

**Western Snowy Plover and California Least Tern
Nesting Outcome Season Summary 2023
Ormond Beach, California**

Submitted to
Recovery Permit Coordinator
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Permit# TE-181713-4
January 30, 2024



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Introduction

The abundance and productivity of the western snowy plover (WSP) (*Charadrius nivosus nivosus*) and the California least tern (CLT) (*Sternula antillarum browni*) was monitored at Ormond Beach in Oxnard, Ventura County, California from March 16, 2023 to August 30, 2023. The pacific coast population of WSP was federally listed as threatened under the ESA on March 5, 1993 (Federal Register 1993). The California least tern subspecies was listed as an endangered species under the Federal Register in 1970 (USFWS 1985) and as endangered by the state of California in 1980 (USFWS 1985).

Ormond Beach is uniquely located at the urban/agricultural/wetland interface of Ventura County. It is part of a Globally Important Bird Area, has been designated WSP critical habitat by the USFWS and an Environmentally Sensitive Habitat Area (ESHA) by the Ventura County Local Coastal Plan. Nesting of WSP and CLT have been documented at Ormond Beach since the 1970's, and these species have likely nested at Ormond Beach historically. The 2023 data marks 21 years of continuous collection on nesting outcomes, locations, and factors influencing nesting success.

Executive Summary

Western Snowy Plover

A total of 66 WSP nests were located; of those, 54 hatched (81.2%) and 12 failed (18.2%). Of the 12 failed nests, 6 were (50%), 3 failed because of predators (25% of failed nests), 2 nest was were lost to take by a human (17%) and one nest failed due to a tidal washout (8%). The number of breeding WSP reached a peak of 51 on June 14, 2023. Re-sighting fledglings is inexact without banding, therefore we report a range between 16-24 WSP fledglings confirmed to be from Ormond Beach nests.

Table 1. WSP 2023 Season Summary

First Nest Initiation	March 28
First Hatch	April 24
Period of Peak Nesting	May 24-27 and June 13-14
Last Nest Initiation	July 18
Last Hatch	August 3

Table 2. WSP Nesting Outcome 2023

# nests	Hatch	Fail	Maximum Breeding Adults	Fledglings	Chick Survival Rate
66	54	12	51	16-24	10-16%

Threats to WSP Nesting Success: In most years the greatest cause of nests losses are due to predators, in particular ravens. But in 2023 no nests were lost to corvids. The greatest losses were to abandonment. Each year some nests are abandoned, and in 2023 the amount of nests abandoned were consistent with previous years.

With a lack of serious predator problems, human disturbance was the most significant problem. Two nests failed due to human take. These were nests at the tideline and outside habitat fencing, so we protected with symbolic fencing to prevent trampling by humans. Within days of fencing, the eggs were taken from both nests and trail cameras tampered with.

California Least Terns

CLT first appeared on Ormond Beach on May 5, 2023. Nesting occurred in 2 colonies, one at the north end of the beach by Ormond Lagoon and one at the south end near the Pt Mugu fence line. The last CLT were seen on August 3, 2023. A total of 19 CLT nests were found between the two colonies, with 6 nests in the south habitat and 13 nests in the north habitat. Overall, 13 nests hatched (68%), 5 failed (26%) and 1 had unknown outcome. Although nests hatched in both colonies, only the north colony successfully fledged chicks.

Table 3. CLT 2023 Season Summary

	North Colony	South Colony
Number nests:	13	6
First Nest Initiation:	May 31, 2023	June 1, 2023
First Hatch:	June 21, 2023	June 22, 2023
Last Hatch:	June 29, 2023	July 6, 2023
Number fledgling:	6-10	0

Table 4. CLT Nesting Outcome; North and South Colonies

Colony Location	# Nests	Nest Outcome			Fledglings
		Succeed	Fail	Unknown	
North	13	7	5	1	6 to 10
South	6	6	0	0	0
Total	19	13	5	1	6-10

Threats to CLT Nesting Success: The majority of failed nests were predated by an unknown small mammalian predator and one was lost to a coyote. We did not lose any nests to corvids in 2023. We were fortunate to not lose any nests to off roaders, which made frequent visits inside the nesting habitat throughout the season. Off roader damage escalated in August, which was after CLT had left the nesting habitat. There was also regular trespassing inside the nesting habitat by individuals pushing bicycles and taking short cuts through the fences.

Threats to both CLT and WSP

Habitat fences were vandalized weekly, rope used for symbolic fencing was cut and stolen, and monitoring supplies, in particular trail cameras, were stolen from the field. Off highway vehicles were a constant presence inside nesting habitat and on the beach. Motorcycle riders illegally entered the beach, rode at high speeds at the tideline and entered the nesting habitat to ride in the dunes. There was also regular foot traffic through the nesting habitats, especially in the north habitat.

Site Description

Ormond Beach is owned by three landowners that jointly manage the property with a Memorandum of Understanding (Figure 1). The landowners are the California State Coastal Conservancy (SCC), the Nature Conservancy (TNC), and the City of Oxnard (the City).

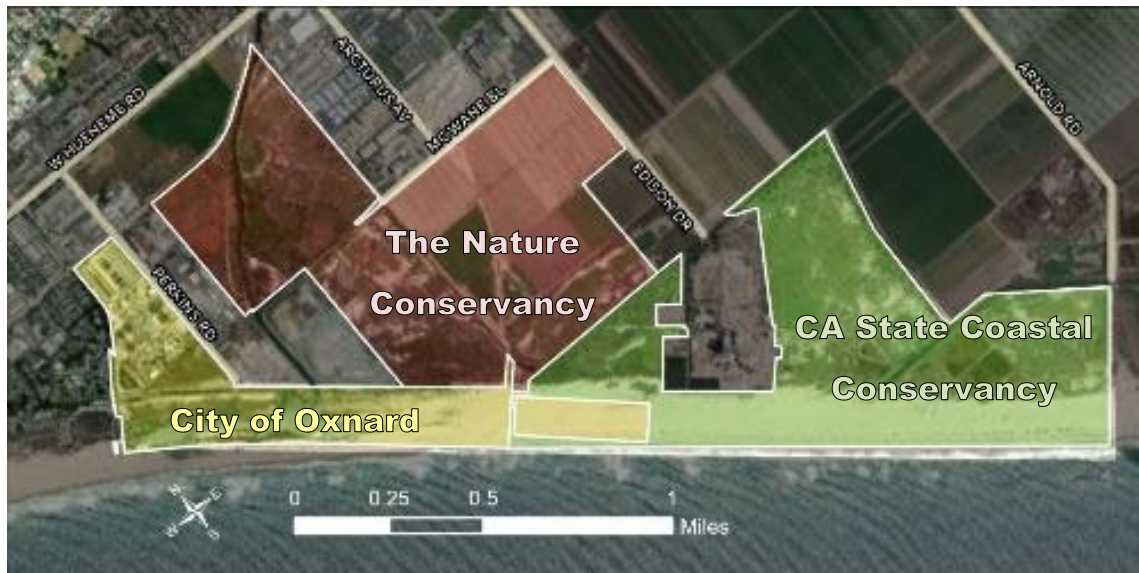


Figure 1. Ormond Beach landowners

Survey Area

The survey area spans 200 acres along 2 miles of coastline, with approximately 160 acres providing suitable nesting habitat. Both WSP and CLT nest in the sandy dunes along the entire length of the property, while WSP also nests in the salt panne inland at the southern end.

Public Access: There are just 2 public access points 2 miles apart, at the far north and south ends of the beach. The north public access is via Hueneme Beach in the city of Port Hueneme (Hueneme Beach). The southern access is via Arnold Rd which has a public parking lot that fits about 30 vehicles adjacent to the Point Mugu fence. There are other ways to access the beach, but these are on private property not open to the public. These access points are used illegally by trespassers.

Important Features: The Ormond Lagoon is just inside the northern boundary of Ormond Beach

and it is used by breeding and migrating birds. The furthest north nests are found between the lagoon and the ocean. Moving south and just inland from the lagoon area is the former Halaco property. It was a metal smelting operation from 1965 to 2004 and was designated an EPA superfund site in 2007. More recently it is the site of illegal encampments. Further south there is upland habitat owned by TNC, then a working power plant owned by Genon Energy. The southern end of the property has an inland salt panne used for nesting by WSP. Adjacent to this is a small property owned by a private hunting preserve, the Ventura County Game Preserve. Adjacent and inland from this is a yard waste composting operation owned and operated by Agromin Industries. The southern boundary of Ormond Beach is demarcated by a fence at the property line of Naval Base Ventura County Pt Mugu.



Figure 2. Ormond Survey Area

Habitat Protection

Fences define nesting areas to the public and significantly reduce disturbance to nesting birds and trampling of nests and chicks.

Nesting areas are protected with the following fence types:

Habitat Fence

The primary material used is black mesh Cintoflex-C fencing attached to metal T-posts. The mesh fencing has openings that are 1.75" square through which birds and small animals can easily move through, including WSP adults, WSP chicks and CLT chicks. The T-posts are placed every 10-20'. The fence is intended as a visual and physical demarcation of the nesting area, rather than a predator or human exclusion fence. It provides a physical barrier that is challenging, although not impossible, for humans to cross. It presents a significant barrier to dogs and is the fencing of choice in areas where beach goers disregard leash laws and let dogs off-leash. The bottom of the fencing is constructed with a gap of 6 inches at the bottom, so even though they sometimes fill in with windblown sand, natural openings occur. Sea mammals including sea lions and elephant seals can roll under these fences, as well as the debris brought in with tidal wash overs. See [Figure 3A](#) below.

Symbolic Fence

Steel anchor rod posts strung with cable wire or rope. This is strictly a visual fence, as it presents no physical barrier to animals, and humans can easily step over or under it. This type of fence is used in low areas that regularly have tidal over wash or where the dunes are growing and shifting. [Figure 3B](#) below.

Portable Fencing

This type of fencing is put up on an as-needed basis when nests are established outside of, or right next to the edge, of the mesh habitat fences. Fences are constructed of PVC posts strung with string. This material is light weight and can be carried by a few people long distances on the beach. It is inexpensive, easy to assemble and durable in the beach environment, [Figure 3C](#) below.

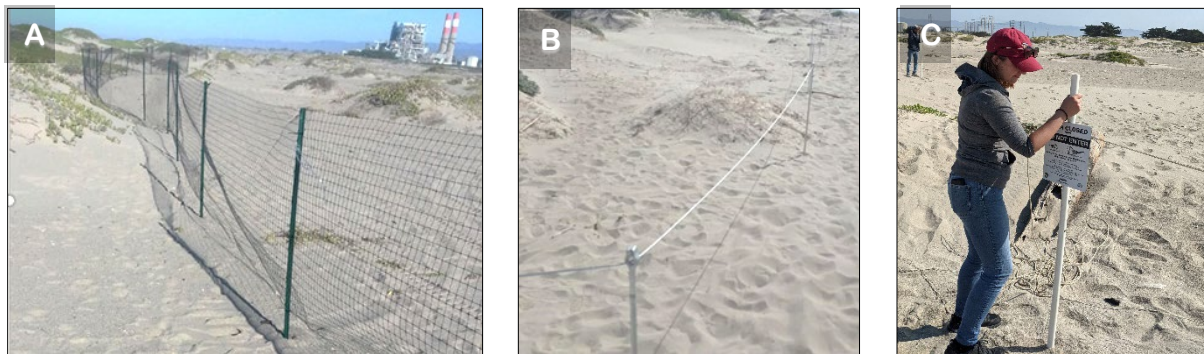


Figure 3. Types of fencing used on Ormond Beach to protect nesting areas or nests established outside protected habitat areas. Panel A - Mesh Fencing; Panel B - Symbolic Fencing; Panel C – PVC Nest Fencing

Fall Removal of Tideline Fence: Tideline fences are removed in fall and replaced in late winter before nesting season starts. This entails pulling posts, rolling up the mesh and storing approximately 1.5 miles of fence. Just before nesting season in February the fencing is installed above the high tideline with a combination of salvaged fencing that was stored over the winter, or new fencing to replace unsalvageable materials. Volunteers repair fences at the sides or back of the habitats. Fence lines are adjusted pre-nesting season based on changes to nesting patterns.

Methods

Population Abundance

Whenever possible the beach is surveyed simultaneously by two biologists working in different areas of the site, and another team walked the tideline to count adults and look for chicks. When the beach could not be surveyed simultaneously, surveys were conducted on subsequent days. A total of 42 surveys were conducted over a 25-week period from March 16 through August 30. Monitoring for nests and population counts in the dunes was conducted by walking wandering transects, the tideline was walked at the top of the wrack line the entire length of Ormond Beach. Observed WSP were recorded by age and gender. Numbers of CLT adults and

juveniles were recorded each time the colony was visited and entered in the CLTE Data Reporting spreadsheet provided by CDFW for data tracking. Chicks were aged according to Aging Classification Chart included in the spreadsheet package. The entire beach was surveyed a minimum of once per week for both species.

Banded Birds

During weekly surveys WSP were examined for leg bands through binoculars. Field cameras watching nests also captured band combinations of nesting birds. All band combinations seen on WSPs were reported to the “SNPL Band Reporting Band sighting” list serve. CLTs were monitored for bands and/or transmitters.

Trail Cameras

Camera traps were used to remotely monitor the nesting area to document the presence of predators, predation events, nest hatching and human disturbance. Several camera models were used: Browning Defender 940 (model# BTC-10D), Campark models T70 and T100, EZETAI models E2, E-10 and H0401 and Vikeri Tech models 4K and M-9. All cameras had “no-glo” nighttime infrared emitters and detectors, triggered by motion activation and recorded either a photo and/or a 10-20 second video. Cameras were placed on the ground approximately 10-30 feet from nests. SD cards were switched out on a weekly basis.

To minimize the risk of theft, camera bodies and cases were camouflaged using “stone creations bleached stone” spray paint, which coated the cameras in a sand-colored heavy texture paint that blended with beach environment. Using indelible markers, the cameras were labeled with identifying information and VAS contact information. Cameras were programed with a password lock that is required in order to activate the cameras.

Trail cameras were not used in the north or power plant habitats due to the risk of theft. This area always has a high amount of trespassing, and in past years most equipment has been stolen from this area.

Nest Fate

When a nest was found, it was approached to collect GPS coordinates. The date found and number of eggs was recorded. For WSP, the sex of brooding adult WSP was noted. Because of the presence of ravens, when an adult WSP could be observed brooding a previously marked nest from a distance it was not approached. CLT nests were marked with a numbered <6” long piece of driftwood or other natural beach debris and placed no closer than 4 feet from the nest. WSP nests that had exclosures did not require markers. Those that did not have exclosures were marked by 6” to 1’ pieces of beach wood or debris placed vertical or at an angle in small dunes on either side of the nest at a distance of at least 10’ from the nest. If no adult was observed brooding from a distance, the nest was approached to check for the presence of eggs. Each nest was followed until hatching or failure. Once a nest no longer contained eggs, a 2-meter area around the nest was examined for eggshell fragments, egg yolk, tracks of birds or predators or any other disturbance. The nest scrape was examined for prints and shell fragments. Nest hatching was determined by locating a pip shell (1-4 mm) within the hatched

nest, by observing displaying behaviors of adults, noting whether footprints in the nest were from plovers/terns, or other animals, and locating chicks when possible (Mabee 1997). Any nest that had at least one egg was determined to have hatched and was categorized as successful.

If eggs remained in the nest for more than the expected gestation time after discovery (28 days for WSP, 21 days for CLT) and no adult was observed nearby it was tested for continued brooding by placing an egg on end and rechecking within 3-7 days to see if an adult was in attendance. If eggs remained in the same position and no fresh plover/tern footprints could be found in the nest, the nest was determined to have failed due to abandonment. Eggs that disappeared before the end of the full gestation period were determined to have failed if no signs of hatching were evident and signs of tracks from animals other than plovers/terns were at the nest site. Nests were determined to have unknown outcome if the eggs were gone after being brooded for the full gestation period but did not have any signs of hatching or depredation, and no chicks were seen in the nest vicinity.

Nest Initiation Date

Nest initiation dates were calculated for nests confirmed to have hatched by subtracting the expected gestation period for the species plus 2 days from the hatch date. This accounts for the time it takes a pair to start laying the first egg until clutch completion. Hatch dates for nests with a newly hatched chicks inside the nest scrape were the same day as the chick observation. If chicks were observed after they left the nest and could be associated with a given nest, hatch date was estimated based on the age of the chick. If a nest was determined to have hatched but no chicks were observed, hatch date was estimated to be 2 days following the last date of observed brooding for both WSP and CLT. If eggs were abandoned or depredated, the last day the nest was active was determined as the day of the last survey when an adult was observed brooding the nest, and nest initiation was estimated to be date the nest was discovered minus 2 days.

Breeding Adult Calculation

Western Snowy Plover: Total number of breeding adults for the season were calculated from the survey that yielded the highest number of breeding adults, derived by attributing a male and female pair to each active nest and 1 breeding male to each clutch with at least 1 chick. This method is essentially a window count for breeding adults and assumes that all the breeding adults recorded on the count are representative of the entire breeding population.

California Least Tern: Unlike WSP data which we track in detail on our internal spreadsheets, we submit a year end spreadsheet required by CDFW. Because the CLT is a listed as a California State Endangered species, CDFW is the lead agency and manages the data submitted by all nest site managers.

Chick and Fledgling Observations

Western Snowy Plover: Once a nest hatched, chicks were looked for each week and as much as possible tracked until fledging. Care was taken to document the same chick only once per week so chicks' survival could be followed until fledgling age. All chick sightings were recorded on an

ArcGIS Pro field map built to document chick observations on Ormond Beach. Using a mobile device, the GPS location was recorded as close as possible to the location where chicks were either directly observed or reported by volunteers. Each week all chick observation and the approximate age of the chicks was documented. Fledglings were determined to be from Ormond Beach if they had been observed regularly in the same area and were observed to be accompanied by a guarding adult prior to reaching fledge age. Hatch year chicks that did not meet these criteria were assumed to be from other beaches and were recorded separately.

California Least Tern: Nests were checked a minimum of once per week. Chicks were re-sighted and associated with nests as much as possible. If we confirmed that a nest had hatched from a distance and a chick was present or still being brooded by an adult, we avoided approaching the nest. The number of fledglings were calculated as per CDFW instructions by adding the daytime counts of fledglings every 3 weeks starting 2 weeks after the first fledglings were sighted (method 3WD from the CA Department of Fish and Wildlife report spreadsheet).

Fences

As described in the previous [Habitat Protection](#) section, different types of fencing is used. See Table 5 below for detailed fence statistics. See [Figure 4](#) for the fence map . The specific locations protected with fencing include:

- South Habitat and Salt Panne: On the south end of the beach, 1.5 miles of mesh fencing encloses 79 acres. This fence also encloses the salt panne which is just inland of the south habitat dune area.
- Middle Habitat: Southeast of the power plant, 0.6 mile of fencing encloses 9 acres. The back and sides are mesh with T-posts and the tideline is steel post with rope
- Power Plant Habitat: Just northwest of the power plant, 0.8 mile of fencing encloses 3.5 acres. The back and sides are mesh with T-posts and the tideline is steel post with rope
- North Habitat: On the north end of Ormond Beach, 1 mile of mesh fence encloses 20 acres. Part of the tideline side is symbolic fencing. The rest is T-post and mesh. The footprint of this habitat was altered in 2023 due to changes in nesting patterns. Part of the northern end was shortened, reducing the overall area enclosed in 2023.
- Lagoon: In 2023 we constructed an enclosed 2-acre habitat area to protect this location which has had an increase in nesting attempts by CLT and WSP. The back and sides are mesh with T-posts and the tideline is steel post with cable wire.

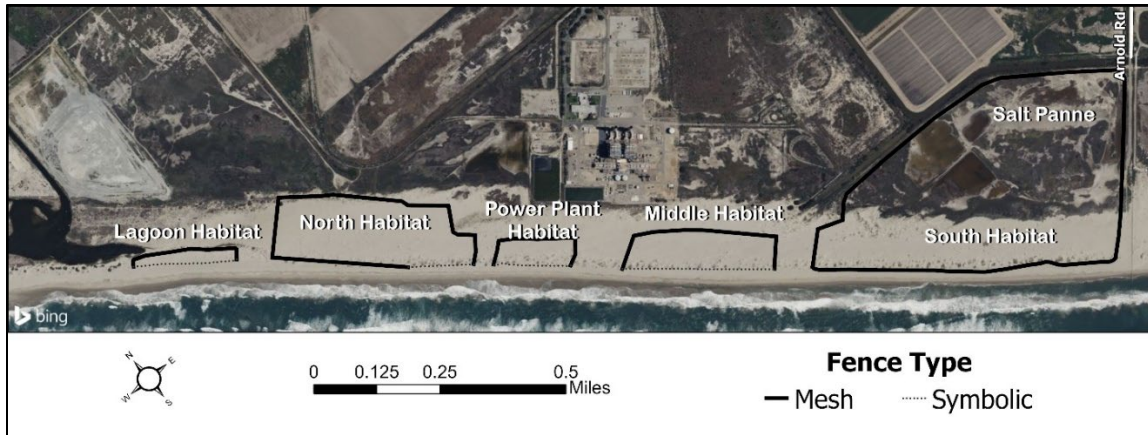


Figure 4. Annual fencing during the 2023 nesting season

Table 5. Fence statistics in 2023

Ormond Beach Fenced Areas	Area (acres)	Perimeter (ft)	Perimeter (miles)
Lagoon	2	1800	0.3
North	20	4440	0.8
Power Plant	3.5	1800	0.3
Middle	9	3100	0.6
South/Salt Panne	79	7,800	1.5
Total	113.5	18,940	3.5

Signs

We use several sign designs to inform the public about nesting birds and the ordinance provisions. Signs were fabricated in metal with anti-graffiti coating and holes pre-drilled to allow attachment of signs to fence posts. We affix signs to the metal posts around the perimeter of the fenced areas and at the main entrances to the beach, both the public and the unlawful entry ways. See [Figure 5](#) for sign images.

- A. Children's "Share the Shore" are signs were created by school children as part of an Explore the Coast grant in 2017, and at previous VAS Share the Shore programs over the past 10 years.
- B. Enforcement "Do Not Enter" signs list Federal, state and municipal codes that protect nesting endangered birds and the penalties for entering nesting areas. Signs also list seasonal closure dates for the nesting season.
- C. Educational signs focus on the protection of birds and appeal to beach visitors to help nesting WSP and CLT.
- D. We designed and printed metal "No Dog" signs to have an educational component. These signs were posted on the tideline to assist police with the enforcement of the no dog rule at Ormond Beach.



Figure 5. Sign Designs Used in 2023

Mini Exclosures (ME)

No predator mini-exclosures were used in 2023 due to an lack of corvids targeting nests.

Results

Western Snowy Plover

Adult Population Abundance

The number of adult WSP fluctuated between 21 and 91 individuals (Figure 6). During the spring window count on May 23-26, 2023 a total of 38 adult WSP were counted. Following the window count, population numbers increased over the next two months to a peak of over 90 adult WSP in June and July. The average population count over the season was 56 ± 19 , compared to 37 ± 10 in 2022. In comparison, in 2022 adult population numbers dropped after the spring window count in May. In past years we have had heavy losses of nests due to raven depredation in May or June, but in 2023 we had no problems with ravens targeting nests. This may account for the higher number of adult WSP staying on Ormond Beach.

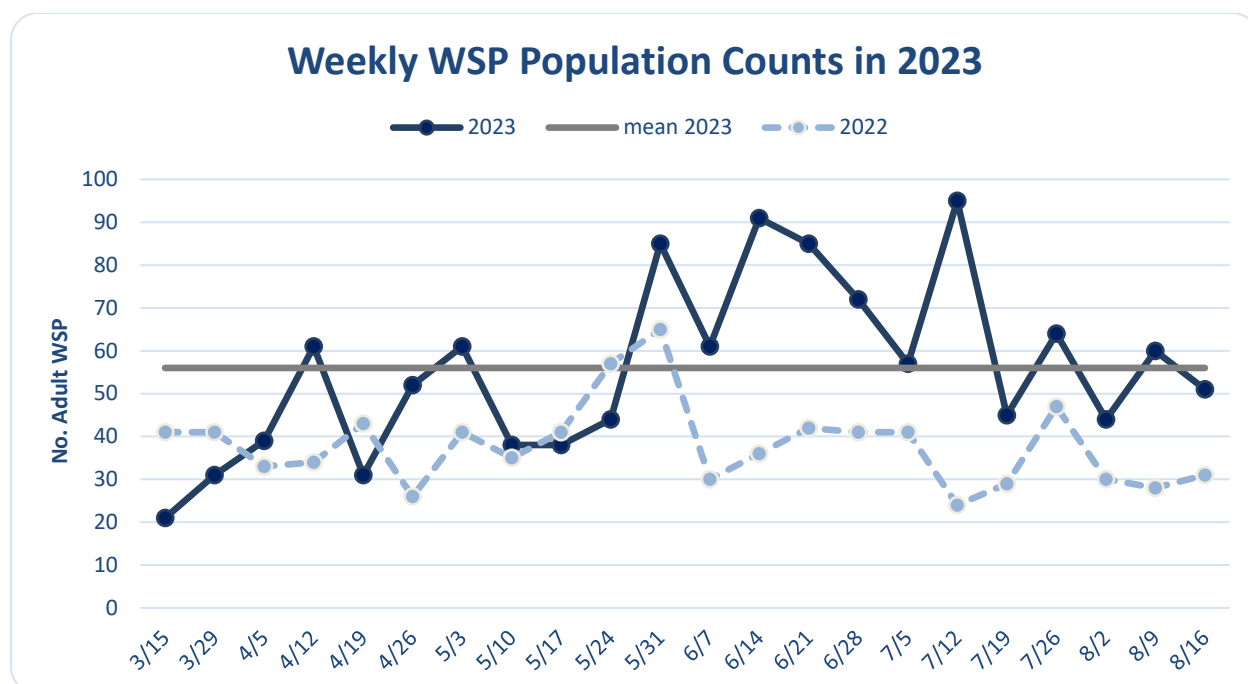


Figure 6. Weekly WSP adult population numbers

Banded WSP

A total of 6 WSP with bands were sighted during the 2023 nesting season. All birds displayed nesting behavior or were captured on trail camera video associated with a nest. See [Table 6](#) for details.

Table 6. Banded birds sighted at Ormond Beach

Band Combo	Sex	Year Banded	Fledging Beach	Behavior/ Nests and Outcomes
an:ny	male	2015	Vandenberg, Surf North	Near Ormond Lagoon in March and June. Appeared to have been with a juvenile in June. This bird has been seen since 2017 on Ormond Beach
nb:aa	female	2022	Vandenberg, San Antonio Beach	Seen on trail camera video associated with nest 22 in late May and nest 48 in late June, both in middle habitat. Both nests hatched.
O:yy	male	2018	Camp Pendleton	Seen regularly on surveys at the tideline in north and south habitats. Was with a 2-week-old chick on 5/24/23. This bird has nested on Ormond Beach since 2022. This bird fights a lot with other WSP.
Op:wa	male	2021	Naval Base Coronado	Regular south tideline. Father nest 20, seen with chicks at south tideline. Hatched on 6/15/23. This is the first year we have sighted this bird.
vv:bo	male	2019	SB Zoo reared, originally from Oceano	nested twice, nest #24 and #57. Nest 24 chicks didn't make it, he re-nested in 10 days
y/w:y	male	2020	New River Coos County, Oregon - hatched 6/11/2020	Displayed nesting behavior all season. Believe he fathered nest 6 (north habitat) and nest 41 (south habitat). He fought all summer with O:yy.

Breeding Adults

The USFWS recovery target for breeding WSP on Ormond Beach is 50 breeding individuals. This year the estimated number of breeding WSP adults just exceeded 50. On May 24th there were 50 (22 nests and 6 clutches of chicks), which was also during the spring window count week. Then on a subsequent wave of nesting there were 51 on June 14th (21 nests and 9 clutches of chicks). The plot of breeding adults is a jagged line because the calculation is reliant on the number of clutches, which are displayed as points on the date when all the clutches were observed, instead of a continuous line like the nest number. Peak breeding numbers occurred over a 1-month period from 5/24-6/21. See [Figure 8](#).

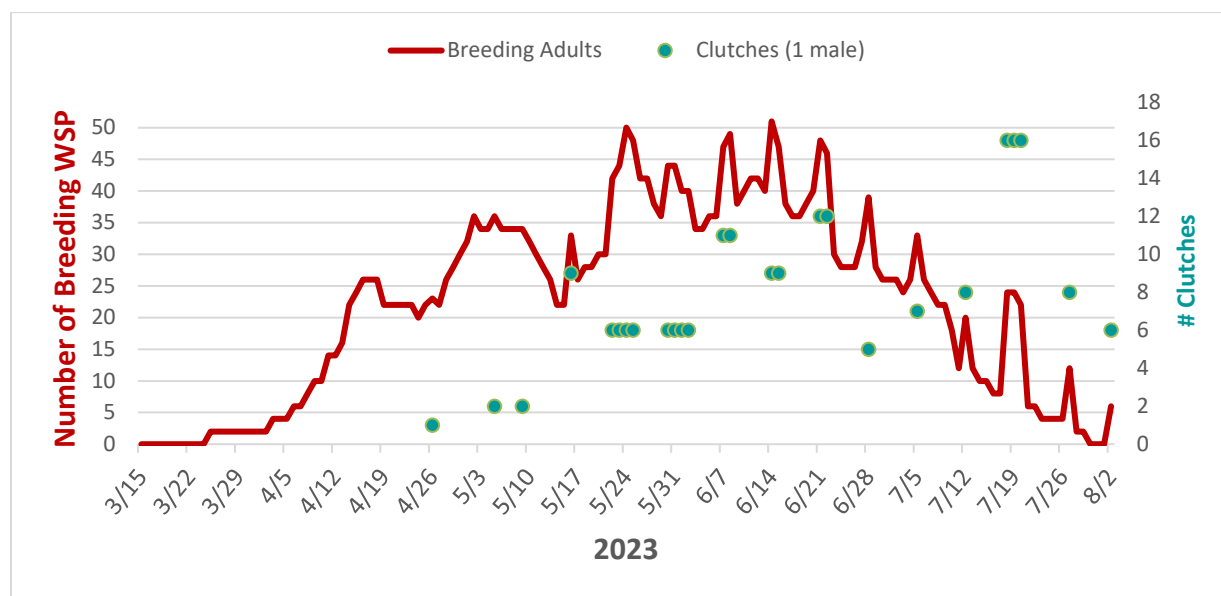


Figure 7. Breeding Adults

Nest Chronology

The first nest in 2023 was established on March 25, 10 days later than the first nest in 2022 (March 15, 2022). There were roughly 4 waves of nesting, with one each in April, two in May and one in June. Each peak had more nests, with the highest peak reached in early May with 22 nests. This year, without a major depredation event from ravens, the June peak was over 20 nests. In past years when ravens depredated most active nests there has been a sharp decline in nests and breeding birds for the remainder of the season. See [Figure 8](#).

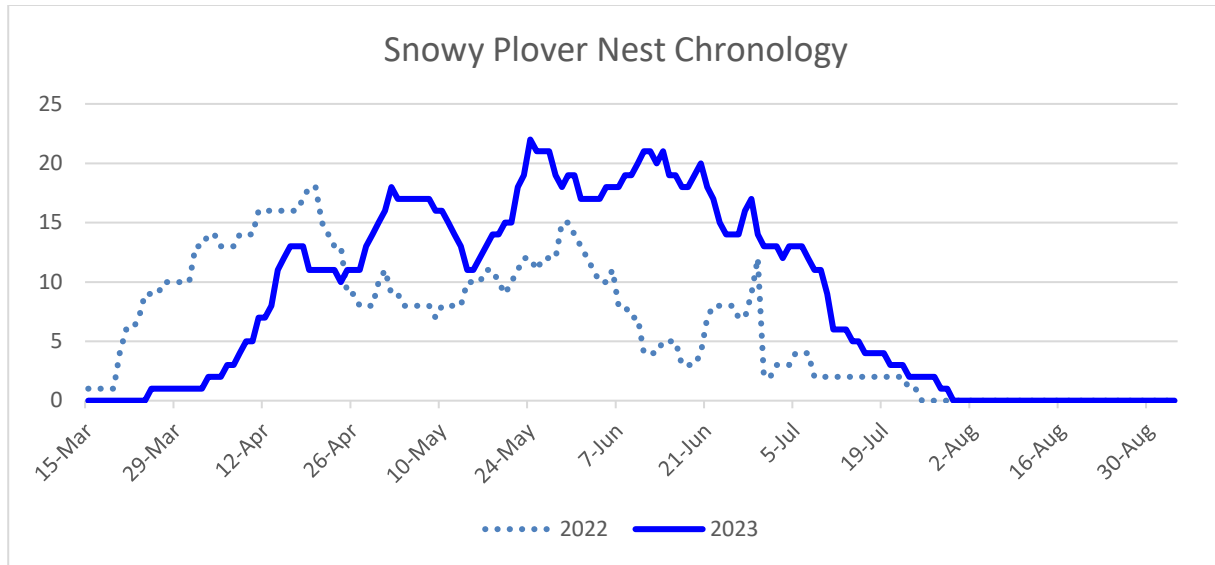


Figure 8. Nest number chronology

Nest Locations

Sixty-six WSP nests were established along the entire length of Ormond Beach, from the Mugu fence to Ormond Lagoon. This was 10 more nests than in 2022. Nests were concentrated primarily in the north and south habitat areas (19 and 26 nests, respectively). Most of the remaining nests were distributed between the power plant, middle and salt panne fences (7, 9 and 5 nests). Although in the power plant area there were several nests behind the fences and in the gap between the power plant and middle habitats. There was one additional nest by the south end of the lagoon. See Table 7 and Figure 9 below.

Table 7. Distribution of WSP in the habitat areas of Ormond Beach

Habitat/Area	Lagoon	North	Power Plant	Middle	South	Salt Panne
2023	1	19	7	9	26	4
2022	2	19	6	10	14	5

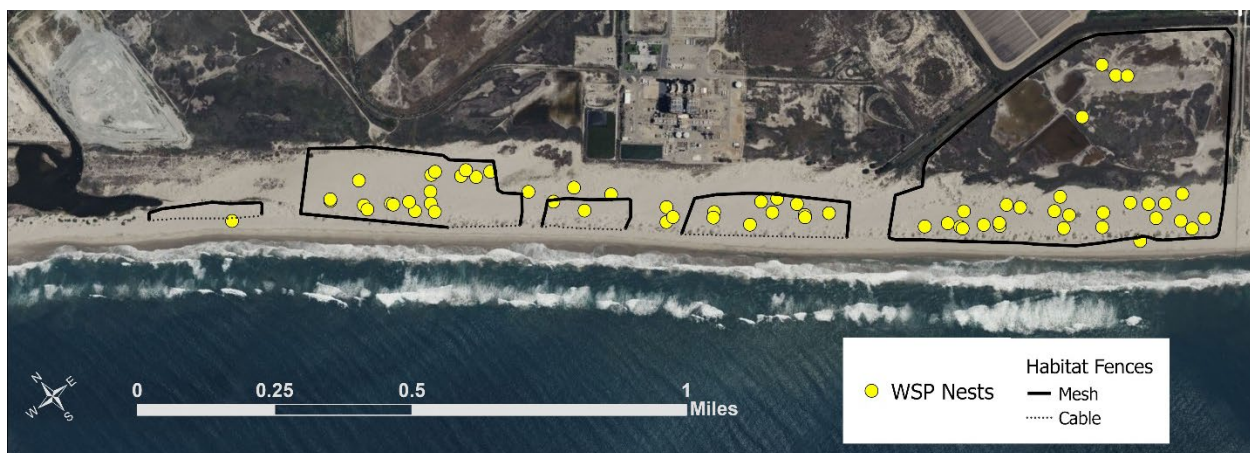


Figure 9. WSP nest locations on Ormond Beach

Undiscovered Nests: Two of the 4 salt panne nests were not found before they hatched, although the nest scrapes were found. The salt panne floods during annual winter rains and can be inaccessible in the early part of the nesting season, which happened again this year. Hatchlings from two nests were discovered as chicks guarded by males in the salt panne early in the season.

Nest Fates

There were 66 nests in 2023 compared to 56 nests in 2022; In 2023 a total of 54 hatched (81.8%) and 12 failed (18.2 %). The north and south habitats had most nests, with 29% in the north and 27% in the south habitats. See [Figure 10](#) map of hatched and failed nest locations.

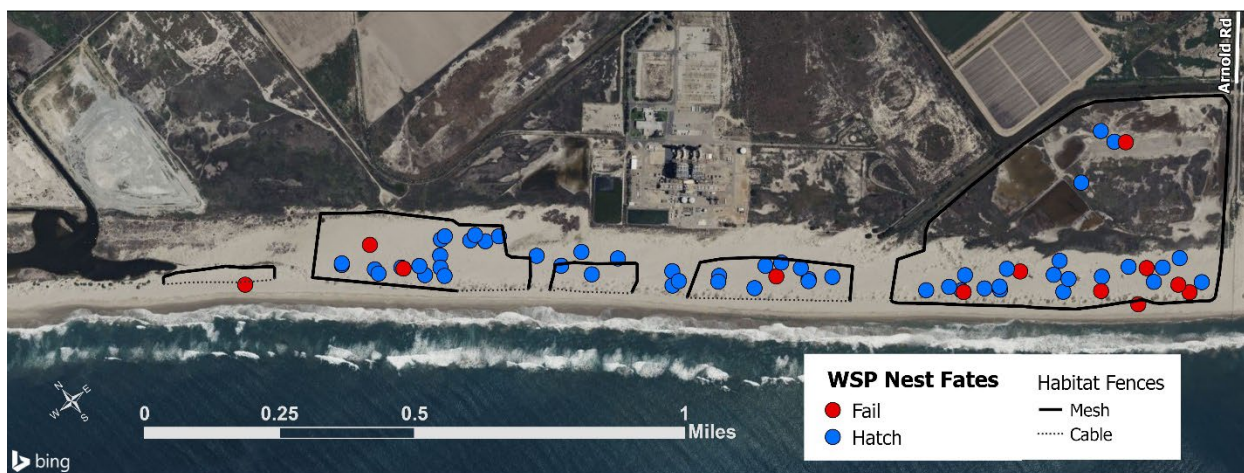
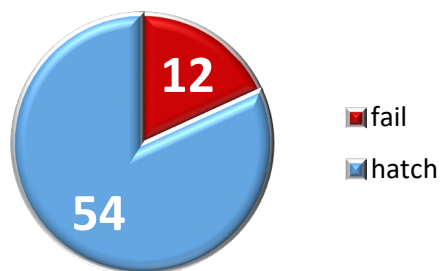


Figure 10. Map of WSP nest outcome

Causes of Failed Nests

Out of the 12 failed nests 6 were abandoned (50%), 3 were depredated (25%), 2 were lost to human take (17%) and 1 was lost to a tidal wash out (8%). Abandonments occurred primarily in late season when birds laid eggs but did not stay with them. One nest of 3 eggs was incubated long enough that small embryos developed. In this case one of the adults may have been killed by a predator. Only one nest depredation was to a known predator, when a skunk was caught on trail camera video destroying the nest. The other two were losses in the north habitat to an unknown mammalian predator where we cannot use cameras. The other 2 nest losses were nests outside of the tideline fences to human take. We protected them with symbolic fencing to prevent trampling by beach goers and places cameras on them. Both nests were targeted by humans that probably used the fencing and cameras to find the nests. One nest had all the eggs taken and the camera blocked by a wood plank. The other nest had the eggs and the camera taken. See [Figure 11](#) chart and [Figure 12](#) for a map.

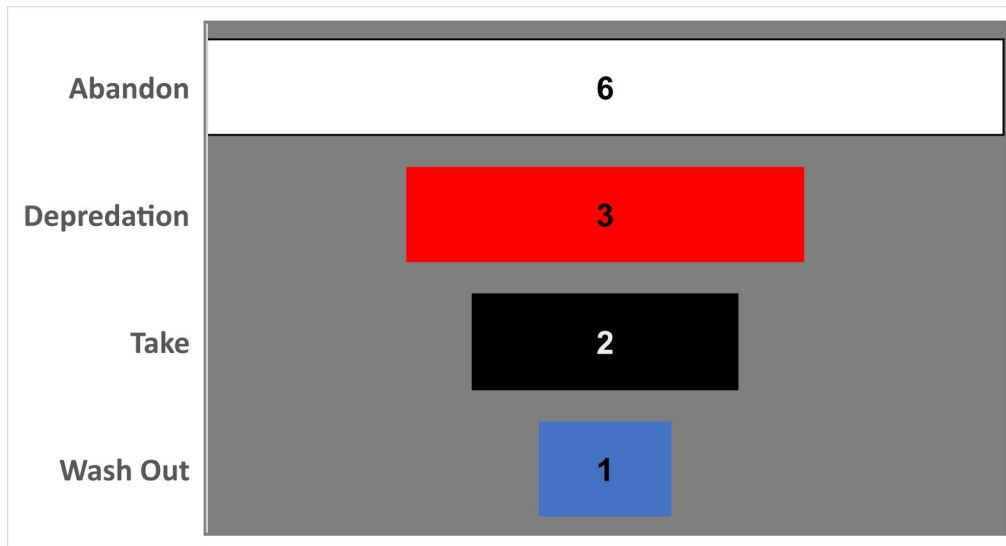


Figure 11. Chart of WSP nest losses

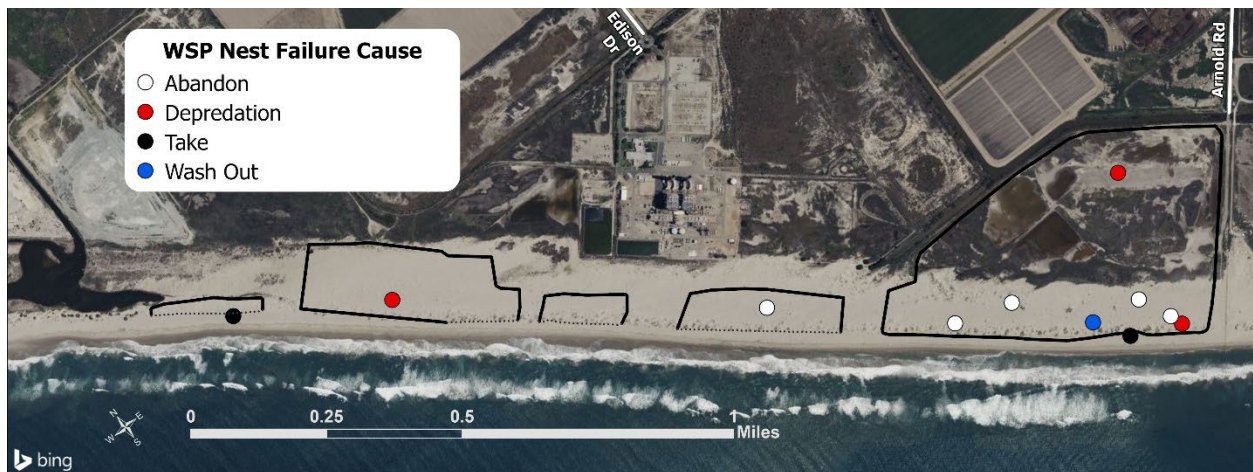


Figure 12. Map of WSP nest losses

The Gantt style plot below (Figure 13) shows a high and steady hatch rate throughout the nesting season. The first two nest losses were to human take within the first three weeks of the season. All but one of the nest abandonments and depredations occurred during the two months of the season.

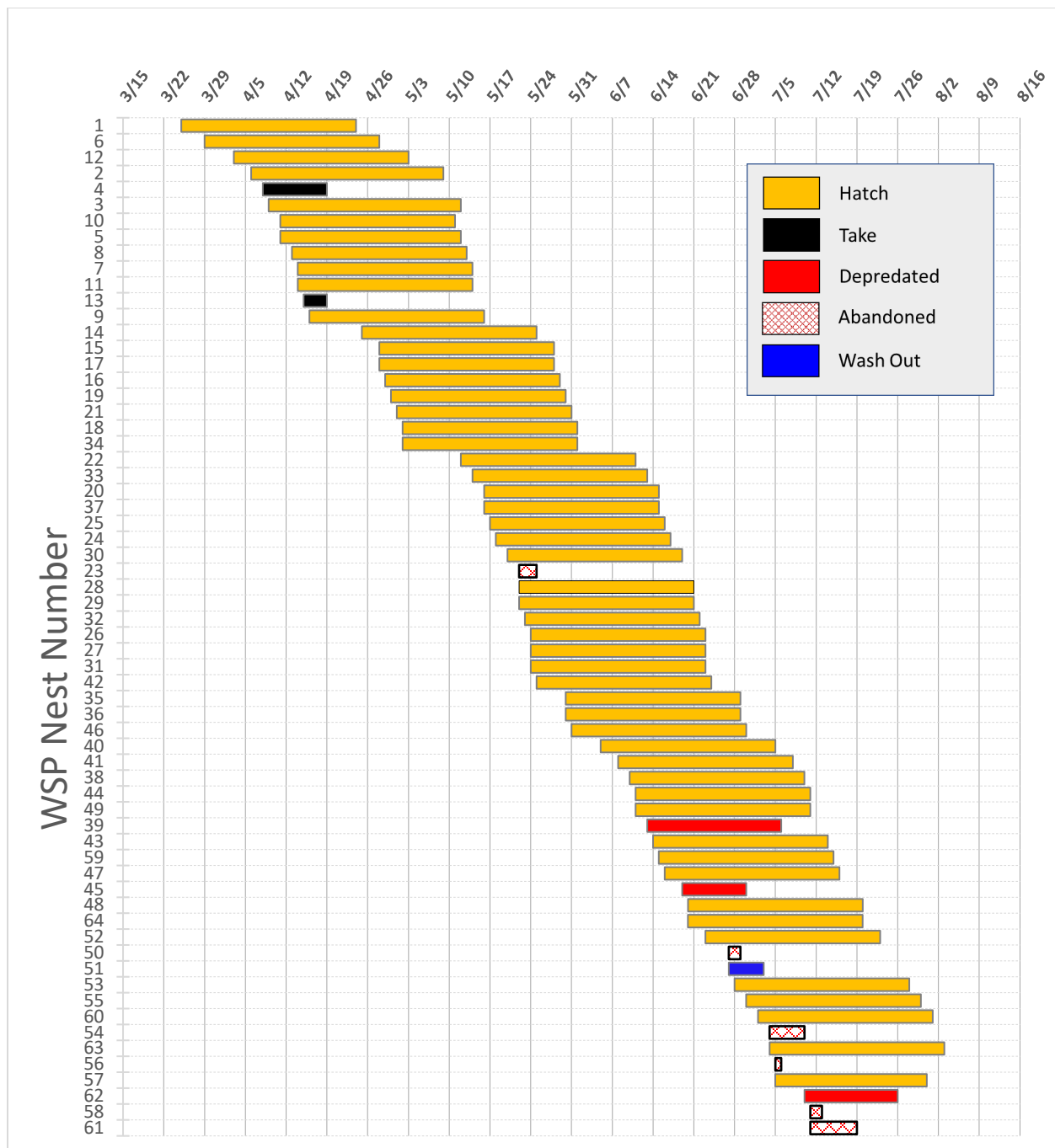


Figure 13. Gantt chart of WSP nest duration and outcomes

Santa Barbara Zoo Reared WSP

No eggs were taken to the zoo in 2023.

Chick and Fledgling Observation

A total of 152 eggs hatched and we tracked these hatchlings on weekly surveys by documenting chick observations with a GPS location and approximate age of chick in our field maps collector.

Chicks were sighted inside fences near nests normally within the first few days of hatching, then older chicks moved to the tideline. After the first week clutches typically stayed in the same area, so could often be re-sighted each week until reaching flight age. The exception to this is nests that hatched in the salt panne. Ponds of water remained there most of the summer and chicks stayed at the pond edges until they reached fledgling age. The tideline of the north habitat attracted clutches and chicks of all ages, more so than the tideline in other habitat areas. We regularly found many clutches in this area, more than the numbers of nests that hatched nearby. We believe clutches from further away on the beach migrated to this area. See [Figure 14](#) below. We estimate we observed between 16-24 fledglings which results in a survival rate of 10-16% for chicks that hatched in 2023.

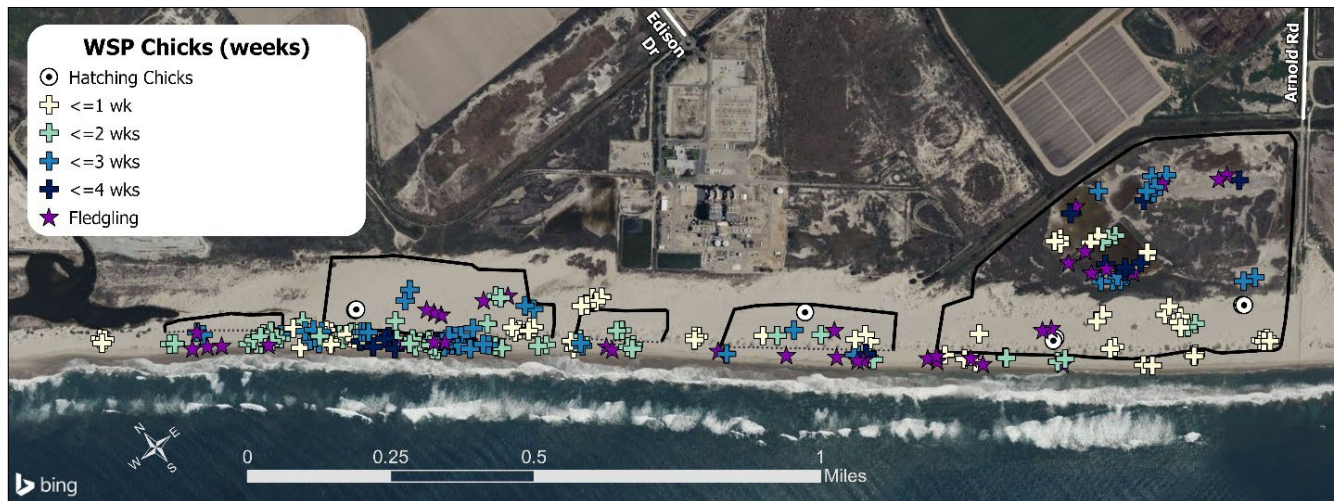


Figure 14. WSP chick sightings during weekly surveys

California Least Tern

In 2022 CLT nested in both the north and south of Ormond Beach. Because the nesting areas are separated by 0.5 mile they are regarded as separate colonies. Breeding adults are calculated by CDFW. This year there were fewer total number of nests than in 2022, although there were more nests in the south habitat and more nests hatched, although they did not produce any fledglings in that location.

In 2023 there were total of 19 nests, with 13 CLT nests in the north colony and 6 nests in the south colony. There were no nesting attempts outside of the fences or near the lagoon. a single nest near the were concentrated in the central part of the fenced area, closer to the tideline.

Summary of North and South Colony Outcomes

CLT appeared for the first time at Ormond Beach on May 5th in both the north and south habitats. They established nests in both areas, consistent with past years. Each area is separated by over 0.5 mile and are treated as separate nesting colonies. See [Figure 15](#) for a chart of adult CLT sightings and [Figure 16](#) for nest locations.

North Colony

On May 5th, 4 adult CLT were seen flying over and landing in the north habitat. CLT continued to fly over the north habitat but not land until May 23rd, and the first nest was found on May 31st. During June the adult population in the north habitat varied but reached a peak of 16 individuals on June 21st. The number of adult CLT dropped from 6 adults in early July, then to just 1 on July 27. This was the last date CLT were seen in the north colony. Out of the 13 nests in the north colony, 7 hatched, 5 failed and 1 had unknown outcome. Although the nest numbers were small, the success rate was better than in recent years. Failed nests were clustered together. Four of the 5 failed nests were depredated, and the nests were clustered closely together. One predator was a coyote, the other nests were lost to an unknown mammalian predator. There were no raven depredations this year, consistent with what happened with the WSP. Based on weekly survey counts of CLT fledglings, we estimate there were between 3-7 fledglings in the north colony.

South Colony

The first CLT of the season were sighted in the south habitat on May 5th, when 4 adults were observed flying overhead. Terns flew over the south colony throughout May and were not seen landing on the sand until May 30th. In June they established 6 nests, all of which hatched. The observed number of adult CLT reached a peak on June 14th of 10 adults, which corresponded to the peak of CLT nesting. All of the 6 nests in the south colony hatched, although no chicks survived to fledge. CLT were last seen on July 12, 2023, just one week after the final nest hatched.

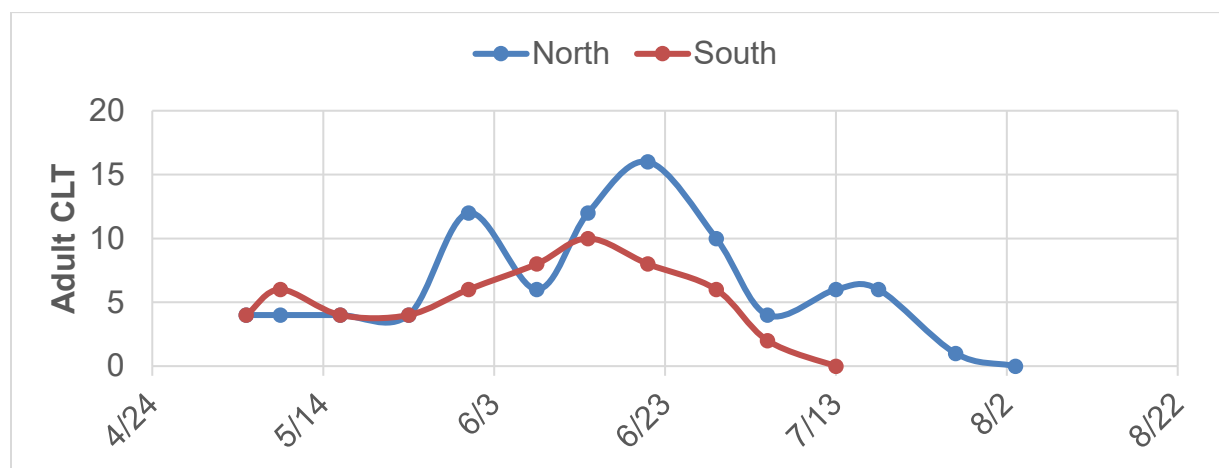


Figure 15. Adult CLT Population Counts in the North and South Colonies



Figure 16. Map of CLT nest fates

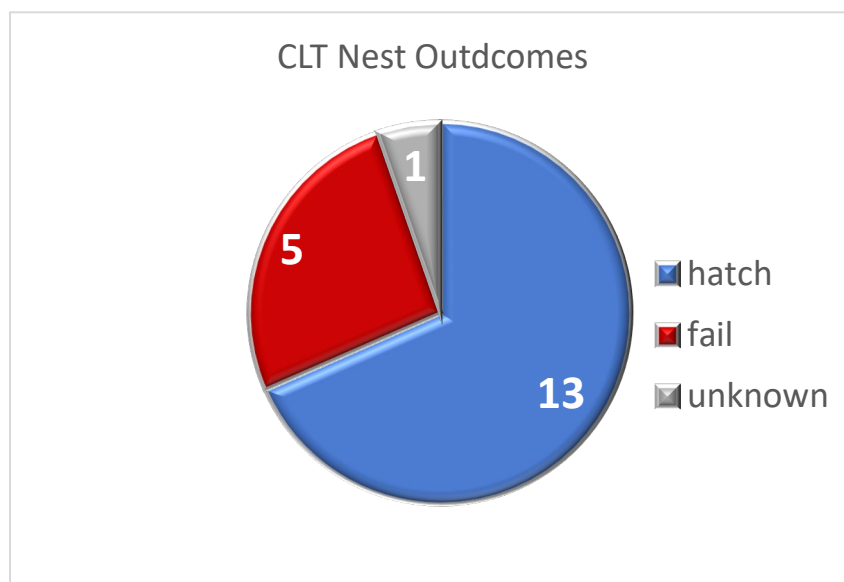


Figure 17. Chart of CLT nest outcomes



Figure 18. Cause of CLT nest failures

Banded CLT

No banded CLT were seen.

Predators of WSP and CLT

Known predators of WSP and CLT nests were striped skunk (*Mephitis mephitis*) and coyote (*Canis latrans*). Our trail cameras documented the skunk depredation.

Table 8. Predators sighted in 2022

Common Name	Scientific	Abbreviation	Sightings in 2023
American Crow	(<i>Corvus brachyrhynchos</i>)	AMCR	X
American Kestrel	(<i>Falco sparverius</i>)	MAKE	X
California Ground Squirrel	(<i>Otospermophilus beecheyi</i>)	CAGU	X
Common Raven	(<i>Corvus corax</i>)	CORA	X
Cooper's Hawk	(<i>Accipiter cooperii</i>)	COHA	X
Coyote	(<i>Canis latrans</i>)	CALA	Depredated CLT nest
Great Blue Heron	(<i>Ardea herodias</i>)	GBHE	X
Great Egret	(<i>Ardea alba</i>)	GREG	X
Great Horned Owl	(<i>Bubo virginianus</i>)	GHOW	X
Horned Lark	(<i>Eremophila alpestris</i>)	HOLA	X
Loggerhead Shrike	(<i>Lanius ludovicianus</i>)	LOSH	X
mouse - unknown species		Mice	tracks
Northern Harrier	(<i>Circus cyaneus</i>)	NOHA	X
Opossum	(<i>Didelphis virginialis</i>)	DIVI	tacks
Peregrine Falcon	(<i>Falco peregrinus</i>)	PEFA	X
Raccoon	(<i>Procyon lotor</i>)	PRLO	tracks
rattlesnake	(<i>Crotalus atrox</i>)	CRAT	X
Red-tailed Hawk	(<i>Buteo jamaicensis</i>)	RTHA	X
Snowy Egrets	(<i>Egretta thula</i>)	SNED	X
Striped Skunk	(<i>Mephitis mephitis</i>)	MEME	Depredated WSP nest, on trail camera
Turkey Vulture	(<i>Cathartes aura</i>)	TUVU	X
Western Gull	(<i>Larus occidentalis</i>)	WEGU	X

X = sighted on nest surveys

Human Threats to Nesting Success

Throughout the history of Ormond Beach people driving motorcycles, 3-wheelers and trucks have been a problem. Each year there are several incidences of vehicles illegally entering the nesting habitat. However, this problem escalated in 2023. Drivers of motorcycles and 3-wheel vehicles routinely cut the fence and rode inside the habitats on an almost weekly basis, although throughout most of the season it was just one or two vehicles driving directly across the habitat areas. The photo below left is a nest that had the edge of the nest scrape run over by a 3-wheel vehicle. The photo below right is the vehicle track from the same incident. It drove directly all the way across the entire north habitat.



Figure 19. 3-wheeler crossing north habitat nearly missed a WSP nest (circled in white)

The worst destruction we have witnessed in 40 years occurred between Sunday August 20th and Thursday August 21st. Someone pushed down the back of the north habitat fence and drove in back and forth tracks, over dunes and rode donuts in a large area inside the fenced area. From the tracks it look like it was at least one motorcycle and a quad. It is hard to determine how many of each. Had this occurred earlier in the season many nests would have been destroyed. We were able to fly a drone the same week to document the damage.

See [Figure 20](#) below for photos and [Figure 21](#) for a drone view of the damage caused to habitat by the off-roaders. See [Figure 28](#) for an aerial image of the damage.



Figure 20. Habitat damage from off-roaders taken on the ground



Figure 21. Drone view of habitat destruction by ATV

Discussion

21 Year WSP Trends

The number of WSP nests has been trending upward over the last 20 years on Ormond Beach. In 2013 ravens depredated most WSP nests and only one out of 37 nests hatched. Thereafter annual nest numbers gradually recovered each year, despite ongoing problems with raven predation. After 2013 the use of mini-exlosures (ME) was instituted. This protected nests from raven predation but makes adults vulnerable to attacks from other kinds of predators that can enter the cages or catch the adults as they enter or exit. However the use of this tool has increased nest hatching. We were fortunate in 2023 to not need ME and the hatch rate was the highest we have documented in 4 years. The 20-year average for total nests is 34.8 and the mean for hatched nests is 22.2 ([Figure 22](#)). In 2023 Ormond Beach had the greatest number of WSP recorded in the last 21 years. Breeding adult WSP numbers is also increasing over time, and in 2023 we reached the FWS recovery goal for the first time with 51 breeding birds. ([Figure 23](#)).

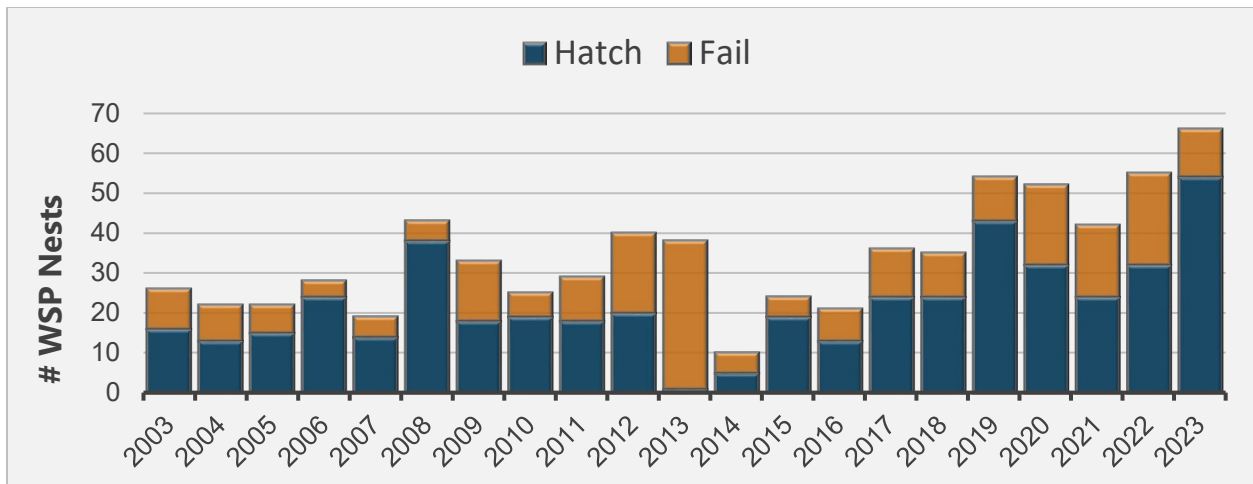


Figure 22. 21 years of plover nesting data at OB

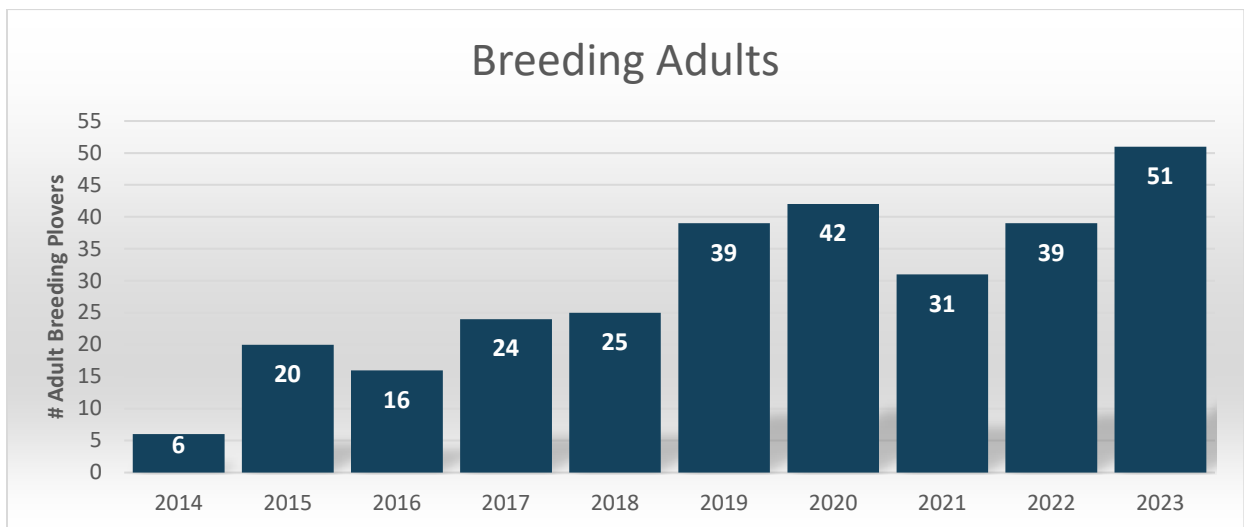


Figure 23. Breeding adult plovers at WSP. FWS recovery goal is 50 breeding birds.

20 Year CLT Trends

Unlike WSP, CLT nesting outcomes have varied widely at Ormond Beach, and in the past 5 years have done poorly. The number of nests over the last 19 years has fluctuated from a high of 93 nests in 2019, to 0 nests in 2015. The 2023 season had amongst the lowest depredation and lowest hatch rates of all years recorded, although number of nests established was amongst the lowest. The Ormond colonies are likely a second-choice nesting area for the Pt Mugu CLT colony which numbers in the 100's of nests. When there is a major depredation event at Pt. Mugu, CLT move to Ormond. In 2023 nesting was largely successful for Pt Mugu CLT, so this is likely why the Ormond colonies were relatively small.

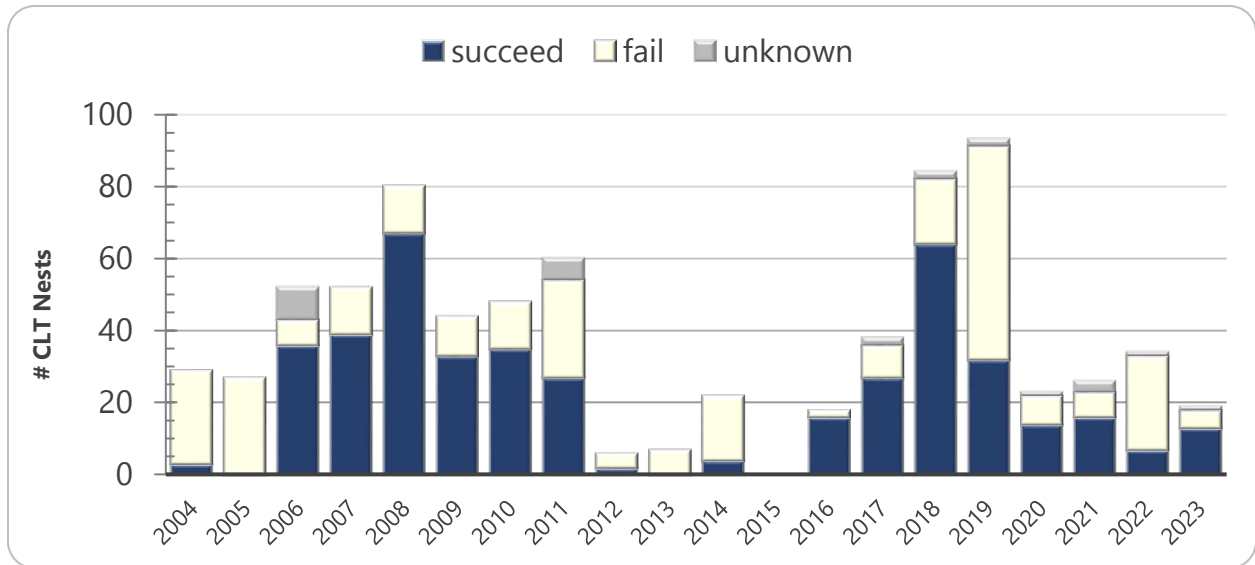


Figure 24. Tern nesting at Ormond Beach from 2003-2022 (north and south colony data combined)

Factors Impacting Nesting Success at Ormond Beach

Off Road Vehicles

While no nests were directly lost to off-roaders this year, the damage caused to the north habitat by off-road vehicles was the most severe we have witnessed in the last two decades. Furthermore, we also had off-roaders in the middle habitat, which is also something we have not seen before. The worst of the habitat destruction occurred in August after most nests had hatched. But had it happened earlier in the season many CLT and WSP would have been destroyed. It is deeply concerning that this is a trend that will continue, and nests will be lost if a way is not found to stop off-roaders.

Homeless Encampments Near Nesting Habitat

In 2023 homeless encampments and the foot and bike traffic they generate in the nesting habitat continued to be a problem for WSP and CLT. This has been an escalating problem over the past decade. Homeless encampments have been cleared out in the non-nesting season every few years, but they always re-appear in other areas near the nesting habitat.

This generates foot traffic from people cutting across the north habitat, some pushing bikes. As with the case of off-road vehicles we are seeing an increase of this activity in all the other habitat areas as well. Because we do not use trail cameras due to this risk of theft, it impairs our ability to monitor and protect nests.



Figure 25. Aerial view of encampments near slag heap

Theft of Fencing and Nest Monitoring Equipment

This season saw continued theft of fencing and monitoring equipment. A total of 2000 feet of rope and cable was stolen off symbolic fencing. Four trail cameras were stolen, including batteries and SD cards. One camera was found buried in the sand 200 feet away from the nest it was taken from, another camera was turned into the Port Hueneme police. A 5th camera was not stolen, but a board was placed over it to block it taking images and the eggs were stolen.



Figure 26. Camera that was on a nest, blocked by a board

Violations of the Ormond Beach Ordinance

Ormond Beach is designated an Environmentally Sensitive Habitat Area (ESHA) as defined by the California Coastal Commission. It is also designated critical habitat for WSP. In 2016 the [Ormond Beach Ordinance](#) (Ordinance 2906) was passed to protect this habitat. Not only does it ban domestic animals, but it also restricts many other activities harmful nesting WSP and CLT. It is probably not a coincidence that all indicators of nesting success for WSP have improved since 2016. However, we see violations of the ordinance on each nest survey. Our outreach program is designed to educate the public about nesting birds, how the ordinance protects beach wildlife and to recruit the community to engage in stewardship. But there are several areas of concern where we need support from local authorities:

To bring, walk (whether leashed or unleashed), ride or release any domesticated animal including but not limited to cats, dogs, horses and pigs

Dogs: It is rare we do not see a dog each week during nest surveys. Our biologists and volunteers approached dog owners to educate them about the impact's dogs have on birds and about the dog ban. Based on our conversations with dog owners, they are rarely approached by police or animal control. The City of Port Hueneme also has a dog ban, and in 2023 efforts were made by the Port Hueneme police department to raise awareness about the dog ban after a beach goer was threatened by off leash dogs and testified at a council meeting about the incident. We provided our dog brochure in English and in Spanish to the Port Hueneme Police Department to hand out to dog owners. However, we still regularly see people walking dogs coming from Hueneme Beach. This is the biggest risk to chicks that forage at the tideline outside of fences. We have provided a Survey123 "Dog Log" app to our volunteers to documents dog sightings. When overlayed with weekly WSP chick sightings it illustrates the problem. This level of disturbance causes chicks to expend tremendous energy running away from dogs and decreases fitness of adults. Chick survival is extremely poor on Ormond Beach (~13%) and dogs at the tideline likely contribute to this problem.



Figure 27. 2023 Dog and WSP chick sightings overlayed

To go within or interfere with any protected habitat area as designated by fencing, signage: Humans crossing the nesting habitat introduce regular disturbance to nesting birds and attracts the attention of predators that follow human activity. This activity is detrimental to nesting CLT,

which fly off of nests when human walk by. It exposes eggs to predators, decreasing the time adults keep eggs warm and decreases fitness of adults. In past years before we pulled cameras from the north habitat, they captured walkers inside fences with off leash dogs near nests, joggers regularly running among nests. We found cut fences on each survey and patched them weekly. But the vandalism continued throughout the season.



Figure 28. Cut fence where ATV's entered throughout the season

To operate any motorized vehicle: Each year we have motorcycles riding inside the nesting habitat and along the tideline. Even without directly destroying nests, it introduces disturbance to nesting birds. So far, we have been fortunate not to have nests run over, but loss of chicks is likely to have happened. If this problem continues nest losses will occur, and it could cause the loss of an entire least tern colony. We are also seeing an increase in electric bikes which is a concerning trend.



Figure 29. Aerial view of habitat damage by off-roaders the last week of August

Recommendations to improve nesting success

The Shorebird Recovery Program at Ormond Beach has established requirements and processes for improving WSP and CLT nest success. The following are recommendations to continue and improve nest performance at Ormond Beach.

1. A stable source of funding for monitoring, data collection and public outreach: We have seen that better funding increases the amount of time monitors and volunteers are on the beach, which improves our ability to protect CLT and WSP, and benefits the entire dune ecosystem. There is currently no secure long term funding and future monitoring is at risk.
2. A funded predator management plan: Predators, in particular ravens, need to be removed because mini-exlosures are a poor solution to this predator problem, and we know they cause the death of nesting adult WSP. However, when ravens target nests it is the only way to save eggs. NBVC Point Mugu has a predator removal program and this program successfully reduces the numbers of predators observed at the south breeding habitat. However the benefit only directly helps the south end of Ormond Beach which shares a fence line with Pt Mugu. Other WSP nesting sites have demonstrated that ongoing predator removal alongside habitat protection is the only effective way to protect nesting WSP and CLT.
3. Zero tolerance to camping and illegal activities in and around Ormond Beach: Camping and trespassing is a persistent problem at Ormond Beach. These activities are not only a threat to WSP and CLT nest outcomes, they also present a safety risk to biologists working near these encampments and the public. There needs to be increased presence of an authority who can effectively engage individuals who enter closed habitat areas or camp nearby.
4. Zero tolerance to theft of nest monitoring supplies and fencing: Regular theft inhibits our ability to protect CLT and WSP. Fencing supplies are taken and used in the homeless encampments. Not only does this impair the boundaries of the fences that protect the nesting area, it drains our limited funds and consumes labor hours that would otherwise be used to conduct nest monitoring.

Funding

In 2023 our nest monitoring work was supported by a National Coastal Wetlands Conservation Grant provided by The Nature Conservancy, a Whale Tail grant from the California Coastal Conservancy and community donations through the Ventura Audubon Shorebird Recovery Fund. Thank you to our funders who make our work possible.

Acknowledgements

Thank you to our Ventura Audubon Society Shorebird Recovery Team at Ormond Beach; Kat Whitehouse, Alecia Smith, Joan Tharp, summer Whale Tail interns Kai Miyashiro and Hector Serrano Abundez and Ormond Beach Steward Walter Fuller. A huge thank you to our Beach

Naturalist volunteers who have donated many hours patrolling the beach, collecting data, handing signs and maintaining habitat fences.

We would like to thank Ormond Beach landowners the California Coastal Conservancy, The Nature Conservancy and the City of Oxnard for your partnership, support and assistance. Thanks also to The Nature Conservancy who has made available the use of an access road through their property allows us to transport fencing materials to the least tern nesting area in the north habitat.

GenOn has made available the use of their private contractor's parking lot which provides us safe and easy access to the middle and north nesting areas.

In memory of Reed Smith, my mentor and friend who began Ventura Audubon's work on Ormond Beach 3 decades ago.