Russian River Estuary Management Project

Pinniped Monitoring Plan

February 2011

Reference as:
Sonoma County Water Agency and Stewards of the Coast and Redwoods. 2011. Russian River Estuary Management Project Pinniped Monitoring Plan. February 2011.

Table of Contents

Introduction **1**
Background 1
Biological Opinion and the Estuary 4
Previous Monitoring Efforts 5
Goals and Objectives **7**
Monitoring Components **8**
Schedule 8
Methodology 8
Staffing 12
Reporting 12
References **13**

Figures

Figure 1. Vicinity Map 2
Figure 2. Haulout map 3

Introduction

The Russian River estuary (Estuary) is located about 97 kilometers (km; 60 miles) northwest of San Francisco in Jenner, Sonoma County, California (Figure 1). The Russian River watershed encompasses 3,847 km^2 (1,485 square miles) in Sonoma, Mendocino, and Lake counties. The Estuary extends from the mouth of the Russian River upstream approximately 10 to 11 km (6 to 7 miles) between Austin Creek and the community of Duncans Mills (Heckel 1994).

Harbor seals (*Phoca vitulina richardii*) regularly haul out at the mouth of the Russian River (Jenner haulout) (Figure 2). California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustirostris*) are occasionally observed at the mouth. There are also several known river haulouts at logs and rock piles in the Russian River estuary. This monitoring plan has been prepared as part of the Sonoma County Water Agency's (Water Agency) application for incidential harassment authorization (IHA) under the Marine Mammal Protection Act (MMPA) for activities associated with the Russian River Estuary Management Project. These activities include:

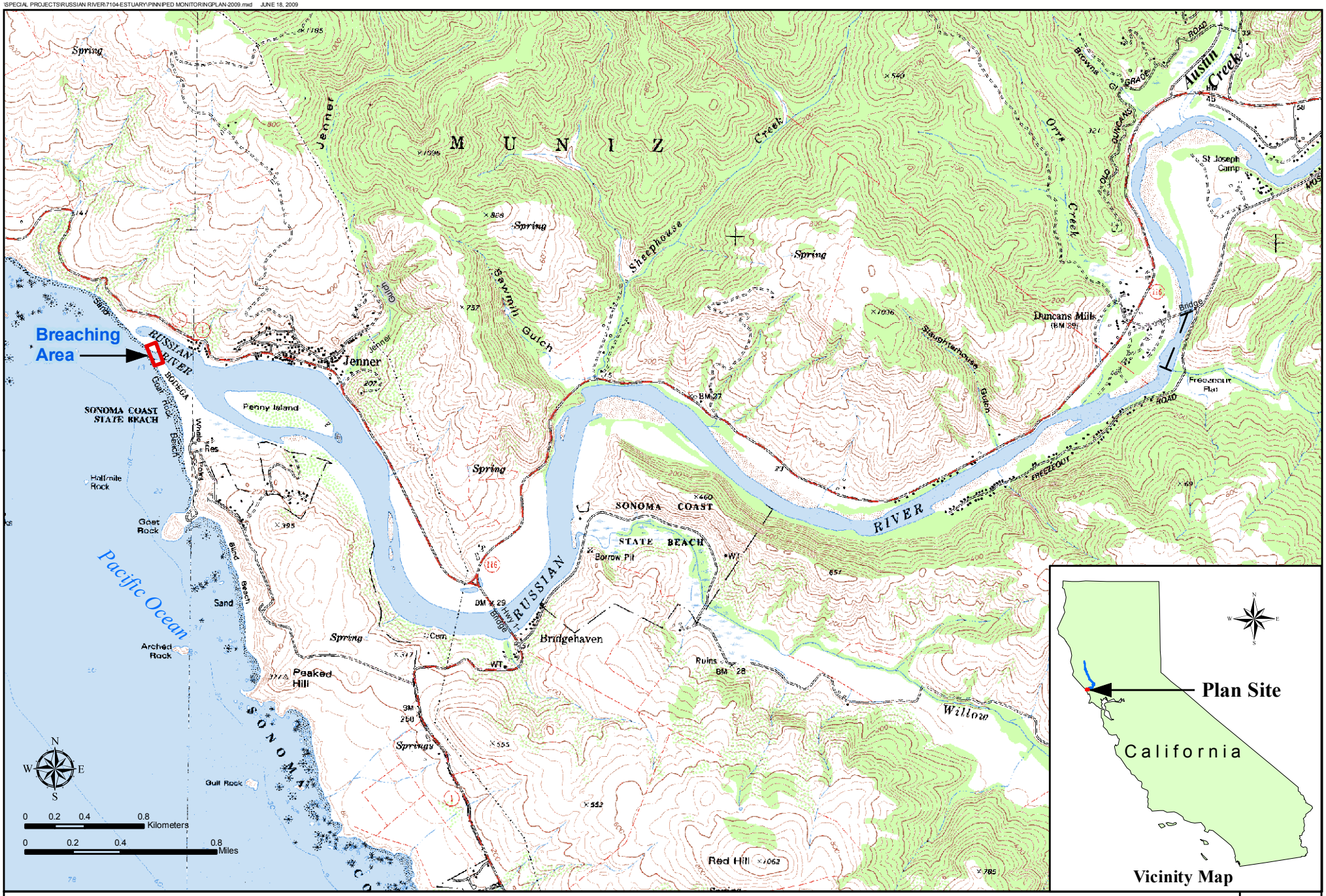
- construction and maintenance of a lagoon outlet channel that would facilitate management of a closed barrier beach at the mouth of the Russian River and create a summer lagoon to improve rearing habitat for listed steelhead as mandated by the Russian River Biological Opinion (NMFS 2008); and
- artificially breaching the barrier beach to minimize the potential for flooding of low-lying properties along the Estuary.

The monitoring plan is a collaborative effort between the Water Agency and the Stewards of the Coast and Redwoods (Stewards).

Background

The Estuary may close throughout the year as a result of a barrier beach forming across the mouth of the Russian River. The mouth is located at Goat Rock State Beach (California Department of Parks and Recreation). Although closures may occur at anytime of the year, the mouth usually closes during the spring, summer, and fall (Heckel 1994; Merritt Smith Consulting 1997, 1998, 1999, 2000; Sonoma County Water Agency and Merritt Smith Consulting 2001). Closures result in ponding of the Russian River behind the barrier beach and, as water surface levels rise in the

\SPECIAL PROJECTS\RUSSIAN RIVER\7104-ESTUARY\PINNIPED MONITORINGPLAN-2009.mxd JUNE 18, 2009



RRIFR
Russian River Instream Flow and Restoration

Russian River Estuary

This Map is for general reference only.

Figure 1

SPECIAL PROJECTS/RUSSIAN RIVER/7104-ESTUARY/HARBOR SEAL-2009-JENNER FEBRUARY 10,2011

Pinniped Haulouts at the Russian River Estuary and Surrounds

Figure 2

Estuary, flooding may occur. Natural breaching events occur when Estuary water surface levels exceed the capability of the barrier beach to impound water, causing localized erosion of the barrier beach and creation of a tidal channel that reconnects the Russian River to the Pacific Ocean.

The barrier beach has also been artificially breached for decades; first by local citizens, then the County of Sonoma Public Works Department, and, since 1995, by the Sonoma County Water Agency (Water Agency). The Water Agency's artificial breaching activities are conducted in accordance with the Russian River Estuary Management Plan recommended in the Heckel (1994) study.

Biological Opinion and the Estuary

The Water Agency and the U.S. Army Corps of Engineers (Corps) consulted with the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA) regarding the potential effects of their operations and maintenance activities, including the Water Agency's estuary management program, on federally-listed steelhead (*Oncorhynchus mykiss*), coho salmon (*O. kisutch*), and Chinook salmon (*O. tshawytscha*). As a result of this consultation, the NMFS issued the Russian River Biological Opinion (NMFS 2008) finding that artificially elevated inflows to the Russian River estuary during the low flow season (May through October) and historic artificial breaching practices have significant adverse effects on the Russian River's estuarine rearing habitat for steelhead, coho salmon, and Chinook salmon. The historic method of artificial breaching, which is done in response to rising water levels behind the barrier beach, adversely affects the estuary's water quality and depth of freshwater. The California Department of Fish and Game (CDFG) issued a consistency determination on November 9, 2009, finding that the Russian River Biological Opinion was consistent with the requirements of the California Endangered Species Act (CESA) and adopted the measures identified in the Russian River Biological Opinion.

The historic breaching practices create a tidal marine environment with shallow depths and high salinity. Salinity stratification contributes to low dissolved oxygen at the bottom in some areas. The Biological Opinion (NMFS 2008) concludes that the combination of high inflows and breaching practices impact rearing habitat because they interfere with natural processes that cause a freshwater lagoon to form behind the barrier beach. Fresh or brackish water lagoons at the mouths of many streams in central and southern California often provide depths and water quality that are highly favorable to the survival of rearing salmon and steelhead.

The Biological Opinion's Reasonable and Prudent Alternative (RPA) 2 (NMFS 2008) requires the Water Agency to collaborate with NMFS and CDFG to modify estuary water level management in order to reduce marine influence (high salinity and tidal inflow) and promote a higher water surface elevation in the Estuary (*i.e.*, formation of a fresh or brackish lagoon) for purposes of enhancing the quality of rearing habitat for juvenile (age 0+ and 1+) steelhead from May 15th to October 15th (lagoon management period) A program of potential, incremental steps are prescribed to accomplish this, including adaptive management of a lagoon outlet channel.

The Water Agency anticipates that lagoon outlet channel management activities would occur in accordance with the Russian River Biological Opinion between May 15 and October 15. Artificial breaching activities would occur in accordance with the Russian River Biological Opinion primarily from October 16 to May 14. However, if Estuary water surface elevations rise above 7.0 feet (at the Jenner gage) and threaten to flood low-lying properties during the lagoon management period, the Water Agency may consult with NMFS and CDFG regarding artificially breaching the barrier beach to alleviate potential flooding, as discussed in the Biological Opinion. The Biological Opinion incidental take statement estimates that the Water Agency may need to artificially breach the the barrier beach "twice per year between May 15 and October 15 during the first three years covered by this opinion, and once per year between May 15 and October 15 during years 4-15 covered by this opinion" (NMFS 2008).

Previous Monitoring Efforts

The Jenner haulout has been extensively monitored. The Stewards' Seal Watch Public Education Program began in 1985, when Dian Hardy and other local activists from Jenner discovered that the harbor seals at Goat Rock State Beach were in greater danger from beach visitors and unleashed dogs than from the pollution of a recent sewage spill into the Russian River. In response to these concerns, they organized and set up four-hour shifts on the beach at the river mouth where they asked visitors to abide by the Marine Mammal Protection Act and stay at least 50 yards from the harbor seals. Today, State Parks Volunteer Docents assist the public in safeguarding this local harbor seal habitat, the largest on the Sonoma Coast. Docents are available at Goat Rock State Beach on weekends during the pupping and molting season (March through Labor Day weekend) when the seals are most vulnerable to public interactions. In addition to public outreach, the volunteers record the numbers of visitors and seals on the beach, other marine mammals observed, and the number of boats and kayaks present.

Joe Mortenson began his ongoing monthly seal counts at the Jenner haulout and Bodega Rock in January 1987, with nearby haulouts added to the counts thereafter. Elinor Twohy began daily counts of seals and people at the Jenner haulout, including photographing the haulout, on November 1, 1989. Her daily counts were taken at different times on successive days to determine if there were diurnal patterns in use of the haulout (Mortenson and Twohy 1994). She also photographed and noted whether the mouth at the Jenner haulout was opened or closed each day. The information that has emerged from these data sets is that the Jenner haulout is atypical in terms of the time of year that the peak numbers of harbor seals are present. The numbers of seals at the Jenner haulout peaks in the late winter (February and March); at other harbor seal haulouts, peaks are typically observed during the pupping and molting season (spring and summer; Mortenson and Twohy 1993). The Jenner haulout is also atypical in terms of the time of day seal count peaks are observed. At other harbor seal haulouts, daily peaks are typically observed at midafternoon low tides regardless of the season. Although daily harbor seal numbers at the Jenner haulout do peak at midday during the winter (November 16th to March 30th) and in the pupping and molting seasons

(April/May and June/July/August, respectively), a midday peak is not observed during the fall (Mortenson and Twohy 1994).[1]

The Water Agency monitored biological and water quality conditions before, during, and after artificial breaching events from 1996 to 2000. Harbor seals regularly hauled out at the mouth of the Russian River, with the greatest numbers observed in late winter and mid-summer. California sea lions and elephant seals were occasionally observed at the river mouth. In all five years of monitoring, the number of pinnipeds hauled out at the mouth of the Estuary declined when the barrier beach was closed and increased soon after it was breached (Sonoma County Water Agency and Merritt Smith Consulting 2001). Seals at the haulout responded most negatively to human disturbances on the beach (typically beach visitors approaching the haulout). When approaching the breaching location, Water Agency crews walked ahead of the bulldozer to ensure that no pinnipeds were harmed on the beach. Most pinnipeds usually abandoned the haulout prior to the bulldozer reaching the breaching location due to disturbance from visitors prior to crews arriving onsite. The remaining pinnipeds flushed as the crew approached the breaching location ahead of the heavy equipment. Once breaching was completed, equipment and crews left the beach and pinnipeds returned to the haulout within a day.

[1] The winter, pupping, and molting seasons were defined in Mortenson and Twohy (1994).

Goals and Objectives

The purpose of this monitoring plan is to detect the response of pinnipeds to estuary management activities at the Russian River estuary. Specifically, the following questions are of interest:

- Under what conditions do pinnipeds haul out at the Russian River estuary mouth at Jenner?
- How do seals at the Jenner haulout respond to activities associated with the construction and maintenance of the lagoon outlet channel and artificial breaching activities?
- Does the number of seals at the Jenner haulout significantly differ from historic averages with formation of a summer (May 15th to October 15th) lagoon in the Russian River estuary?
- Are seals at the Jenner haulout displaced to nearby river and coastal haulouts when the mouth remains closed in the summer?

Monitoring Components

Pinnipeds will be monitored to meet the plan's goals and objectives. The results would provide information on the effects of estuary management activities on the pinnipeds, primarily Pacific harbor seals, that haul out at the mouth of the Russian River estuary. Methods may be revised as data are collected and evaluated in the field. Any significant changes in methodology would be documented and included in the annual report (see below).

Schedule

The term of the monitoring plan would correspond with the MMPA IHA issued by NMFS. Baseline data on conditions associated with seal presence at the Jenner haulout would be collected for the term of the IHA. Generally, monitoring associated with implementation and maintenance of the lagoon outlet channel would occur between May 15 and October 15. Monitoring of artificial breaching activities would occur with each event, generally from October 16 to May 14. Should the mouth remain open during the lagoon management period, biweekly monitoring of the Jenner and river and coastal haulouts would continue as described below.

Methodology

Baseline (Jenner Haulout Use)

Based on previous monitoring efforts, it is known that harbor seals haul out at the mouth of the Russian River at various times of day, with the highest counts in the afternoon, except in the fall (Mortenson and Twohy 1993, Mortenson 1996). Additional information is needed for the Jenner haulout regarding a possible relationship between tides, time of day, and the highest seal counts. Other studies have found that the optimum time to census seals is afternoon low tides (Allen 1987, Pauli and Terhune 1987). It is important to gain a better understanding about what specific conditions seals may prefer for hauling out at the mouth. This baseline information could be a foundation for planning future estuary management activities to minimize disturbances at the Jenner haulout.

Seals at the Jenner haulout would be counted twice monthly for the term of the IHA. Counts would be scheduled for two days out of each month with the intention of capturing a low and high tide each in the morning and afternoon. This may require differing durations of time between baseline monitoring each month to capture the target tides (e.g. 2 weeks between surveys in some months, 1 week between in other months). This census would begin at local dawn and continue for 8 hours. All seals hauled out on the beach would be counted every 30 minutes from the overlook on the bluff along Highway 1 adjacent to the haulout using high powered spotting scopes (Figure 2). Monitoring may conclude for the day if weather conditions affect visibility (e.g. heavy fog in the afternoon). Depending on how the sandbar is formed, seals may haul out in multiple groups at the mouth. At each 30-minute count, the observer would indicate where groups of seals are hauled out on the sandbar (e.g. Site A, Site B mapped on datasheet) and provide a

total count for each group. If possible, adults and pups should be counted separately.

In addition to the census data, disturbances of the haulout would be recorded. The methods for recording disturbances would follow those in Mortenson (1996). Disturbances would be recorded on a three-point scale that represents an increasing seal response to the disturbance (Table 1). The time, source, and duration of the disturbance, as well as an estimated distance between the source and haulout, would be recorded.

Table 1. Seal response to disturbance.

Level	Type of Response	Definition
1	Alert	Seal head orientation in response to disturbance. This may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, or changing from a lying to a sitting position.
2	Moving	Movements away from the source of disturbance, ranging from short withdrawals over short distances to hurried retreats many meters in length.
3	Flight	All retreats (flushes) to the water, another group of seals, or over the beach.
SOURCE: Mortenson, J. 1996. Human interference with harbor seals at Jenner, California, 1994-1995. Prepared for Stewards of Slavianka and Sonoma Coast State Beaches, Russian River/Mendocino Park District. July 11. 1996.		

Weather conditions would be recorded at the beginning of each census. These include temperature, percent cloud cover, and wind speed (Beaufort scale). Tide levels and Estuary water surface elevations can be correlated to the monitoring start and end times in the office at the end of each day.

In an attempt to understand possible relationships between use of the Jenner haulout and nearby coastal and river haulouts, several other haulouts on the coast and in the Russian River estuary would be monitored (Figure 2). These peripheral haulouts include North Jenner and Odin Cove to the north, Pocked Rock, Kabemali, and Rock Point to the south, and Penny Logs, Patty's Rock, and Chalanchawi in the Russian River estuary. These are known harbor seal haulouts that have been monitored by Joe Mortenson, researcher with the Stewards from 1994 to 1995, with Merritt-Smith on breaching studies from 1996 through 1999, and with the Gulf of the Farallones Marine Sanctuary Association for7 years.

The peripheral haulouts would be monitored concurrently with the Jenner haulout baseline monitoring. This monitoring would begin at local dawn and continue for 8 hours. Each peripheral haulout would be visited four times during the monitoring event (twice in the morning, twice in the afternoon). All seals at the peripheral haulout would be counted for 10 minutes from the same vantage point (or points for the haulouts that require more than one vantage point) using binoculars or high powered spotting scopes. Monitoring may conclude for the day if weather

conditions affect visibility (e.g. heavy fog). Disturbances and weather conditions would be recorded as described above for the Jenner haulout.

Lagoon Outlet Channel Monitoring

Should the mouth close during the lagoon management period, the Water Agency would construct a lagoon outlet channel as required by the Russian River Biological Opinion and described in the MMPA IHA. Activities associated with the initial construction of the outlet channel, as well as the maintenance of the channel that may be required, would be monitored for disturbances to the seals at the Jenner haulout.

A one-day pre-outlet channel survey would be made within 1 to 3 days prior to constructing the outlet channel. The haulout would be monitored on the day the outlet channel is constructed and daily for up to 2 days during channel excavation activities. Monitoring would also occur on each day that the outlet channel is maintained using heavy equipment for the duration of the lagoon management period. Monitoring of outlet channel maintenance would correspond with the monitoring described under the "Jenner Haulout Use" section above. Methods would follow the census and disturbance monitoring protocols described in the "Jenner Haulout Use" section.

Displacement. In an attempt to understand if seals from the Jenner haulout are displaced to coastal and river haulouts nearby when the mouth remains closed in the summer, several other haulouts, on the coast and in the Russian River estuary, would be monitored (Figure 2). These haulouts include North Jenner and Odin Cove to the north, Pocked Rock, Kabemali, and Rock Point to the south, and Penny logs, Patty's Rock, and Chalanchawi in the Russian River estuary. Each of these coastal and river haulouts would be monitored concurrent with monitoring of outlet channel construction and maintenance activities. This would provide an opportunity to qualitatively assess if these haulouts are being used by seals displaced from the Jenner haulout during lagoon outlet channel excavation and maintenance. This monitoring would not provide definitive results that individuals from the Jenner haulout are displaced to the coastal and river haulouts as individual seals would not be marked; however, it would useful to track general trends in haulout use during lagoon outlet channel excavation and maintenance.

As volunteers would be required to monitor these haulouts (please see "Staffing" below), haulout locations may need to be prioritized if there are not enough volunteers available. In that case, priority would be assigned to the North Jenner and Odin Cove haulouts, followed by the Russian River estuary haulouts, and finally the Pocked Rock, Kabemali, and Rock Point haulouts.

To obtain more definitive data on displacement of harbor seals from the Jenner haulout and use of the coastal and river haulouts, a mark/tagging program should be considered for future studies. Such a program would be valuable for long-term management of the Jenner haulout and would be an effective method of identifying seasonal activity patterns and seal response to estuary management activities. A similar program implemented at the Point Reyes National Seashore for the Drakes

Estero harbor seal population would be an example that could be reviewed in development of a mark/tagging program (Allen et al. 1987a, 1987b).

Artificial Breaching Events

Pinniped responses to the Water Agency's artificial breaching activities were extensively monitored from 1996 to 2000 (Merritt-Smith Consulting 1997, 1998, 1999, 2000; Sonoma County Water Agency and Merritt-Smith Consulting 2001). In accordance with the Russian River Biological Opinion (NMFS 2008), the Water Agency would artificially breach the barrier beach outside of the summer lagoon management period (from October 16 to May 14), unless Estuary water surface elevations from May 15 to October 15 rise above 7 feet at the Jenner gage. In that case, the National Marine Fisheries Service and California Department of Fish and Game could be consulted regarding potentially scheduling an artificial breaching event to open the barrier beach and reduce flooding risk.

Pinniped response to artificial breaching would be monitored at each such event during the term of the MMPA IHA. Methods would follow the census and disturbance monitoring protocols described in the "Jenner Haulout Use" section, which were also used for the 1996 to 2000 monitoring events (Merritt-Smith Consulting 1997, 1998, 1999, 2000; Sonoma County Water Agency and Merritt-Smith Consulting 2001). Half-hour counts of all seals hauled out on the beach would begin at least one hour before artificial breaching is scheduled to begin and conclude at least 2 hours after crews and equipment have left the beach, with a minimum of 6 hours of monitoring. If breaching is scheduled in the morning, monitoring could be begin as early as local dawn. For breaching events scheduled in the afternoon, monitoring would conclude at least 2 hours after crews and equipment have left the beach or at dusk..

Monitoring During Pupping Season

The pupping season is March 15 to June 30. Baseline, lagoon outlet channel, and artificial breaching monitoring during the pupping season will include recording observations of neonates (pups less than 1 week old). Characteristics of a neonate pup include: body weight is less than 15 kg; thin for their body length; an umbilicus or natal pelage present; wrinkled skin; and awkward or "jerky" movements on land. The Water Agency shall coordinate with the Stewards SealWatch monitoring program to determine if pups less than one week old are on the beach (e.g., a pup was sighted being born) prior to a water level management event.

If, during monitoring, observers sight any pup which may be abandoned, the Water Agency would contact the NMFS stranding response network [Marine Mammal Center, 415-289-7350] immediately and also report the incident to NMFS' Southwest Regional Office and NMFS Headquarters within 48 hours. Observers are not to approach or move the pup. Potential indications that a pup may be abandoned include: no observed contacts with adult seals, no movement of the pup, pup's attempts to nurse are rebuffed.

Staffing

Monitoring would be conducted by qualified individuals with prior approval by NMFS. Generally, these individuals would include professional biologists employed by NMFS or the Water Agency or volunteers trained by the Stewards. All volunteer monitors would be required to attend a classroom-style training and field site visits to the haulouts. Training would cover the MMPA and any conditions of a MMPA permit issued by NMFS, this Pinniped Monitoring Program, pinniped species identification, age class identification (including a specific discussion regarding neonates), recording of count and disturbance observations (including completion of datasheets), and use of equipment. Pinniped identification would include harbor seal, California sea lion, and northern elephant seal, as well as other pinniped species with potential to occur in the area.

Generally, Water Agency staff and volunteers would collect baseline data on Jenner haulout use during the twice monthly monitoring events. A schedule for this monitoring would be established with Stewards of the Coasts and Redwoods once volunteers are available for the monitoring effort. Water Agency staff would monitor lagoon outlet channel excavation and maintenance activities and artificial breaching events at the Jenner haulout, with assistance from Seal Watch volunteers as available. Seal Watch volunteers would monitor the coastal and river haulout locations during lagoon outlet channel excavation and maintenance activities.

Reporting

An annual report would be prepared and distributed to the NMFS, California State Parks, and Stewards of the Coasts and Redwoods. The report would also be available to the public on the Water Agency's website.

The annual report would include an executive summary, monitoring methodology, tabulation of estuary management events, summary of monitoring results, and discussion of problems noted and proposed remedial measures.

References

Allen, S. 1987. Pinniped assessment in Point Reyes, California, 1983 to 1994. Report to National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA Technical Memoranda Series NOS/MEMD 7. August 1987.

Allen, S., D.G. Ainley, L. Fancher, and D. Shuford. 1987a. Movement and activity patterns of harbor seals (Phoca vitulina) from the Drakes Estero population, California, 1985-1986. Report to National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA Technical Memoranda Series NOS/MEMD 6. August 1987.

Allen, S., J.F. Penniman, and D. Ainley. 1987b. Movement and activity patterns of harbor seals (Phoca vitulina) from the Drakes Estero population, California, 1986-1987. Annual report to the Marine and Estuarine Division, National Oceanic and Atmospheric Administration. December 1987.

Heckel, Melanie. 1994. Russian River Estuary Study 1992-1993. Prepared for Sonoma County Department of Planning and California State Coastal Conservancy.

Merritt Smith Consulting. 1997. Biological and Water Quality Monitoring in the Russian River Estuary, 1996. Prepared for Sonoma County Water Agency. February 21, 1997.

Merritt Smith Consulting. 1998. Biological and Water Quality Monitoring in the Russian River Estuary, 1997. Second Annual Report. Prepared for the Sonoma County Water Agency. February 5, 1998.

Merritt Smith Consulting. 1999. Biological and Water Quality Monitoring in the Russian River Estuary, 1998. Third Annual Report. Prepared for the Sonoma County Water Agency. March 15, 1999.

Merritt Smith Consulting. 2000. Biological and Water Quality Monitoring in the Russian River Estuary, 1999. Fourth Annual Report. Prepared for the Sonoma County Water Agency. March 24, 2000.

Mortenson, J. 1996. Human interference with harbor seals at Jenner, California, 1994-1995. Prepared for Stewards of Slavianka and Sonoma Coast State Beaches, Russian River/Mendocino Park District. July 11. 1996.

Mortenson, J. and E. Twohy. 1994. Harbor seals at Jenner, California, 1974-1993. Prepared for Prepared for Stewards of Slavianka and Sonoma Coast State Beach, California Department of Parks and Recreation, Duncans Mills, CA.

NMFS (National Marine Fisheries Service). 2008. Biological opinion for water supply, flood control operations, and channel maintenance conducted by the U.S. Army

Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed. NMFS-Southwest Region, Long Beach, CA. 367 pp.

Pauli, B.D. and J.M. Terhune. 1987. Tidal and temporal interaction on harbour seal haul-out patterns. Aquatic Mammals 13.3: 93-95.

Sonoma County Water Agency and Merritt Smith Consulting. 2001. Biological and Water Quality Monitoring in the Russian River Estuary, 2000. Fifth Annual Report. June 12, 2001.