Russian River Estuary Management Project

Marine Mammal Protection Act Incidental Harassment Authorization (No. 14426)

Report of Activities and Monitoring Results – April 1 to December 31, 2010

Prepared for
Office of Protected Resources and Southwest Regional Administrator
National Marine Fisheries Service

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The purpose of this report of activities and monitoring results is to comply with the requirements of the Incidental Harassment Authorization (IHA) issued pursuant to Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C 1361 et seq.) to take small numbers of marine mammals, by Level B harassment, incidental to the Sonoma County Water Agency's (Water Agency) Russian River Estuary Water Level Management Activities (dated March 30, 2010, NMFS IHA No. 14426, Attachment A).

The Water Agency applied in 2009 to the National Marine Fisheries Service (NMFS) Office of Protected Resources for an IHA under the Marine Mammal Protection Act (MMPA) for activities associated with water level management activities in the Russian River estuary (Estuary). NMFS issued IHA No. 14426 to the Water Agency on March 30, 2010. This report provides the results of baseline monitoring and water level management activities during the term of IHA No. 14426 from April 1 to December 31, 2010.

The Estuary may close throughout the year as a result of a barrier beach forming across the mouth of the Russian River. Closures result in ponding of the Russian River behind the barrier beach and, as water surface levels rise in the Estuary, flooding may occur. The Water Agency's artificial breaching activities are conducted in accordance with the Russian River Estuary Management Plan recommended in the Heckel (1994) study. The purpose of artificially breaching the barrier beach is to alleviate potential flooding of low-lying properties along the Estuary.The Water Agency and the U.S. Army Corps of Engineers (Corps) consulted with the 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 sandbar breaching, which is done in response to rising water levels behind the barrier beach, adversely affects the Estuary's water quality and freshwater depths.

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 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 (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 15 to October 15 (referred to hereafter as the lagoon

management period). A program of potential, incremental steps are prescribed to accomplish this, including adaptive management of a lagoon outlet channel on the barrier beach.

Harbor seals (*Phoca vitulina richardii*) regularly haul out at the mouth of the Russian River (Jenner haulout). California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustirostris*) are occasionally observed at the haulout. There are also several known river haulouts at logs and rock piles in the Russian River estuary. The Water Agency applied for an IHA under the MMPA for activities associated with Russian River estuary management activities, which occur in the vicinity of these haulouts, including:

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

Monitoring was performed in accordance with the requirements of NMFS IHA No. 14426 and the Russian River Estuary Management Activities Pinniped Monitoring Plan (Sonoma County Water Agency and Stewards of the Coast and Redwoods 2009).

In an attempt to understand possible relationships between use of the Jenner haulout and nearby coastal and river (peripheral) haulouts, several other haulouts on the coast and in the Russian River estuary were monitored. These haulouts included 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.

Two types of monitoring were performed: baseline and water level management activities. Baseline monitoring was performed to gather additional information regarding a possible relationship between tides, time of day, and the highest pinniped counts at the Jenner haulout and to gain a better understanding about which specific conditions harbor seals may prefer for hauling out at the mouth. Baseline monitoring of the peripheral haulouts was completed concurrently with the monitoring of the Jenner haulout. Pinniped use of the haulouts was also monitored in relation to Water Agency water level management events (lagoon outlet channel implementation and artificial breaching). Each of the peripheral haulouts were monitored concurrently with baseline and monitoring of water level management activities in the vicinity of the Jenner haulout.

The July 8, 2010, beach management event was the only lagoon management event in 2010. There were two artificial breaching events during the lagoon management period, September 30-October 1, and October 11-12, 2010. The September 30-October 1 was an artificial breaching event over two days. The first attempt to breach occurred on September 30, 2010, but was unsuccessful due to high wave activity and did not result in a decrease in water surface elevation in the estuary; a second attempt to artificially breach the estuary on October 1, 2010, was successful. The October 11-12 was also an

artificial breaching event over two days due to high wave activity affecting the breaching activity. Pinniped monitoring occurred the day before, the day of, and the day after each water level management activity. Data collected included counts of seals occupying the Jenner haulout every 30 minutes and recording of pinniped response to disturbances of the haulout. The peripheral haulouts were monitored similarly, with the exception of all seals were counted for 10 minutes at each haulout and visited twice each day. The NMFS IHA No. 14426 allows 4,200 occurrences of incidental harassment during the lagoon management period and 258 occurred.

The Water Agency surveys the sandbar (or barrier beach) monthly to collect a topographic map of the beach, as required by the Russian River Biological Opinion. A monitor was present during these surveys to record any disturbances of the Jenner haulout during the survey. The count and disturbance data was utilized to estimate the number of takes by incidental harassment for the April through December 2010 water level management work. The NMFS IHA No. 14426 allows 64 occurrences of incidental harassment and an estimated 32 occurred.

The Russian River Estuary Management Activities from April to December 2010 resulted in incidential harassment (Level B harassment) of 290 marine mammals, well under the total allowed by NMFS IHA No. 14426.

INTRODUCTION

The purpose of this report of activities and monitoring results is to comply with the requirements of the Incidental Harassment Authorization (IHA) issued pursuant to Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C 1361 et seq.) to take small numbers of marine mammals, by Level B harassment, incidental to the Sonoma County Water Agency's (Water Agency) Russian River Estuary Water Level Management Activities (dated March 30, 2010, NMFS IHA No. 14426, Attachment A).

The Water Agency applied in 2009 to the National Marine Fisheries Service (NMFS) Office of Protected Resources for an IHA under the Marine Mammal Protection Act (MMPA) for activities associated with water level management activities in the Russian River estuary. NMFS issued IHA No. 14426 to the Water Agency on March 30, 2010. This report provides the results of baseline monitoring and water level management activities during the term of IHA No. 14426 from April 1 to December 31, 2010.

BACKGROUND

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 square kilometers (km) (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).

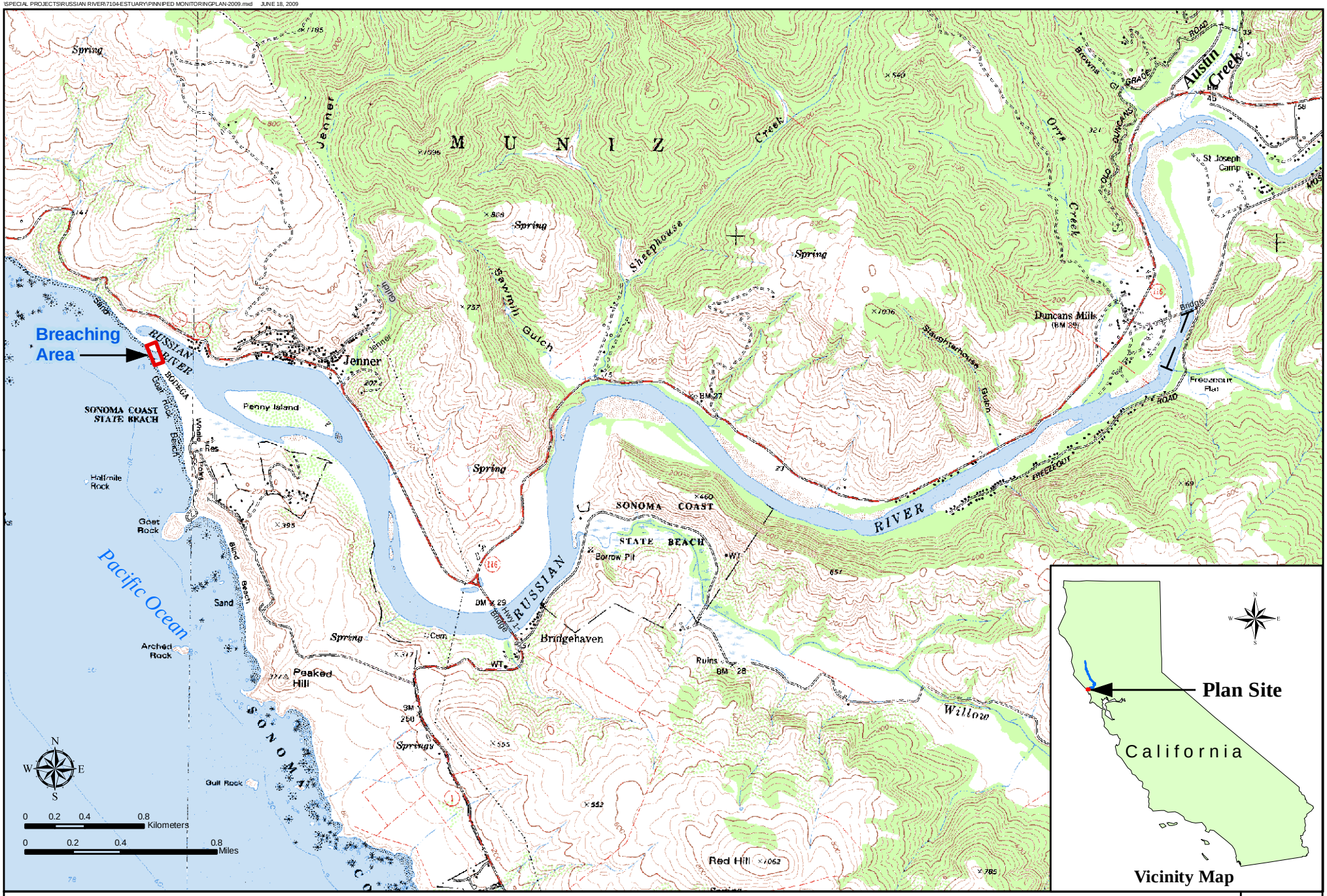
The Estuary may close throughout the year as a result of a barrier beach forming across the mouth of the Russian River. The mouth is located at Goat Rock State Beach (California Department of Parks and Recreation). Closures result in ponding of the Russian River behind the barrier beach and, as water surface levels rise in the 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 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. The purpose of artificially breaching the barrier beach is to alleviate potential flooding of low-lying properties along the Estuary.

Biological Opinion and the Estuary

The Water Agency and the U.S. Army Corps of Engineers (Corps) consulted with the 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

\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

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 sandbar breaching, which is done in response to rising water levels behind the barrier beach, adversely affects the estuary's water quality and freshwater depths.

The historic artificial breaching practices create a tidal marine environment with shallow freshwater 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 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 (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 15 to October 15 (referred to hereafter as the lagoon management period). A program of potential, incremental steps are prescribed to accomplish this, including adaptive management of a lagoon outlet channel on the barrier beach.

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 haulout. There are also several known river haulouts at logs and rock piles in the Russian River estuary (Figure 2). The Water Agency applied for an IHA under the MMPA for activities associated with Russian River estuary management activities, including:

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

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

Pinniped Haulouts at the Russian River Estuary and Surrounds

Figure 2

METHODS

Monitoring was performed in accordance with the requirements of NMFS IHA No. 14426 and the Russian River Estuary Management Activities Pinniped Monitoring Plan (Sonoma County Water Agency and Stewards of the Coast and Redwoods 2009, Appendix B).

Water Agency biologists and Stewards of the Coast and Redwoods (Stewards) volunteers and staff monitored pinnipeds at the Jenner and peripheral haulouts. The Stewards provided training for all volunteers on March 10, 2010. The training session was also attended by Water Agency biologists participating in the monitoring program. The training agenda covered:

- the Marine Mammal Protection Act;
- anticipated IHA monitoring requirements;
- the Russian River Estuary Management Activities Pinniped Monitoring Plan and monitoring methods therein, including completion of data sheets;
- field identification of pinnipeds of the California coast, including harbor seals, California sea lions, Stellar sea lions, and northern elephant seals;
- field identification of neonates (pups less than 1 week old);
- care and use of field equipment (e.g. cameras, spotting scopes, binoculars); and
- field visits to each haulout monitoring location.

In an attempt to understand possible relationships between use of the Jenner haulout and nearby coastal and river (peripheral) haulouts, several other haulouts on the coast and in the Russian River estuary were monitored (Figure 2). These haulouts included 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 for the past 8 years.

Two types of monitoring were performed: baseline and water level management activities. Baseline monitoring of the Jenner haulout was shared by Water Agency biologists and Stewards volunteers (each group monitored once a month), with volunteers monitoring the peripheral haulouts for all baseline monitoring. The water level management activity monitoring at the Jenner haulout was also shared, but Water Agency biologists monitored lagoon outlet channel and artificial breaching activities on the day of the event. Pre- and post-management activity monitoring was shared by the organizations depending on the availability of volunteers and Water Agency staff. Stewards volunteers monitored the peripheral haulouts during most of the pre- and post-management monitoring events.

Baseline (Jenner Haulout Use)

Baseline monitoring was performed to gather additional information regarding a possible relationship between tides, time of day, and the highest pinniped counts at the Jenner haulout and to gain a better understanding about which specific conditions harbor seals may prefer for hauling out at the mouth. Baseline monitoring of the peripheral haulouts was completed concurrently with the monitoring of the

Jenner haulout. Baseline counts were scheduled for two days out of each month with the intention of capturing a low and high tide each in the morning and afternoon.

Pinnipeds at the Jenner and peripheral haulouts were counted twice monthly. This census began at local dawn and continued for 8 hours. All pinnipeds hauled out on the beach were counted every 30 minutes from the overlook on the bluff along Highway 1 adjacent to the Jenner haulout using a high-powered spotting scope. Depending on how the sandbar is formed, harbor seals may haul out in multiple groups at the Jenner haulout. 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. Adults and pups were counted separately through June, after which it became difficult to differentiate between age classes. All neonates were also recorded and were identified by one or more of the following characteristics: less than 1 week old, less than 15 kg, thin for their body length, an umbilicus or natal pelage present, wrinkled skin, or awkward or "jerky" movement.

The peripheral haulouts were visited for 10 minute counts twice during each baseline monitoring day. All pinnipeds hauled out during the 10 minutes were counted from the same vantage points at each haulout using a high-powered spotting scope or binoculars.

In addition to the census data, disturbances of the haulouts were recorded. The methods for recording disturbances followed those in Mortenson (1996). Disturbances were 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, were recorded.

Table 1. Levels of pinniped response to disturbance used for Russian River Estuary Management Activities pinniped monitoring.

Level	Type of Response	Definition
1	Alert	Seal head orientation changes 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 were recorded at the beginning of each census. These included temperature, visibility, ocean conditions and wind speed (Beaufort scale). Tide levels and Estuary water surface elevations were correlated to each monitoring day.

Water Level Management Activities

Pinniped use of the haulouts was also monitored in relation to Water Agency water level management events (lagoon outlet channel implementation and artificial breaching). Each of the peripheral haulouts were monitored concurrently with monitoring of water level management activities in the vicinity of the

Jenner haulout. This provided an opportunity to qualitatively assess if these haulouts were being used by seals displaced from the Jenner haulout during water level management activities.

A one-day, pre-event survey was made within 1 to 3 days prior to all water level management events. On the day of the management event, pinniped monitoring began at least one hour prior to the crew and equipment accessing the beach work area and continued during the duration of the event until at least one hour after the crew and equipment left the beach. Monitoring continued on the day following each water level management event to document the number of seals utilizing the haulouts. Methods followed the census and disturbance monitoring protocols described in the "Baseline (Jenner Haulout Use)" section above.

Monitoring During Pupping Season

If any pup which was potentially abandoned was observed during monitoring, the Water Agency contacted the NMFS stranding response network (Marine Mammal Center in Sausalito, CA) immediately and also reported the incident to NMFS' Southwest Regional Office and NMFS Headquarters within 48 hours. Monitors were instructed not to approach or move the pup. Monitors used the following potential indications that a pup may be abandoned: no observed contacts with adult seals, no movement of the pup, and the pup's attempts to nurse were rebuffed.

Additional Training

A worker training on the MMPA, pinniped identification, and the conditions of the NMFS IHA No. 14426 was held on May 12, 2010, for Water Agency staff and contractors assigned to Russian River Estuary Management Activities. The training included equipment operators, safety crew members, and surveyors and was led by a Water Agency biologist. In addition, prior to each water surface elevation management event beginning (lagoon outlet channel implementation or artificial breaching), the biologist monitoring the event participated in the onsite tailgate safety meeting to discuss the location(s) of pinnipeds at the Jenner haulout that day and methods of avoiding and minimizing disturbances to the haulout as outlined in NMFS IHA No. 14426.

RESULTS

The NMFS IHA No. 14426 requires the following information be provided in this report:

(a) the number of seals taken, by species and age class (if possible);

(b) behavior prior to and during water level management events;

(c) start and end time of activity;

(d) estimated distances between source and seals when disturbance occurs;

(e) weather conditions (e.g., temperature, wind, etc.);

(f) haulout reoccupation time of any seals based on post activity monitoring;

(g) tide levels and estuary water surface elevation; and

(h) seal census from bi-monthly and nearby haulout monitoring.

Estuary water surface elevations are recorded at the Jenner gage (operated by the Water Agency), located at the State Parks visitor center in the town of Jenner. Appendix C includes the Estuary water surface elevations associated with pinniped monitoring in 2010, including both baseline and water elevation management events.

Baseline (Jenner Haulout Use)

Baseline monitoring of the Jenner and peripheral haulouts was performed two days out of each month with the intention of capturing a low and high tide each in the morning and afternoon (Table 2).

Table 2. Baseline pinniped monitoring events for Russian River Estuary Management Activities under the NMFS IHA No. 14426 from April to December 2010. Tides are corrected for Fort Ross, CA.

Date	Corrected AM Tide Time	Corrected AM Tide (feet)	Corrected PM Tide Time	Corrected PM Tide (feet)
29-April	05:54	-0.34	13:01	4.51
6-May	05:52	3.94	11:45	0.58
27-May	04:59	-0.34	12:14	4.42
14-June	06:47	-0.64	14:13	4.61
21-June	08:10	3.65	12:46	1.92
13-July	05:44	-0.54	12:58	4.90
19-July	06:45	3.65	11:20	2.21
9-August	04:38	-0.96	11:42	4.99
16-August	05:11	4.03	09:55	2.30
9-September	05:28	0.29	12:07	6.05
16-September	07:45	4.42	12:23	2.98
7-October	04:15	0.77	10:47	6.24
14-October	06:05	4.42	10:53	3.07
3-November	05:05	2.69	11:10	6.14
18-November	07:50	5.57	14:37	0.19
2-December	07:17	6.34	14:03	-0.58
23-December	05:15	2.78	11:17	6.24
SOURCE: Pacific Publishers, 2010 Tidelog.				

Appendix D provides the harbor seal baseline census (count) and weather conditions data collected at the Jenner from April to December 2010. Appendix D provides the harbor seal baseline census for the Jenner and peripheral haulouts, including all weather observations. No other species of pinnipeds were observed at the Jenner or peripheral haulouts during the baseline monitoring. Table 3 shows the mean number of harbor seal adults and pups (identified only during the pupping season) during twice monthly baseline monitoring events. The highest means were observed from the end of the pupping season into molt in 2010. Comparison of count data between the Jenner and peripheral haulouts did not show any obvious correlations (e.g. the number of seals occupying peripherals did not necessarily increase or decrease compared to the Jenner haulout).

Appendix E provides harbor seal disturbance observations during baseline monitoring. Disturbances to the Jenner haulout were regularly observed. Disturbances were infrequently observed at the peripheral haulouts and Appendix E includes alert response to a biological survey (not associated with the Water Agency) observed at the North Jenner haulout and a motor boat at the Penny Logs haulout.

Table 3. Mean number of harbor seals observed at the Jenner haulout (Goat Rock State Beach) during Russian River Estuary Management Project baseline pinniped monitoring from April to December 2010. Pups are counted separately through June, after which all seals are counted as adults as it becomes more difficult to accurately age individuals.

Date	No. Harbor Seals at Jenner Haulout				
	Adults	Neonate pups (<1 week old)	Pups (>1 week old)	Total Pups	Total Harbor Seals
29-April	142			19	162
6-May	111	3	15	19	130
27-May	78	1	10	10	88
14-June	101	0	1	0	102
21-June	184				184
13-July	295				295
19-July	230				230
9-August	133				133
16-August	94				94
9-September	47				47
16-September	72				72
7-October	13				13
14-October	37				37
3-November	102				102
18-November	75				75
2-December	71				71
23-December	0				0

Water Level Management Activities

There were 6 barrier beach formations (sandbar closures) at the mouth of the Russian River in 2010 (Table 4). Implementation of the 2010 Lagoon Outlet Channel Adaptive Management Plan (PWA 2010) occurred once in 2010 on July 8. The outlet channel closed during high tide on the same day and the barrier beach naturally breached on July 11, 2010. The Water Agency artificially breached the barrier beach 3 times in 2010. Two of the artificial breaching events occurred during the lagoon management period (May 15 to October 15) following consultation with the NMFS and California Department of Fish and Game (CDFG) regarding potential flood risk associated with high wave events and inflows into the Russian River estuary. The timing of the closures late in the lagoon management period provided little or no habitat benefit to juvenile steelhead and the potential for flooding was high due to the limited beach access caused by high wave events breaking across the beach. The artificial breaching events

during the lagoon management period were covered under the Incidental Take Statement provided in the Russian River Biological Opinion (NMFS 2008).

Table 4. Russian River Estuary barrier beach closures in 2010 and summary of Sonoma County Water Agency water level management activities under the NMFS IHA No. 14426 from April to December 2010.

Approx. Sandbar Closure Date	Approx. No. Days Closed	Event Type and Date	Jenner Gage Water Surface Elevation at Event (feet)
8-January	3	Artificial breach -11-January	7.5
4-July	4	Lagoon outlet implementation - 8-July[a]	5.6
8-July	3	Natural breach – 11-July	7.2
21-September	10	Artificial breach -1-October[b]	7.7
4-October	8	Artificial breach – 12-October[c]	6.9
21-October	3	Natural breach – 24-October	8.7
2-November	1	Natural breach – 2-November	6.7

[a] Water Agency implemented the 2010 lagoon outlet channel adaptive management plan on July 8,2010. The outlet channel closed during a high tide event on the same day. The barrier beach naturally breached July 11, 2010.

[b] Water Agency consulted with National Marine Fisheries Service and California Department of Fish and Game regarding the potential flood risk posed by high surf activity and inflows making access to the beach difficult. Consensus was that artificial breaching should be done to minimize flood risk. Attempted to breach on September 30, 2010, but high wave activity re-formed the barrier beach. Successfully breached the barrier beach on October 1, 2010.

[c] Water Agency consulted with National Marine Fisheries Service and California Department of Fish and Game regarding the potential flood risk posed by high surf activity and inflows making access to the beach difficult. Consensus was that artificial breaching should be done to minimize flood risk. Attempted to breach on October 11, 2010, but high wave activity re-formed the barrier beach. Successfully breached the barrier beach on October 12, 2010.

Monitoring of the Jenner and peripheral haulouts occurred the day before, day of, and day after each water level management activity. Table 5 provides a summary of the pinniped monitoring events, tides, and an approximate Estuary water surface elevation during each monitoring day.

Appendix F provides the pinniped monitoring census data collected at the Jenner and peripheral haulouts from April to December 2010 during water level management activities. Appendix G provides the observations of pinniped responses to disturbance, including the responses to staff and equipment presence in the vicinity of the Jenner haulout.

Lagoon Outlet Channel Implementation – July 8, 2010

The July 8, 2010, beach management event was the only lagoon management event in 2010. The barrier beach formed, closing the mouth of the Russian River, on July 4, 2010. Prior to the closure, the river channel had been flowing to the northwest in an orientation similar to the target orientation for the lagoon outlet channel (Figure 3). Prior to the closure, harbor seals were observed at the Jenner haulout. The most recent Baseline census was on June 21, 2010, when a mean of 184 harbor seals was observed (Table 3).

Table 5. Pinniped monitoring for Russian River Estuary water level management activities under the NMFS IHA No. 14426 from April to December 2010.

Pinniped Monitoring Date	Pinniped Monitoring Type	Event Type	Corrected Low Tide (feet)	Corrected High Tide (feet)	Jenner Gage Water Surface Elevation at Event (feet)
7-July	Day before event	Lagoon outlet implementation	0.29	5.86	
8-July	Day of event	Lagoon outlet implementation	-0.19	6.14	5.6
9-July	Day after event	Lagoon outlet implementation	-0.67	5.94	
29-Sept.	Day before event	Artificial breaching			
30-Sept.	Breach attempt/ Day before event[a]	Artificial breaching	0.29	4.80	
1-October	Day of event	Artificial breaching	3.17	4.80	7.7
2-October	Day after event	Artificial breaching	0.19	4.80	
10-October	Day before event	Artificial breaching			
11-October	Breach event/ Day before event[a]	Artificial breaching	-0.48	5.95	
12-October	Day of event	Artificial breaching	-0.19	5.57	6.9
13-October	Day after event	Artificial breaching	0.19	4.86	

[a] This artificial breaching event was unsuccessful on the first day due to high wave events closing the pilot channel and required a second attempt on the following day.

July 1, 2010 Natural Open Channel. Photo from Highway 1 Overlook.

July 7, 2010 Channel Closed by Tidal Action. Photo from Highway 1 Overlook.

July 8, 2010 Created Outlet Channel. Photo from Highway 1 Overlook.

Figure 3. Russian River Estuary: Natural outlet channel closed and created outlet channel conditions, July 2010

The Jenner and peripheral haulouts were monitored for the pre-lagoon outlet channel implementation on July 7, 2010. The mean number of harbor seals at the Jenner haulout on July 7 was 101 individuals (Figure 4). Implementation of the lagoon outlet channel adaptive management plan occurred on July 8, 2010 (Table 5). A Water Agency biologist began monitoring the Jenner haulout at 04:45, with the first count at 05:15 (estimated 123 harbor seals, Appendix F). Observations of harbor seal responses to disturbance on July 8 are provided in Appendix G. The first response to Water Agency beach management activities occurred at 06:31, when 4 seals alerted (zero flushed) and briefly looked toward the Goat Rock State Beach parking lot in the direction of equipment beeping (heavy equipment beeps when it is operated in reverse). At 06:35, staff and equipment approaching on the beach resulted in 143 harbor seals alerting (zero flushed). The first movements and flushing from the beach resulting from the approaching crew began at 06:44 over a course of two minutes as 135 harbor seals left the beach (8 remained hauled out). At 07:11, over 5 minutes, 9 harbors seals alerted to a surveyor taking points, with 4 seals flushing from the haulout to the river and 5 remaining at the haulout. A Stewards monitor recorded 5 disturbed seals (zero flushed) from 07:13 to 07:26 and noted "dredging of channel," but did not indicate an alert or movement response to the disturbance. A seal response of alert and movement of 14 harbor seals at the haulout, with 6 flushes and commented "dredging channel open" was noted at 09:02, but did not indicate the number of harbor seals remaining when the disturbance ended at 09:12. However, the seal count taken at 09:15 shows 9 harbor seals hauled out on the river side of the beach (Appendix F). The next harbor seal response to disturbance began at 09:16 and ended at 09:20 as the crew and equipment began to leave the beach for the parking lot. The first responses to two safety crew members approaching was 9 harbor seals alerting and moving, with 3 seals flushing from the haulout to the river/estuary side of the beach and 6 remaining at the haulout. The second response was alert and movement behavior of 5 of the 6 previously remaining seals to the river/estuary as the two safety crew members escorted the two pieces of equipment past the haulout. One harbor seal remained on the beach at 0920 when equipment and crews had left the beach. At 09:45, one harbor seal was hauled out on the river side of the beach. For the Water Agency's final count at 10:15, 3 harbor seals were hauled out on the river side of the beach, with the monitor noting "movement back and forth across the bar into and out of the water," and 4 harbor seals hauled out on the ocean side. The Steward's monitors made a count from 11:30 to 11:40 and counted 60 harbor seals at the Jenner haulout, noting "10 very active, move across sand, in and out of water" (Appendix F). Sixty-five harbor seals were counted at the Jenner haulout from 13:26 to 13:33. The barrier beach was re-formed and the outlet channel closed during the high tide on July 8. It is difficult to provide a definite time between when the equipment left the beach and the first haulout was formed, but the first harbor seal hauled out approximately 25 minutes after the equipment left and had increased to 65 seals approximately 3 hours later.

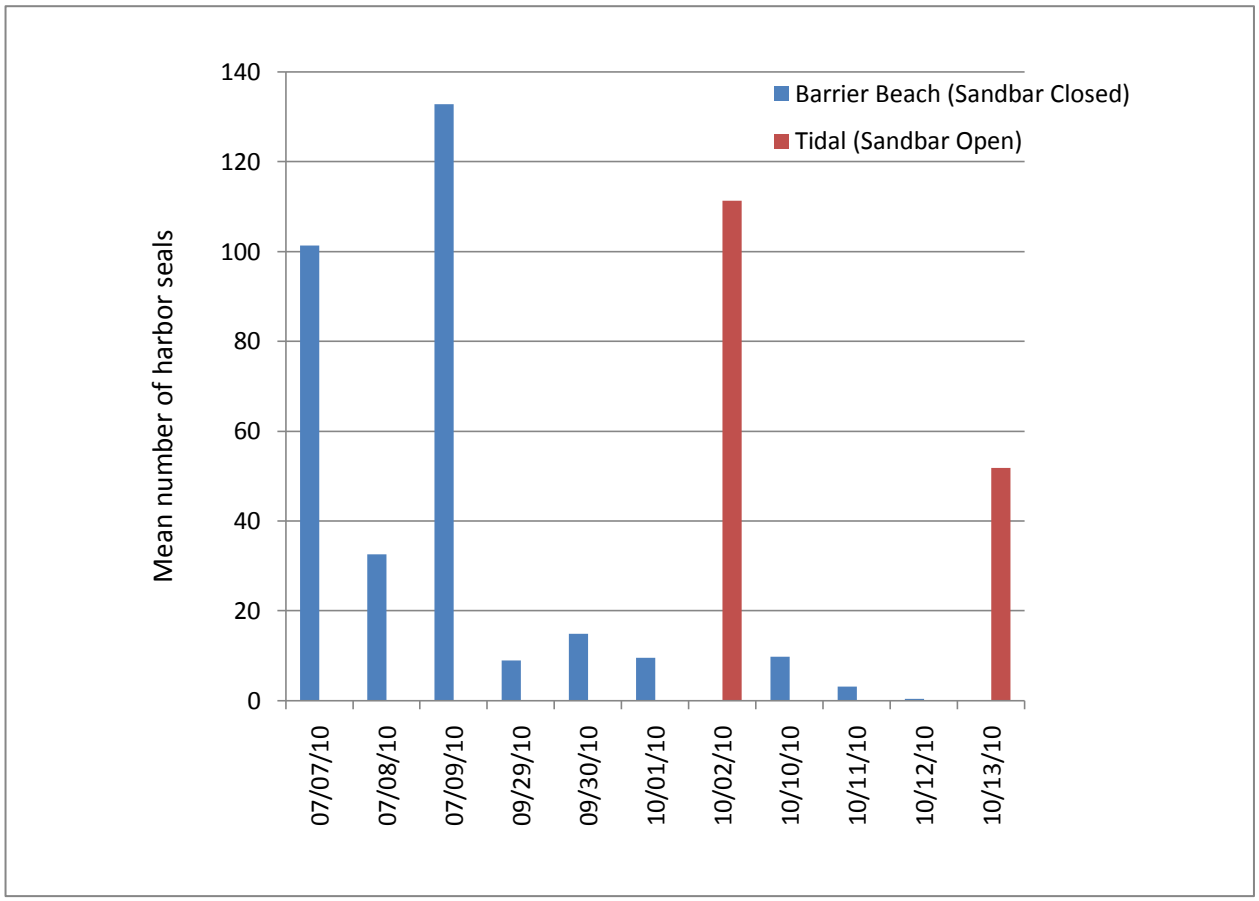


Figure 4. Mean number of harbor seals observed at the Jenner haulout (Goat Rock State Beach) during pinniped monitoring for Russian River Estuary Project water level management activities from April to December 2010.

Post-lagoon outlet channel monitoring occurred on July 9, although the barrier beach remained closed. The first census at 06:00 counted 204 harbor seals at the Jenner haulout. The barrier beach naturally breached on July 11, 2010. Baseline monitoring was already scheduled for July 12 and at 06:00, 244 seals were hauled out and from 06:58 to 07:08, 270 harbor seals were at the Jenner haulout.

The estimated take by incidental harassment (Level B), as defined by the Marine Mammal Protection Act,[1] of harbor seals during the July 8, 2010, lagoon outlet channel adaptive management plan implementation is 170 harbor seals (4 seals, then 143 seals, then 14 seals, plus 9 seals responded, Table 6). All of the seals flushed from the haulout over the course of the outlet channel implementation event. Take included all alerts, movements, or flushes from the haulout as a result of Water Agency staff or equipment presence near the Jenner haulout. It was assumed that the same individual seals were present during the entire event.

[1] Under the Marine Mammal Protection Act, take is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." Level B Harassment (provided for in NMFS IHA. 14426) is defined as "any act of pursuit, torment, or annoyance which… has the potential to disturb a marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

Table 6. Estimated incidental harassment (Level B harassment) of pinnipeds protected under the Marine Mammal Protection Act during Russian River Estuary Management Activities from April to December 2010. Level B harassment is authorized under the NMFS IHA No. 14426.

Date	Event Type	Estimated Take		
		Species	Age class	Number
8-July	Lagoon outlet implementation	Harbor seal	Adult [a]	170
30-Sept and 1-October	Artificial breaching	Harbor seal	Adult	80
11-October and 12-October	Artificial breaching	Harbor seal	Adult	8
	Subtotal	Harbor seal	Adult	258
14-June	Biological and physical monitoring in the Estuary	Harbor seal	Adult [a]	5
30-June	Beach topographic survey		Adult	5
17-November	Beach topographic survey		Adult	22
	Subtotal	Harbor seal		32
Total Estimated Take		**Harbor seal**	**Adult**	**290**

[a] Pups are counted separately through June, after which all seals are counted as adults as it becomes more difficult to accurately age individuals.

Artificial Breach – September 30 and October 1, 2010

The next formation of the barrier beach occurred on September 21, 2010, during a series of high wave events that remained an issue over the next several weeks, making safe access to the beach difficult. Implementation of the lagoon outlet channel implementation adaptive management plan was scheduled for September 29, but high surf made accessing the beach too dangerous and following consultation with the NMFS and CDFG, an artificial breach was scheduled for September 30. The September 30-October 1 activity was an artificial breaching event over two days. The first attempt to breach occurred on September 30, 2010, but was unsuccessful due to high wave activity and did not result in a decrease in water surface elevation in the estuary; a second attempt to artificially breach the estuary on October 1, 2010, was successful. The failed attempt and subsequent successful breaching is considered a single event. Baseline monitoring of the Jenner haulout on September 16, 2010, indicated a mean of 72 harbor seals (Table 3). Pre-breaching monitoring on September 29 and breaching/pre-breaching monitoring on September 29 counted low numbers of harbor seals at the Jenner haulout (Appendix F).

Observations of harbor seal responses to disturbance on October 1 are provided in Appendix G. The first census of harbor seals for the September 30 breach attempt was at 07:00, with 23 harbor seals at the Jenner haulout. The bulldozer and excavator began excavation of the barrier beach at 07:59, cut the berm to allow outflow to the ocean at 10:35, and left the beach at 12:04. The monitor at the Jenner overlook first heard the equipment entering the beach from Goat Rock State Beach parking lot at 07:36, without response from the harbor seals at the haulout. At 07:42, two Water Agency crew members walked past the jetty without response from the seals. From 07:49 to 07:52, the harbor seals began to respond to the approaching excavator as it passed within approximately 75 feet of the haulout. At

07:49, 33 harbor seals alerted and/or moved, with 24 flushing from and 9 remaining at the haulout. Then a second response resulted in the remaining 9 harbor seals leaving the haulout by 07:52. During the 08:00 seal census, 5 harbor seals were hauled out on the beach. At 08:09, 5 harbor seals flushed from the haulout. Following the excavator opening the berm to allow outflow from the estuary towards the ocean, harbor seals were observed hauling out on the beach for short periods of time in the vicinity of the equipment, sometimes crossing part or the entire beach or entering the channel but staying on the ocean side of the beach. The equipment left the beach at 12:04. At 12:22, one harbor seal hauled out, but was shortly swamped by a large wave. At 12:35, 3 harbor seals hauled out on the beach south of the channel. The last count of the day occurred at 14:10 and 10 harbor seals were hauled out on the beach. However, by this time the barrier beach had re-formed and the mouth of the river was closed.

A second attempt at breaching the barrier beach was successful on October 1, 2010. The first census was taken at 07:10 and counted 36 harbor seals hauled out. Between 08:13 and 08:17, 38 harbor seals flushed from the haulout when the safety crew approached. Harbor seals crossed the barrier beach to the ocean approximately 300 feet away from the breaching operation, and 3 harbor seals were hauled out at the ocean shoreline during the 10:15 census. The barrier beach was breached at 11:45. At 12:45, two harbor seals were hauled out. The last count of the day was taken at 1310 and no harbor seals were at the Jenner haulout.

The time between when the equipment left the beach and the first haulout reoccupation by a single harbor seal on September 30 was approximately 18 minutes after the equipment left. The haulout had increased to 10 seals approximately 2 hours later. On October 1, the haulout was re-occupied by harbor seals approximately 1 hour after equipment and staff completed the artificial breaching of the barrier beach (Appendix F).

Post-breaching monitoring occurred on October 2, 2010. The first census of the day at 07:00 counted 85 harbor seals at the Jenner haulout. Poor visibility due to fog hampered some the early morning counts, but by 09:00, the visibility improved and the harbor seal count at the Jenner haulout increased to 124.

The estimated take by incidental harassment (Level B), as defined by the Marine Mammal Protection Act,[2], of harbor seals during the September 30-October 1, 2010, artificial breaching is 80 harbor seals (on September 30, 33 plus 9, and October 1, 38 seals responded, Table 6-). Take included all alerts, movements, or flushes from the haulout as a result of Water Agency staff or equipment presence near the Jenner haulout. It was assumed that the same individual seals were present during the entire event.

Artificial Breach – October 11 and 12, 2010

A barrier beach closed the mouth of the Russian River again on October 4, 2010, during a series of high wave events that remained an issue over the next several weeks, making safe access to the beach difficult. The high surf made accessing the beach too dangerous and following consultation with the NMFS and CDFG regarding the safety of the crews, potential for flooding of low-lying properties, increased releases from reservoirs upstream, and the closure occurring at the end of the lagoon

[2] Ibid.

management period, an artificial breach was scheduled for October 11, 2010. The October 11-12 was an artificial breaching event over two days due to high wave activity affecting the breaching activity. The October 11-12 activity was an artificial breaching event over two days. The first attempt to breach occurred on October 11, 2010, but was unsuccessful due to high wave activity and did not result in a decrease in water surface elevation in the estuary; a second attempt to artificially breach the estuary on October 12, 2010, was successful. The failed attempt and subsequent successful breaching is considered a single event. Baseline monitoring of the Jenner haulout on October 7 indicated a mean of 13 harbor seals (Table 3). Pre-breaching monitoring on October 10, 2010, counted a maximum of 37 harbor seals at the Jenner haulout (Appendix F).

On October 11, 2010, the first census of the Jenner haulout was made at 11:55 and 7 harbor seals were counted. At 11:56, a visitor walked down the beach from the north and "startled" 9 harbor seals causing them to flush (Appendix G). Three harbor seals remained and were shortly joined by 2 harbor seals returning to the haulout. At 13:06, the Water Agency staff and equipment began to enter the beach. The 5 harbor seals alerted and moved to the water from the shallows of the estuary. Excavation of the pilot channel began at 13:06 and ended at 14:57 with an unsuccessful breach.

A second, successful attempt to artificially breach the barrier beach occurred on October 12, 2010. There were no pinnipeds hauled out on the beach at the first census at 11:30. The Water Agency staff entered the beach at 13:33 and began excavating the channel at 13:45. The pilot channel was open at 15:45 and excavation ended at 16:45. The staff and equipment were off the beach at 17:08. At 13:35, 1 harbor seal flushed from the beach. At 13:48, two harbor seals were observed: 1 harbor seal at the shoreline alerted and 1 harbor seal crossed the beach. At 14:00, one harbor seal was observed at the haulout (while equipment was still operating). No other seals were observed during the census counts between 14:00 and the last count at 17:00. Reoccupation of the Jenner haulout following completion of the artificial breaching activity was not observed.

Post-breaching monitoring occurred on October 13, 2010. The first census was made at 07:00 and 98 harbor seals were observed at the Jenner haulout.

The estimated take by incidental harassment (Level B), as defined by the Marine Mammal Protection Act,[3], of harbor seals during the October 11-October 12, 2010, artificial breaching is 8 harbor seals (on October 11, 5 harbor seals; on October 12, 3 seals responded, Table 6). Take included all alerts, movements, or flushes from the haulout as a result of Water Agency staff or equipment presence near the Jenner haulout. It was assumed that the same individual seals were present during the entire event.

Natural Breaches – October 24 and November 2, 2010

There were two additional barrier beach formations and closure of the mouth of the Russian River. The Water Agency did not have to respond to these closures. The first was on October 21, which resulted in a natural breach on October 24, 2010. Baseline monitoring of the Jenner haulout on October 14, 2010, had a mean of 50 harbor seals hauled out.

[3] Ibid.

The second closure was on November 2 with a natural breach on the same day. Baseline conditions at the Jenner haulout were monitored on November 3, 2010. Thirty-one harbor seals were counted at 07:00, with a maximum count for the day at 14:30 of 149 harbor seals.

The estimated Level B Harassment (incidental take) of pinnipeds under the NMFS IHA No. 14426 during Russian River Estuary water level management activities is summarized in Table 6. The IHA allows 4,200 occurrences of incidental harassment during the lagoon management period and 258 occurred.

Biological and Physical Monitoring

The NMFS IHA No. 14426 also provides incidental take for Level B harassment of pinnipeds that may result from monitoring of biological resources and physical processes in the Russian River estuary. The number of harbor seals flushed from haulouts in the Russian River estuary during monitoring were not recorded during the surveys, but are expected to be within the take limits based on the baseline monitoring counts of the peripheral haulouts (Appendix D).

The Russian River Biological Opinion requires monthly topographic surveys of the sandbar at the mouth of the Russian River. Although not specified in the NMFS IHA No. 14426, a Water Agency biologist was present during topographic surveys to provide guidance to the survey crews on minimizing disturbance of the haulout and to observe pinniped response to the survey work in the vicinity of the Jenner haulout. Appendices H and I provide the pinniped counts and behavioral responses, respectively, during the monthly topographic surveys.

The estimated Level B Harassment (incidental take) of pinnipeds under the NMFS IHA No. 14426 during Russian River Estuary biological and physical monitoring activities is summarized in Table 5. The IHA allows 64 occurrences of incidental harassment and an estimated 32 occurred.

CONCLUSIONS

The Russian River Estuary Management Activities from April to December 2010 resulted in incidental harassment (Level B harassment) of 290 marine mammals, well under the total allowed by NMFS IHA No. 14426.

The purpose of the Russian River Estuary Management Activities Pinniped Monitoring Plan (Sonoma County Water Agency and Stewards of the Coast and Redwoods 2009) is to detect the response of pinnipeds to estuary management activities at the Russian River estuary. Specifically, the following questions are of interest:

1. Under what conditions do pinnipeds haul out at the Russian River estuary mouth at Jenner?
2. 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?
3. 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?

4. Are seals at the Jenner haulout displaced to nearby river and coastal haulouts when the mouth remains closed in the summer?

The baseline data collected in 2010 shows the highest number of pinnipeds observed at the Jenner haulout during molt and the late part of pupping season (Table 3). The 2010 baseline effort focused on understanding if tides affected the timing of the use of the Jenner haulout by harbor seals (Table 2). There does not appear to be a clear pattern in the data that the haulout is used by a greater number of seals during high or low tides. Additional evaluation and data is needed to understand the influence of tides on the daily timing of harbor seal use of the Jenner haulout. It is likely multiple factors (e.g. season, tides, wave heights, level of beach disturbance) influence when the haulout is most utilized.

The Water Agency implemented the lagoon outlet channel in a single event on July 8, 2010. The response of harbor seals at the Jenner haulout to the outlet channel implementation activities (Question 2 above) was similar to the responses observed during artificial breaching events in 2010 and in previous years of monitoring the Jenner haulout during breaching events (Merritt Smith Consulting 1997, 1998, 1999, 2000; Sonoma County Water Agency and Merritt Smith Consulting 2001). The harbor seals alerted to the sound of equipment on the beach and left the haulout as the crew and equipment approached closer on the beach. Harbor seals hauled out on the beach while equipment was operating, left the beach when equipment and staff were leaving the beach, and began to return to the haulout within 30 minutes to 3 hours of the work ending. Because the barrier beach reformed soon after outlet channel implementation and subsequently breached on its own, maintenance of the outlet channel was not necessary and the response of pinnipeds at the Jenner haulout to maintenance of the outlet channel and management of the lagoon for the duration of the lagoon management period was not possible in 2010. For the same reason, Question 3 above cannot be definitively answered as the duration of closure associated with the lagoon outlet channel implementation was not dissimilar from the duration of closure that have been previously observed at the Estuary.

Responding to Question 4 is also difficult due to the lack of extended lagoon conditions in 2010. However, initial comparisons of peripheral (river and coastal) haulout baseline and water level management activity count data (Appendix D) to the Jenner haulout counts provide a clearer picture of the need to bring additional information into the analysis. For example, during the October 11-12 breaching event, low numbers (or zero) of harbor seals were observed at the peripheral haulouts, particularly the coastal haulouts, during the closure of the mouth, which initially could be interpreted that seals are not utilizing these haulouts during closure. However, we know that high surf conditions were present during this event and could have affected access to the haulouts. Further analysis evaluating water surface elevations in the Estuary (for the river haulouts) and wave height (for the coastal haulouts) could help in this evaluation.

Remedial Measures

Based on the results of the pinniped monitoring, several changes to the monitoring methods will be implemented for the remainder of the term of the NMFS IHA No. 14426 and during future monitoring. Visibility ratings will be recorded for each census taken at the Jenner and peripheral haulouts, rather than at the beginning of each monitoring event. The Beaufort wind speed scale will be replaced with

handheld wind meters to increase consistency and accuracy of data collection. The Beaufort scale with continue to be used for ocean state observation. Disturbance narratives will be prepared by monitors at the Jenner overlook to more fully document incidental harassment of pinnipeds at the Jenner haulout during water level management activities. During biological and water quality monitoring in the Estuary, the number of pinnipeds flushing from the peripheral haulouts in the Estuary (Chalanchawi, Patty's Rock, and Penny Logs) will be recorded to document the Level B harassment of pinnipeds utilizing these haulouts.

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