SAN FRANCISCO BAY
BIRD OBSERVATORY

SNOWY PLOVER RECOVERY AT HAYWARD REGIONAL SHORELINE, ALAMEDA COUNTY, CALIFORNIA

Photo taken at OBN16 by Josh Scullen, 2023

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SUMMARY

During the 2024 breeding season, the San Francisco Bay Bird Observatory (SFBBO) monitored Western Snowy Plover (*Anarhynchus nivosus nivosus*; Snowy Plover) population size, nesting and fledging success, and identified potential predators at Hayward Regional Shoreline (Hayward Shoreline) in Alameda County. Hayward Shoreline is co-owned by Hayward Area Recreation and Park District (HARD) and East Bay Regional Parks District (EBRPD). SFBBO monitored three sites within Hayward Shoreline: Franks Dump West (FDW), Franks Dump East (FDE), and Oliver Brothers North (OBN) (Figure 1, Figure 2.)

As part of the Pacific Coast breeding season window survey (May 18-26, 2024), we counted 13 adult Snowy Plovers at Hayward Shoreline (Table 1).

Over the course of the breeding season (March-September), SFBBO staff monitored nine nests at OBN and three nests at FDW, which all successfully hatched at least one egg (

Table 2; Figure 3). An additional nest was detected at the brood stage in OBN.

SFBBO color-banded 19 chicks and five adults across Hayward Shoreline. Of the 19 banded chicks from Hayward Shoreline, 14 have been confirmed to have fledged. We conducted band re-sight surveys at the end of the season on FDW and Hayward Shoreline Pond 2B, two locations where juveniles from across the South Bay flock prior to fall migration. This was the first time SFBBO conducted any survey on Pond 2B after locating a flock of around 60 birds roosting on the pond. From these band re-sighting surveys, we were able to determine that three chicks we banded in other sites throughout the South Bay survived to fledge (28 days post-hatching).

Avian predator surveys showed that the most common predator species observed at Hayward Shoreline were California Gulls (*Larus californicus*), American Crows (*Corvus brachyrnhynchos*), Red-tailed Hawks (*Buteo jamaicensis*), Common Ravens (*Corvus corax*), and other unidentified gull species. While opportunistically looking for mammalian predator sign, biologists observed off-leash dog (*Canis familiaris*) prints on the pond, as well as prints from skunk (*Mephitis mephitis*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*) (Table 3).

INTRODUCTION AND BACKGROUND

The Pacific Coast population of the Western Snowy Plover breeds along or near tidal waters and is behaviorally distinct from the interior population (Funk 2006). Coastal-breeding Snowy Plovers have declined as a result of poor reproductive success, likely due to habitat loss, habitat alteration, human disturbance, and increasing predation pressure (Page et al. 1991, USFWS 2007). In response to this decline, the U.S. Fish and Wildlife Service (USFWS) listed the Pacific Coast Western Snowy Plover population as federally threatened in 1993 (USFWS 1993). They are listed as a species of special concern in California (CDFW 2023). The most recent 5-year review (USFWS 2024), which reviewed all available data in all six recovery units, determined that the population remains threatened due to the same threats described above.

The Western Snowy Plover Recovery Plan split the species' range into six Recovery Units (USFWS 2007). Recovery Unit 3 (RU3) consists of the San Francisco Bay Estuary and includes Alameda, Contra Costa, Napa, Santa Clara, and Solano counties, and the Bay-facing portions of

Marin, San Mateo, and Sonoma Counties (USFWS 2007). Snowy Plovers in this Recovery Unit nest almost exclusively in dry salt panne habitat provided by former salt evaporation ponds, as well as on pond berms, levees, and in dry, degraded marsh habitat. In 1992, the Don Edwards San Francisco Bay National Wildlife Refuge (the Refuge) began surveying for Snowy Plovers on Refuge lands.

Since 2003, SFBBO has conducted annual Snowy Plover monitoring and research within the South San Francisco Bay in support of the Recovery Goals set for RU3. In 2024, SFBBO: 1) identified areas used by Snowy Plovers through regular surveys of all potential nesting habitat from March through September, 2) participated in USFWS-coordinated range-wide breeding and winter window counts to estimate RU3 numbers, 3) recorded nest fates, nest densities, and chick fledging rates through nest-monitoring and chick-banding, 4) surveyed for potential avian predators, and 5) identified areas of potential disturbances from predators, trespass, construction activities and other human activities. The activities at Hayward Shoreline detailed in this report are encompassed by this larger framework of SFBBO's Snowy Plover population monitoring and research in the South Bay.

METHODS

Study Area

SFBBO staff conducted Snowy Plover and avian predator surveys at Hayward Shoreline, which is owned by Hayward Area Recreation District (HARD), managed by East Bay Regional Parks District (EBRPD), and includes 1,841 acres of salt, fresh, and brackish water marshes, seasonal wetlands, and public trails.

Suitable nesting habitat for Snowy Plovers is located at three different sites within Hayward Shoreline: FDE, FDW, and OBN. FDE and FDW are two parcels of land bordered by Sulphur Creek to the north and separated by a remnant of historical landfill that is unsuitable for plovers (Figure 1). OBN is a historical salt pond complex that is located at the southwestern edge of Hayward Shoreline. It is bordered by Highway 92 to the south and the San Francisco Bay to the west (Figure 1). OBN is divided into 17 small ponds that are abbreviated as OBN1-17, but SFBBO considers this area one pond for analyses (Figure 2).

Surveys

Snowy Plover Breeding Surveys

Snowy Plovers in the San Francisco Bay nest predominantly on dry pannes, berms, and levees located within former salt production ponds. To document areas used by Snowy Plovers and to estimate the number of Snowy Plovers at Hayward Shoreline, SFBBO surveyed FDE, FDW, and OBN, from the week of March 3 to the week of September 15, 2024. Due to high rainfall during the winter of 2023-2024, all three sites were completely inundated for the first third of the breeding season. Therefore, SFBBO conducted surveys every other week to monitor water levels and assess when suitable breeding habitat would become exposed. From the date the first Snowy Plover was observed using each site, survey frequency increased to weekly. Weekly surveys began the week of April 29 at OBN, and the week of May 13 at Frank's Dump.

SFBBO biologists conducted surveys by driving slowly on the levees or walking levees without vehicle access. We stopped approximately every 0.3 miles to scan for Snowy Plovers with spotting scopes. During each survey, we recorded the number and behavior of all Snowy Plovers present, identified the sex and age class of each individual using plumage characteristics (Page et al. 1991), and marked the approximate location of sightings using the Field Maps by Esri mobile application. We also recorded the color-band status, and combination, of any banded Snowy Plover sighted. Any observed instances of intraspecies aggression between Snowy Plovers and interspecies aggression between Snowy Plovers and other shorebirds and/or seabirds were also recorded.

From January 27 to February 4, 2024, SFBBO participated in the Pacific Coast Snowy Plover winter window survey, which aims to census the population of Snowy Plovers on the coast during the non-breeding season. From May 18 to 26, 2024, SFBBO participated in the Pacific Coast Snowy Plover breeding window survey. This survey was coordinated by the USFWS as part of an annual, regional effort to census all coastal-breeding Snowy Plovers during the same week. SFBBO surveyed all three sites detailed in this document during the window survey.

Band Re-Sight Surveys

Band re-sighting is a crucial aspect of assessing Snowy Plover fledging and survival rates. SFBBO always opportunistically records the band combinations of any Snowy Plovers we see during every breeding survey. However, at the end of the season when breeding activity at a site is fully completed, we will also perform specialized band re-sight surveys with the specific goal of reading as many color bands as possible.

During these surveys, biologists first locate a large flock of roosting or foraging birds. After reading as many band combinations as possible from the levee, the biologists will walk onto the pond bottom and strategically flush the flock just enough for the birds to stand up and reveal their color bands. This is accomplished by slowly and quietly walking several steps at a time and pausing whenever the birds start to move. Band re-sight surveys are best done in pairs where one person walks towards the flock at a time while the other person watches through a scope.

Nest Monitoring

Snowy Plover nests were located by first scanning for incubating adults or other signs of breeding behavior during weekly surveys. We then searched for nests on foot and recorded nest locations using the Field Maps by Esri mobile application. Despite surveyors' best efforts, the cryptic nature of Snowy Plovers means that some nests are inevitably not discovered before they hatch. If we observe chicks at a site where we were not monitoring any nests close to hatch, we know that we missed a nest and classify it as "detected at brood stage."

SFBBO monitored nests weekly until the final nest fate could be determined. During each survey, all known nests would be observed through a scope to confirm whether an adult was still incubating. If an adult was observed incubating, the nest would be marked as active for that survey and not physically visited again until the nest began to approach its hatch date. If an adult was not observed incubating through the scope, the nest would be physically visited to determine whether the nest was still active (i.e., eggs present) or if the nest was inactive, what the nest fate

was when possible (i.e., hatched, depredated and if visited up close, the number of eggs or chicks in the nest.).

We defined a nest as successful if it hatched at least one egg. We calculated apparent nest success as the percentage of nests that successfully hatched at least one egg divided by the total nests monitored.

Egg Floating

During each physical visit, we floated the eggs (Hays and LeCroy 1971) to estimate egg age if incubation had been observed. Snowy Plover nests are typically a 3-egg clutch throughout most of season, sometimes 1-2 eggs later in season. Snowy Plover nests are active for an average of 33 days, from initiation (the date the first egg was laid) to hatching (Warriner et al. 1986). Using the known egg age, we calculated the nest initiation date and predicted hatch date for all nests monitored. When there were no longer eggs in the nest, we assigned each nest a fate based on evidence seen at the nest (Mabee 1997). Potential nest fates included: hatched, depredated, flooded, abandoned, failed to hatch, or unknown.

Avian Predator Surveys

To identify avian predators in the area that might impact breeding Snowy Plovers, SFBBO biologists conducted predator surveys concurrently when surveying ponds for Snowy Plovers. Observers chose survey points that provided a comprehensive scan of all required ponds for predators. At each survey point, the location, start time, and stop time were recorded. Observers recorded the number, species, behavior, and habitat type at the time of sighting of any predators present. The approximate locations of the predators were marked on a map. In addition, observers documented any predator nests in the area and their fates when possible. We calculated the average number of predators observed per survey at each pond during the season. While most predators likely have a larger territory than a single pond (Strong et al. 2004), we felt it meaningful to present indices of predator abundance at the pond scale since both predator and Snowy Plover surveys were conducted at this level.

We defined avian predators as any species that could potentially prey on a Snowy Plover nest, chick, or adult. This includes most raptors, gulls, corvids, herons, and egrets (

Table 4.) found at Hayward Shoreline. While a number of potential mammalian and reptilian predators (Table 5., Table 6), and their signs (e.g., tracks) were recorded opportunistically, these surveys were not designed to detect other taxa, particularly since many are nocturnal. Among all predators, we considered Northern Harriers (*Circus hudsonius*), Peregrine Falcons (*Falco peregrinus*), Common Ravens, California Gulls, and mammals (especially coyotes [*Canis latrans*], red fox [*Vulpes vulpes*], and striped skunk [*Mephitis mephitis*]) to be the most critical potential predators to Snowy Plover adults, eggs, and chicks due to previous predation events captured on camera and consistent with previous documentation of predation.

Statistical Analyses

Fledge Success

We defined a fledged chick as one that survived to 28 days of age, at which point it is considered to be capable of flight (Warriner et al. 1986). We calculated apparent fledging success as the percentage of fledged, banded chicks out of the total chicks banded. Since re-sighting banded chicks on large salt ponds can be very difficult, this method of estimating fledging success has significant limitations and is a conservative estimate.

RESULTS

Snowy Plover Surveys

From March 3 through September 14, we observed a mean of 22.7±24.8 adult Snowy Plovers per week at Hayward Shoreline, as shown in Figure 4. Looking at abundance per site, OBN supported the largest numbers of Snowy Plovers at Hayward Shoreline, with a mean of 12.5±23.1 adults observed per week (Figure 5). FDW supported 10.8±22 adults per week. No snowy plovers were observed at FDE throughout the duration of the breeding season. All abundances by pond are shown in Figure 5.

Early and Late Season Trends

At the beginning of the breeding season, all the sites discussed in this report were fully inundated with no habitat available for Snowy Plovers to utilize. Therefore, no birds were seen at these sites until sufficient habitat was exposed. The first Snowy Plover was seen at OBN the week of April 29 and the first adult was not observed at FDW until May 13.

Beginning in late August through September 15, we observed large post-breeding flocks of 52.5±27.5 adults at FDW. During this same time period, we observed between one and nine birds at OBN, suggesting post-breeding flocks were not forming at this location. On August 26 we recorded this year's high count for all of Hayward Shoreline at 81 birds, observed between FDW and OBN. However, 77 of those birds were observed at FDW while only four birds were found at OBN (Figure 5). These flocks form when Snowy Plovers are longer breeding, but instead either molting, staging for migration, or gathering into winter flocks.

Band Re-Sight Surveys

Band re-sight surveys occurred on September 17, 2024 at Frank's Dump West and September 25, 2024 at Frank's Dump West and Hayward Shoreline Pond 2B. During our first re-sight effort on FDW, SFBBO staff observed 12 banded Snowy Plovers in a flock of about 70 birds, two of which were confirmed as new fledges. Our second effort at FDW on September 25 yielded three known banded birds out of a flock of about 15 Snowy Plovers. During SFBBO's first ever survey of Hayward Shoreline Pond 2B, SFBBO located a flock of roughly 60 Snowy Plovers, 17 of which were banded. We confirmed one juvenile as a new fledge in this flock.

Snowy Plover Nesting

Nesting Abundance and success

Over the course of the breeding season, we monitored three Snowy Plover nests at FDW, nine nests at OBN, and detected one additional nest at the brood stage at OBN. Across Hayward Shoreline, all nests were determined to have hatched at least one egg, giving us a 100% hatch success for monitored nests. Of the 36 eggs monitored across Hayward Shoreline, 32 hatched, giving us an 89% hatch rate per egg (

Table 2). The other four eggs were considered failed to hatch due to unknown reasons.

Snowy Plover Color Banding

Beginning in early June, SFBBO staff banded chicks and adults at OBN and FDW. Over the course of two months, 16 chicks and four adults were banded across six broods on OBN while three chicks and one adult were banded across two broods on FDW. Of the 19 chicks banded across Hayward Shoreline, 14 birds have been confirmed as fledged, providing us with a fledge rate of 74% for chicks banded at this location.

Avian Predators

During avian predator surveys, we counted Common Ravens as the most numerous avian predators at FDW (0.44/survey), followed by American Crows (0.28/survey); at FDE, American Crows were the most numerous observed predator during surveys (1.92/survey), followed by Red-tailed Hawks (0.24/survey); and at OBN, California Gulls were the most numerous observed predator (21.1/survey), followed by unidentified gulls (4.25/survey) (Table 3). Gull species were usually found transiting overhead or roosting in large flocks on dry pond bottoms. Both American Crows and Common Ravens were observed foraging on pond bottoms.

Mammalian Predators

Tracks of mammalian predators, including skunk, red fox, coyote, and domestic dog, were observed at OBN during the breeding season; however, no mammals were observed at this location during predator surveys. At FDW, the only mammalian predators observed during surveys were off leash domestic dogs, which were anecdotally observed on multiple occasions.

Reptilian Predators

While they are known to be present in the area and have been seen on bike trails and levees in previous years, this was the first time a gopher snake was observed on the pond at OBN.

Human Disturbance

At both OBN and FDW we observed signs of human disturbance. At OBN we found footprints in multiple areas of the pond, as well as the northern and western levees, which are closed to the public. At FDW we directly observed trespassers and unleashed dogs on the pond as well as finding tracks from both. The recently erected fence on the northern levee of FDW was found to have been cut through before the breeding season began in 2023. Multiple people and unleashed dogs were observed going through this hole in the fence on at least three separate occasions.

DISCUSSION

Population Size

The number of adult Snowy Plovers observed at Hayward Shoreline during the breeding window increased to 13 compared with zero in 2023. While these numbers in 2023 and 2024 are lower than previous years, it is likely due to lack of habitat availability during the window survey caused by heavy rains the previous winter. While the winter of 2023-2024 was wet, rains were not as extreme as storms experienced in winter 2022-2023. This allowed for habitat to become available slightly early in 2024 compared to 2023. Most locations across Recovery Unit 3 were close to or slightly above the five year average for birds observed during the breeding window survey in 2024, yielding a high overall breeding window count for 2024.

Nest Abundance and Success

With an increase in the number of breeding adults at Hayward Shoreline during the breeding window survey, we also observed a large increase in nesting activity from 2023 (2 nests) to 2024 (13 nests). Hayward Shoreline began to dry during one of the peaks of the breeding season, allowing multiple pairs to initiate nests at both OBN and Frank's Dump West. From late May into mid-June we saw a sharp increase in both initiated and active nests, having a peak of nine active nests across Hayward Shoreline from the week of June 23 through the week of June 30 (Figure 6).

Even though nesting attempts made in 2024 were higher than 2023, all of the nests detected at Hayward Shoreline were observed to have hatched (Table 2) for the second year in a row.

Snowy Plover Banding

Chick Fledging Success

Our banding effort in 2024 was increased at Hayward Shoreline due to increased nest abundance and personnel availability during the middle of the breeding season. All 12 nests monitored from the egg stage were considered for band deployment. We were able to band chicks from eight of those 12 nests, and band adults from five of the eight nests at which chicks were banded. This allowed us to accurately monitor and keep track of the different broods as they neared fledge throughout the season. Without bands, it becomes difficult to know which nest a brood came from on a pond with multiple broods active at the same time. With multiple broods banded across Hayward Shoreline, we were also able to calculate apparent fledge success at this location.

As stated in the results, there is currently a 74% fledge rate for chicks banded at Hayward Shoreline in 2024. This is the highest fledge rate across all monitored areas in the South Bay Area. The 14 chicks fledged from Hayward Shoreline account for over 19% of fledged birds across the South Bay. Fledging success like this is not common in the South Bay, so it will be interesting to see if this is an outlier year or a sustainable fledge rate. The more chicks we are able to band across the South Bay and at a location like Hayward Shoreline, the more accurate the calculated fledge rate will be for RU3.

Avian Predators

Although unidentified gulls and California Gulls were the most numerous predator species observed at Hayward Shoreline (Table 3), most were roosting or transiting rather than actively foraging, and thus we believe that their impact on breeding Snowy Plovers was limited. While typically Common Ravens are one of the largest threats to Snowy Plover breeding success, it is difficult to gauge what kind of impact they had on Hayward Shoreline in 2024, since no nests were depredated at Hayward Shoreline and most observations of Common Ravens were either flyovers or foraging on exposed pond bottom away from breeding activity. In order to reduce the impact of ravens on breeding Snowy Plovers at Hayward Shoreline in future years, it is important that ravens are not allowed to nest on or near the property, as recent research has found that ravens provision their chicks with a higher proportion of other bird's eggs and chicks when close to a high density nesting area (Harju et al. 2021). In the past, the California Department of Fish and Wildlife (CDFW) and the Refuge have worked in cooperation with the United States Department of Agriculture (USDA) and the Pacific Gas & Electric Company (PG&E) to remove the nests of ravens and other predators from power towers near Eden Landing Ecological Reserve and Refuge lands, including along Highway 92. If EBRPD and HARD were to join in this program by scouting power towers and other potential nesting sites within and adjacent to Hayward Shoreline, this could further strengthen the effectiveness of this program and limit raven predation on Snowy Plover and Least Tern eggs and chicks.

In addition to preventing ravens from nesting nearby, lethal predator control, which is already implemented at Least Tern Island (an EBRPD property slightly north of OBN) but not yet at FDW and OBN, is an important tool that could be used to reduce the amount of eggs and chicks taken by predators in future years, especially by ravens, which can learn to target nesting Snowy Plovers. As a component of using this method, plover volunteer docents stationed along trails could also keep watch on breeding areas and notify SFBBO, EBRPD, and HARD staff when ravens and other predators are hunting in ponds. An experimental approach that may be worth considering if predator control is not a viable option is aversive conditioning, in which quail eggs treated with a mild poison that makes bird species temporarily sick are placed in fake nests in breeding areas. If this approach were effective, ravens and other avian predators that ate treated eggs would learn to avoid eating eggs. Similar experiments have been conducted in other Snowy Plover breeding areas with some success (Avery et al. 1995).

Human Disturbance

Consistent with the trends observed in past years, pedestrian and cyclist use of trails at Hayward Shoreline remained high in 2024. Although trespass into sensitive areas was observed on multiple occasions, the impact on breeding plovers was likely minimal overall. However, since most plover breeding areas in the South Bay have relatively few trail users, the high trail use provides a unique opportunity in the Bay Area to conduct outreach with the public. Stationing docents near FDW and OBN would allow biologists to reach a much greater amount of the public, hopefully resulting in less trespass and greater support for pond dependent breeding species like Snowy Plovers.

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Figure 1. Snowy Plover breeding areas in HARD/EBRPD's Hayward Regional Shoreline, Hayward, California.

Figure 2. Ponds within Oliver Brother's North, Hayward Regional Shoreline, Hayward, CA.

Figure 3. Snowy plover nest at Oliver Brother's North, Hayward Regional Shoreline, Hayward, CA.

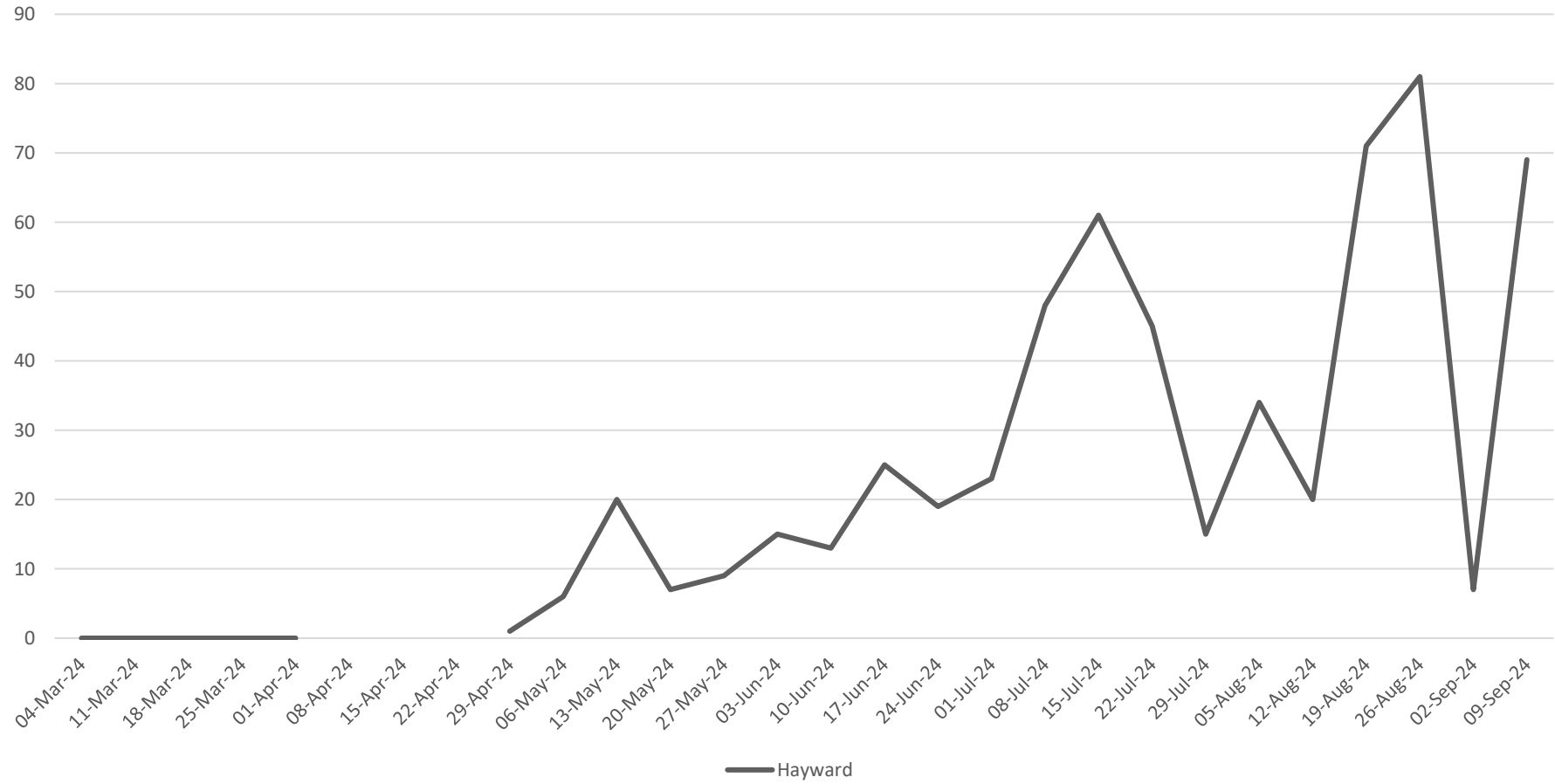

Figure 4. Weekly counts of adult Snowy Plovers at Hayward Regional Shoreline, Alameda County, California, 2024.

Due to high water levels at all locations, ponds were surveyed every other week until the first observation of a snowy plover in the pond. After that, each pond was surveyed weekly until the end of the season. For OBN the first observation date was 4/29/24; for FDW the first observation date was 5/13/24.

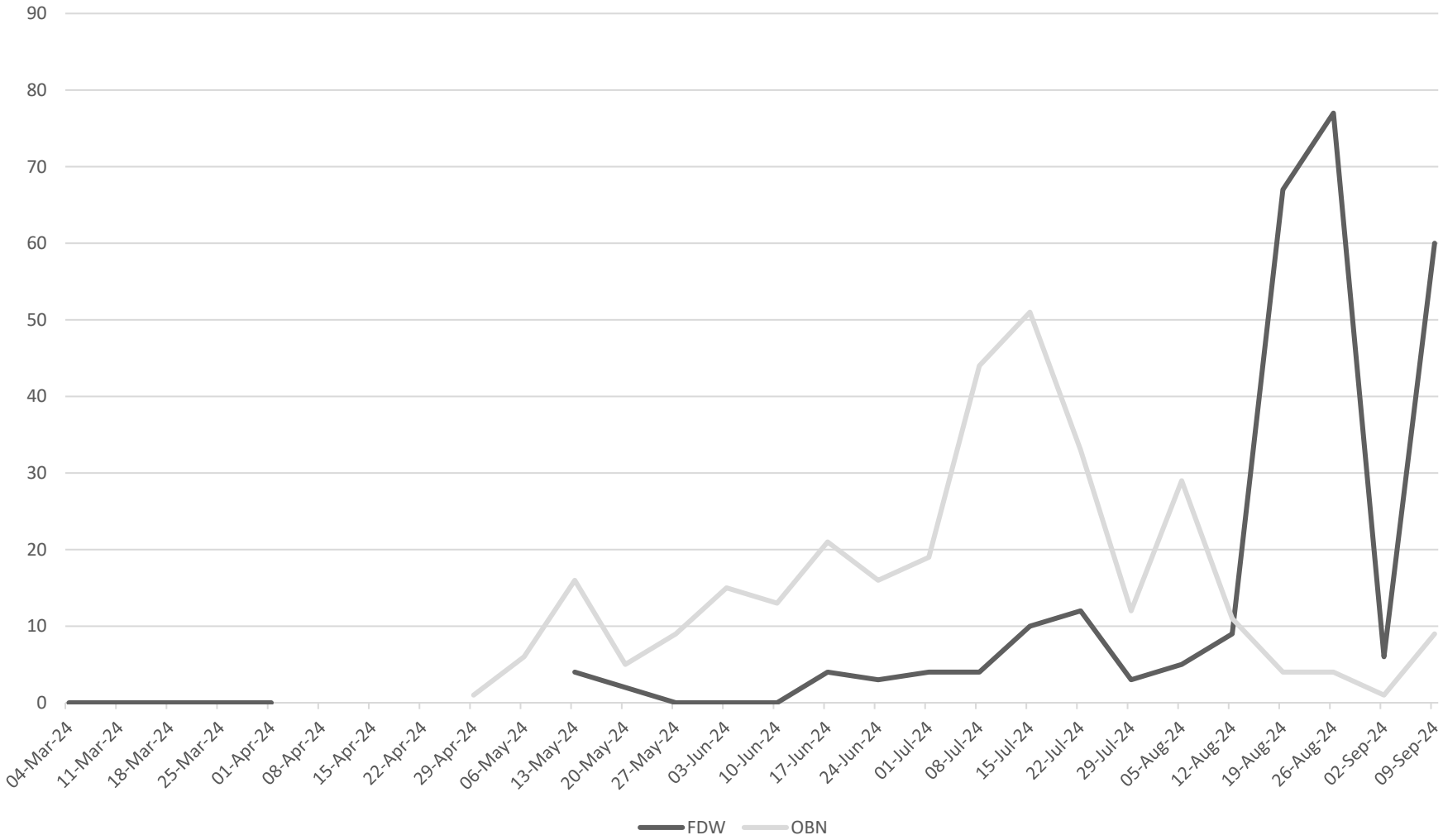

Figure 5. Weekly counts of Snowy Plover adults observed from March 3-September 15, 2024, at Frank's Dump West and OBN, Hayward Shoreline. No birds were observed at Frank's Dump East throughout the breeding season.

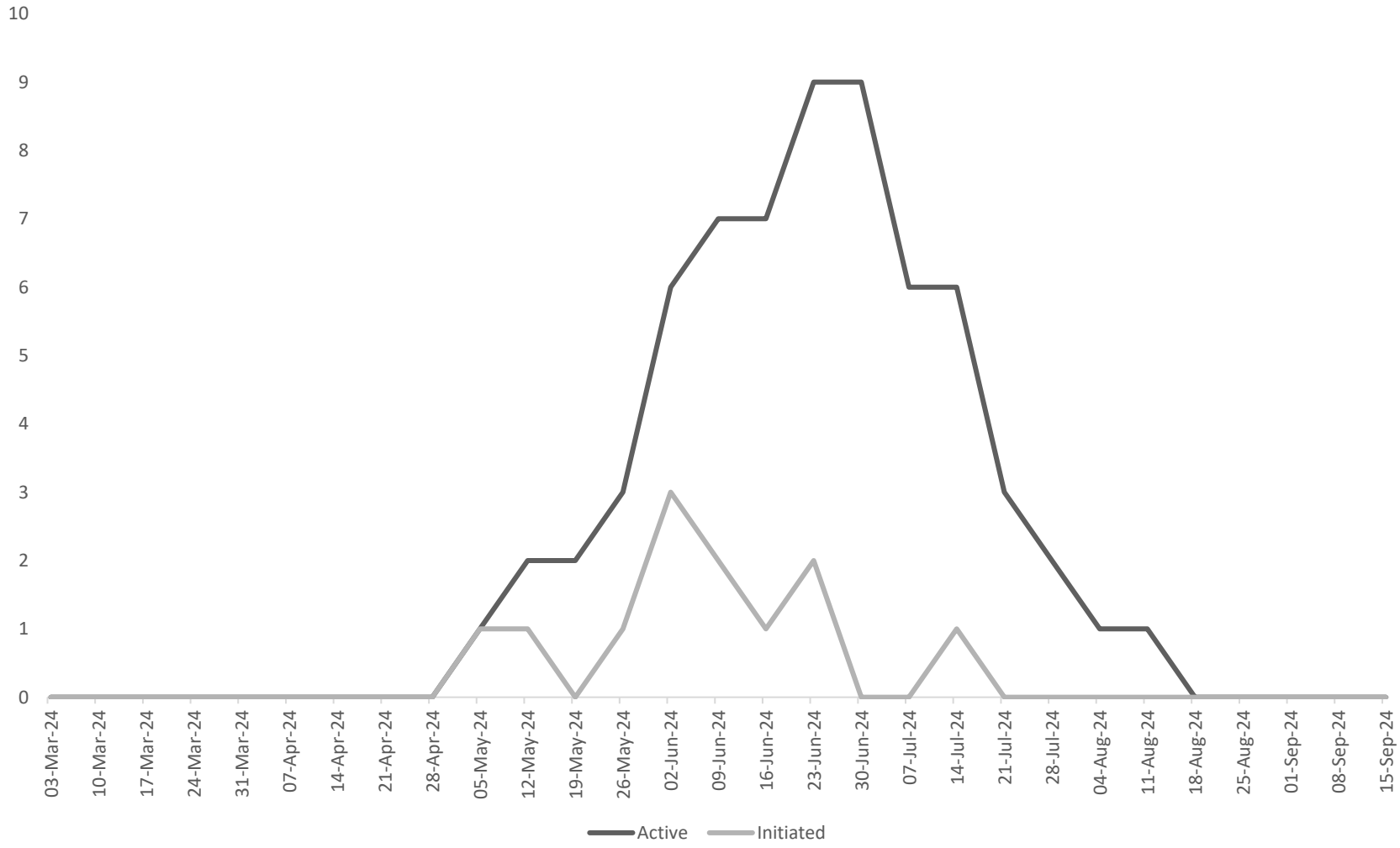

Figure 6. Active and initiated Snowy Plover nests at Franks Dump West and Oliver Brothers North, Hayward Regional Shoreline during the 2024 breeding season.

Table 1. Number of Western Snowy Plovers observed at Recovery Unit 3 sites during annual breeding window surveys in May, 2011-2024. A dash in place of a number indicates that the site was not surveyed.

REGION	SITE	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Alameda	Eden Landing	185	82	97	94	76	120	144	142	117	115	44	89	116	123
	Coyote Hills	0	0	0	0	0	1	0	0	1	0	8	4	1	6
	Crown Beach	-	-	-	0	0	0	-	-	-	-	0	0	0	0
	Dumbarton	0	0	0	0	0	0	2	7	2	-	16	12	55	15
	Hayward	8	9	32	7	2	4	0	7	12	19	56	36	5	13
	Warm Springs	17	3	1	11	24	14	2	20	7	-	5	5	18	24
Marin	Hamilton Wetlands	-	-	-	-	-	0	-	0	0	2	0	5	9	8
Napa	Napa	1	0	3	10	10	0	-	2	2	-	0	4	0	0
San Mateo	Ravenswood	27	33	59	45	68	42	76	51	48	-	67	74	84	81
Santa Clara	Alviso	11	20	10	0	1	21	19	4	1	-	23	39	70	38
	Mountain View	-	-	-	11	0	0	0	2	0	8	35	8	1	0
Solano	Montezuma Wetlands	-	-	-	-	14	6	3	0	0	3	9	5	4	13
	Cullinan Ranch East	-	-	-	-	-	-	-	-	-	-	-	0	5	0
Total Unit 3		**249**	**147**	**202**	**178**	**195**	**208**	**246**	**235**	**190**	**147**	**263**	**281**	**368**	**321**

Table 2. Snowy Plover nest fates in 2024 at Hayward Regional Shoreline, Hayward, CA.

	Hatched		Depredated		Total Monitored		Detected as Brood		Total	
Pond	**Nests**	**Eggs**	**Nests**	**Eggs**	**Nests**	**Eggs**	**Nests**	**Chicks**	**Nests**	**Eggs**
FDW	3	6	0	0	3	9	0	0	3	9
OBN	9	26	0	0	9	27	1	1	10	28
Total	**12**	**32**	**0**	**0**	**12**	**36**	**1**	**1**	**13**	**37**

Table 3. The average number of predators observed per survey at Frank's Dump East, Frank's Dump West, and Oliver Brothers North Ponds, Hayward Regional Shoreline, Hayward, California, March-September 2024. The number of surveys conducted is in parentheses.

Predator Species	FDE (25)	FDW (25)	OBN (24)
California Gull	0	0.04	21.125
Unidentified Gull	0	0	4.25
American Crow	1.92	0.28	0
Common Raven	0.2	0.44	0.75
Black Turnstone	0	0	0.75
Red-tailed Hawk	0.28	0.24	0
Ruddy Turnstone	0	0	0.333
White-tailed Kite	0.04	0.2	0.042
Peregrine Falcon	0	0.04	0.208
Great Egret	0	0.08	0.042
Northern Harrier	0.04	0.04	0.042
Great Blue Heron	0	0	0.083
Snowy Egret	0	0	0.083
Herring Gull	0	0	0.083
Osprey	0	0	0.042
Gopher Snake	0	0	0.042
Cooper's Hawk	0	0.04	0
American Kestrel	0.04	0	0

Table 4. Potential avian predator species.

Common Name	Scientific Name
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrines*
Prairie Falcon	*Falco mexicanus*
Bald Eagle	*Haliaeetus leucocephalus*
Golden Eagle	*Aquila chrysaetos*
Cooper's Hawk	*Accipiter cooperii*
Red-Tailed Hawk	*Buteo jamaicensis*
White-tailed Kite	*Elanus leucurus*
Northern Harrier	*Circus Cyaneus*
California Gull	*Larus californicus*
Western Gull	*Larus occidentalis*
Herring Gull	*Larus argentatus smithsonianus*
Glaucous-winged Gull	*Larus glaucescens*
Mew Gull	*Larus canus*
Ring-Billed Gull	*Larus delawarensis*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Cattle Egret	*Bubulcus ibis*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Snowy Egret	*Egretta thula*

Loggerhead Shrike	*Lanius ludovicianus*

Table 5. Potential mammalian predator species.

Common Name	**Scientific Name**
Red fox	*Vulpes vulpes*
Grey Fox	*Urocyon cinereoargenteus*
Striped Skunk	*Mephitis mephitis*
Virginia Possum	*Didelphis virginiana*
Domestic Cat	*Felis catus*
Coyote	*Canis latrans*

Table 6. Potential reptilian predator species.

Common Name	**Scientific Name**
Gopher Snake	*Pituophis catenifer*