessary for Commission technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director. In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental fish hatchery. The Commission has since approved amendments to the conditions in April 1997 and October 1998.

Implementation of the mitigation projects is the responsibility of SCE whereas the Commission is responsible for implementing its independent monitoring and technical oversight function, including the wetland pre-restoration monitoring program and experimental reef monitoring program described below. The Commission has operated under approved work programs and budgets since 1993. The Commission unanimously approved the work program and budget for calendar years 2004 and 2005 in November 2003.

Another aspect of the Commission's monitoring and oversight is periodic public review of the performance of the mitigation projects. The staff and contract scientists conducted workshops on the San Dieguito wetland and reef mitigation projects on February 18 and March 22, 2004, respectively. Slides of the wetland workshop presentations are posted on the Coastal Commission website at www.coastal.ca.gov in PDF format. Results presented at the reef workshop are being compiled into a proceedings which should be available on the Commission's website by late June 2004.

WETLAND RESTORATION MITIGATION**The Project**

Condition A of the permit requires the permittee to create or substantially restore a minimum of 150 acres of wetlands to mitigate for the reduction in the standing stocks of nearshore fishes

caused by the operation of SONGS. In April 1997, the Commission reaffirmed its 1992 approval of the permittee's choice of the San Dieguito River Valley as the site for the wetland restoration project and allowed for up to 35 acres credit for enhancement at San Dieguito Lagoon on the condition that the ocean inlet is maintained open to tidal flow in perpetuity.

Progress Report

Wetland Restoration Planning. The Commission approved SCE's preliminary wetland restoration plan for the San Dieguito Lagoon in November 1997. The CEQA/NEPA environmental review incorporated the mitigation project into the overall San Dieguito River Valley Regional Open Space Park project. The lead agencies for the CEQA/NEPA review were the San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) and the U.S. Fish and Wildlife Service (USFWS).

In September 2000, the JPA certified the EIR after public hearing. The EIR/S designated the Mixed Habitat plan as the environmentally preferred alternative. As required by NEPA, the availability of the final EIR/EIS was published in the Federal Register in September 2000; however, the USFWS had not yet issued a final Record of Decision (ROD) when lawsuits on the Final EIR (FEIR) were filed. The lawsuits have now concluded (see next paragraph). USFWS issued the ROD on November 28, 2003.

Litigation on Final EIR. Lawsuits challenging the adequacy of the FEIR were filed by the Del Mar Sandy Lane Association and Citizens United to Save the Beach. Although in a July 2001 decision the Court rejected certain of the plaintiff's claims, it determined that the FEIR was inadequate with regard to several issues, most significantly that there was insufficient evidence supporting the FEIR's conclusion that the project will not increase scour and loss of sand at the river mouth. The Court set aside the JPA's certification of the FEIR and remanded the matter back to the JPA. Both parties appealed the Court's decision. In August 2003, the Court of Appeal ruled that there is substantial credible evidence supporting each of the JPA's conclusions concerning the environmental impacts of the restoration project and the appropriateness of the mitigation measures, thus reversing the judgment of the trial court. All appeals are final; on October 6, 2003, the Appeals Court issued its order directing the Superior Court to issue the revised judgment.

Outstanding issues/Next steps in implementing wetland restoration. The permit requires SCE to submit a final plan and coastal development permit application to the Commission and to obtain other agency approvals and permits. The plan submitted must substantially conform to the preliminary restoration plan approved by the Commission in November 1997, unless the CEQA/NEPA review concludes that an alternative plan that meets the conditions for minimum standards and objectives is the environmentally superior alternative.

SCE is currently preparing its final design and engineering plans. In early June 2004, SCE conducted a planning meeting with Commission staff, contract scientists, consultants, and agency representatives to review engineering details and to ensure that the plan will meet the requirements of the permit and address Coastal Act issues. Later this year SCE will begin the process to obtain other necessary permits before the Commission acts on SCE's coastal development permit application for the wetland restoration.

Two other issues remain to be resolved before the Commission considers the final plan and coastal development permit application: the JPA's proposal for public trails and the 22nd Agricultural District's requirement for Least Tern nesting habitat under its previously granted coastal development permit (CDP No. 6-84-525). Consultations regarding the trails are continuing during the final design and engineering phase. In addition, the staff continues to work with representatives of the Attorney General's Office to help resolve the remaining issues involving the Least Tern nesting sites.

Pre-restoration Monitoring. The SONGS permit establishes physical and biological performance standards that must be met by the restored wetland. As part of the Commission's technical oversight, monitoring and management responsibilities under Condition D, the contract scientists are conducting pre-restoration monitoring in San Dieguito Lagoon and other southern California wetlands that may be used as reference sites in post-restoration monitoring. Pre-restoration monitoring includes the collection of baseline physical and biological data on the wetland attributes that will be monitored during post-restoration monitoring. Pre-restoration data are required to assess changes in the existing wetland following construction. Pre-restoration monitoring data are also needed to develop sampling designs for post-restoration monitoring that can effectively determine whether the various performance standards have been met. This information will be incorporated into the CCC Monitoring Plan.

Contract scientists continued to collect and analyze pre-restoration data on water quality, invertebrates, and fishes in San Dieguito Lagoon and prospective reference wetlands. Results of the pre-restoration monitoring activities undertaken during 2003 were reviewed at an annual public workshop held on February 18, 2004, in Del Mar. The Commission's contract scientists made presentations at both technical and general workshop sessions. The presentations in both sessions discussed the sampling methods that will be used to evaluate the performance standards during post-restoration monitoring, and the purpose and status of the CCC Monitoring Plan, including the technical appendices which will contain detailed results of pre-restoration monitoring. Additional workshop presentations given by SCE and the JPA focused on the status of the restoration project and public trails proposal.

Fish sampling methods. Contract scientists continue to develop methods for sampling fish with beach seines and purse seines. This work includes efforts to minimize impacts to fish populations and wetland habitats by optimizing gear configurations, streamlining field sampling methods, and determining the appropriate numbers and spacing of samples for each gear type.

Water quality. Water quality is one of the long-term physical standards that will be used to measure the performance of the restored wetland. The contract scientists continue to monitor salinity and oxygen concentration, which are important to the health, abundance, and richness of estuarine biota. These baseline data on water quality, and also tidal height, are collected by continuously recording instruments placed in San Dieguito Lagoon and Carpinteria Salt Marsh (a reference wetland).

Vegetation monitoring. Wetland-wide monitoring of various habitats, including vegetated and un-vegetated intertidal habitat will be necessary to insure that conditions of the SONGS permit are met. Contract scientists are exploring the use of aerial photography in combination with ground-truthing to monitor changes both in restored habitats and in existing wetland.

Invertebrate monitoring. Compilation of the results of pre-restoration monitoring for wetland invertebrates is nearly complete and finalization of sampling designs and protocols will be completed during the Fall 2004.

Bird monitoring. The SONGS permit has two monitoring requirements regarding birds: (1) monitoring of the total abundance and number of species of birds in the restored and reference wetlands, and (2) monitoring of bird feeding rates in the restored and reference wetlands as a measure of food chain support. The contract scientists prepared general requirements for such monitoring and are working with Kathleen Whitney, a wetlands bird expert at Marine Science Institute, UCSB, to design specifics of monitoring protocols to address these requirements. The target date for testing these protocols is Fall 2004.

KELP REEF MITIGATION

The Project

Condition C of the permit requires construction of an artificial reef that consists of an experimental reef and a larger mitigation reef. The experimental reef must be a minimum of 16.8 acres and the mitigation reef must be of sufficient size to sustain 150 acres of medium to high density kelp bed community. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage are most likely to achieve the performance standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

In April 1997, the Commission added the requirement for a payment of \$3.6 million to the State's Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture/marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. SCE has fully satisfied this portion of the kelp mitigation requirement.

Progress Report

Following completion of the environmental review and permitting process, construction of the experimental reef located off San Clemente was completed in September 1999. The experimental reef tests eight different reef designs that vary in substrate composition (quarry rock or recycled concrete), substrate coverage (actual coverages are higher than the intended nominal coverages of 17%, 34% and 67%, at approximately 54%, 65%, and 84%, respectively), and presence or absence of transplanted kelp on quarry rock modules with a nominal coverage of 34%. All eight reef designs are represented as individual 40 m x 40 m modules that are replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. Efforts to transplant kelp were deemed successful in 2001. Dense natural recruitment of kelp, however, also occurred on all reefs and swamped the effect of kelp transplantation. Consequently, kelp densities did not differ between reefs with and without transplanted kelp and, therefore, monitoring of the two reef designs with transplanted kelp was discontinued in 2001. The results presented below are for the remaining six designs, which represent different combinations of substrate cover and type.

Results from Experimental Reef Monitoring. The monitoring plan approved by the Commission specifies that the abundance of giant kelp, macro invertebrates, understory algae, and kelp bed fish, and the area and coverage of hard substrate on the artificial reef modules be surveyed each year for five years.

The fourth year of these studies was completed at the end of 2003. Results from the first four years of the five-year artificial reef experiment were reviewed at an annual public workshop held at the San Clemente Community Center on March 22, 2004. The focus of the presentation, given by CCC contract scientists, was on the effectiveness of the different experimental reef designs in supporting kelp forest biota. The effectiveness of the different reef designs was gauged in relation to their ability to meet the fixed and relative performance standards that will be used to judge the success of the 150 acre mitigation reef. Fixed standards include: (1) percent cover of reef hard substrate must remain at or above 90% of originally constructed hard substrate, (2) density of adult giant kelp must be at or above 4 plants/100 m² for every acre of artificial reef, and (3) the artificial reef must produce 28 tons of fish standing stock. Relative standards include: (1) the abundance and species richness of the benthic community (reef associated invertebrates and algae) on the artificial and natural reference reefs must be similar; (2) the abundance and species richness of the kelp bed fish assemblages on the artificial and natural reference reefs must be similar, and (3) the artificial reef functions must not be impaired by invasive benthic species (e.g. sea urchins, sea fans). Results to date are as follows.

Fixed standards.

- (1) Hard substrate: Five out of the 6 designs are currently meeting the standard of at least 90% of originally constructed hard substrate available for reef biota.
- (2) Giant kelp: All designs currently support giant kelp at densities substantially greater than the standard of 4 plants/m². It is uncertain whether these densities will be sustained over the long term because nearly all adult kelps on the artificial reef colonized during the first year of the experiment, with little to no colonization since.
- (3) Fish standing stock: Designs consisting of medium to high cover of rock and concrete are near or above the standing stock standard while low coverage designs are slightly below the standard.

Relative standards.

- (1) Benthic Communities: The abundance and species richness of understory algae on all reef designs are continuing to decline and are well below the range of values on the reference reefs. The abundance of bottom dwelling invertebrates on all reef designs is increasing through time and is generally above the range of values seen on the natural reference reefs. The species richness of invertebrates is also increasing through time and is either within or slightly below the range of values seen on the natural reference reefs.
- (2) Fish: Both the abundance and species richness of kelp bed fishes in all reef designs are within or above the range of values seen on the natural reference reefs.
- (3) Invasive Species: There was significant colonization of sea fans (*Muricea* spp.) on all reef designs in 2002. Colonization densities were much higher on the artificial reef than on the natural reference reefs. Sea fans are growing rapidly and experienced relatively low mortality during their first year. If these demographic trends continue, future densities of sea fans may be high enough to preclude subsequent colonization and ultimate sustainability of adult kelp plants on all the reef designs.

Areas of concern. Based on four years of monitoring there are three major concerns about some or all of the artificial reef designs:

- There is a potential for dominance of all reef designs by the sea fan, *Muricea*.
- Dominance by *Muricea* and possibly other benthic invertebrates could inhibit the sustainability of giant kelp and thus prevent the artificial reef from succeeding in meeting the performance standard for giant kelp.
- None of the reef designs currently meet the permit standards for the abundance and richness of understory algae whose mean values are diverging from the natural reference reefs on all reef designs.

Studies to address concerns. Two studies are currently under way and will continue through 2005 to address areas of concern. One is a continuation of demographic studies of sea fans. These studies will provide information necessary to make projections regarding the densities of large adult sea fans likely to become established on the different reef designs. A second study will determine the relative importance of competition by invertebrates and shading by adult giant kelp on the abundance and species richness of understory algae and on the abundance of juvenile giant kelp. These studies will provide much needed insight into whether one or more designs are heading inexorably toward dominance by benthic invertebrates (which would prevent them from meeting the performance standards for giant kelp and understory algae) or whether the patterns are due primarily to the more ephemeral effects of shading by adult kelp. Information gained from these studies will be extremely useful in deciding on the eventual design of the 150-acre mitigation reef.

FISH BEHAVIORAL MITIGATION

The Project

Condition B requires the permittee to install and maintain behavioral barrier devices at SONGS to reduce fish impingement losses.

Progress Report

SCE is currently in compliance with Condition B of the SONGS permit.

SCE conducted a number of laboratory and in-plant experiments testing the behavioral response of fish to lights and sound devices from 1992 through 1999. None of the experiments showed evidence that these devices would reduce fish impingement losses as required by Condition B. At the same time, SCE continued its modified heat cleaning treatments at the plant (called the Fish Chase procedure), which result in a considerable reduction in fish impingement

In October 2000, the Commission reviewed the results and concluded that no further testing of alternative behavioral barriers should be required at this time, provided that (1) SCE continues to adhere to the operating, monitoring, and reporting procedures for the modified heat cleaning treatments and (2) SCE makes every effort to test and install, if feasible, future technologies or techniques for fish protection if such techniques become accepted industry standards or are required by the Commission in other power plant regulatory actions.

The contract scientists reviewed data and analyses on the fish chase procedure at SONGS that were contained in SCE's 2002 *Annual Marine Environmental Analysis* report, which indicates that the fish chase procedure is consistent with the Commission's requirements and that SCE continues in compliance with Condition B. The next report, covering 2003 operations, is due from SCE in July 2004.