

CALIFORNIA COASTAL COMMISSION

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COASTAL DEVELOPMENT PERMIT APPLICATION

Application number3-03-015, Pajaro River Breaching

Applicant.....Santa Cruz County Public Works Department, Attn: Thomas Bolich, Public Works Director

Project locationMouth of Pajaro River, extreme southwest Santa Cruz County, at the border of Monterey County

Project descriptionBreaching of the sandbar at the mouth of the Pajaro River as necessary for flood control purposes.

Local approval.....None required by the County.

File documents.....*Pajaro River Lagoon Management Plan* (Mitchell Swanson & Associates, 1993); Army Corps of Engineers Permit 223670S (Expires September 30, 2007); California Department of Fish & Game 1602 Lake and Streambed Alteration Agreement (Expires September 1, 2007); U.S. Fish and Wildlife Service Biological and Conference Opinion (September 15, 1999); National Marine Fisheries Service Biological and Conference Opinion (July 7, 1999); County of Santa Cruz Mitigated Negative Declaration (January 2003).

Staff recommendation ...Approval with Conditions

Summary: The Santa Cruz County Public Works Department is proposing periodic breaching of the sandbar at the mouth of the Pajaro River as necessary for flood control purposes. Like many central coast rivers, a sandbar periodically forms at the mouth of the Pajaro River, preventing river outflow to the ocean. During some years, winter flows and wave action are not sufficient to naturally breach the sandbar; consequently, as river flows are impounded behind the sandbar, water levels rise in the river channel, the Pajaro River lagoon and its associated sloughs and marshes, causing localized flooding in the agricultural and residential areas surrounding the lagoon. To prevent flooding-related health and safety hazards, as well as property damage, the sandbar is mechanically breached when lagoon waters threaten to rise to flood stage.

Artificial breaching can have deleterious impacts on marine and riverine resources, including changes in salinity that are detrimental to fish and impacts to special status species, such as the western snowy plover, steelhead, and the tidewater goby.



California Coastal Commission
June 2006 Meeting in Santa Rosa

Staff: Susan Craig Approved by: Steve Monowitz
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Pursuant to Coastal Act Section 30236, such substantial alteration of streams may be permitted for flood control where no other method for protecting existing structures is feasible and where such protection is necessary for public safety or to protect existing development. In addition, Coastal Act Sections 30230 and 30231 provide for protection of marine and riverine environments, and Coastal Act Section 30240 provides protection for environmentally sensitive habitat areas and the species associated with these habitats.

To maintain consistency with these Coastal Act requirements, staff recommends that the Commission **approve** the proposed breaching activities as conditioned in this report to require that breaching occur only at specified times and location, and by specific methods agreed to by the California Department of Fish & Game (CDFG), U.S. Army Corps of Engineers (ACOE), National Marine Fisheries Service, and U.S. Fish & Wildlife Service. The conditions of approval also require extensive monitoring of the breach area and the lagoon environment, in order to gain a better understanding of the impacts of breaching, and submittal of all monitoring reports to the Executive Director for review. The project is also conditioned to require protection of public access and implementation of best management practices during mechanical breaching events. Furthermore, the recommended permit conditions limit the duration of the permit to September 30, 2012, provided that the associated CDFG and ACOE permits are extended without material changes. Finally, the permit is conditioned to require that the Executive Director reviews and approves a work program for an expanded alternatives analysis, which must be submitted in conjunction with any future applications for breaching, to identify and evaluate options that may reduce the need for artificial breaching in the future. As conditioned, the project is consistent with the Coastal Act.

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I. Staff Recommendation on CDP Application

The staff recommends that the Commission, after public hearing, **approve** a coastal development permit for the proposed development subject to the standard and special conditions below.

Motion. I move that the Commission approve Coastal Development Permit Number 3-03-015 pursuant to the staff recommendation.

Staff Recommendation of Approval. Staff recommends a **YES** vote. Passage of this motion will result in approval of the coastal development permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution to Approve a Coastal Development Permit. The Commission hereby approves the coastal development permit on the grounds that the development as conditioned, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the coastal development permit complies with the California Environmental Quality Act because either: (1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment; or (2) there are no feasible mitigation measures or alternatives that would substantially lessen any significant adverse effects of the development on the environment.

II. Conditions of Approval

A. Standard Conditions

- 1. Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the Permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
- 2. Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

3. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
4. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the Permittee to bind all future owners and possessors of the subject property to the terms and conditions.

B. Special Conditions

1. **Approved Development.** This permit approves the breaching of the sandbar at the mouth of the Pajaro River lagoon according to the methods and procedures described in the Pajaro River Lagoon Management Plan, the California Department of Fish & Game's 1602 Lake and Streambed Alteration Agreement (dated 12/19/05), the Army Corps of Engineer's permit No. 22367S (dated August 19, 2002), and the conditions of this permit. Any proposed revisions to the methods or procedures shall be submitted to the Executive Director for review and approval or for a determination that a permit amendment will be required if the changes are material.
2. **Term of Permit.** For purposes of Section 13156(g) of the Coastal Commission's regulations, the time for commencement of the approved development shall be any time during the term of this permit. **This permit is valid until at least September 1, 2007**, which is the expiration date of the California Department of Fish & Game's (CDFG) 1602 Lake and Streambed Alteration Agreement (Notification Number: R3-2002-0668). If the CDFG Agreement is extended with material changes, other than incorporating the conditions of this permit into it, then this permit will remain valid only upon the Commission's approval of a commensurate amendment. If the CDFG Agreement is extended without material changes, then this permit will remain valid through the same years (not to exceed September 30, 2012). **All of the above is dependent upon extension of the Army Corps of Engineers' (ACOE) Permit No. 22367S, which expires September 30, 2007.** If the ACOE permit is extended without material changes and the ACOE has granted a five-year extension approval, then this permit will remain valid until September 30, 2012 or until the expiration of the CDFG Agreement, whichever comes first. If the ACOE permit is extended with material changes, other than incorporating the conditions of this permit into it, then this permit will remain valid only upon the Commission's approval of a commensurate amendment, which shall remain valid until expiration of either the ACOE permit or the CDFG permit, whichever comes first. If the ACOE permit is not extended, then this permit shall also expire at that time, regardless of whether the CDFG Agreement has been extended. **In addition, extension of the permit beyond September 1, 2007 shall be dependent upon the Executive Director's review and approval of the alternatives analysis work program required by Special Condition #7 below. In any case, this permit shall expire no later than September 30, 2012.**
3. **Other Approvals.** The County shall submit to the Executive Director for review and approval evidence from the Regional Water Quality Control Board and the State Lands Commission that the permit (RWQCB) and lease (State Lands) have been extended, by the

following dates:

RWQCB 401 Water Quality Certification Permit: 4/4/2008

State Lands Commission Lease PRC 7934.9: 12/14/2007

In addition, the County shall submit to Executive Director for review, written evidence of Monterey Bay National Marine Sanctuary approval, or evidence that no such approval is needed, prior to commencing any breaching activities.

- 4. Public Access.** Operational plans shall minimize disruption of public access to and on the beach. Staging areas shall be located in a manner to least interfere with public access. Equipment on the beach shall be removed promptly upon completion of the breaching operation. The permittee shall be responsible for providing construction personnel and/or temporary fencing or flagging as necessary to protect public safety and maintain the general public's ability to gain access to and along the shoreline outside of the construction area.
- 5. Breaching Notification.** 24 hours prior to any breaching event, the permittee shall notify the Executive Director that breaching is going to take place. This notification shall include the current height above Mean Seal Level (MSL) as measured by the staff gauge at Watsonville Slough.
- 6. Monitoring Reports.** The following sampling/survey results, completed in accordance with the project description and the terms and conditions contained in the CDFG and ACOE agreement/permit (attached as Exhibits #5 through #7), shall be submitted to the Executive Director for review per the following schedule:

 - a. No later than one month after each breaching episode:**

 - Mapping and bathymetry results;
 - Photographs of the lagoon taken before, during, and after breaching;
 - Water quality sampling results;
 - Surveys for western snowy plovers;
 - Monitoring logs including the date and time of breaching, type of equipment and manpower used, daily water depth measured at the Watsonville Slough staff gauge, and a description of tidal and wave action.
 - b. Within 30 days of completion of report:**

 - The annual report summarizing fish sampling data.
 - c. Within 90 days of the completion of each mechanized breaching event:**

- Army Corps of Engineers report on the effectiveness of the terms and conditions contained in the U.S. Fish & Wildlife's Biological Opinion regarding the western snowy plover and the tidewater goby.

7. Alternatives Analysis. By January 31, 2007, the permittee shall submit an alternatives analysis work program for Executive Director review and approval that identifies the full range of alternatives to breaching, including but not limited to:

- The installation of one-way flap gate covers along Rio Boca Road, i.e. how well these reduced or eliminated flooding of the Pajaro Dunes community building and whether additional flap gate covers along Beach and Shell Roads would provide an effective flood control alternative to breaching;
- Elevating Shell and Beach Roads sufficiently to eliminate flooding of these roads;
- Flood-proofing of the Shell Road pump station;
- Flood-proofing of sewer lines and the sewer pump station;
- Elevating electrical boxes and sewer manholes;
- Installation of a weir or a flume along the lagoon edge;
- Other flood protection measures as described in Exhibits 4 & 8.

The work program shall identify the methodology used to develop and evaluate each potential alternative, including the methods used to investigate the feasibility of each alternative, the impacts (if any) of each alternative, a list of potential funding sources to implement any alternative found to be feasible, the permits required for implementation of each alternative, and a timetable for completing the alternatives analysis. The timetable shall correspond to the potential expiration dates of the permit as described in Special Condition #2, and shall also provide for annual progress reports. In addition to describing the methodology that will be used to identify and evaluate each particular alternative, the work program shall include a process for evaluating a combination of alternatives with the specific objective of avoiding artificial breaching until lagoon levels reach an elevation of at least +5.4 MSL (prior to Shell and Beach Road flooding) during the rainy season, instead of at +4.5 MSL, as is currently proposed, as well as a combination of alternatives that may reduce the need to breach until at least +5.9 MSL or eliminate the need to breach at all (e.g., through the use of a weir or flume system). Submittal of the final alternatives analysis, completed in accordance with the approved work program, shall be submitted for Executive Director review and approval prior to the filing of any future coastal development permit application to renew or extend authorized breaching activities.

8. Best Management Practices During Construction. The following best management practices shall be employed during each mechanical breaching event to ensure protection of water quality:

- All work shall take place during daylight hours;
- Equipment operations shall not be conducted below the mean high water line unless tidal waters have receded from the authorized work areas;
- When transiting on the beach, all vehicles shall remain as high on the upper beach as possible and avoid contact with ocean waters.
- All vehicles and equipment shall be removed in their entirety from the beach area by sunset each day that work occurs.
- Equipment washing, refueling, and/or servicing shall not take place on the beach.
- Any equipment or vehicles driven onto the beach and/or operated within or adjacent to the Pajaro River shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic life.

III. Recommended Findings and Declarations

The Commission finds and declares as follows:

A. Project Location

The Pajaro River forms the boundary between Santa Cruz and Monterey Counties and discharges into the Monterey Bay National Marine Sanctuary. The project site is located at the sandbar that occasionally closes off the mouth of the Pajaro River. The Pajaro River lagoon exists from the river mouth to the Highway 1 Bridge. The lower Pajaro River lagoon is designated as the area between the river mouth and the upper limits of salt marsh (about 2000 feet upstream from the river mouth). Watsonville Slough, generally considered a part of the lagoon, flows into the river from the north. Sunset State Beach is located to the north of the Pajaro River mouth and Zmudowski State Beach is located to the south. The Pajaro Dunes residential community is located adjacent to the river mouth, just east of Sunset State Beach. Agricultural lands occur on both the northern and southern sides of the lagoon. Please see Exhibit #1 for a location map and a photograph of the project site.

B. Permit History

Like many central coast rivers, a sandbar periodically forms at the mouth of the Pajaro River, typically in the late summer or fall. The sandbar closes off the mouth of the river, preventing river outflow to the ocean. Normally, the sandbar is breached by winter flood flows and the high-energy waves accompanying winter storms. During some years, winter flows and wave action are not sufficient to naturally breach the sandbar; consequently, as river flows are impounded behind the sandbar, water levels rise in the river channel and in the Pajaro River lagoon and its associated sloughs and marshes, causing localized flooding in the agricultural and residential areas surrounding the lagoon. To prevent

flood-related health and safety hazards, as well as property damage, the sandbar is mechanically breached when lagoon waters threaten to rise to flood stage.

As shown in the table below, since 1988 the County has mechanically breached the river mouth fourteen times, with eight of the breaches taking place in the years 1992 through 1994. Breaching has only been done twice since 2000 (on December 10, 2002 and December 5, 2003).

YEARS	DATES & ACTION TAKEN
1988/89	May 6, 1988 – Breach November 26, 1988 - Breach
1989/90	None
1990/91	March 1, 1991 – Breach May 13,15,16, 1991 – Attempted to Close River Mouth June 3, 1991 – Closed the River Mouth
1991/92	January 23, 1992 – Breach January 31 1992 – Breach February 1, 1992 – Breach
1992/93	October 29, 1992 – Breach December 7, 1992 – Breach
1993/94	December 9, 1993 – Breach January 24, 1994 - Breach
1994/95	December 27, 1994 - Breach
1996/97	None
1997/98	November 14, 1997 - Breach
1998/99	None
1999/00	None
2000/01	January 4, 2001 – Mobilization Only
2001/02	November 20, 2001 – Mobilization Only
2002/03	December 10, 2002 - Breach
2003/04	November 21, 2003 – Mobilization Only December 5, 2003 - Breach
2004/05	None
2005/06	None (so far)

The Santa Cruz County Department of Public Works (County) has performed breaching activities on an annual basis since the 1950s. Prior to this time, local area residents were known to perform breaching activities individually. The Pajaro River Lagoon Management Plan (Plan) was prepared for the County in 1993 to address lagoon flooding issues and sandbar breaching activities. As a result of the Plan, special breaching protocols to avoid adverse water quality conditions in the lagoon and to protect

fisheries were identified and have been included in the proposed sandbar breaching procedures.

The area of the breaching operation remains under the retained coastal permit jurisdiction of the Coastal Commission. The standard of review for the project is the Coastal Act. Commission regulatory authority was first exercised over Pajaro River lagoon sandbar breaching in mid-1988, during a period of unusually high lagoon water (emergency permit 3-88-57-G). Between that time and 1998, dry season breaching took place pursuant to an Interim Criteria Plan, which included a Memorandum of Understanding (MOU) between the County and the California Department of Fish and Game (CDFG). In 1998, the Commission granted a five-year coastal development permit to the County to allow breaching of the sandbar at the mouth of the Pajaro River as necessary for flood control purposes (CDP 3-97-047). This permit was allowed subject to the requirement that the County follow the methods and procedures for breaching described in the County's Plan and in the MOU between the County and CDFG. The permit also noted that if the MOU were not extended, then permit 3-97-047 would expire at the time that the MOU expired. The MOU expired without extension on June 1, 1999. Although CDP 3-97-047 expired on June 1, 1999 as well, the County has performed two un-permitted breaches since that time: one on December 10, 2002 and one on December 5, 2003. The current permit application effort is intended to prevent future breaching violations from taking place.

The County currently has the following permits in place for Pajaro River breaching:

- CDFG 1602 Lake and Streambed Alteration Agreement (expires 9/1/07);
- Army Corps of Engineers 404 Permit (includes terms and conditions from biological opinions issued by National Marine Fisheries Service and U.S. Fish & Wildlife Service; expires 9/30/07);
- Regional Water Quality Control Board 401 Water Quality Certification Permit (expires 4/4/08);
- State Lands Commission five-year lease (expires 12/14/07).

State Parks is *not* requiring an encroachment permit in order for breaching mobilization access to occur on State Parks property. Instead, in an email dated August 11, 2005 from State Parks staff to the County, the California Department of Parks and Recreation stated that "State Parks consents to ongoing breaching, but reserves the right to withdraw that consent by notifying all involved. State Parks places conditions on that breaching that (1) we be notified 48 hours in advance of any breaching and may impose further conditions depending on current conditions and (2) a U.S.F.W.S.-approved snowy plover biologist review each breaching."

Special Condition #1 approves breaching of the sandbar at the mouth of the Pajaro River in accordance with the methods and procedures described in the Pajaro River Lagoon Management Plan, the CDFG streambed alteration agreement, and the ACOE permit, as well as the other special conditions of this permit.

Special Condition #2 outlines the terms of this permit, the expiration date of which is dependent upon the County being granted extensions of its ACOE and CDFG permits, as well as the County submitting

an alternatives analysis work program for Executive Director review and approval. Special Condition #3 requires submittal of evidence of renewal of the Regional Water Quality Certification Permit in April 2008 and renewal of the State Lands Commission lease in December 2007, as well as evidence that the necessary approval, if any, has been obtained from the Monterey Bay National Marine Sanctuary.

C. Project Description

High water levels in the lower lagoon generally occur when the sandbar closes off the mouth of the Pajaro River, preventing outflow to the ocean. When the sandbar remains closed, the river inflows are impounded behind the sandbar, filling the river channel, sloughs, and marshes in the lagoon. Rising water levels may cause flooding of adjacent agricultural land, residential land, and roads. This typically happens during the rainy season when the lagoon water often rises quickly, and may happen during the summer and early fall months when the lagoon water rises slowly from agricultural and other runoff. High levels of flooding can result in sewer manholes and other sewage systems being flooded, resulting in possible sewage spills.

Six different areas are impacted (as shown in Exhibit #2) when water levels reach various heights above Mean Seal Level (MSL), measured from the staff gauge at in Watsonville Slough on the southeast corner where the slough is crossed by Beach Road:

1. The farmland on the Monterey County side of the lagoon begins to be affected at water elevations of 3.0 to 3.5 above MSL. At that level, the fields are not yet flooded but the soil becomes too saturated to support crops. Between elevations of 4.5 and 5.5 above MSL, the fields flood. Gravity drainage ditches function only at lower water levels.
2. At +3.5 to +4.0 MSL, marsh areas along the lagoon and the Watsonville Slough begin to flood. In spring and summer this can adversely affect nesting and foraging areas for waterfowl, especially given that the majority of the marshland in the area has been converted to agricultural use. Also, salt marsh vegetation is destroyed if it is inundated for too long a period of time.
3. At +4.0 MSL the lower areas of the Pajaro Dunes residential development begin to flood. These lower areas consist mostly of open space, but also include a community building.
4. At +5.0 MSL the Shell Road pump systems, which function to lower water levels in Watsonville Slough, become overworked and potentially ineffective. This leads to drainage problems on agricultural lands and makes the pumps work harder. Also, the Beach Road shoulder begins to flood.
5. At 5.5 to 5.8 MSL, Shell Road and Beach Road begin to flood. This can cut off vehicle passage to and from the Pajaro Dunes residential development.
6. A sewer pump station at Pajaro Dunes begins flooding at water level 6.0 MSL. This can result in raw sewage spills into Watsonville Slough. Sewer manholes throughout the area are also flooded. PG&E junction boxes are threatened.

The County will delay breaching the sandbar as long as safely possible in the fall (September to early December) to avoid situations in which the sandbar is breached in response to a brief, early storm. This will avoid undesirable conditions that result when the sandbar rapidly reforms, creating highly saline and stratified conditions. To the extent possible, the sandbar will not be breached until seasonal rains are sufficient to maintain an open sandbar for the winter.

Breaching of the Pajaro River mouth during the rainy season (November through April) would begin when the staff gauge at Watsonville Slough reads +4.5 MSL and river flows are predicted that would cause flooding, or when water begins to flood Beach Road or Shell Road. During the non-rainy season (May through October), breaching would begin at a water level of +5.5 MSL. The thresholds are higher during the dry season because the rise in water level is much slower than in the rainy season when heavy rainfall upstream can cause a large rise in the water level in a short period of time. The California Department of Fish & Game, National Marine Fisheries Service, and the California Department of Parks and Recreation must be notified prior to any mobilization for a breaching event. Special Condition #5 of this permit requires the County to notify Commission staff 24 hours prior to any breaching event. According to the project description, the river mouth opening will be timed to take place under the following conditions:

- After high tide has peaked and receded to allow sufficient time for the river flow to widen and deepen the new cut enough so that it will stay open during the next high tide, and;
- During daylight hours, when large waves can be seen, so that danger to County staff from large waves sweeping over the sandbar is minimized.

The breaching is accomplished by grading or digging an opening in the sandbar with heavy equipment (see Exhibit #3). Heavy equipment and support vehicles would be mobilized along the beach below the high tide line, where the beach is un-vegetated and where impacts to plants and wildlife will be avoided or minimized. Access will be provided from Beach Road through a State Parks maintenance road that passes through a eucalyptus and cypress tree grove, through an un-vegetated break in the dunes, and onto Sunset State Beach. The vehicles would traverse approximately ¼ mile of beach to get to the river mouth.

The breaching location will be selected after locating the deepest portion of the lagoon and determining where the least amount of excavation would need to occur. The area of excavation would vary depending upon the size of the sandbar. In past breaching episodes, a 10- to 15-foot-wide trench, approximately 4 to 6 feet deep and 100 to 600 feet long, has been necessary to breach the sandbar (as shown in Exhibit #3).

Heavy equipment would begin trenching in the vicinity of ocean wave action and proceed towards the sandbar. Excavated material will be cast aside. A sand plug approximately 15 to 20 feet long and 10 to 15 feet wide will be left intact between the lagoon and the ocean so that lagoon waters do not rush out to the ocean, causing the sandbar to blow out. A slight scraping off of the top of the sand plug will create a slow outflow of lagoon waters, which will gradually erode the sand plug and subsequently the sandbar. Past breaching events done in this manner have resulted in the sand plug gradually eroding after about

an hour. When the water level has dropped to a level of +3.5 MSL, the breach may be closed with machinery (during the non-rainy season only) or it may close on its own depending on tides and weather conditions. After breaching the lagoon, the water level is monitored twice daily until stabilized and sandbar reformation has occurred. No attempt is made to close the breach in the rainy season. If the sandbar should reform and subsequent work is necessary, all follow-up breaching work would adhere to the procedures identified for the initial breaching.

Following a non-rainy season breach (May through October), the County would attempt to re-close the river mouth by reconstructing the sandbar once the water level recedes to a level of +3.5 MSL. Reconstruction of the sandbar would require approximately the same amount of sand material that was excavated during breaching. Re-closing the mouth will result in less lagoon stratification and lower lagoon salinities, creating better water quality for the tidewater goby and other wildlife habitat during the summer months. However, no mechanical closures would be made before June 15th to allow out-migration of the federally endangered steelhead trout.

Once the breaching has been completed, the lagoon will be monitored twice a day until the water level has stabilized and the sandbar reformed. The County will submit a summary of the monitoring activities to all permitting agencies. The summary will include the date and time of breaching, type of equipment and manpower used, and a description of tidal and wave action. A log sheet will be completed each time the lagoon water level is monitored. Log sheets will be submitted to agencies on a monthly basis. Photographs of the Watsonville Slough and the Pajaro River and its mouth will be taken on a regular basis during the time of intense monitoring (when waters are rising or are expected to rise). Special Condition #6 requires that all monitoring reports, surveys, summaries, etc. be submitted to Commission staff for review.

D. Coastal Act Issues

1. Flood Protection

a. Background

The Pajaro River drains a watershed that has been severely manipulated by urban development, conversion of wetlands to agricultural use, and containment of the river within levees. It is recognized that the river cannot be presently returned to a completely pristine, natural state. The river, though, still maintains many of its natural attributes such as riparian vegetation (in the Coastal Zone, at least) and anadromous fish runs. In many respects, it still functions as a natural system. For example, a lagoon still forms at the mouth of the river behind a sandbar on a seasonal basis. As discussed above, the County has manipulated the water level in the lagoon for flood control purposes by means of breaching the sandbar. The Commission's review of this permit application provides an opportunity to more closely examine the manipulation of water levels in the lagoon and to develop a method by which both flood control and lagoon and river system ecological objectives may be better achieved.

The primary Coastal Act policy for addressing flood management concerns is Section 30236, which states:

30236. Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

Breaching of the sandbar at the mouth of the Pajaro River is a substantial alteration of the river and its lagoon. It meets two of the relevant tests of Coastal Act Section 30236. First, the best mitigation measures feasible are contained in the terms and conditions of the Biological Opinions of the National Marine Fisheries Service (Exhibit #6) and U.S. Fish & Wildlife Service (Exhibit #7) (which are incorporated into the Army Corps of Engineers permit), as well as the California Department of Fish & Game's Lake and Streambed Alteration Agreement (Exhibit #5). The above-mentioned biological opinions and streambed alteration agreement were developed in consultation with professional biologists. Of course, new information from future monitoring may dictate changes in the method of lagoon water manipulation or in the mitigation measures themselves, particularly concerning the timing of breaching activities. Thus, the conditions of this permit approval limit the duration of the permit in order to provide the Commission with the ability to consider any new information or changed circumstances prior to approving future breaching permits. Second, the public safety necessity is to prevent hazardous driving conditions on Shell and Beach Roads due to flooding. The existing structures needing protection are the roads, sewage system, pumps, and any facilities, such as tile drains, on the farmlands. However, another test of Coastal Act Section 30236 regarding alternatives to breaching has not been adequately addressed by the permit application, as detailed below.

b. Alternatives to Breaching

Coastal Act Section 30236 allows alterations of rivers and streams "for flood control projects where no other method for protecting existing structures in the floodplain is feasible." As mentioned earlier in this report, rising water levels result in a variety of impacts in the vicinity of the Pajaro River mouth, including impacts to farmland, marsh areas, the Pajaro Dunes residential development, Beach Road and Shell Road, the Shell Road sewage pumps, and sanitary sewer manholes (see Exhibit #2).

In the case of the Pajaro River, alternatives to breaching discussed in the Pajaro River Lagoon Management Plan include flood-proofing all threatened structures, providing backup storage, using a pump or bypass, or further improving drainage (see Exhibit #4 for a full discussion of these alternatives). The Plan concludes that none of these alternatives are feasible in the immediate future, but that some may be feasible in the long-term. The findings for the last breaching permit issued to the County (CDP 3-97-047) stated that although some of the alternatives discussed in the Plan had constraints, that it may be possible to derive one or more alternative scenarios to breaching involving a combination of measures. That permit was conditioned to require submittal of an alternatives analysis

that incorporated information learned from the monitoring programs that were required under that permit and any changed circumstances, by June 1, 2003. This alternatives analysis was never received. The County, however, has submitted a summary of measures taken by the County to implement the recommendations of the Plan (Exhibit #8). These measures include replacement of two dilapidated agricultural pumps with two used pumps donated to the County by the City of Watsonville, as well as future proposed replacement of a culvert and a flap gate and replacement of the Shell Road pump facility's electrical system.

During the rainy season, the County does not breach until the staff gauge at Watsonville Slough reads +4.5 MSL and river flows are predicted that would cause flooding, or when water begins to flood Beach Road or Shell Road. During the non-rainy season (May through October), breaching would begin at a water level of +5.5 MSL, when flooding of Shell Road and Beach Road are imminent. The lower areas of the Pajaro Dunes residential development along Rio Boca Road (a private road), including open space areas and a community building, begin to flood at +4.0 MSL. Shell and Beach Roads and other infrastructure, such as sewer manholes, sewer pipes, and electrical boxes, begin to flood at water levels ranging from +5.0 MSL to +6.0 MSL. One potential solution to address the flooding of the roads would be to elevate the roads above the flood level. However, large portions of these roads (including private Rio Boca Road on the Pajaro Dunes property) are located adjacent to sensitive marshland habitat. Elevating the roads might result in resource impacts to these adjacent wetlands due to the probable need for more fill in wetland areas to accomplish the road elevation, and could raise issues of consistency with Coastal Act Section 30240, which requires protection of environmentally sensitive habitat. Nevertheless, this alternative should be evaluated and considered as necessary to compare these impacts to those attributable to artificial breaching and determine which is the least environmentally damaging over the long term.

A series of other improvements to local infrastructure, however, may cumulatively lead to a reduction in the need to mechanically breach the sandbar. For example, according to County staff, the Pajaro Dunes Homeowners' Association has installed one-way flap gate covers over some of the drainage culverts on Rio Boca Road to prevent or reduce the amount of slough water running oceanward under the road and into the open space area and the community building, which begin to flood at an elevation of +4.0 MSL. This and other improvements to existing infrastructure, such as elevating or waterproofing electrical boxes and sewer manholes, are possible methods which may reduce or eliminate the need for breaching in certain years.

Special Condition #7 requires the County to submit an alternatives analysis work program for Executive Director review and approval that identifies the full range of alternatives to breaching, including but not limited to:

- The installation of one-way flap gate covers along Rio Boca Road, i.e. how well these reduced or eliminated flooding of the Pajaro Dunes community building and whether additional flap gate covers along Beach and Shell Roads would provide an effective flood control alternative to breaching;

- Elevating Shell and Beach Roads sufficiently to eliminate flooding of these roads;
- Flood-proofing of the Shell Road pump station;
- Flood-proofing of sewer lines and the sewer pump station;
- Elevating electrical boxes and sewer manholes;
- Installation of a weir or a flume along the lagoon edge;
- Other flood protection measures as described in Exhibits 4 & 8.

This condition also requires that the work program identify the methodology used to develop and evaluate each potential alternative, including the methods used to investigate the feasibility of each alternative, the impacts (if any) of each alternative, a list of potential funding sources to implement any alternative found to be feasible, the permits required for implementation of each alternative, a timetable for completing the alternatives analysis, and annual progress reports. In addition to describing the methodology that will be used to identify and evaluate each particular alternative, the work program shall include a process for evaluating a combination of alternatives with the specific objective of avoiding artificial breaching until lagoon levels reach an elevation of at least +5.4 MSL (prior to Shell and Beach Road flooding) during the rainy season, instead of at +4.5 MSL, as is currently proposed, as well as a combination of alternatives that may reduce the need to breach until at least +5.9 MSL or eliminate the need to breach at all (e.g., through the use of a weir or flume system). This condition also requires submittal of the final alternatives analysis, completed in accordance with the approved work program, to the Executive Director for review and approval prior to the filing of any future coastal development permit application to renew or extend authorized breaching activities. With this condition, the project will adequately meet the test of Coastal Act Section 30236 regarding alternatives to breaching.

2. Marine and Riverine Lagoon Environment

Background

The fish population of the Pajaro River Lagoon includes marine and freshwater species. Pacific herring, shiner perch, staghorn sculpin, striped bass, juvenile steelhead, and tidewater goby have been found in the lagoon. Both the steelhead and the tidewater goby are listed by the federal government as threatened and endangered species, respectively. The lagoon and surrounding vegetation support a number of species of birds including the federally listed (endangered) brown pelican, as well as a variety of duck species and migratory waterfowl. The federally listed (threatened) snowy plover nests on the sandy beach adjacent to the lagoon. Vegetation in and around the lagoon includes pickleweed, salt grass, alkali heath, willow, and other species of salt marsh, brackish marks, riparian, and coastal scrub communities.

The following Coastal Act sections provide for protection of marine and riverine environments:

Section 30230: *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231: *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30240: *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

Beneficial Impacts of Breaching

Breaching can have some beneficial impacts to habitat. As mentioned above, marsh areas along the lagoon flood at water levels of +3.5 to +5.0 MSL, disrupting nesting and foraging activities. According to the Pajaro River Lagoon Management Plan (Plan), flooding of the marsh areas can significantly preclude wildlife use of portions of the lagoon and slough habitats, particularly use of the marshes by nesting ducks and shorebirds. This is clearly a concern under Coastal Act Sections 30230, 30231 and 30240, especially since historical maps of the area show a much larger area of salt marsh than now exists. Most of the historical marshland has been converted to farmland or residential uses. Thus, retaining the remaining marsh area in a functional manner is vitally important to a number of species. Additionally, according to the National Marine Fisheries Service's biological opinion, "Manual breaching of the sandbar during the rainy season simulates the natural breaching process. This is a beneficial effect allowing access in and out of the Pajaro River for adult steelhead during the spawning season."

Potential Impacts and Necessary Mitigations

Breaching can also have deleterious impacts on marine and riverine resources. The quantity and quality of habitat can be radically altered by breaching. For example, species living in the lagoon can be swept out to the ocean, changes in salinity could be detrimental to fish, and pesticides in the lagoon water could be released to the ocean when the sandbar is breached. Snowy plovers could be negatively impacted, especially if breaching takes place during the snowy plover's nesting season (March – September).

Sandbar formation and subsequent breaching can have varying effects on the habitat, depending on the season. When the lagoon is open to the ocean, the salinity of the water ranges from ocean levels (approximately 34 parts per thousand) to fresh or almost freshwater levels in the extreme upstream end of the lagoon. The salinity varies not only horizontally, but also vertically. Calm conditions result in stratification – the “layering” of water where the hotter, denser, and heavier saline water occupies the lower portions of the water column, with the cooler, lighter, and less saline water rising to the top of the water column. Strong winds or the influx of additional water can cause the layers to mix, resulting in a more uniform water column with respect to salinity and temperature. With a greater or lesser amount of freshwater inflow from upstream and a lack of additional saltwater because of the sandbar, a closed lagoon will gradually convert from saline water to freshwater. The data in the Plan indicate that, at least in drier years, conversion of the lagoon water from saline to relatively non-saline could occur in about 2½ months. The later the sandbar forms and/or the more saltwater that enters the lagoon, the longer it takes to convert to freshwater and the greater the potential for harming organisms dependent on the conversion. Conversely, without tidal mixing (which is dependent upon a breached sandbar, either done mechanically or by current and/or wave action), water quality may not be adequate for species such as steelhead.

The California Department of Fish & Game has conditioned its 1602 Streambed Alteration Agreement for the project to require water quality sampling to be performed 24 hours prior to each breaching event, 24 hours after each breaching event, and 7 days after each breaching event, with sampling results forwarded to CDFG after survey completion (see Exhibit #5). One sampling site shall be located in the Watsonville Slough, approximately 0.25 mile upstream of the confluence with the Pajaro River. Nine sites within the lagoon shall be sampled as well, starting near the sandbar and extending upriver to where the lagoon turns to riverine habitat. Water quality parameters to be measured include dissolved oxygen, temperature, salinity, and pH. These parameters are good indicators of the quality of fish habitat in the lagoon and river. Special Condition #6a requires submission of the water quality sampling results, as well as mapping and bathymetry results and photographs of the lagoon taken before, during, and after breaching, to Commission staff for review.

Although pesticides are likely present in the lagoon due to large areas of agricultural land located along the Pajaro River throughout most of its length, no pesticide testing will be required as part of the water quality sampling, for several reasons. Pesticides will eventually enter ocean waters with or without mechanical breaching because natural breaches generally occur during winter periods when the sand berm is breached by high tidal action. Also, according to the Commission’s staff water quality specialist, a coordinated long-term program between the State Water Resources Control Board and the Commission is being developed with farmers in the region to reduce pesticide runoff through a variety of non-point source best management practices. This type of program is a more appropriate way to address the issue of pesticide runoff in the Pajaro River rather than addressing the issue in a breaching permit.

Additional impacts to water quality due to the breaching project could result from the use of vehicles on the beach and adjacent to river waters. To protect water quality, Special Condition #8 requires the implementation of best management practices during each breaching episode.

Seasonal Effects of Sandbar Formation and Breaching

If a sandbar forms in the **spring**, high lagoon water levels would not generally occur, but could with a late rain or release of water from nearby College Lake. Mature steelhead migrate from the river to the ocean from April to early June and, in most years, should be out of the lagoon before a sandbar forms in the summer. If a sandbar does form in the spring and a mechanical breach is necessary during the non-rainy season (May through October), the project description calls for sandbar reconstruction, except that this would not be implemented prior to June 15th to allow for out-migration of steelhead. Therefore, mechanical breaching and sandbar reconstruction during the non-rainy season is not expected to adversely impact anadromous fish migration, but may reduce the amount and quality of lagoon habitat available to the steelhead, as discussed below. The ACOE permit incorporates the findings and the conditions of a Biological Opinion developed by the National Marine Fisheries Service (see Exhibit #6 for the Prudent Measures/Terms and Conditions of this Biological Opinion). Regarding steelhead, the Biological Opinion concludes:

After reviewing the current status of the South-Central California Coast steelhead, the environmental baseline for the action area, the effects of the proposed breaching and closure of the Pajaro River mouth sandbar and the cumulative effects, it is NMFS' biological opinion that the breaching and closure of the Pajaro River mouth sandbar is not likely to jeopardize the continued existence of the South-Central California Coast steelhead and is not likely to destroy or adversely modify proposed critical habitat.

The basis for this determination is as follows:

- 1. Breaching the mouth of the Pajaro River during the rainy season allows for adult steelhead passage to and from the Pajaro River and smolt passage to the ocean. Breaching during the non-rainy season allows for smolt out-migration. This is a beneficial effect for steelhead.*
- 2. Re-closing the mouth after breaching during the non-rainy season (after June 15th) will maintain water quality within the lagoon.*
- 3. The number of juvenile steelhead which may be harmed or killed during breaching activities is expected to be minimal due to the breaching methods developed by the County to avoid detrimental flushing flows; and during non-rainy season breaching, the number of steelhead occurring in the lagoon is minimal.*

The Biological Opinion includes the following “Reasonable and Prudent Measures” to avoid take of steelhead:

- 1. Delay manual breaching of the sandbar as long as safely possible to maintain a stable aquatic environment within the lagoon.*
- 2. Excavate the sandbar in a manner to gradually open the mouth to avoid detrimental flushing flows.*
- 3. Notify NMFS during the mobilization phase when breaching will occur and submit to NMFS*

monitoring log sheets during the monitoring phase.

The County has incorporated the first two measures into its project description and will comply with the third measure as part of its overall notification procedure requirements. Special Condition #6a requires that the monitoring log sheets be submitted to the Executive Director for review.

The Biological Opinion also notes that:

After sandbar breaching, the amount of habitat available to steelhead will be decreased due to the lower lagoon water level. Loss of habitat can result in decreased food supply, increased predation, and increased competition for space and available food. The overall effects of decreased habitat on steelhead depend largely on the number of steelhead present in the lagoon during breaching events.

The amount of lost habitat is difficult to determine since the actual water level varies with each breaching event. During a rainy season breaching event, the amount of habitat available to steelhead will also depend upon the amount of streamflow entering the lagoon from the Pajaro River. During a non-rainy season breach, the sandbar will be reconstructed [after June 15th] and therefore the amount of habitat lost would be minimal.

The Biological Opinion notes that some “take” of steelhead could occur during breaching activities and includes an “Incidental Take Statement,” which states that “taking that is incidental to and not intended as part of the proposed action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.” NMFS anticipates that incidental take associated with loss of habitat caused by reducing the water elevation in the lagoon to +2.5 MSL due to breaching activities will result. NMFS, however, determined that this level of anticipated take is not likely to result in jeopardy to the species or adverse modification of critical habitat. NMFS did not require any special conditions as part of its Biological Opinion regarding fish sampling. CDFG, however, is requiring that fish sampling throughout the lagoon and the lower Watsonville Slough be done prior to breaching (see Exhibit #5 for the conditions of CDFG’s 1602 Streambed Alteration Agreement. The County proposes to sample fish between September 1st and October 15th of each year regardless of whether breaching is required that year or not). Fish sampling will be carried out by qualified biologists. This sampling is contingent upon the availability of a CDFG or NMFS staff member with a Section 10 recovery permit (which allows for the handling of steelhead and tidewater gobies) to be present during sampling (see condition #3 on page 3 of Exhibit #5). All data will be summarized in an annual report and provided by the biologist to the County. Special Condition #6b requires submission of the fish sampling annual report to the Executive Director for review. The report will include an analysis of any factors potentially limiting steelhead use of the lagoon as a result of any breaching, and a discussion of the usage of the lagoon for different life stages of the steelhead after breaching.

Breaching in **late spring or summer** months delays seasonal conversion to freshwater. The sandbar usually forms in early to mid-summer, but has closed as late as August. Once the sandbar has formed the Pajaro River lagoon changes from a brackish water system to a freshwater system during the

summer seasons when there are no abnormal weather patterns or events that cause the sandbar to breach naturally. According to the Pajaro River Lagoon Management Plan:

A well-circulated lagoon in the summer months is important for biological productivity, especially for benthic (bottom dwelling) organisms. These become food for larger animals and eventually birds. Steelhead trout may use the lagoon for juvenile rearing since the lagoon can provide good conditions for growth before entering the ocean. Sandbar breaching delays or prohibits the summer conversion to freshwater and causes a degradation of habitat quality, possibly creating lethal conditions... It should be noted that, in general, high lagoon levels (say above 4.0 MSL) are not necessarily needed to have good habitat per se; what is important is to find alternative methods of flood prevention and lagoon water level control without sandbar breaching.

Summer breaching may also wash spawning fish out to sea before they are ready, which is not until late fall. According to U.S. Fish & Wildlife Service's Biological Opinion on the project, regarding the tidewater goby:

Tidewater gobies may be killed if they are swept out to sea when the sandbar is breached [during the summer]. This loss is not likely to be substantial during manual breaching that is conducted from October through June because most tidewater gobies in the lagoon are expected to be further away from the sandbar. The use of methods to gradually breach the sandbar would further reduce the likelihood of sweeping tidewater gobies out to sea... The necessity for manual breaching during the summer months would be rare, which further reduces the likelihood of substantial impacts to the population at this site.

As noted above, the project description calls for re-closing the sandbar after an artificial breach during the non-rainy season, but that reconstruction of the sandbar shall not take place until June 15th to allow the out-migration of steelhead. This date limitation, however, should be adequate to provide protection for the tidewater goby given the above statement from USFWS. Thus, the Biological Opinion issued by USFWS, and incorporated into ACOE's permit, does not include any special conditions to mitigate impacts to the tidewater goby, except to require that any observation of the loss of tidewater gobies due to manual breaching events be submitted to USFWS within 90 days of each manual breaching (see Exhibit #7 for the Prudent Measures/Terms & Conditions of this Biological Opinion). Special Condition #6c requires submission of this report to Commission staff.

Breaching in the **fall** creates salinity conditions that are too high. After a breach, the sandbar would reform quickly and create highly saline, stratified conditions in the lagoon. The Pajaro Lagoon Management Plan states:

Under stratified conditions, fish and other aquatic organisms, especially benthic organisms, cannot survive. Without the basis for a healthy food chain, the biological productivity of the lagoon is diminished for fish, birds, and other wildlife.

The usual scenario is for the sandbar to be breached by high flows in the river combined with a beach

reduced in height by storm waves in late fall or early winter. Lagoon levels can rise quickly to higher levels in the rainy season. At such times, mechanical breaching may be hazardous, if not impossible if there are also large storm waves that can preclude operation of heavy equipment on the sand. In drought years, however, the sandbar may remain closed throughout the year. This may necessitate a fall or winter breach if the lagoon water level gets too high. The County's project description also states that sandbar breaching will be delayed as long as safely possible in the fall (September to early December) to avoid situations where the sandbar is breached in response to a brief, early storm. This will avoid the undesirable conditions that result when the sandbar rapidly reforms, creating highly saline, stratified conditions. To the extent possible, the sandbar will not be breached until seasonal rains are sufficient to maintain an open sandbar for the winter.

Winter flows associated with upstream rainfall often lead to non-mechanical breaching of the sandbar, depending on the specific weather pattern for that year. Thus, open lagoons are a natural occurrence in winter and artificial breaching does not necessarily need to occur.

Snowy Plover

The western snowy plover is a small shorebird that forages for invertebrates in areas such as intertidal zones, dry sandy areas above the high tide line, salt pans, and the edges of salt marshes. The Pacific coast population nests in loose colonies near tidal waters along the mainland coast and on offshore islands from southern Washington to southern Baja California, Mexico. Most nesting occurs on sand spits and on unvegetated or moderately vegetated dune-backed beaches. The nesting season typically extends from early March through September. The Pacific coast population of the western snowy plover has suffered widespread loss of nesting habitat and has experienced reduced reproductive success at many nesting locations. Reduced reproductive success is most frequently tied to disturbance from human activities.

The Pacific coast population of the western snowy plover was federally listed as threatened on March 5, 1993. The proposed project site is within Sunset and Zmudowski State Beaches. Snowy plovers on these beaches are currently monitored during the breeding season by a non-profit organization, the Point Reyes Bird Observatory. This monitoring, however, is privately funded and there is no guarantee that it will continue on an annual basis. Although there is currently no state or federal agency financial support of this monitoring, the California Department of Parks and Recreation provides personnel and materials for construction of nest enclosures and wire fencing for seasonal closure areas.

The ACOE permit incorporates the findings, terms, and conditions of the USFWS Biological Opinion regarding the western snowy plover (see Exhibit #7). The Biological Opinion found that the proposed project "is not likely to jeopardize the continued existence of the western snowy plover." USFWS, however, anticipates that incidental "take" (defined as "to harass, harm pursue, hunt shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct") may occur due to the project, specifically that some western snowy plover adults and chicks could be crushed by moving equipment during mobilization, and that all western snowy plovers and chicks within 1000 feet of work activities during the breeding/nesting season will likely be harassed. However, it should be noted that in the past 28 years mechanical breaching has only been done twice during the snowy plover's nesting season: once

on May 6, 1988 and once on March 1, 1991. To minimize the probability of take of western snowy plovers, the conditions included in the Biological Opinion (See Exhibit #7) that are incorporated into the ACOE permit include, but are not limited to:

- Exclosures and fencing shall be erected if lagoon alteration is performed between March 1 and September 30;
- The County shall coordinate with State Parks or USFWS staff to determine a suitable lagoon alteration location to minimize impacts on the snowy plover;
- The County shall halt operations if they cause an adult plover to leave the nest or a brood of chicks for more than 30 minutes, and this type of disturbance may not occur more than twice in a two-hour period, or more than four times in a 24-hour period;
- The breaching trench shall be excavated as far as possible from the closest edge of the fenced breeding area, with a minimum distance of 100 feet between the fenced breeding area and the trench;
- County employees shall be informed that they are not authorized to handle or move snowy plovers or their eggs;
- The County shall ensure that no unauthorized personnel enter areas where snowy plovers could be disturbed.
- The County shall have a qualified biologist onsite daily during project activity to ensure that only minimal impacts occur to fish and wildlife habitat.

In addition, State Parks has noted that the mouth of the Pajaro River is one of the most productive snowy plover breeding sites in Monterey Bay, and is also an important wintering site, with flocks of plovers exceeding 100 birds common. CDFG is requiring that a qualified biologist be onsite during each breaching event to ensure that only minimal impacts occur to fish and wildlife habitat. State Parks is requiring that a USFWS-approved snowy plover biologist be present during *any* breaching episode throughout the year, and not just those breaching episodes that occur during the March – September nesting/breeding season. The County has contacted a biological firm (H.T. Harvey & Associates) that will provide a qualified biologist to be on site during each breaching episode. The approved biologist will conduct a brief training session for all breaching personnel before any mobilization for breaching activities begins within the project area. Training shall include a brief description of the snowy plover's behavior, habitat, sensitivity to human activities, and measures to be implemented to protect and conserve the western snowy plover during breaching operations. The approved biologist will also perform surveys for western snowy plovers prior to each breaching event and submit a report to the County after each breaching episode regarding any impacts to the snowy plover, which will be submitted to the ACOE for submission to USFWS. The report will document the effectiveness of the terms and conditions of the USFWS's Biological Opinion. The report shall also include recommendations as necessary to modify the conditions of the ACOE permit to enhance the conservation of the western snowy plover. Special Condition #6a requires submission of all surveys for western snowy plovers to Commission staff. Special Condition #6c requires that a copy of the ACOE report be submitted to Commission staff.

Conclusion

Artificial breaching can have deleterious impacts on marine and riverine resources, including impacts to listed species such as the western snowy plover, the tidewater goby, and steelhead. The CDFG 1602 Streambed Alteration Agreement and the ACOE permit, which incorporates the requirements of NMFS and USFWS, include a number of conditions regarding operational methods to protect these and other species during breaching events, as well as a number of reporting requirements including breaching notification and submission of the results of required surveys, mapping, bathymetry, and fish and water quality sampling. Special Condition #5 of this permit requires that the County notify Commission staff 24 hours prior to any mechanical breaching event. Special Condition #6 requires submission of all monitoring reports to Commission staff for review. The results of these reports collectively will offer guidance to all agencies regarding future adaptive management requirements for breaching of the Pajaro River mouth to ensure the best protection of the marine and riverine lagoon environment and the species that inhabit this environment. Additionally, this permit is conditioned to require implementation of best management practices to protect water quality during breaching episodes. With these conditions, adverse impacts to sensitive habitat areas will be minimized. Full conformance with Coastal Action Sections 30230, 30231, and 30240 (read in conjunction with Coastal Act Section 30236), however, requires such impacts to be avoided where there are feasible alternatives to protect existing structures. Therefore, Special Condition #2 of the permit limits the duration of the permit and requires future extensions and renewals of the breaching permit only upon completion of a thorough alternatives analysis as described in Special Condition #7.

3. Public Access

The following Coastal Act Sections must be adhered to with respect to public access:

***Section 30210:** In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

***Section 30211:** Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

***Section 30212(a):** Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military needs, or the protection of fragile coastal resources...*

***Section 30221:** Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

Coastal Act Section 30240(b) also protects parks and recreation areas such as Sunset State Beach and Zmudowski State Beach. Section 30240(b) states:

Section 30240(b). Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The beach seaward of the Pajaro River lagoon is accessible from Sunset State Beach to the north and Zmudowski State Beach to the south. The beach itself is owned and managed by the California Department of Parks and Recreation. As discussed above, State Parks is not requiring that the County obtain an encroachment permit, but instead is requesting that State Parks be notified 48 hours in advance of any breaching activities and is requiring that a USFWS-approved snowy plover biologist be present during any breaching activities, regardless of the time of year. The wide, sandy beach is almost always passable; the times when it may not be are when there are high tides coupled with storms or when the Pajaro River is flowing to the ocean.

The number of times per year (if any) that the County Public Works Department breaches the lagoon can vary widely depending on winter rainfall, the height of the sandbar, agricultural runoff, etc. In any event, when the sandbar is breached, either with or without human assistance, the breach may be impassable depending on the depth of the channel resulting from the breaching and the strength of the current flow from the lagoon into the ocean.

The Coastal Act's Public Access and Recreation policies require that development generally not interfere with the public's right of access to the sea and along the coast. One of the exceptions to this requirement is when such access is inconsistent with public safety. In the case of breaching, whether natural or induced, the volume and velocity of water flowing from the lagoon to the ocean may be such that lateral beach access is impossible. There are a number of public safety issues here. One is the hazardous nature of attempting to cross the river; another is the need to protect the public from sewage spills (which can occur if the sewer pump station or sanitary manholes are flooded); and finally, protection from hazardous driving conditions if Beach Road or Shell Road flood. If the sewage pump fails, the lagoon waters will become contaminated and a public hazard will result. Therefore, maintenance of water levels in the lagoon, or addressing existing flood hazards using alternative measures, are essential for maintaining safe public access.

On the other hand, the work involved with a mechanical breach can temporarily interfere with coastal access and recreation in the vicinity of construction activities, and by creating an open channel to the ocean, may result in an obstruction to lateral coastal access. To minimize temporary construction impacts, Special Condition #4 requires that mobilization and breaching procedures minimize disruption of public access to and on the beach. This condition also requires that staging areas be located in a manner that least interferes with public access and that any equipment on the beach is promptly removed upon completion of the breaching operation. To minimize unnatural disruptions to lateral access caused by artificial breaching, the project description and the permit conditions delay such breaches until they are absolutely necessary, require reconstruction of the sandbar from June 15th through October, and

require the County to pursue alternatives to artificial breaching. As conditioned, the proposal is consistent with the public access and recreation policies of the Coastal Act.

IV. California Environmental Quality Act (CEQA)

Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with coastal development permit applications showing the application to be consistent with any applicable requirements of CEQA. Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. This staff report has discussed the relevant coastal resource issues with the proposal, and has recommended appropriate mitigations to address adverse impacts to said resources. Accordingly, the project is being approved subject to conditions which implement the mitigating actions required of the Applicant by the Commission (see Special Conditions). As such, the Commission finds that only as modified and conditioned by this permit will the proposed project not have any significant adverse effects on the environment within the meaning of CEQA.

Site Plan showing proposed development- sandbar breaching.

RIOBOCALDON

Pajaro Dunes Community

Sandbar at Pajaro Rivermouth

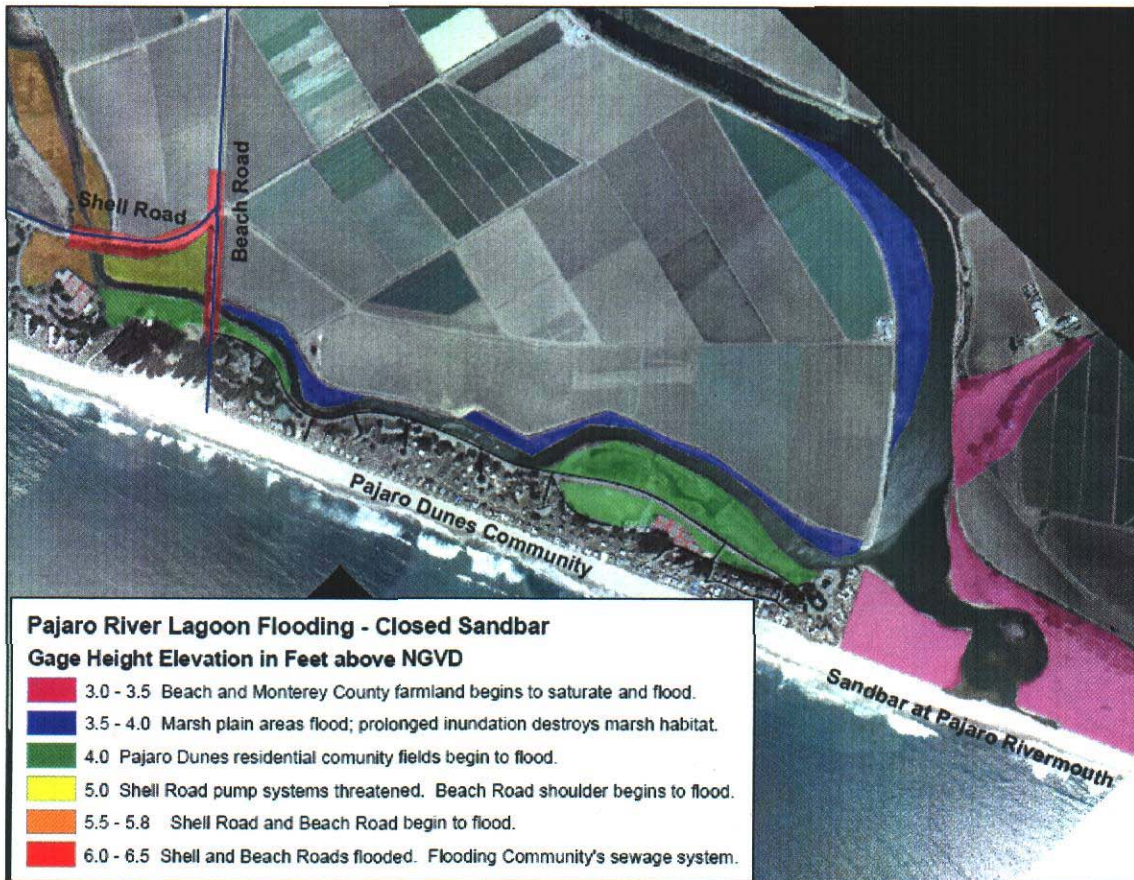
Approximate location of breaching trench from the closed lagoon to the ocean.

An Overview of the Six Stages of Flooding

Table 1
Flooding Problems Associated with High Water Levels*

Elevation in feet Above NGVD	Flooding Problem
3.0 - 3.5	Monterey County farmland soils begin to saturate and flood
3.5 - 4.0	Marsh plain areas begin to flood; prolonged inundation destroys marsh habitat.
4.0	Pajaro Dunes Residential Community fields begin to flood
5.0	Shell Road pump systems becomes overworked and potentially ineffective; Beach Road shoulder begins to flood.
5.5 - 5.8	Shell Road and Beach Road begin to flood.
6.0 - 6.5	Shell Road and Beach Road flooded; sewer manholes flooded, chance of raw sewage spill.

Flooding during summer conditions with river mouth closed by sandbar.
Source: Pajaro River Lagoon Management Plan.



Costs to the Public Works Department
For the Breaching Program

Eighteen Most Recent Years of Expenditures Since 1988:



Breaching event: Friday December 5, 2003 @11:30 AM.

4.2 Improve Water Quality

Water quality can be improved in the lagoon by improving drainage facilities, directing agricultural runoff away from the lagoon, managing water levels, and establishing buffer filter strips of vegetation along channels sloughs and ditches.

There is not adequate information at this time to address treatment of potential pollutant runoff from the various land use areas of Watsonville Slough. A specific plan should be developed (See recommendations).

4.3 Environmental Enhancement

The opportunities to enhance habitats include:

- a) Improve habitat value of vegetation cover by removing invasive non-native plants;
- b) Re-vegetate select areas to improve and expand habitat in marsh and riparian lands (e.g. areas where non-native plants have been removed);
- c) Preserve and enhance the coastal scrub plant community on levees.

5. ALTERNATIVES ANALYSIS FOR WATER LEVEL CONTROL

Alternative 1: Install a Water Level Control Pump and Tie into the City of
Watsonville's Outfall

CCC Exhibit 4
(page 1 of 4 pages)

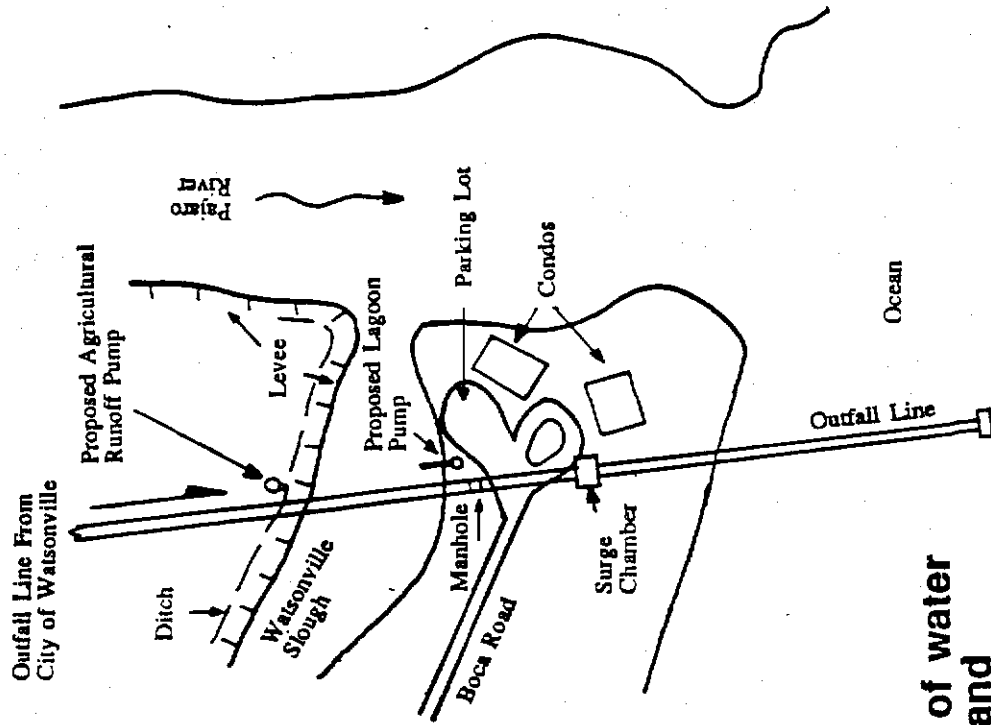
Several lagoon water level control alternatives were investigated for feasibility. These included installation of pumps tied to existing and older outfall lines, and various pipeline, pump and outlet alignments (Figure 6). The required pump capacity of 1300 gallons per minute and degraded water quality (pesticides) preclude discharging

directly onto the beach or near the rip-rap embankment of Pajaro Dunes. Use of an old sewer outfall line was dismissed after it was concluded that the cost of rehabilitation might exceed the cost using the existing outfall line. The final pump alternative design considered called for installing a pump on the existing outfall at the mouth of Watsonville Slough. This method if it were inexpensive could be used to reduce the number of artificial sandbar breachings. However, potential benefits of such a system on the Pajaro River Lagoon with recently completed drainage improvements (see Alternative 2 below) are relatively small and infrequent. If water level control pump is installed, a desired gage height based upon fisheries values appears to be approximately 3 feet.

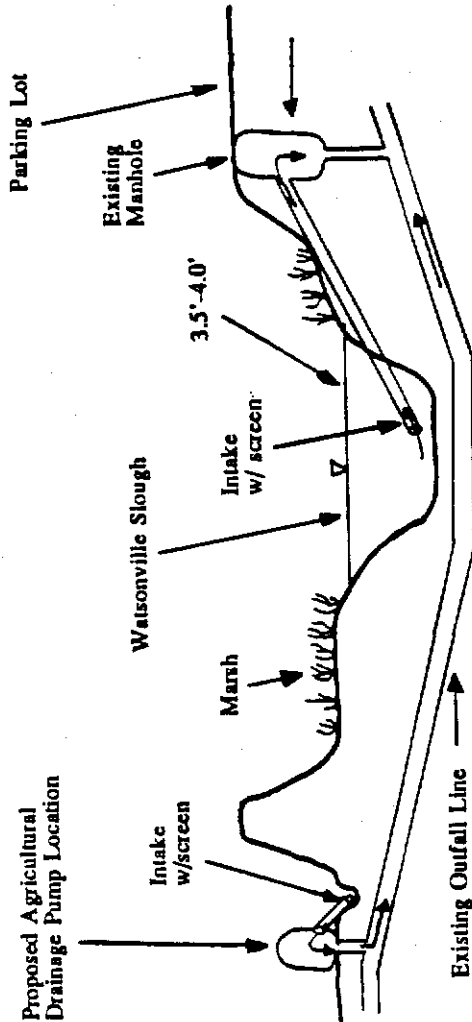
Three constraints make the pump option problematic, potentially infeasible, and likely very costly. First, the periodic contamination of lagoon waters by pesticides could be worsened by the increased circulation of waters and muddy substrates brought about by pumping; it is desirable to draw hotter saline water off the base of the lagoon, therefore waters would be drawn toward the pump horizontally and vertically. A separate pump and drainage system would be required to avoid impacts of increased pesticide circulation. This would require easements across five different parcels with five different landowners, a pipeline from the contaminant source areas (Beach Road and Watsonville Slough at Shell Road) to the outfall line at the mouth of Watsonville Slough, and a separate pump. Second, the pump intake would have to be screened for fish. Third, the only feasible discharge point is the City of Watsonville's outfall pipeline because the periodically pesticide contaminated lagoon waters must be diluted to be discharged into Monterey Bay (per CRWQCB and SWRCB). Lagoon waters could not be collected and discharged directly. To gain use of the outfall line would require revision of the permit issued to the City of Watsonville by CRWQCB, which in turn requires the agreements by many agencies; it is uncertain whether this could be successful. The final cost of the pump option depends upon the outcome of

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Plan view:



Cross sectional view:



Mitchell Swanson & Associates
 CONSULTANTS
 HYDROLOGY/GEOLOGY/SEDIMENTOLOGY
 WATER RESOURCES
 ENVIRONMENTAL PLANNING

Figure 6: Detail of pump alternative for control of water levels within the Pajaro River Lagoon and Watsonville Slough.

design studies and permitting requirements. A rough initial estimate for 2 pumps and 8,000 feet of pipeline (diameter to be determined) is \$300,000 to \$500,000, excluding additional costs for easements, design and environmental studies, fish screen, power drops permitting and operation and maintenance.

Alternative 2: Improve the Drainage System around the Lagoon and Continue the Present Interim Breaching Program.

A second alternative was developed to improved flood protection on adjacent lands by improving the drainage system that services vulnerable areas around the lagoon combined with the interim breaching plan already in place. This alternative includes improving and/or adding pumps, perimeter ditches, and culverts and continuing the interim breaching program. When implemented, this alternative should buffer adjacent lands from flooding when the Summer lagoon reaches 5.0 + feet. A monitoring program should be implemented to ensure the success of this alternative. This alternative is described in detail below (a letter describing these measures was prepared in February, 1992, see Technical Appendix F).

The proposed improvements are designed to help alleviate flooding on lands surrounding the lagoon during common summer lagoon conditions when a sand bar has formed across the Pajaro River mouth. There are other circumstances when these improvements will have a limited effect, principally when the sand bar is present during periods of rainfall. Under these circumstances, often in the Fall, it may be necessary to breach the sandbar when the lagoon level reaches critical stage (above 4.5 feet) or earlier, as provided for in the Interim Breaching Agreement and proposed modifications (see Technical Appendix F).

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(page 4 of 6 pages)

1 - SHELL ROAD PUMPS: The Beach Road pumps become inefficient in draining upper Watsonville Slough when the lagoon water level exceeds 5.0 feet MSL. The

problem is leakage from the riser that connects the pump outlet pipe to the outfall line which then discharges into Watsonville Slough on the downstream side of Shell Road. To alleviate this problem, the riser should be abandoned (unless there is a better reason to keep it) and the pump outlet pipe should be directly connected to the outfall pipe. This will provide a short term solution until Zone 7 can replace the system with an upgraded facility.

2 - MONTEREY COUNTY GRAVITY OUTFALLS: The best solution for persistent flooding on Monterey County farmland is to install low flow pumps on the land side of the two gravity culverts to pump water over the levee and into the River. This should solve the summer flooding problem when the lagoon is above 3.0 feet MSL. The summer pumps may not be of sufficient size to handle flow from winter storms with the mouth closed; under those circumstances, the sandbar would either be breached manually, as provided by the Interim Maintenance Agreement, or naturally when river flows rose. The intent of this project is to relieve flooding and drain the farmland when the summer lagoon level is higher than 3.0 feet MSL. At the January, 1992 Task Force Meeting, Monterey County Flood Control Agency's Representative agreed to pursue a project by his agency to install these pumps.

It may be necessary to install a perimeter ditch system around the agricultural fields to intercept seepage flow. The effectiveness of the pump system should be monitored to determine whether additional measures are necessary to satisfactorily drain the lands.

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3 - BEACH ROAD DRAINAGE DITCH OUTLET: The outlet of Beach Road Ditch, located at the Beach Road crossing over Watsonville Slough, consists of a 36 inch culvert with a flapgate, and an earthen fill/ wooden headwall structure. The outlet is leaky allowing a backflow from Watsonville Slough into the Beach Road

Ditch. Although this has not created major problems, this outlet should be replaced with a new culvert and flapgate. A pump at this site would aid drainage from fields east of Beach Road when the lagoon is high, however this does not seem to be a significant problem since the sandbar would be breached when the lagoon level exceeded elevation 5.5 feet MSL during the summer, and 4.5 feet MSL during the winter per the newly proposed Interim Breaching Agreement.

6. RECOMMENDATIONS

1. Lagoon Water Level Control: Implement Drainage Improvements and Continue with Interim Breaching Program

The preferred water level control plan is to implement the drainage improvements described as Alternative 2 above and continue the present Interim Breaching Program with some modifications.

Improvements of the Shell Road Pump outlet have already been implemented and appear to be working well. Monterey County and landowners are proceeding with a plan to install pumps on the two ditches. Santa Cruz County is investigating improvement of the Beach Road Ditch outlet.

These projects should be closely monitored once installed to ensure that they work under flood conditions and that adjustments are made if necessary.

The following considerations should be integrated into the present Interim Breaching Agreement (these were prepared by Dr. Jerry Smith):

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(page 6 of 6 pages)

DEPARTMENT OF FISH AND GAME

Mailing Address
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
Street Address
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558
(707) 944-5820



Notification Number: R3-2002-0668
Pajaro River, Santa Cruz County

Thomas Bolich, Director
Santa Cruz County Department of Public Works
701 Ocean Street, Room 410
Santa Cruz, CA 95060

PROJECT DESCRIPTION and PROJECT CONDITIONS**DESCRIPTION**

The Operator proposes to use large equipment to breach the sandbar at the mouth of the Pajaro River when rising river water has the potential to flood adjacent agricultural and residential land and roads. The need to reduce the water level in the lagoon can occur during the rainy season (October 15th through June 15th) or outside of the rainy season (June 15th until the first rain). The sandbar is normally breached by winter flood flows and high-energy waves associated with winter storms. In years with drier winters, breaching occurs less frequently, and the County may on average initiate artificial breaching up to three times per year. Breaching processes and resource protection conditions will differ for the two seasons, and are described separately.

The Pajaro River watershed supports a number of sensitive fish and wildlife species. Federally threatened steelhead trout and federally endangered tidewater goby inhabit the lagoon and lower river, and federally threatened western snowy plover nest on the sandbar at the river mouth. Protection for both of the listed species will be required by federal and state regulatory agencies.

From a road located behind the ranger's quarters on Beach Road, equipment can enter the site through a eucalyptus and cypress tree grove onto an unvegetated break in the dunes and onto Sunset State Beach.

The elevation of the lagoon shall not be allowed to decrease below +2.5 MSL. Prior to June 15th, the sandbar will not be reconstructed.

Rainy season breaching

The sandbar may need to be breached at any time during the rainy season when the staff gauge at Watsonville Slough reads +4.5 MSL and river flows are predicted that would cause flooding of adjacent land, or when Beach and Shell Roads begin to flood.

Once on the beach, equipment will be transported on rubber tired vehicles at the High Tide Line to a 50' x 50' staging area that is adjacent to the breaching site.

Breaching will occur during daylight hours after high tide has peaked and receded enough to allow the river flow to deepen and widen the new cut. The breach will occur through the deepest part of the lagoon. The area excavated will depend upon the size of the sandbar. In the past this has been from 10 to 15 feet wide, 4 to 6 feet deep and 100 to 600 feet in length. Excavation will begin at the ocean side and continue back towards the lagoon with a sand plug approximately 15 to 20 feet long and 10 to 15 feet wide left at the upper end to prevent lagoon water from rushing out. The sand will then be scraped off the plug until the pressure of the lagoon water erodes the remainder of the plug.

Dry season alteration

From June 15 until the first rain (defined as one-half of one inch in a 24-hour period at any point within the Pajaro watershed), the water level in the lagoon may need to be reduced when the water level at the staff gauge in the Watsonville Slough reaches +5.5 MSL.

Reduction of lagoon volume will occur during daylight hours. The elevation shall be reduced to no less than +2.5 MSL by pumping, placing a standpipe or constructing a flume.

This agreement had first been applied for in August 2002. A draft agreement was provided to the Operator in July 2003, and a revised agreement in March of 2004. The Operator reinitiated contact with the Department in the summer of 2005. A primary impediment for finalization of the agreement has been the Department's request that monitoring for potential impacts to fish be included. In this third revision of the draft agreement, the Department agrees to two more breaching seasons without monitoring or mitigation of fish populations. This will allow the Operator to maintain breaching as necessary to reduce flooding risk throughout the 2005-2006 water year, and until September 30, 2007. This is the date that the U.S. Army Corps of Engineers permit expires for this activity. The Operator will need to renew this permit, which will allow the National Marine Fisheries Service the option to modify the Biological Opinion to allow the steelhead monitoring that is needed to further evaluate the status of the use of the lagoon for rearing. Water quality monitoring, however, will begin at the next available opportunity.

CONDITIONS

Rainy season conditions

1. Because of the concern for the potential of the lagoon being drained and fish flushed to sea with a manual breach, the lagoon perimeter and Watsonville Slough up to Shell Road shall be mapped and bathymetry measurements taken sometime between October 15th and the first breach. While conducting the pre-breach survey, the lagoon and its perimeters, and Watsonville Slough shall be recorded with digital photos. During the breach and directly after the breach, the lagoon shall also be recorded with digital photos. Monitoring stations and digital photos shall be submitted to the Department for approval. Bathymetry information, maps and digital photos shall be submitted to the Department.

2. Between August 1 and August 15, 2006, the Operator shall propose a fish monitoring schedule to the Department via email per Condition 10 below. The plan shall include sampling throughout the lagoon and the lower Watsonville Slough (downstream of Shell Road) by a qualified fishery biologist. As agreed in previous discussions the plan will include the following premises:
 - a. All fish captured shall be identified.
 - b. All tidewater gobies captured shall be enumerated by age class.
 - c. All steelhead captured shall be enumerated, measured for fork length and the degree of smoltification determined by pigmentation patterns (silvery parr vs. fully smolted).
3. The Department shall have 15 calendar days to respond to the proposed schedule and arrange to oversee implementation of the monitoring plan. If the Department does not respond affirmatively to the proposal within 15 days, Condition 2 above shall not be required.
4. The Operator shall submit the fish monitoring proposal that has been approved to date for consideration to the NMFS in a timely manner.
5. Pre-breaching water quality sampling will occur within 24 hours prior to any planned breach. After breaching, water quality sampling will occur within 24 hours of the breach and then again seven and fourteen days later.

One site in the Watsonville Slough, approximately 0.25 mile upstream of the confluence with Pajaro River and nine sites within the lagoon shall be sampled in the mornings. The nine sampling sites within the lagoon shall start near the sandbar and extend upriver to where the lagoon turns to riverine habitat. The sampling sites shall include the deepest areas of the lagoon and extend up the lagoon in a linear sequence as opposed to a grid system. Water quality parameters measured shall include dissolved oxygen (DO), temperature, salinity, and ph. Measurements shall start at the surface and extend to the bottom at .5m intervals. With exception to the parameters outlined in this condition, water quality sampling shall be done as described in Attachment 1 of the correspondence received by the Department on September 23, 2005, entitled 'PAJARO RIVER LAGOON MONITORING PROTOCOL, 2005' (attached).

6. The results of the survey will be sent to the Department within one week of survey completion.

Dry season conditions (these conditions shall be applied from June 15 until the first following rainfall event)

7. If water surface elevation in the lagoon exceeds +5.5 MSL during the dry season as measured at the staff gauge in the Watsonville Slough, the elevation shall be reduced to no less than +2.5 MSL by pumping, placing a standpipe or constructing a flume. The sandbar shall not be otherwise breached.

8. If the beach needs to be accessed by vehicles, the following conditions shall apply:
- A. The hydraulic excavator, one county support vehicle, and one CDPR support vehicle could be brought to the project site through the identified access route. The County's access route begins behind the rangers quarters located at Beach Road. If necessary, another support vehicle may be used for monitoring and controlling alteration activities.
 - B. Equipment and support vehicles would travel along the beach below the high tide line where the beach is unvegetated to minimize the impacts to plant and wildlife. A staging area measuring approximately 50' by 50' would be set up on the beach.

General Conditions

9. This agreement shall be valid from the date of execution by the Department until September 1, 2007. It is anticipated that renewal of this agreement, or initiation of a new agreement, should be done in coordination with renewal of the U.S. Army Corps of Engineers permit.
10. The Operator shall notify the Department as early as possible, but no later than 12 hours before beginning work within the area covered in this agreement. In addition, the Operator/Contractor shall notify the Department no later than seven days of the completion of work within the area covered in this agreement. Notification shall be made by email to the following addresses: KUrquhart@dfg.ca.gov, JeNelson@dfg.ca.gov, KAtkinson@dfg.ca.gov, SGlushkoff@dfg.ca.gov, and ccr1600@dfg.ca.gov. This notification must include all of the following information:
- a. Notification number
 - b. Stream name
 - c. Operator name
 - d. Project title (e.g. "Smith property bridge repair")
 - e. County
 - f. Street address or geographical description of work site (e.g. Redwood Creek bridge at Spring Road)
 - g. Name of DFG staff who reviewed your project (if known)
 - h. Contact person and phone number during the work phase of the project
 - i. Anticipated dates of work within the riparian area(s) covered in this agreement.
11. The project site has been identified as an area that is potentially inhabited by western snowy plovers (*Charadrius alexandrinus*), a federally threatened species, and tidewater gobies (*Eucyclogobius newberryi*) a federally endangered species. This agreement does not allow for the take, or incidental take of any State or Federal listed threatened or endangered listed species. The Operator is required, as prescribed in the state or federal endangered species acts, to follow the measures produced by the U.S. Fish and Wildlife Service, dated September 15, 1999. Any unauthorized take of listed species may result in prosecution.

12. The site is within Sunset and Zmudowski State Beaches, which have been proposed as critical habitat areas for western snowy plovers. Breeding and nesting can occur as early as mid-February, and last through September. The following terms and conditions, based on those developed by the U.S. Fish and Wildlife Service, shall be incorporated into this agreement:
- A. Exclosures and fencing shall be erected if lagoon alteration is done between March 1 and September 30.
 - B. The Operator shall coordinate with State Park or USFWS staff to determine a suitable lagoon alteration location to minimize effects to the western snowy plover.
 - C. The Operator shall halt alteration activities if they cause an incubating adult western snowy plover to leave the nest or brood for more than 20 minutes. The Operator shall temporarily halt activities if such disturbance to incubating adults occurs again within two hours of the first disturbance. The Operator shall not allow such disturbances to occur more than four times within a 24-hour period.
 - D. The pumping site, standpipe, or flume shall be excavated as far as possible from the closest edge of the fenced breeding area for the western snowy plover on the sandbar. The minimum distance shall be 100 feet. If conditions require the installation to be dug within 100 feet of the breeding area, the Operator shall first contact the Department and the USFWS for approval.
 - E. Employees shall be informed that they are not authorized to handle or otherwise move western snowy plovers or their eggs and chicks encountered on the project site.
 - F. The Operator shall ensure that there are adequate staff to monitor and control access to the breaching alteration site to prevent unauthorized personnel from entering areas where western snowy plovers may be disturbed.
13. The Operator shall have a qualified biologist on-site daily during project activity to ensure that only minimal impacts occur to fish and wildlife habitat. The biologist shall be authorized to stop construction if necessary to protect fish and wildlife resources. If any sensitive state listed Species of Special Concern (such as western pond turtle) are found the biologist shall inform the Department. If there is a threat of harm to any sensitive species, the biologist shall halt construction and notify (or leave a message for) Environmental Scientist Serge Glushkoff at (707)944-5597 and (707)944-5520. If there is no response from Department staff within four hours, the biologist may either capture individuals and hold them in suitable conditions for up to 24 hours and then release them at the site of if it is safe to do so, or relocate them to the nearest suitable habitat.
14. If any special-status species are observed, the Operator shall submit Natural Diversity Data Base (NDDDB) forms to the NDDDB for all preconstruction survey data within five working days of the sightings, and provide DFG Region 3 with copies of the NDDDB forms and survey maps.
15. The above information, and any other information the Operator must submit to the Department under this Agreement, shall be mailed to the following address:

Department of Fish and Game
Central Coast Region
P.O. Box 47
Yountville, California 94599
Attn: 1600 Program (2002-0668/ Pajaro breach/Santa Cruz County)

16. Any equipment or vehicles driven and/or operated within or adjacent to the river/lake shall be cleaned of all external oil, grease, and materials that, if introduced to water, could be deleterious to aquatic life, wildlife or riparian habitat.
17. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the river channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the river shall be positioned over drip-pans. Any equipment or vehicles driven and/or operated within or adjacent to the river must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles must be moved away from the river prior to refueling and lubrication.
18. Large woody debris or trees within the river channel or on the lower banks of the river shall not be removed.
19. A copy of this agreement must be provided to the contractor and all subcontractors who work within the river zone and must be in their possession at the work site.
20. Building materials and/or construction equipment shall not be stockpiled or stored where they could be washed into the water or where they will cover aquatic or riparian vegetation.
21. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a river or lake, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.
22. The contractor shall not dump any litter or construction debris within the riparian/river zone. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.
23. Department staff or agents may inspect the work site at any time.
24. The Operator is liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. The Department reserves the right to

suspend construction activity described in this Agreement if the Department determines any of the following has occurred:

- A). Failure to comply with any of the conditions of this Agreement
- B). Information provided in support of the Agreement is determined by the Department to be inaccurate.
- C). Information becomes available to the Department that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
- D). The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

Any violation of the terms of this Agreement may result in the project being stopped, a citation being issued, or charges being filed with the District Attorney. Contractors and subcontractors may also be liable for violating the conditions of this agreement.

herbicides on the levee slopes and corridor benches; removal of all vegetative growth, silt and other debris from flapgate channels by heavy equipment that is operated from above the channel; and routine maintenance of levee roads and slopes by application of base rock, and minor grading to stabilize slopes. The County of Santa Cruz is in the process of developing an Habitat Conservation Plan for this management program (CH2MHill, 1997).

CONCLUSION

After reviewing the current status of the South-Central California Coast steelhead, the environmental baseline for the action area, the effects of the proposed breaching and closure of the Pajaro River mouth sandbar and the cumulative effects, it is NMFS' biological opinion that the breaching and closure of the Pajaro River mouth sandbar is not likely to jeopardize the continued existence of the South-Central California Coast steelhead and is not likely to destroy or adversely modify proposed critical habitat.

The basis for this determination is as follows:

- 1) Breaching the mouth of the Pajaro River during the rainy season allows for adult steelhead passage to and from the Pajaro River and smolt passage to the ocean. Breaching during the non-rainy season allows for smolt outmigration. This is a beneficial effect for steelhead.
- 2) Re-closing the mouth after breaching during the non-rainy season (after June 15) will maintain water quality within the lagoon.
- 3) The number of juvenile steelhead which may be harmed or killed during breaching activities is expected to be minimal due to the breaching methods developed by the County to avoid detrimental flushing flows; and during non-rainy season breaching, the number of steelhead occurring in the lagoon is minimal.

INCIDENTAL TAKE STATEMENT

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 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. 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 7(o)(2), taking that is incidental to and not intended as part of the proposed action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps so that

they become binding conditions of any grant or permit issued to the County of Santa Cruz, 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 County of Santa Cruz 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. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement. (50 CFR §402.14(I)(3))

AMOUNT OR EXTENT OF TAKE

NMFS anticipates that the incidental take of South-Central California Coast juvenile steelhead will be difficult to detect for the following reasons: 1) the variability and uncertainty in the utilization of habitat within the project area; 2) the variability and uncertainty in steelhead population sizes and run sizes; 3) finding a dead or impaired specimen is unlikely; and 4) the unknown effects of returning a closed lagoon back to tidal influence and the short and long term effects the change in salinity will have on smolts within the estuary. Since manual breaching is dependent on the sandbar formation and on the amount of inflow into the lagoon, it is unknown when manual breaching will be necessary and how many juveniles will be present in the lagoon at that time.

When it is difficult to determine the extent of take of individuals, a surrogate must be used. In this instance, the extent of take can be determined by the amount of habitat lost within the lagoon during the breaching and closure activities of the mouth. If steelhead are present, they may be harassed, harmed, or killed from the resultant loss of habitat due to the decreased water depth within the lagoon after breaching. Loss of habitat can result in decreased food supply, increased predation, and increased competition for space and available food. NMFS anticipates that the proposed activity will result in incidental take associated with loss of habitat caused by reducing the water elevation in the lagoon to +2.5 feet MSL. Therefore, NMFS authorizes the incidental take of steelhead in the form of habitat lost within the lagoon associated with breaching and closure activities reducing water levels to +2.5 feet MSL. If the water level drops below +2.5 feet MSL, authorized incidental take will be exceeded and reinitiation will be required.

EFFECT OF THE TAKE

In the accompanying biological and conference opinion, NMFS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

NMFS believes the following reasonable and prudent measures are necessary and appropriate to

minimize take of South-Central California Coast steelhead:

- 1) Delay manual breaching of the sandbar as long as safely possible to maintain a stable aquatic environment within the lagoon.
- 2) Excavate the sandbar in a manner to gradually open the mouth to avoid detrimental flushing flows.
- 3) Notify NMFS during the Mobilization phase when breaching will occur and submit to NMFS monitoring log sheets during the Monitoring phase.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the permittee must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

- 1) Accurately measure input flows into the lagoon from the staff gage at Watsonville Slough and follow weather forecasts to predict when breaching is absolutely necessary and to avoid situations where the sandbar reforms shortly after breaching.
- 2) Implement excavation methods which allow the lagoon water to be slowly released through the sandbar breach by leaving a sand plug intact between the lagoon and the ocean. Slight scraping off of the top of the sand plug will create a slow outflow of lagoon waters, which will gradually erode the sand plug, and subsequently, the sand bar.
- 3a) Notify NMFS by phone when the Watsonville Slough gage indicates that the water level has reached an elevation of approximately +3.5 feet MSL and is rising and mobilization to breach the mouth is beginning.
- 3b) Monitor the lagoon twice a day after breaching until the water level has stabilized and the sandbar has reformed. Monitoring logs will include date and time of breaching, type of equipment and manpower used, daily water depth measured at the Watsonville Slough staff gage, and a description of tide and wave action. Monitoring logs will be submitted on a monthly basis.

Mobilization notification and Monitoring log submittals shall be sent to:

Ms. Joyce Ambrosius
National Marine Fisheries Service
777 Sonoma Avenue, Rm 325
Santa Rosa, California 95404

(707) 575-6064

NMFS believes that no more than the number of South-Central California Coast steelhead present within the lagoon associated with habitat lost during the manual breaching activities when the water elevation is reduced to +2.5 feet MSL will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with NMFS the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on a listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Prohibit building in the floodplain so the river can naturally overflow during high flows and mouth closure without causing property damage. The need to manually breach the mouth of the river would therefore become unnecessary.
2. Study alternative methods for flood control in areas that are affected during mouth closure.
3. Repair or replace sewage facilities to minimize raw sewage entering lagoon waters during flooding.
4. Return the riverine system to natural flushing flows to improve sediment transport and to restore hydrogeomorphic equilibrium to the system.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. 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 action

manual breaching in the summer may prevent population growth. Such an effect would be reduced or avoided by reclosing the mouth immediately after manual breaching from May through October. The necessity for manual breaching during the summer months would be rare which further reduces the likelihood of substantial impacts to the population at this site.

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. We are not aware of any future State, tribal, local or private actions that are proposed in the vicinity of the proposed actions that may affect western snowy plovers.

CONCLUSION

After reviewing the current status of the western snowy plover and tidewater goby, the environmental baseline for the action area, the effects of the proposed sandbar breaching and the cumulative effects, it is our opinion that the proposed action is not likely to jeopardize the continued existence of the western snowy plover or the tidewater goby. It is also our opinion that the proposed action is not likely to result in adverse modification of proposed critical habitat for the western snowy plover. No critical habitat has been designated for the tidewater goby; therefore, none will be affected.

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 by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior 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 County, 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 County 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. [50 CFR §402.14(i)(3)]

We anticipate that the following forms of incidental take of the western snowy plover may occur as a result of actions that are evaluated in this biological and conference opinion:

1. Given ongoing monitoring and protective measures implemented by CDPR and PRBO and other measures proposed by the County, we do not anticipate that any nesting western snowy plover adults will be killed or injured or eggs will be crushed during manual breaching activities at the mouth of the Pajaro River for the duration of the section 404 permit. However, some western snowy plover adults and chicks could be crushed by moving equipment during mobilization. The number that may be taken cannot be determined because we cannot anticipate movement of adults or their broods.
2. We expect all western snowy plovers adults and chicks within 1000 feet of work activities within the project area to be harassed. The project area is defined as Sunset State Beach from the beginning of either alternative access route to the southern most end of the sandbar at the mouth of the Pajaro River
3. No take of eggs is authorized.

We anticipate that an unquantifiable number of tidewater gobies in the Pajaro River lagoon may be taken in the form of injury or mortality from manual sandbar breaching activities at the mouth of the Pajaro River. The number cannot be quantified because the small size and secretive nature of individuals prohibits an accurate assessment of their abundance. Although take cannot be quantified, we do not anticipate that all will be taken with the proper implementation of minimization measures described in the Corps' public notice. These measures should ensure that the manual breaching does not extirpate the population of tidewater gobies in the Pajaro River lagoon.

REASONABLE AND PRUDENT MEASURES

We believe that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of western snowy plovers and tidewater gobies:

1. The take of adults, chicks, and eggs of western snowy plovers through injury, mortality, harassment, and harm in the project area shall be avoided or minimized by fully implementing the minimization measures contained in the Corps' public notice with minor notifications as described in the terms and conditions. These measures are repeated in the "Description of the Proposed Action" section of this biological and

conference opinion.

2. The take of adults, chicks, and eggs of western snowy plovers through injury, mortality, harassment, and harm shall be reduced by educating workers on the presence of western snowy plovers and protective measures, by controlling access to the breaching site, by properly storing trash, and by preventing leaks or spills of hazardous fluids.
3. The take of tidewater gobies through injury and mortality in the project area shall be avoided or minimized by fully implementing the minimization measures contained in the Corps' public notice and repeated in the "Description of the Proposed Action" section of this biological and conference opinion.

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 measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure 1, the following terms and conditions are established:
 - a. The measures contained in the Corps's public notice and repeated in the "Description of the Proposed Action" section of this biological and conference opinion are hereby incorporated as terms and conditions of this biological opinion and shall be fully implemented by the Corps.
 - b. Surveys for breeding western snowy plovers shall be conducted by qualified biologists approved by the Service no more than 24 hours before the mobilization stage for manual breaching is initiated between March 1 and September 30. PRBO and CDPR biologists are qualified to conduct such surveys and do not require further approval from the Service.
 - c. The County shall coordinate with CDPR to determine locations for temporary enclosures or symbolic fencing for the breeding area on the sandbar before initiating the mobilization stage for manual breaching from March 1 through September 30. Enclosures and fencing installed by the CDPR and PRBO may serve this purpose. The County is responsible for installation and removal of any enclosures and fencing necessary beyond that provided by CDPR and PRBO. Signs shall also be installed indicating the presence of a threatened species and warning visitors to stay out of the fenced area. The County shall coordinate with CDPR to determine the timing of removal of fencing and signs after breaching has been completed.
 - d. The County is responsible for ensuring that the Supervising State Park Ranger for Sunset State Beach and Zmudowski State Beach has the opportunity to review survey results, oversee enclosure and fencing installations, and monitor all breaching activities. The County shall notify and coordinate with the Supervising State Park Ranger before staging begins for mobilization to monitor all four stages of the breaching process, including evacuation of equipment and workers. The County shall coordinate with the Supervising State Park Ranger to determine a suitable breaching location to minimize effects to the western snowy plover. If the Supervising State Park Ranger is unable to monitor breaching activities, the County shall contact the Service for approval of a qualified biological monitor. The County shall temporarily halt breaching activities during any stage if the

Supervising State Park Ranger or Service-approved monitor determines that such activities may result in adverse effects to western snowy plovers beyond those anticipated in this biological opinion ***Change #6: , provided that the health and safety of both the public and the Santa Cruz County Department of Public Works staff is not at risk.** The current Supervising State Park Ranger is Mr. David Dixon, who can be reached 24 hours a day through a dispatcher at 831-649-2817.

- e. The speed limit for any vehicle during mobilization and evacuation of breaching equipment shall be five miles per hour. If the Supervising State Park Ranger or Service-approved monitor observes western snowy plover adults or chicks in the path of equipment during mobilization or evacuation, the County shall halt project activities until the birds move out of harm's way or shall proceed on a path at the direction of the Supervising State Park Ranger or Service-approved monitor to avoid injury or mortality to the birds. We do not anticipate the injury or death of an adult or chick of the western snowy plover with the implementation of this term and condition. However, if one western snowy plover adult or chick is injured or killed during mobilization or evacuation, the County shall immediately halt all project activities ***Change 7: , provided that the health and safety of both the public and the Santa Cruz County Department of Public Works staff is not at risk,** and notify the Service to determine if further protective measures are necessary.
- f. The County shall temporarily halt breaching activities if they cause an incubating adult western snowy plover to leave the nest or brood for more than 30 minutes. The County shall temporarily halt breaching activities if such disturbance to incubating adults occurs again within two hours of the first disturbance. The County shall not allow such disturbances to occur more than four times within a 24-hour period. ***Change 8: The County will be excused from the provisions in this section (f.) if the health and safety of either the public, or Santa Cruz County Department of Public works staff is at risk.**

Justifications for Changes:

* Changes #6, 7, 8: The health and safety of the public may be threatened by potential flooding of Beach Road, and the roads within the Pajaro Dunes community. Such flooding creates the potential for traffic accidents, and blocked access for both personal and emergency vehicles. Also, the health and safety of the public may be threatened by potential flooding of the sewage pump station that is directly adjacent to the Pajaro Dunes Community and the River; such flooding potentially results in overflow of raw sewage from the sub-station into the surrounding land area and waterways. The health and safety of the Public Works staff may be threatened by an un-foreseen hazard that may occur during operation of the excavator or support vehicles while they are in the vicinity of the flow way of the River channel as the sandbar is cleared from the River mouth.

- g. The County shall coordinate with CDPR and PRBO to determine areas being used by broods before staging begins for mobilization. The County shall ensure minimal disturbance to broods by ***Change 9: coordinating with CDPR and PRBO, or by providing a Service-approved biologist to install installing** symbolic fencing around such areas if practicable and informing workers that equipment and breaching activities are restricted to outside such areas.
 - h. The breaching trench shall be excavated as far as possible from the closest edge of the fenced breeding area for the western snowy plover on the sandbar. The minimum distance shall be 100 feet. If conditions require the trench to be dug within 100 feet of the breeding area, the County shall contact the Service for approval before beginning excavation.
 - i. If the ***Change #10: proposed Access #2 must be used** breaching site must be accessed during the breeding season of western snowy plovers from March 1 through September 30, vehicles shall be restricted to travel along Sunset State Beach on the ocean side of the wrack line only at low tide.
2. To implement reasonable and prudent measure 2, the following terms and conditions are established:
- a. A Service-approved biologist shall conduct a brief training session for all breaching personnel before any mobilization for breaching activities begins within the project area. Training shall include a brief description of the western snowy plover's behavior, habitat, sensitivity to human activities, the project measures to be implemented to protect and conserve the western snowy plover, and the general provisions of the Act. Employees shall be informed that they are not authorized to handle or otherwise move western snowy plovers or their eggs and chicks encountered on the project site.
 - b. The County, in cooperation with the CDPR, shall provide adequate staff to monitor and control access to the breaching site to prevent unauthorized personnel from entering areas where western snowy plovers may be disturbed.

Justifications for Changes:

* Change #9: This was changed so that the County's own staff does not erect the fencing because erection of the fence occurs at the beginning of the nesting season and monitoring of it continues throughout the nesting season.

* Change #10: There is only one access route now.

- c. Trash shall be stored in covered containers at all times during breaching activities and shall be removed daily. No pets shall be allowed in the work area.
 - d. All vehicles and equipment to enter the breaching site shall be properly maintained to prevent leaks or spills of hazardous fluids. Refueling and changing of hazardous fluids shall be conducted only in areas where any spills cannot reach breeding or roosting habitat.
3. To implement reasonable and prudent measure 3, the following term and condition is established:
- a. The measures contained in the Corps's public notice and repeated in the section, "Description of the Proposed Action," in this biological and conference opinion are hereby incorporated as terms and conditions of this opinion and shall be fully implemented by the Corps.

REPORTING REQUIREMENTS

The Corps shall prepare a report to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003, (805) 644-1766) within 90 days following the completion of each manual breaching event. The report shall document the effectiveness of the terms and conditions, the number of adults and chicks of western snowy plovers that were harassed, killed or injured or eggs destroyed, any observation of loss of tidewater gobies, and the date(s) such incidental take occurred. The report shall contain a brief discussion of the approximate acreage of habitat affected and recommendations for modifying the stipulations to enhance the conservation of western snowy plovers and tidewater gobies, results of biological surveys and sighting records, and any other pertinent information. This document will assist the Service and the Corps in evaluating future measures for conservation during similar manual breaching activities.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating dead or injured western snowy plovers or tidewater gobies, initial notification must be made by telephone and writing to the Ventura Fish and Wildlife Office within three working days of finding the animal. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care shall be taken in handling injured animals to prevent additional injury. Injured animals may be released to the wild after receipt of concurrence from the Service. Care shall be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Dead tidewater gobies shall be preserved in 90 or 95 percent ethanol.

The remains of intact western snowy plovers shall be placed with the University of California at

Santa Barbara (Contact: Mark Holmgren, University of California at Santa Barbara, EEMB Department, Santa Barbara, California, 93106, (805) 893-4098). The remains of tidewater gobies shall be placed with the Los Angeles County Museum of Natural History, Section of Fishes, 900 Exposition Boulevard, Los Angeles, California 90007 (Attn: Jeffrey Seigel, (213) 763-3374); Marine Vertebrate Collection, Scripps Institute Oceanography - 0208, La Jolla, California 92093-0208 (Attn: H.J. Walker, Jr., (619) 534-2199); or Department of Ichthyology, California Academy of Sciences, Goldengate Park, San Francisco, California 94118 (Attn: Tomio Iwamoto, (415) 750-7054). The County shall ***Change #11: make arrangements ensure that arrangements are made** with the appropriate repository prior to the onset of the project. The arrangements shall include receiving instructions from the repository on the correct means of preserving the specimens, the proper collection data to be provided with the specimens, and a copy of the project authorization and citation of this biological and conference opinion to provide the repository with proof that the animals were taken legally.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following conservation measure to promote recovery of listed species and reduce the need to list candidate species:

1. The Corps should encourage and work with Santa Cruz and Monterey Counties, CDPR, CDFG, CCC, National Resources Conservation Service, landowners, and farm operators to develop a holistic flood control, sedimentation control, and restoration program that would return natural riparian ecosystem functions to the Pajaro River.

We request notification of the implementation of this conservation recommendation to keep us informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats.

Justifications for Changes:

* Change #11: This allows to the County to coordinate with CDPR ad PRBO to have them make the repository arrangements, but still leaves the ultimate responsibility with the County to ensure that this is done.

End of changes.

Summary of Measures Taken by the County to Implement Recommendations of the Pajaro River Management Plan, Swanson & Associates, 1993 (Request Item #7 from the Coastal Commission)

In 1993, Swanson & Associates prepared a final Pajaro Lagoon Monitoring Plan (1993 Plan). The 1993 Plan was prepared for the County of Santa Cruz Department of Public Works, and the California State Coastal Conservancy. The Plan provided six recommendations for management of the Pajaro River Lagoon (pages 33- 37). Following is a summary of the measures taken by the County to implement the Plan's six recommendations.

1) Lagoon Water Level Control: a.) **Implement Drainage Improvements;** and b.) **Continue with Interim Breaching Program.**

a) **Drainage Improvements** to relieve flooding problems around the Pajaro River Lagoon were proposed to the County by Swanson & Associates in a letter dated February 19, 1992. This letter is provided in the 1993 Plan as a Technical Appendix. The recommended improvements were to:

i) **Reconfigure/repair Shell Road Pump Facility:** In 2004, the City of Watsonville donated to the County two used agricultural pumps for the Shell Road Pump Facility. This replaced the existing dilapidated pumps that had originally been donated by the local farmers. The two City-donated pumps are a marked improvement; however, full-scale replacement of the pumps is still needed. In August 2005 the facility's electrical system was assessed by an electrician. That assessment determined that the facility's electrical system is in need of full-scale replacement. This project has been budgeted as a line item in the County's Flood Control and Water Conservation District Zone 7 benefit assessment budget. For Fiscal Year 2005-06, \$120,000 is planned for this project.

ii) **Install pumps to protect Monterey County farmland during summer flooding:** Approximately three acres of the farmland parcel that is on the Monterey County side of the River, adjacent to the Rivermouth, are subject to flooding when high levels in the Pajaro River lagoon result from a closed lagoon condition. The land owner constructed a levee alongside the lagoon to protect this area of farmland. This levee does not have adequate drainage structures that allow the fields to drain back into the lagoon when they become inundated by high lagoon water levels. The 1993 Plan concluded that a pump station installed at this private levee location would be a useful solution to reduce flooding damage to this farmland. County of Santa Cruz Public Works staff remains available to work with staff of Monterey County, and the landowner in any effort they may initiate to pursue improvements there.

iii) **Replace culvert and flap gate at terminal end of Beach Road Ditch (at Watsonville Slough):** It appears that the flap gate at this location has become non-functional and that the culvert leaks to the point of necessitating full-scale replacement of the culvert and flap gate at this location. The cost to replace this flap gate and culvert (D:36 in.; L:20 ft.) is estimated to be approximately \$20,000.

Funds appear to be available in the Maintenance & Operation budget of the Pajaro Storm Drain and Maintenance District budget. It is anticipated that the County will complete this project in-house, or put this project out to bid sometime within this fiscal year.

iv) **Continue With Interim Breaching Program:** As recommended in the 1993 Plan, the following considerations prepared by Dr. Jerry Smith, were integrated into the present breaching protocol: Artificial breaching is delayed as long as possible in order to avoid situations where the sandbar is naturally breached in responses to a brief early storm. In the event of a closed lagoon with high water levels in late spring, the sandbar is maintained where safely possible to prevent prolonged stratification after the bar reforms and to prevent a delay in conversion towards freshwater. If a late spring artificial breach becomes necessary, a controlled breach is attempted, with partial opening of the bar and subsequent closing to reduce tidal inflow.

2) **Continue Fisheries and Aquatic Habitat (Water Quality) Monitoring:** On January 1, 2005, The County Department of Public Works entered into contract with the consulting firm of H.T. Harvey and Associates in order to provide services for lagoon monitoring. The latest draft of the monitoring program that includes lagoon bathymetry measurements, water quality monitoring, and fish sampling. However, currently at issue is a legal incongruity that does not allow the County to get a 'take' permit to perform fisheries sampling. Fisheries sampling was not deemed necessary in the Biological Opinions from NOAA Fisheries (NOAA) for steelhead, nor the U.S. Fish and Wildlife Service (USFWS) for tidewater goby, in our federal 404 permit from the Army Corps of Engineers. Therefore NOAA and USFWS did not issue 'take' permits for fisheries sampling. This issue will be taken up with NOAA and USFWS when the County 404 permit is renewed in September 2007, at which time NOAA and USFWS will have an opportunity to consider issuing 'take permits' for any fisheries sampling that may be deemed necessary. In the meantime, both bathymetry and water quality measurements remain part of the protocol for monitoring of aquatic habitat.

The following answers items 3, 4, 5, and 6 in conglomeration.

- 3) **Improve Water Quality:**
- 4) **Develop Specific Water Quality Improvement Plan for Watsonville Slough:**
- 5) **Implement Vegetation and Habitat Enhancement Projects:**
- 6) **Coordinate with Other Efforts to Manage the Pajaro River Lagoon and Watsonville Slough:**

In 1995 AMBAG produced the Water Resources Management Plan for the Watsonville Slough System (1995). This plan assesses water quality problems in the Watsonville Sloughs wetland system in southern Santa Cruz County, and recommends several measures to improve water quality there.