Russian River Estuary Management Project

Marine Mammal Protection Act Incidental Harassment Authorization
Report of Activities and Monitoring Results – January 1 to December 31, 2024

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

Sonoma Water

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EXECUTIVE SUMMARY

The purpose of this report of activities and monitoring results is to comply with the provisions of the Marine Mammal Protection Act (MMPA) and Regulations Governing Taking of Marine Mammals Incidental to Russian River Estuary Management Activities (50 CFR Part 217, Subpart A) under Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) to take small numbers of marine mammals incidental to the Sonoma County Water Agency's (Sonoma Water) Russian River Estuary Water Level Management Activities (April 20, 2022, NMFS LOA).

Sonoma Water 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 an original IHA to Sonoma Water on March 30, 2010, and in each subsequent year until a Letter of Authorization (LOA) was issued on April 21, 2017, and most recently on April 20, 2022. This report provides the results of all monitoring of baseline conditions and water level management activities for the 2024 calendar year and additional summary information for all related activities.

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 the formation of a lagoon behind the barrier beach and, as water surface levels rise in the estuary, flooding may occur. Sonoma Water's artificial breaching activities are conducted in accordance with the approach 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. Sonoma Water and the U.S. Army Corps of Engineers (Corps) consulted with NMFS under Section 7 of the Endangered Species Act (ESA) regarding the potential effects of their operations and maintenance activities, including Sonoma Water'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, NMFS issued the 2008 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. 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 Sonoma Water 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 (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 richardsi*) regularly haul out at the mouth of the Russian River (Jenner haul-out). California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustirostris*) are occasionally observed at the haul-out. There are also several known resting areas in the river at logs and rock piles. Sonoma Water applied for an LOA under the MMPA for activities associated with Russian River estuary management activities, which occur in the vicinity of these haul-outs, including:

- excavation and maintenance of a lagoon outlet channel that would facilitate management of a summer lagoon to improve rearing habitat for listed steelhead as required 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;
- biological and geophysical monitoring activities associated with the management actions described above; and
- geophysical surveys conducted at the barrier beach.

Pinniped monitoring was performed in accordance with the requirements of the NMFS LOA issued April 20, 2022, and the Russian River Estuary Management Activities Pinniped Monitoring Plan (SCWA and Stewards 2021).

Baseline monitoring was performed to gather additional information about the population of harbor seals utilizing the Jenner haul-out including population trends, patterns in seasonal abundance and the influence of barrier beach condition on harbor seal abundance. Pinniped monitoring was also conducted in relation to Sonoma Water's water level management events (lagoon outlet channel implementation and artificial breaching). Estuary management monitoring occurred during Sonoma Water's monthly topographic surveys of the barrier beach and biological and physical monitoring of the estuary. The purpose of estuary management monitoring is to record any pinniped disturbances during the above activities.

A barrier beach formed three times during 2024, each of these closure events resulted in construction of a pilot channel to artificially breach the sand bar. The Russian River mouth was closed to the ocean for a total of 50 days (or 14%) in 2024.

Sonoma Water's biological and physical monitoring activities of the estuary are included in the NMFS LOA. Sonoma Water 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 is present during these surveys to record any disturbances of the Jenner haul-out during the survey. Additionally, Sonoma Water field staff conducting biological and physical monitoring in the estuary recorded any pinnipeds they encountered hauled out and any disturbance to pinnipeds associated with their activities.

The Russian River estuary management and monitoring activities in 2024 resulted in incidental harassment (Level B harassment) of 641 harbor seals, well under the total allowed by the NMFS LOA. The number of incidental harassment occurrences in 2024 was lower than the average number per year from 2010 -2020 (1,234 occurrences).

INTRODUCTION

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Sonoma Water 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 an original IHA to Sonoma Water on March 30, 2010, and in each subsequent year until a Letter of Authorization (LOA) was issued on April 21, 2017, and again on April 20, 2022. This report provides the results of all baseline monitoring, water level management and associated activities for the 2024 calendar year, and additional summary information for all related activities.

BACKGROUND

The Russian River 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 the formation of a lagoon 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 Sonoma Water. Sonoma Water'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.

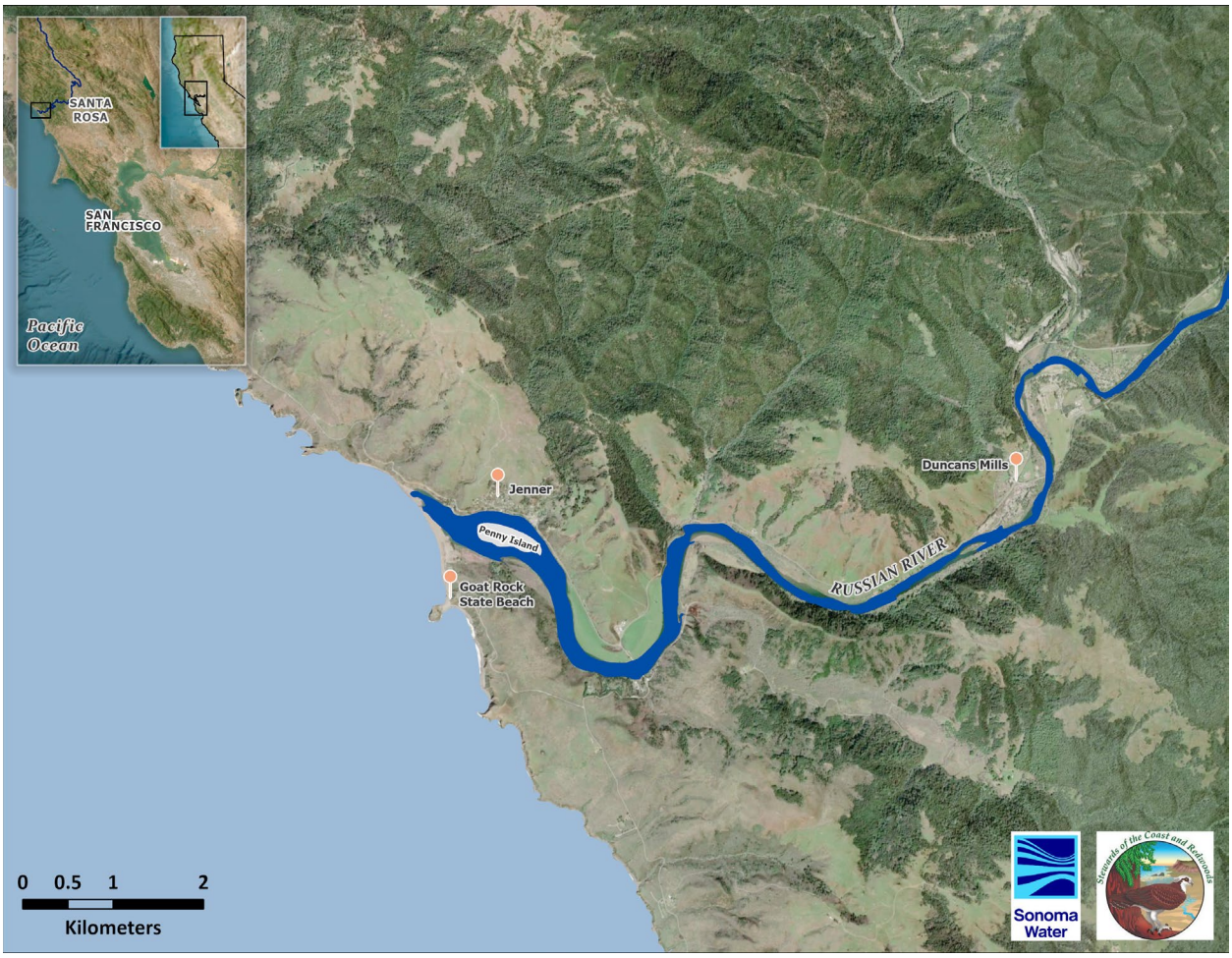

Figure 1. Goat Rock State Beach and the Russian River Estuary.

Biological Opinion and the Estuary

Sonoma Water 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 Sonoma Water'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, NMFS issued the 2008 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 historical artificial breaching practices have significant adverse effects on the Russian River's estuarine rearing habitat primarily for steelhead. The historical 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 historical 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) concluded that the combination of high inflows and breaching practices impacted rearing habitat by interfering with natural processes that form a

freshwater lagoon 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 Sonoma Water to collaborate with NMFS to modify estuary water level management to reduce marine influence on the estuary (tidal inflow and high salinity) and to promote a higher water surface elevation in the estuary to form a fresh or brackish lagoon to enhance rearing habitat for juvenile (age-0+ and -1+) steelhead from May 15 to October 15 (the lagoon management period). The Biological Opinion outlines a program of potential, incremental steps to accomplish this, including adaptive management of a lagoon outlet channel on the barrier beach.

Harbor seals (*Phoca vitulina richardsi*) regularly haul out at the mouth of the Russian River (Jenner haul-out) (Figure 1). California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustirostris*) are occasionally observed at the haul-out. There are also several known resting sites in the river at logs and rock piles in the estuary. Sonoma Water applied for an LOA under the MMPA for activities associated with Russian River estuary management activities, including:

- excavation and maintenance of a lagoon outlet channel that would facilitate management of a summer lagoon to improve rearing habitat for listed steelhead as required 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;
- biological and geophysical monitoring activities associated with the management actions described above; and
- geophysical surveys conducted at the barrier beach.

The purpose of the Russian River Estuary Management Project Pinniped Monitoring Plan (SCWA and Stewards 2021) is to detect the response of pinnipeds to estuary management activities at the Russian River estuary. To achieve this goal, we continue to collect data on annual abundance of harbor seals at the Jenner haul-out to monitor trends in population size and annual pup production. Observations of seal behavior are recorded and reported to monitor any impacts resulting from estuary management and monitoring activities.

METHODS

Monitoring was performed in accordance with the requirements of NMFS LOA issued April 20, 2022, and the Russian River Estuary Management Project Pinniped Monitoring Plan (SCWA and Stewards 2021).

Sonoma Water biologists and Stewards of the Coast and Redwoods (Stewards) volunteers and staff monitored pinnipeds at the Jenner haul-out. The Stewards and Sonoma Water provide annual training for all volunteers. Training sessions occurred on February 23, March 6, and March 21, 2024. Sonoma Water biologists participating in the monitoring program were also trained. The training agenda covered:

- the Marine Mammal Protection Act;
- LOA 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, Steller sea lions, northern elephant seals, northern fur seals and Guadalupe fur 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 the haul-out monitoring location.

Baseline monitoring of the Jenner haul-out was shared by Sonoma Water biologists and trained Stewards volunteers. Monitoring of water level management activities at the Jenner haul-out was also shared, but Sonoma Water biologists monitored artificial breaching activities on the day of the event. Pre- and post-breach monitoring was shared by the organizations depending on the availability of volunteers and Sonoma Water staff. Sonoma Water biologists also monitored pinnipeds during monthly topographic surveys of the beach, and biological and physical monitoring of the estuary.

Baseline

Baseline monitoring was performed to gather information about the population of harbor seals utilizing the Jenner haul-out including population trends, patterns in seasonal abundance and the influence of barrier beach condition on harbor seal abundance. Baseline counts were scheduled each month with an effort to avoid monitoring during periods of high tide. Weather conditions were recorded at the beginning of each survey. These included temperature, visibility, ocean conditions (Beaufort scale) and wind speed. Tide levels and estuary water surface elevations were correlated to each monitoring day.

Jenner Haul-out Use

Pinnipeds at the Jenner haul-out were surveyed multiple times each month. Surveys were conducted between 0800 and 1600. All pinnipeds hauled out on the beach were counted every 30 minutes from the overlook on the bluff along Highway 1 adjacent to the haul-out using binoculars or a high-powered spotting scope. Depending on time of year and how the sandbar is formed, harbor seals may haul out in multiple groups. 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.

Pupping Season

Adults and pups were counted separately through June, after which it became difficult to differentiate between age classes. All neonates (less than one week old) were also recorded and were identified using one or more of the following characteristics: less than 15 kg, thin for their body length, an umbilicus or natal pelage present, wrinkled skin, awkward or “jerky” movement. If any potentially abandoned pup was observed during monitoring, Sonoma Water would contact the NMFS stranding response network (Marine Mammal Center in Sausalito, CA) immediately and report 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.

Disturbance of Seals

In addition to the count data, disturbances of seals on the haul-out were recorded. Disturbances were recorded on a three-point scale adopted by NMFS that represents an increasing seal response to the

disturbance (Table 1). Throughout the survey period, each disturbance event was recorded by the source and level of response.

Table 1. Levels of pinniped response to disturbance used for Russian River Estuary Management Project pinniped monitoring. For permitting purposes a "take" or Level B harassment would include only movement or flush responses.

Level	Type of response	Definition
1	Alert	Seal head orientation or brief movement in response to disturbance, which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length.
2	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
3	Flush	All retreats (flushes) to the water.

Water Level Management Activities

Water level management activities were conducted three times in 2024, with the monitoring methods following a deliberate pattern. To begin, a one-day, pre-event survey was conducted within one to three 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. Sonoma Water monitors participated in the onsite tailgate safety meeting to discuss the location(s) of pinnipeds at the Jenner haul-out that day and methods of avoiding and minimizing disturbances to the seals as outlined in NMFS LOA. Monitoring continued the day following each water level management event to document the number of seals utilizing the haul-outs. Methods followed the count and disturbance monitoring protocols described in the "Baseline" section above with one exception: for each disturbance event the time, response, source, and duration of the disturbance, as well as an estimated distance between the source and seals, were recorded.

Biological and Physical Monitoring

The NMFS LOA also provides incidental take for Level B harassment of pinnipeds that may result from monitoring of biological resources and physical processes in the estuary. Sonoma Water field staff record the presence of pinnipeds hauled out in the estuary in the vicinity of their activities and record any resulting disturbances. The Russian River Biological Opinion also requires monthly topographic surveys of the sandbar at the mouth of the Russian River. A Sonoma Water biologist was present during topographic surveys to provide guidance to the survey crews on minimizing disturbance of the haul-out and to observe pinniped response to the survey work in the vicinity of the Jenner haul-out. Provided that no neonates or nursing pups were on the haul-out, the survey crew approached the haul-out slowly on foot and allowed for the seals to gradually vacate the beach before the survey proceeded. A pinniped monitor was present for all these surveys and carefully documented number of animals disturbed and the seals' response including: duration of the disturbance and the estimated distance between the source and seals. During barrier beach closures extra surveys to measure the lowest beach crest

elevation may also be conducted to aid in planning of breaching activities. Pinniped monitoring occurs during these surveys as well.

RESULTS

The NMFS LOA (April 20, 2022) 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) haul-out reoccupation time of any seals based on post activity monitoring
(g) tide levels and estuary water surface elevation
(h) seal census from baseline monitoring

Estuary water surface elevations are recorded at the Jenner gauge (operated by Sonoma Water), located at the State Parks visitor center in the town of Jenner. Appendix A includes the estuary water surface elevations associated with pinniped monitoring in 2024, including baseline, water level management events and estuary management investigations.

Baseline

In 2024 a total of 19 baseline, ten monthly beach topographic, three pre-breaching, three breaching, three post-breaching, and one beach crest elevation surveys were conducted (Appendix A). One beach topographic survey and one pre-breaching survey also functioned as a baseline survey.

Jenner Haul-out Use

Peak seal abundance, as measured by the single greatest count of harbor seals at the Jenner haul-out, was on July 10 (258 seals). Using the average number of seals hauled out by month, seal abundance at Jenner was greatest in May and lowest in October (Figure 2). Using counts during June and July to represent the typical time of peak seal abundance on land, the average number of seals in 2024 during this period was the lowest recorded in the previous thirteen years (Figure 3). Seal abundance was slightly lower during closed and perched mouth conditions compared to open river mouth conditions (Figure 4).

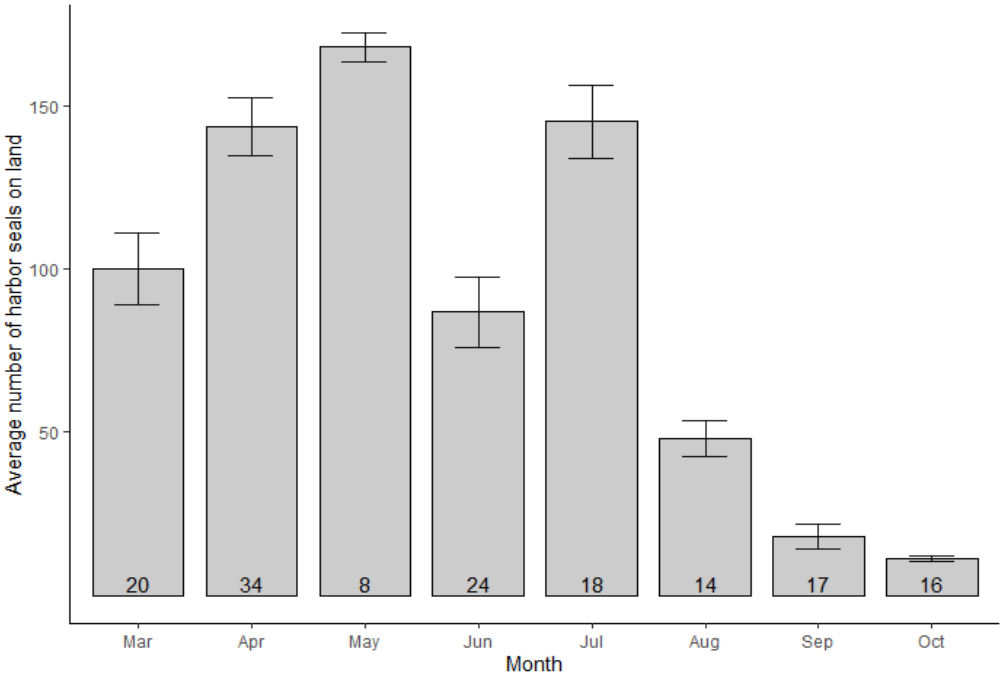

Figure 2. The average number of harbor seals hauled out at the Jenner haul-out (Russian River mouth at Goat Rock State Beach) as counted during 2024 baseline surveys by month. Error bars represent ± 1 standard error and sample size for calculating the mean (n) is shown in the bottom of each bar.

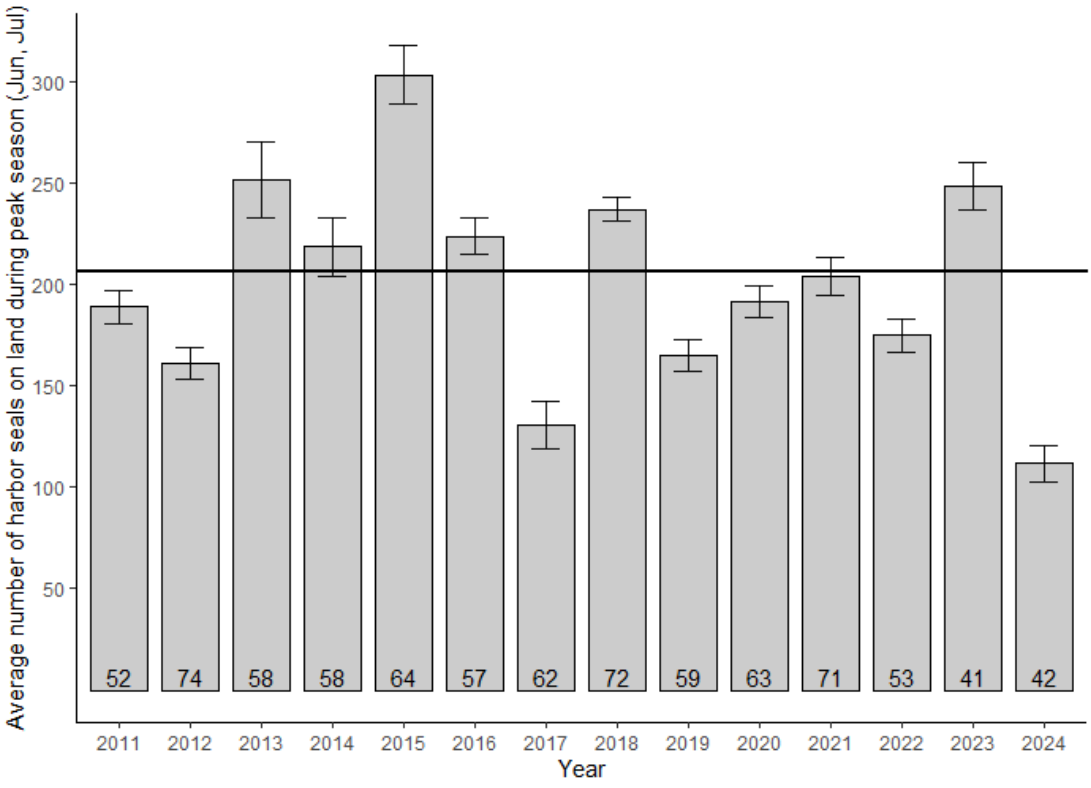

Figure 3. Average number of harbor seals hauled out during baseline surveys in June and July at the Jenner haul-out (Russian River mouth at Goat Rock State Beach) by year. The thirteen-year (2011-2023) average of abundance during this period (206 seals) is represented by the horizontal line. Error bars represent ± 1 s.e. and sample size to calculate the mean (n) is shown in the bottom of each bar.

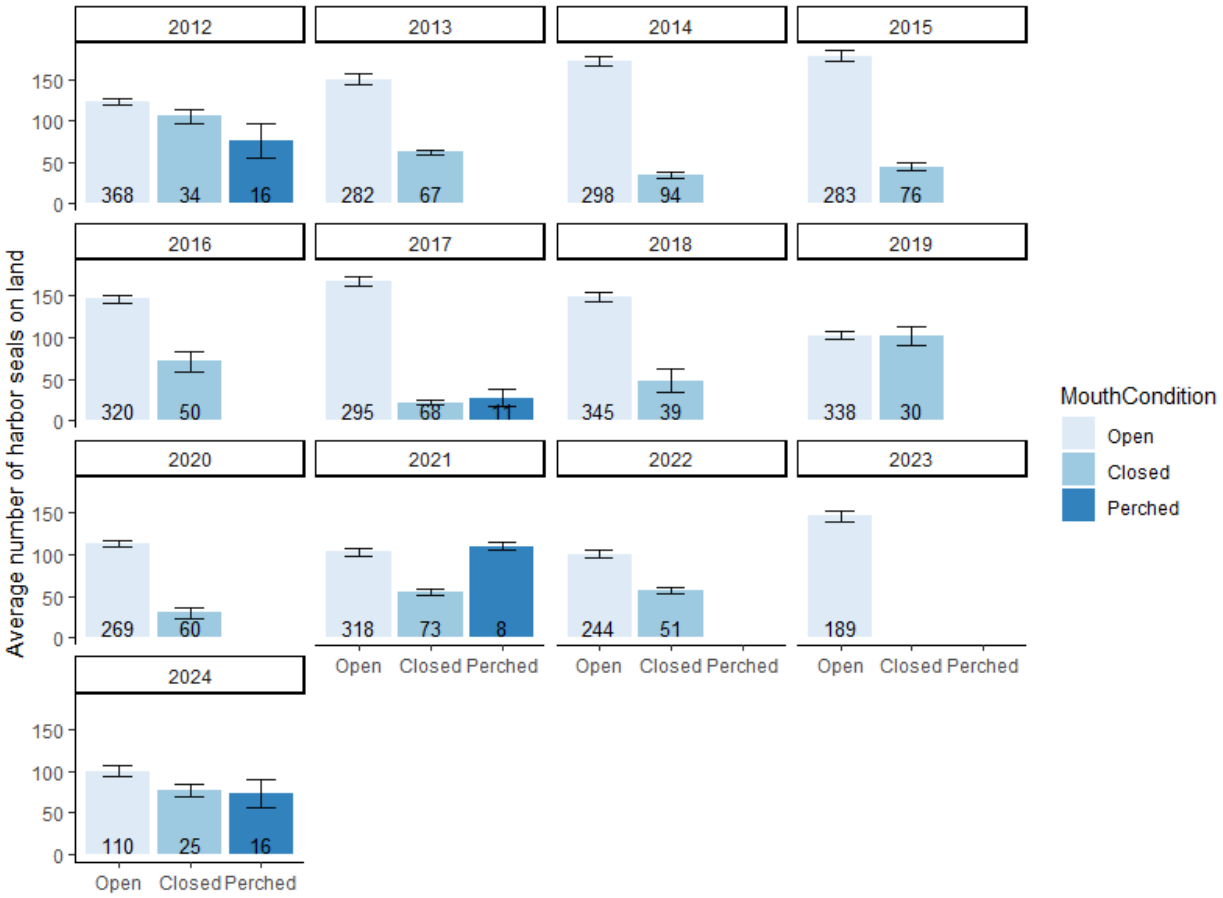

Figure 4. Comparison of the average number of harbor seals hauled out during baseline surveys by year and river mouth condition at the Jenner haul-out (Russian River mouth at Goat Rock State Beach). Error bars represent ± 1 s.e. and sample size to calculate the mean (n) is shown in the bottom of each bar.

Pupping Season

In 2024 the first harbor seal pup was observed on April 2, with the latest observation of pups occurring on June 12 (the last neonate was observed on May 14). Once pups were weaned it became difficult to distinguish pups from sub-adult seals, as a result we did not attempt to classify pups during surveys after June 30. The number of pups observed at the Jenner haul-out was less than last year with an average of 16 pups observed (when pups were present, April - June) and a single daily maximum count of 37 pups for the season (Figure 5).

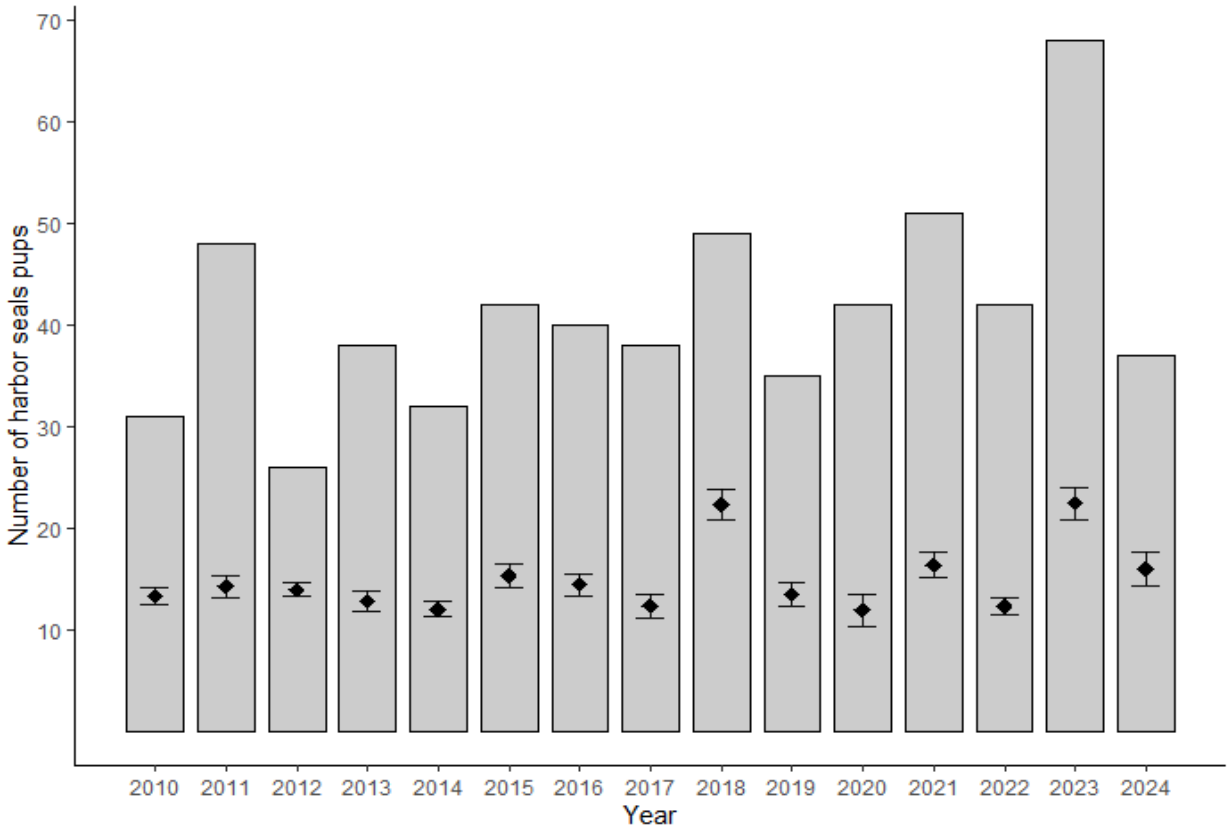

Figure 5. Number of harbor seal pups observed during all surveys at the Jenner haul-out (Russian River mouth at Goat Rock State Beach) by year. Bar height indicates the maximum single day pup count, diamond indicates the average count of pups when pups were present from April-June each year with ± 1 s.e.

Disturbance of Seals

An effort was made to compare the level of disturbance between baseline surveys and surveys when Sonoma Water personnel are working in the vicinity of the Jenner haul-out. In 2024 there were six disturbance sources recorded: birds, bobcat, kayaks, people, unknown, and Sonoma Water. Seals were considered to be disturbed if they moved on or flushed from the haul-out (Table 1).

Harbor seals were most frequently disturbed by people on foot (32% of baseline surveys), with more instances occurring during Sonoma Water activities, when classifying Sonoma Water and other people as one group (79% of surveys) (Figure 6). People in kayaks were the next most frequent source of disturbance (11% of baseline surveys) (Figure 6).

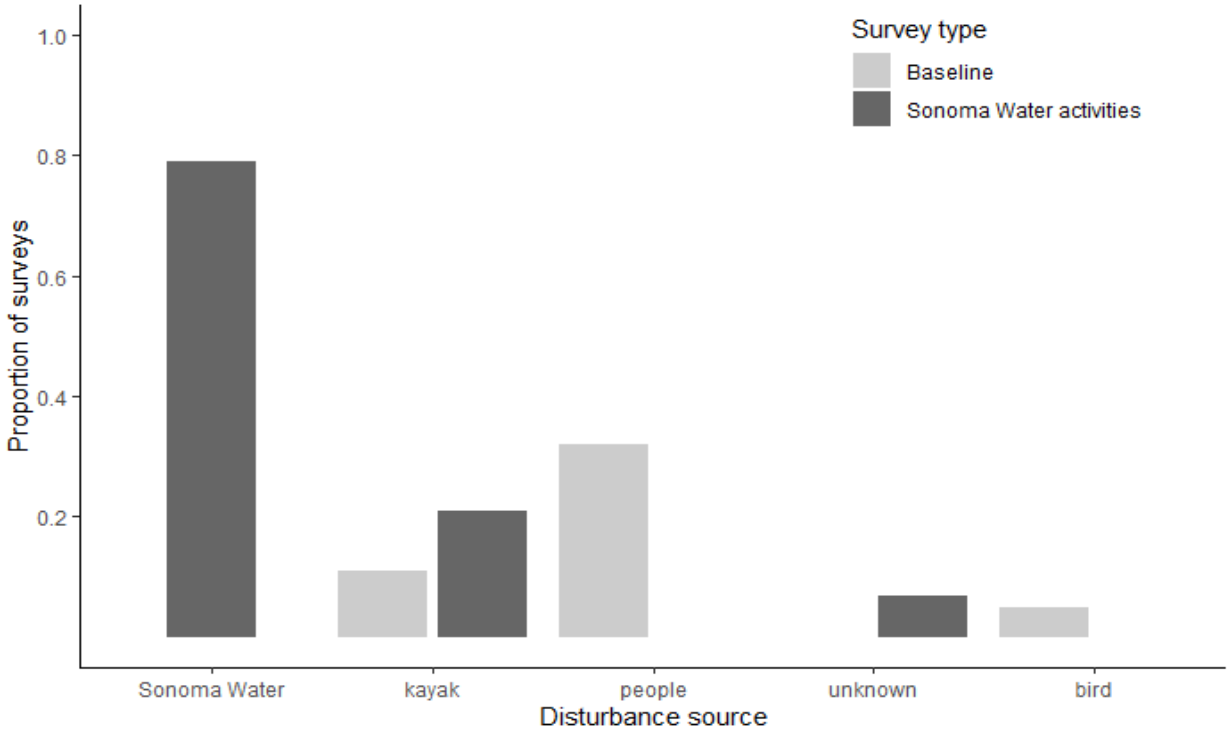

Figure 6. The proportion of surveys where harbor seals were disturbed (moved or flushed) at the Jenner haul-out, by disturbance source. Data includes all baseline surveys (n=19) and Sonoma Water activity surveys (i.e., breaching and topographic surveys, n=14).

Water Level Management Activities

A barrier beach formed three times during 2024 (Table 2). During these events a pilot channel was constructed to reduce the water level in the estuary. The Russian River mouth was closed to the ocean for a total of 50 days (or 14%) in 2024. Two closure events occurred during the lagoon management period, for a total of 26 days of closure during the management period

On July 9 Sonoma Water constructed a pilot channel approximately 400 feet north of the jetty structure at Goat Rock State Beach beginning at 11:06 and lasting until 12:24. Prior to the start of excavation activities, there were 143 harbor seals hauled out on the beach. At 10:47 three staff members walked onto the beach with the equipment following behind. By 10:55 the crew and equipment had entered the area of the beach near the seals. At 10:53 seals were disturbed by Sonoma Water staff and equipment at a distance of 200 feet from the seals, with five seals flushing from the haul-out initially. At 10:55 the crew and equipment were within 100 feet of the seals, flushing the remaining 121 seals from the beach. No seals hauled out during breaching activity. Excavation activities stopped at 12:24 and all staff and equipment were off the beach by 12:43. During the final count of the day three seals had returned to the beach, at 13:40. During the post-breach survey on the following day a maximum count of 258 harbor seals was recorded at the Jenner haul-out, with the first observation made at 10:30.

On October 28 Sonoma Water constructed a pilot channel north of the jetty structure at Goat Rock State Beach beginning at 12:34. The pilot channel was completed at 13:07 and all equipment and crew were off the beach at 13:26. Prior to the arrival of the excavation crew there were 7 harbor seals hauled out north of the jetty structure. Crews walking in advance of the excavator flushed the seals into the estuary at 12:33. Seals on the beach were slow to respond to the presence of the crew and excavator and did

not flush until they were within 50 feet. A few seals were observed swimming in the estuary about 150 feet from the excavation site. During the final counts of the day no seals were observed on the beach or swimming in the estuary. No seals hauled out during breaching activity or within the observation period following the breaching event. During the post-breach survey on the following day a maximum count of 111 harbor seals was recorded at the Jenner haul-out, with the first observation made at 10:00.

On November 13 Sonoma Water constructed a pilot channel north of the jetty structure at Goat Rock State Beach beginning at 11:51. The pilot channel was completed at 12:53 and all equipment and crew were off the beach at 13:12. There was a maximum of 26 harbor seals hauled out on the beach prior to the excavation activities. Crews walking in advance of the excavator flushed the seals into the estuary at 11:42, when they were approximately 400 feet distant. No seals hauled out during breaching activity or within the observation period following the breaching event. A few seals were observed swimming near the opening of the pilot channel in the estuary. During the post-breach survey on the following day a maximum count of 142 harbor seals was recorded at the Jenner haul-out, with the first observation made at 10:00.

Table 2. Summary of river mouth closures in 2024 at the Russian River mouth (Goat Rock State Beach). Peak water level during the event was measured at the gauge located at the Sonoma Coast State Park Visitor's Center in Jenner, CA.

Date mouth closed	Peak height (ft NGVD)	Date mouth opened	Management Activity
June 21	8.22	July 9	artificial breach
October 8	8.34	October 28	artificial breach
November 1	9.14	November 13	artificial breach

Biological and Physical Monitoring

The NMFS LOA (2021) 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 total incidental take in 2024 was calculated based on the number of animals that responded to activities by either moving on their haul-out or flushing from their haul-out (Table 3). Alerts were also recorded by monitors but are not included in the total take number (Table 4). Most often at haul-out sites within the estuary (excluding the Jenner haul-out on Goat Rock State Beach) harbor seals either had no reaction or raised their heads in alert as a boat passed.

The Russian River Biological Opinion requires monthly topographic surveys of the barrier beach at the mouth of the Russian River. A Sonoma Water biologist was present during topographic surveys to monitor the seal response to the survey crew. Between 59% and 100% of seals were flushed from their haul-out during the monthly mapping activities.

Table 3. Summary of pinniped take activity at Goat Rock State Beach in 2024. Maximum count of seals is from the instantaneous counts of seals on the beach, recorded every 30 minutes. Total taken is estimated as the number of individuals taken (move or flush) as a result of Sonoma Water activities each day when take occurred.

Date	Activity	Species	Age class	Maximum count of seals	Total taken[1]
1/30/2024	monthly topo survey	HASE	non-pup	90	88
2/28/2024	monthly topo survey	HASE	non-pup	156	3
3/26/2024	monthly topo survey	HASE	non-pup	140	91
6/24/2024	monthly topo survey	HASE	non-pup	135	2
7/1/2024	monthly topo survey	HASE	non-pup	69	72
7/9/2024	breaching	HASE	non-pup	143	126
7/29/2024	monthly topo survey	HASE	non-pup	153	153
8/27/2024	monthly topo survey	HASE	non-pup	42	61
10/28/2024	breaching	HASE	non-pup	8	7
11/7/2024	beach crest elevation survey	HASE	non-pup	17	18
11/13/2024	breaching	HASE	non-pup	26	20
Total estimated individuals taken		**HASE**	**non-pup**	**-**	**641**

[1] Total taken is the sum of the number of take observations recorded from the day where the source is Sonoma Water activity, and the response is move or flush. Total taken may be greater than maximum count because either: individuals were disturbed more than once or new individuals hauled out between the instantaneous counts.

Table 4. Summary of Russian River Estuary Management Project beach management and monitoring activities for 2024. Disturbances for each event are listed by species, age class, response, and distance from source when disturbances occurred. Tide level reported is from the Point Reyes Station for the hour nearest the activity start time, water surface elevation is the daily average as recorded at the Jenner gage station.

Date	Activity	Activity Start Time	Activity End Time	Air Temp (F)	Precipitation	Wind Speed (mph)	Tide Level (ft)	Water Surface Elevation (ft)	Species	Age Class	Disturbance Response	Distance From Source (ft)	Number Seals Disturbed
1/30/2024	monthly topo survey	08:30	12:00	64	clear	1.5	3.44	1.89	HASE	non-pup	A	70	50
											F	50	38
											F	60	50
2/28/2024	monthly topo survey	08:30	12:00	49	clear	7	2.29	1.26	HASE	non-pup	A	200	140
											M	200	3
3/26/2024	monthly topo survey	08:30	13:20	51	clear	2.5	2.24	1.87	HASE	non-pup	A	50	5
											A	500	100
											M	50	4
											F	50	81
											F	60	10
6/24/2024	monthly topo survey	08:59	12:00	55	fog	1.4	-0.48	5.61	HASE	non-pup	A	150	40
											F	140	2
6/25/2024	estuary seining	14:24	14:32	-	-	1.0	4.30	6.05	-	-	-	-	-
7/1/2024	monthly topo survey	09:00	12:30	69	clear	1.2	3.64	7.43	HASE	non-pup	A	300	25
											F	75	3
											F	230	39
											F	250	30

Table 4. continued

Date	Activity	Activity Start Time	Activity End Time	Air Temp (F)	Precipitation	Wind Speed (mph)	Tide Level (ft)	Water Surface Elevation (ft)	Species	Age Class	Disturbance Response	Distance From Source (ft)	Number Seals Disturbed
7/9/2024	breaching	08:42	13:40	68	clear	1.2	0.13	6.88	HASE	non-pup	A	100	53
											A	200	3
											F	100	121
											F	200	5
7/29/2024	monthly topo survey	09:10	14:10	59	clear	1.2	3.55	1.03	HASE	non-pup	F	50	153
8/27/2024	monthly topo survey	08:30	13:30	-	fog	0.5	3.84	1.08	HASE	non-pup	A	120	24
											A	140	7
											A	150	15
											F	120	24
											F	150	37
9/19/2024	monthly topo survey	09:20	13:00	-	fog	1.5	3.58	1.36	-	-	-	-	-
9/24/2024	estuary seining	9:59	11:45	-	-	5	4.04	1.47	-	-	-	-	-
9/25/2024	estuary seining	10:55	11:30	-	-	4	4.10	1.52	-	-	-	-	-
10/22/2024	monthly topo survey	08:30	12:30	51	fog	4	3.65	7.22	-	-	-	-	-
10/28/2024	breaching	08:30	16:20	54	clear	3.6	5.4	7.00	HASE	non-pup	F	50	7

Table 4. continued

Date	Activity	Activity Start Time	Activity End Time	Air Temp (F)	Precipitation	Wind Speed (mph)	Tide Level (ft)	Water Surface Elevation (ft)	Species	Age Class	Disturbance Response	Distance From Source (ft)	Number Seals Disturbed
11/7/2024	beach crest elevation survey	08:45	11:15	56	clear	4	3.78	6.63	HASE	non-pup	A	100	1
											F	80	2
											F	100	16
11/13/2024	breaching	08:15	16:00	58	rain	3.5	6.42	7.28	HASE	non-pup	F	400	20
12/10/2024	monthly topo survey	08:29	12:57	52	clear	4.1	4.13	0.93	-	-	-	-	-

CONCLUSIONS

The water level management activities and biological and physical monitoring activities conducted by Sonoma Water resulted in incidental harassment (Level B harassment) of 641 harbor seals in 2024, well under the total allowed by NMFS LOA.

The purpose of the Russian River Estuary Management Project Pinniped Monitoring Plan (SCWA and Stewards 2021) is to detect the response of pinnipeds to estuary management activities at the Russian River estuary. The continued collection of data on annual abundance of harbor seals allows us to monitor trends in population size and annual pup production. In addition, observations of the Jenner haul-out are used to report any impacts resulting from estuary management and monitoring activities.

Harbor seals were most abundant on the Jenner haul-out in May and July. Notably, seal abundance was lower in June compared to May and July (Figure 2) and the average abundance during the peak season was lower that all other years reported (Figure 3). The river mouth closure that began in June could have led to the lower average seal abundance during this time. The river mouth was closed for 80% of the baseline surveys that occurred in June and July (Figure 7). Harbor seals will use the beach when there is an open channel or when a barrier beach has formed, however, seal abundance is greater during open mouth conditions (Figure 4). Given that seal abundance increased after the river mouth was opened in July, it is likely that the low numbers in June were not an indication of fewer seals utilizing the rookery during this time, but rather reflect a change in behavior related to the mouth condition. While the barrier beach can form in any month, closures most often occur during September – January (ESA 2022: Figure 6-5), and thus do not often negatively influence seal abundance during the peak season.

Seals are frequently most abundant in July during their annual molt (SCWA 2012, 2013, 2014, 2016, 2021, 2022). Seasonal variation in the abundance of harbor seals at their haul-out locations is commonly observed throughout their range (Allen et al. 1989, Stewart and Yochem 1994, Gemmer 2002). The variation in their abundance can mostly be explained by changes in their biological and physiological requirements throughout the year. While increased seal abundance during the molting season is likely a result of seals spending more time on land to help facilitate the molting process, June coincides with the end of the pupping season and the start of the mating season, also a time when seals may spend more time in and around the haul-out. This annual peak is typically followed by a decline in seal abundance, which is likely a result of individual seals decreasing the amount of time on the haul-out post-reproduction and post-molt to spend more time foraging and coincides with the time that young seals may temporarily disperse from their natal haul-out (Stewart and Yochem 1994, Thompson et al. 1994, Small et al. 2005).

Harbor seals responded to breaching activities in 2024 in the same manner that they have responded to water level management activities in previous years (SCWA 2022, SCWA 2023, SCWA 2024). Seals initially alerted to the noise of the excavator approaching the haul-out or the presence of staff walking in advance of the equipment. As staff and equipment continue to approach seals flush into the estuary. No injurious or hazardous conditions resulted from the observed flushing behavior.

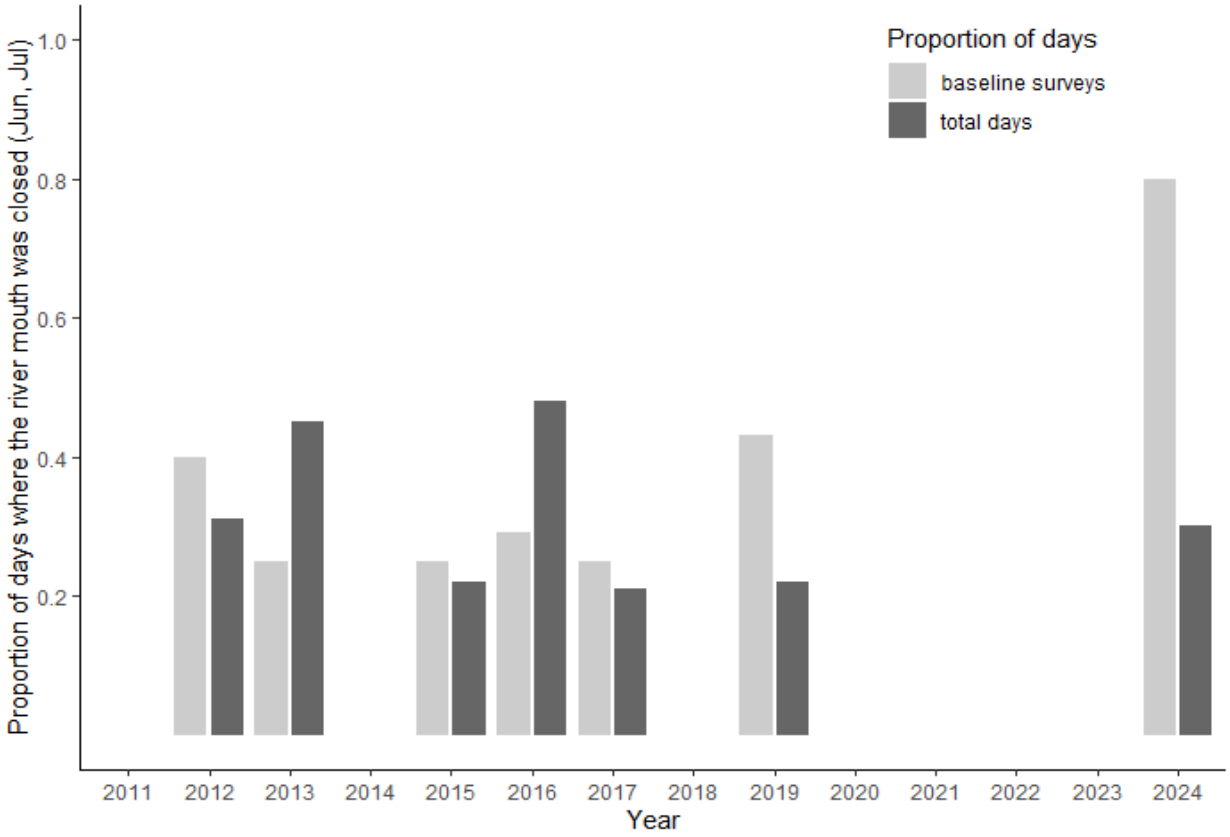

Figure 7. Proportion of days for the months June and July where the river mouth was closed or perched by year.

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Appendix A. Summary of pinniped monitoring activities at the Jenner haul-out (Goat Rock State Beach, Sonoma County) conducted by Sonoma Water and Stewards of the Coast and Redwoods from January to December 2024 for the Russian River Estuary Management Project, including summary of pinniped abundance and estuary water surface elevation.

				HASE[1] adult			HASE[1] pups			HASE[1] neonate					
date	activity	mouth condition	estuary water level	max	mean	s.e.	max	mean	s.e.	max	mean	s.e.	n	CASL[2] present	NES[3] present
2024-01-30	Monthly beach topo survey	Open	1.89	90	33.1	13.44	0	0.0	0.00	0	0.0	0.00	8		
2024-02-28	Monthly beach topo survey	Open	1.26	156	96.1	22.43	0	0.0	0.00	0	0.0	0.00	8		
2024-03-06	Baseline	Open	2.36	198	171.3	13.26	0	0.0	0.00	0	0.0	0.00	4		
2024-03-14	Baseline	Open	1.71	114	94.8	6.59	0	0.0	0.00	0	0.0	0.00	8		
2024-03-21	Baseline	Open	1.81	128	69.9	14.82	0	0.0	0.00	0	0.0	0.00	8		
2024-03-26	Monthly beach topo survey	Open	1.87	140	113.7	6.24	0	0.0	0.00	0	0.0	0.00	11		
2024-04-02	Baseline	Open	1.54	208	95.4	20.51	4	2.2	0.49	1	1.0	na	8		
2024-04-09	Baseline	Open	1.30	123	97.3	9.02	15	9.4	1.03	3	1.8	0.37	8		
2024-04-16	Baseline	Open	1.39	182	165.8	4.96	17	15.0	0.90	17	10.8	1.05	9		
2024-04-30	Baseline	Open	1.06	163	134.4	6.72	34	30.7	1.04	5	3.7	0.29	9		
2024-05-14	Baseline	Open	1.90	161	145.3	3.83	24	19.8	0.77	4	3.4	0.20	8		
2024-06-11	Baseline	Perched	5.22	183	133.1	12.16	4	2.9	0.40	0	0.0	0.00	8		
2024-06-12	Baseline	Closed	5.02	92	71.9	4.96	5	3.1	0.40	0	0.0	0.00	9		
2024-06-24	Baseline/Monthly beach topo survey	Closed	5.61	135	47.1	22.18	0	0.0	0.00	0	0.0	0.00	7		
2024-07-01	Monthly beach topo survey	Closed	7.43	69	16.9	11.05	0	0.0	0.00	0	0.0	0.00	8		
2024-07-08	Baseline/Pre-Breaching	Closed	8.13	126	102.0	6.19	0	0.0	0.00	0	0.0	0.00	9		
2024-07-09	Breaching	Closed	6.88	143	49.1	20.11	0	0.0	0.00	0	0.0	0.00	11		
2024-07-10	Post-Breaching	Open	1.28	258	239.0	5.75	0	0.0	0.00	0	0.0	0.00	9		
2024-07-23	Baseline	Open	1.41	218	188.4	6.24	0	0.0	0.00	0	0.0	0.00	9		
2024-07-29	Monthly beach topo survey	Open	1.03	153	109.2	14.17	0	0.0	0.00	0	0.0	0.00	11		
2024-08-06	Baseline	Open	1.15	64	58.1	1.14	0	0.0	0.00	0	0.0	0.00	8		

[1] HASE = Pacific harbor seal
[2] CASL = California sea lion
[3] NES = Northern elephant seal

Appendix A. Continued

				HASE[1] adult			HASE[1] pups			HASE[1] neonate					
date	**activity**	**mouth condition**	**estuary water level**	**max**	**mean**	**s.e.**	**max**	**mean**	**s.e.**	**max**	**mean**	**s.e.**	**n**	**CASL[2] present**	**NES[3] present**
2024-08-20	Baseline	Open	1.16	72	41.7	7.86	0	0.0	0.00	0	0.0	0.00	9		
2024-08-27	Monthly beach topo survey	Open	1.08	42	22.6	4.90	0	0.0	0.00	0	0.0	0.00	11		
2024-09-10	Baseline	Open	1.02	35	21.1	3.17	0	0.0	0.00	0	0.0	0.00	9		
2024-09-19	Monthly beach topo survey	Open	1.36	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	8		
2024-09-24	Baseline	Open	1.47	44	14.6	7.00	0	0.0	0.00	0	0.0	0.00	8		
2024-10-08	Baseline	Perched	2.38	15	12.5	0.68	0	0.0	0.00	0	0.0	0.00	8		
2024-10-15	Baseline	Open	5.54	15	9.9	1.60	0	0.0	0.00	0	0.0	0.00	8		
2024-10-22	Monthly beach topo survey	Closed	7.22	5	0.9	0.62	0	0.0	0.00	0	0.0	0.00	9		
2024-10-26	Pre-Breaching	Closed	7.89	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	16		
2024-10-28	Breaching	Closed	7.00	8	2.6	0.83	0	0.0	0.00	0	0.0	0.00	17		
2024-10-29	Post-Breaching	Open	1.31	217	100.9	16.36	0	0.0	0.00	0	0.0	0.00	9		
2024-11-07	Beach crest elevation survey	Closed	6.63	17	7.5	3.38	0	0.0	0.00	0	0.0	0.00	6		
2024-11-12	Pre-Breaching	Closed	8.58	19	17.8	0.28	0	0.0	0.00	0	0.0	0.00	9		
2024-11-13	Breaching	Closed	7.28	26	9.9	3.19	0	0.0	0.00	0	0.0	0.00	14		
2024-11-14	Post-Breaching	Open	2.02	142	96.4	17.70	0	0.0	0.00	0	0.0	0.00	7		
2024-12-10	Monthly beach topo survey	Open	0.93	194	71.6	22.16	0	0.0	0.00	0	0.0	0.00	9		

[1] HASE = Pacific harbor seal
[2] CASL = California sea lion
[3] NES = Northern elephant seal