

**Ormond Beach, California**  
**Western Snowy Plover and California Least Tern**  
**Nesting Outcome: 2018 Season Summary**

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## Introduction

The abundance and productivity of the threatened western snowy plover (WSP) (*Charadrius nivosus nivosus*) and the endangered California least tern (CLT) (*Sternula antillarum browni*) was monitored at Ormond Beach in Oxnard, Ventura County, California from March 17, 2018 to September 6, 2018. 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). Nesting of both species has been documented at Ormond Beach since the 1970's and nesting locations and outcomes have been reported in detail since 2003.

Ormond Beach is uniquely located at the urban/agricultural/wetland interface of Ventura County, it is part of a Globally Important Bird Area, it has been designated WSP critical habitat by the USFWS and an Environmentall Senstive Habitat Area (ESHA) by the Local Coastal Plan.

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## Executive Summary

### *Western Snowy Plover*

A total of 35 WSP nests were located, 24 hatched (69%) and 11 failed (31%). Of the failed nests, 9 were predated, 1 lost to wind and 1 nest was possibly vandalized or predated. The calculated number of breeding WSP was 25. Fifty-nine eggs hatched out of the 90 eggs that were produced, 9 were non-viable and the remaining 22 eggs were lost to predators.

First Nest Initiation:	March 31
First Hatch:	April 28
Period of Peak Nesting:	April 24-April28
Last Nest Initiation:	July 13
Last Hatch:	August 10

Threats to WSP Nesting Success: Predators were a problem throughout the season, ravens were the most serious predator. Illegal off roading by dirt bikes nearly missed running over an active nest. Trespassing into the habitat fences on the north end of Ormond Beach was a constant source of disturbance.

### *California Least Tern*

Least terns first appeared landing at the north end of Ormond Beach on May 18. The population reached a peak of 106 adults on June 26. The last CLT were seen on July 17. A total of 84 CLT nests were found, of those 64 hatched (71%), 18 failed (24%) and 2 had unknown outcomes (5%). Of the failed nests, 8 were predated (9%), 6 were abandoned pre-term (7%) and 3 were brooded full term but failed to hatch (4%). The number of breeding pair was calculated to be 77. Two chicks from different nests were found dead, the cause of death for both is unknown. Out of 158 eggs that were laid, 115 hatched. At least 44 chicks fledged.

In 2018 there were the most CLT nests and fledglings of any year since we have collected data since 2003.

First Nest Initiation:	May 30
First Hatch:	June 18
Last Nest Initiation:	June 27
Last Hatch:	July 12
Date of first fledgling:	July 3

Threats to CLT Nesting Success: Squirrels had dens inside the nesting area and were observed in the colony being mobbed by adult terns on several occasions and were responsible for several predated nests. One squirrel was observed taking a chick. Squirrels inside the colony occurred in 2017, but the problem escalated in 2018. Trespassing by humans in the nesting habitat is also a continuing problem from past years. For the first time in many years, off roaders illegally rode in the dunes and are believed to be responsible for killing several CLT chicks.

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## Site Description

### Beach Ownership

Ormond Beach is owned by three landowners that jointly manage the property under a Memorandum of Understanding. The land owners are the California State Coastal Conservancy (SCC), the Nature Conservancy (TNC) and the City of Oxnard (the City). The northern portion of Ormond Beach is owned by the City. The center and southern portion of the dunes and an inland salt pan are owned by the SCC. Inland from the beach area is a large property owned by TNC. The boundaries of Ormond Beach are defined on the southeast by the Naval Base Ventura County Pt. Mugu, and on the northwest by the City of Port Hueneme.

Nesting of the western snowy plover occurs on land owned by the City and the SCC. There are records of California least terns nesting on the northwest end of Ormond Beach since the 1990's on land that is currently owned by the City of Oxnard. Although they have not nested on SCC property recently, in the past (before 2012) CLT have established a nesting colony in the southeast end of Ormond Beach.

Inland on the north end is the former Halaco property, which was a scrap metal recycling operation designated an EPA superfund site in 2007. Southeast of the TNC property is a power plant owned and operated by GenOn Energy. This parcel is encircled by SCC land and fronts the beach dunes where WSP nest. Adjacent to the salt pan is a small parcel owned by the Ventura County Game Preserve. Just inland from this is the Agromin Composting and Soil Amendment Facility property, which processes yard waste and food scraps into compost ([Appendix A: Map 1](#)).

## Survey Area

The survey area is 2 miles in length and runs southeast along the coast covering approximately 200 acres. WSP nest in the dunes along the entire beach, and CLT have nested at the north and south extremes of the beach. The survey area varies in width from 100' by Ormond Lagoon on the north end to over 1000' wide at the south end in the location of the salt pan. The northern end of the survey area begins at the boundary line between City of Port Hueneme and City of Oxnard. The beach in this area is relatively flat and backed by Ormond Lagoon that drains runoff from Oxnard and Port Hueneme. The foredunes have formed a 4-10' tall dune ridge that begins just south of the lagoon and extends along the entire length of the beach to the south. The beach seaward of the dune ridge is flat and varies from 50'-100' wide. The width varies seasonally due to erosion or accretion induced by wave and tide influences ([Appendix A: Map 2](#)).

## Habitat Fencing

Fence Types: Nesting areas are enclosed with three types of fencing;

- 1.) Black mesh Cintoflex-C fencing attached to metal T-posts ([Photo 1](#)) The mesh fencing has openings that are 1.75" square through which birds and small animals can easily move through. The T-posts are placed every 10-20'. The fence is intended as a visual 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. The bottom of the fencing is not buried, so natural openings occur depending on the topography of the beach. Larger mammals including sea lions, elephant seals and coyote are known to cross under the fence.
- 2.) Symbolic fencing - metal eye posts strung with cable wire ([Photo 2](#)) The symbolic fencing is strictly a visual barrier. It presents no barrier to animals, and humans can easily step over or under it. Two types were used, 1) metal post and cable installed pre-season along the Ormond Lagoon and as the front of the middle habitat fence. We are using this type of fence in areas that experiences tidal over wash (by the lagoon) and growing and shifting dunes (middle habitat). It is being used on an experimental basis to test its effectiveness.
- 3.) Symbolic fencing – wooden post strung with rope ([Photo 3](#)) The second type of symbolic fencing 2) wooden stakes with rope which is put up on an as-needed basis when nests are found outside of the habitat fences. The materials are light weight enough they can be carried by several people long distance son the beach.

Three areas of nesting habitat are protected with fences: On the south end of the beach, 1.4 miles of mesh fencing enclose 77 acres and is referred to as the "south habitat". In front and southeast of the power plant, 0.5 mile of fencing encloses 7.4 acres. The fencing facing the ocean is composed of post and cable while the sides and back are mesh. This is the "middle

habitat". On the north end 0.7 miles of mesh fence encloses 18 acres, the "north habitat" ([Appendix A: Map 3](#)).

## Signage

Seasonal closure signs in both English and Spanish were affixed to posts around the perimeter of the fenced habitat areas, as well as Audubon "Share the Shore" signs created by school children.

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## Methods

### Predator Exclosures for WSP

A 2'X2' square wire mesh cage design is used. Exclosures are made of galvanized wire with 2"X3" openings, wire spikes are attached to the top to discourage perching by other birds. A small sign is affixed to the exclosure to warn would-be vandals from moving or tampering with the exclosure (). The exclosures are anchored to the ground with 6-inch landscape staples. Exclosures are used when threats from predators are deemed to put nests at risk. Following placement of the exclosure adults are observed to ensure they return to brooding. Throughout the season several decoy exclosures (not on a nest) are left throughout the beach to confuse predators.

### Population Abundance

To thoroughly cover the entire 200-acre survey area, the beach was broken into different areas that were surveyed over the period of a single morning. This means that in some cases the entire beach was not surveyed on the same day. Different areas were: The tide line in front of the dune ridge from the Mugu boundary line to Hueneme Beach, the south nesting habitat fence, salt pan and dunes in front of the power plant and the north nesting habitat fence. Areas were covered on sequential days when possible and count totals for the week were summed from each of the areas.

A total of 63 surveys were conducted over a 25-week period from March 17 through Sept 6. Monitoring in the dunes was conducted by walking wandering transects, the tideline was walked at the top of the wrack line. The entire beach was covered a minimum of once per week and nests were rechecked between 1-3 times per week. Nest re-checks were done from a distance when possible to minimize nest disturbance and to avoid attracting predators to the nest. All WSP observed were recorded by age and gender. Numbers of CLT adults and juveniles were recorded once weekly in a single effort.

### 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. Three camera models were used: 1) the Stealth Cam Model G42), 2) Browning Defender 940(model# BTC-10D) and 3) Browning Dark Ops Extreme (model# BTC-6HDX). All cameras had "no-glo" nighttime

infrared emitters and detectors, were motion activated and set to take 10-20 second video. Cameras were placed on the ground approximately 30-40 feet from nests. The 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 sand. Cameras were placed on a subset of nests in the salt panne and south dune habitat because these locations had the least human trespassing so there was less risk of the cameras being tampered with or stolen.

## **Determination of Breeding Activity Parameters**

### *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, if an adult WSP could be observed brooding a previously marked nest from a distance it was not approached again. CLT nests were marked with a numbered <6” long piece of driftwood or other natural beach debris and placed no closer than 4 feet seaward from the nest. WSP nests that did not have exclosures were not marked. 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. Next, 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 or 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 eggs were collected. For tern nests, eggs were determined to have hatched if eggs were gone, pips shells could be found, adult fecal matter was present, no large egg shell fragments or yolk were in the scrape, no other animal tracks near scrape, and chicks have been seen in the colony. Nests that had eggs disappear before the end of the full gestation period were determined to have failed if no signs of hatching were evident. 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. All unhatched eggs and one dead adult WSP were submitted to the Western Foundation of Vertebrate Zoology (WVZ) for analysis of incubation stage and for archive. One egg was deposited with the Santa Barbara Zoo for incubation.

### *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. Hatch dates for nests with a newly hatched chick 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 chick(s) 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, the day of abandonment used was the day after the last day an adult was observed brooding the nest. For nests determined to have abandoned or predated, nest initiation was estimated to be the first date the nest was observed minus 1 day.

### *Nest Fate Date*

The date a nest hatched or failed was termed “fate date”. For nests that hatched, the hatch date is the fate date. For nests that failed, the fate date was estimated to be one day after the last date the nest was observed to be active.

### *Pair Estimates*

Western Snowy Plover: Total number of breeding adults for the season are 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 used because Ormond beach does not have a banding program therefore individual birds cannot be tracked, so it is not possible to know how many birds re-nested. This method is essentially a window count for breeding adults and assumes that all the breeding adults captured on the count are representative of the entire nesting population.

California Least Tern: The method used to calculate breeding birds is “Method II” as described in Marschalek 2010. In the Marschalek report, the formula used June 20<sup>th</sup> as the cutoff for the second wave of nesting. The nesting season started late and the first wave of nests were still being established after the cutoff of June 20 in this report. The formula used was:

$$\text{Total Pairs} = \text{Total\# Nests} - (\# \text{ unsuccessful nests prior June 29th} \\ + \# \text{ broods lost prior June 29})$$

## **Chick and Fledgling Observations**

Western snowy plover: All chick sightings were recorded with a GPS waypoint collected as close as possible to locations where chicks were either directly observed or reported by docents. Once a nest hatched, chicks were looked for each week and where possible observed weekly until fledging. Fledglings were determined to be from Ormond Beach if they had been observed for several weeks in the same area prior to reaching fledge age and if a guarding adult accompanied them. Hatch year chicks that did not meet these criteria were assumed to be from other beaches.

California least tern: Nests were checked a minimum of once per week. Chicks were re-sighted and associated with nests as much as possible. In many cases by the time chicks are



dry and rested after hatching they move away from threats, so approaching nests during monitoring makes it difficult to document a downy chick on the nest. It also disrupts the colony and creates a threat to chicks by causing them to expend energy, move long distances from hiding places and makes them vulnerable to predators. Therefore, we observed the colony with a scope from dunes overlooking the nesting area as much as possible, and we observed the nesting colony with a spotting scope before walking it on weekly surveys. If we confirmed that a nest had hatched and a chick was present or still brooding with the spotting scope, we avoided coming near the nest. The general location of feathered and pre-fledging chicks and fledglings was also recorded. The number of fledglings were calculated by adding the daytime counts of fledglings every 3 weeks after the first fledgling observation, starting 2 weeks after the first fledglings were sighted (method 3WD from the CA Department of Fish and Wildlife report spreadsheet).

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## Results

### Western Snowy Plover Breeding Outcome

#### Season Chronology: Population and Nesting Activity

Population Abundance: The population count followed the typical pattern with the greatest numbers at the beginning and end of the season, corresponding to non-breeding season flocking behavior. During these times flocks formed in two main locations, in front of the south habitat fence nearest the north end and near the Ormond Lagoon. As the season progressed the flocks became smaller and WSP dispersed throughout the length of the beach. The highest count in the spring was the first count of the nesting season on March 18, when there were 68 WSP. The numbers dropped weekly until reaching a low of 12 WSP on May 13. On the spring window count on May 22, there were 22 adult WSP (13 males and 8 females), and 4 chicks from 4 clutches. Between May and July, the population fluctuated between 12 and 32 individuals, then in early August it increased each week until reaching a high of 81 on August 26 (Appendix A: Map 4).

For detailed population counts, see Appendix B- 1.

Nest Chronology: Nesting occurred in two waves. Nest numbers reached a peak of 12 concurrent nests in late April. At this time several nests were lost to predation, which may account for a second maximum of 11 concurrent nests that occurred just 2 weeks later in early May. The greatest number of breeding adults occurred at this time when there were also four clutches of chicks on the beach. Nest numbers dropped to 3 in early June, then rebounded to 11 concurrent nests in early July. The last nest hatched on August 10th (Appendix C. 2).

#### Pair Estimate

The highest number of breeding WSP adults at a single time was 25 individuals, which occurred on the May 4, 2017 survey. On this date there were 11 active nests, with 3 clutches

of chicks on the beach. On the May 22 spring window count there were a total of 20 breeding adults (8 nests and 4 clutches of chicks).

## Nest and Egg Fates

Nests: This year 35 nesting attempts were identified, of those 24 nests hatched and 11 failed ([Appendix C. 3](#)). Of the 11 nests that failed, 9 were predated. Six of those nests were lost to ravens, 1 to a squirrel, 1 nest was vandalized and 3 nests were lost to unknown predators ([Appendix C. 3](#)). All the predated nests in the south habitat failed because of ravens, these nests did not have predator exclosures. After this wave of predation subsequent nests were fitted with exclosures. In the north habitat squirrels were present and predated at least one nest, the others had unknown predators. The eggs from the failed middle habitat nest disappeared before its hatching 99date, and there is circumstantial evidence the eggs were taken by a human (kneel marks by nest not made by biologists monitoring the nests).

Eggs: A total of 90 eggs were produced during the nesting season. Out of those 59 hatched for a 65% hatch rate, included one egg that was taken to the Santa Barbara Zoo. Of the 31 failed eggs, 22 were predated and 9 failed to hatch for a variety of reasons. One nest is believed to have had all 3 eggs taken by a human. One egg had a fully developed chick that died soon after pipping through the egg shell. Three eggs were incubated full term, but failed to develop from an early stage. Two other eggs were found outside of the scrape, which was located exterior to the middle habitat fences. The eggs were most likely accidentally kicked out of the nest by a beach goer. When discovered the eggs were replaced into the nest and were brooded, but this nest hatched just a single egg. The unhatched eggs had small embryos.

There were 26 nests with 3 eggs, and 3 nests with just 2 eggs. Six nests were attributed 1 egg because the nests were predated or hatched before being found, so the actual egg count was never verified.

For detailed nest outcomes see [Appendix B- 2](#) and [Appendix B- 3](#).

Nest Locations: Nests were dispersed over the entire 2-mile length of Ormond Beach ([Appendix A: Map 4](#)). Twenty nests were in the south habitat. Four nests were established in the middle fence, although 2 of those nests were outside in front of the fence near the tideline. The 2 outside nests were fitted with predator exclosures, as much to protect them from predators as to keep them from being stepped on, and both successfully hatched. Seven nests were established in the north habitat fences. Four nests were in front of or just north of the power plant in the area where there is no fence.

## Chicks and Fledgling Observations

Young chicks (< 1week old) were seen near their nests of origin, but as they aged sightings were less frequent. Consistent with past years, chicks on the north end of the beach gravitated to the lagoon edge. Chicks were observed at the lagoon edge behind the post and cable fencing, also moving back and forth from the lagoon edge to the north dunes behind the mesh fence.

Older chicks ( $\geq 3$  weeks) were observed in front of all the habitat fences and in the salt panne. Chicks that hatched in the salt panne stayed around the dried ponds. A total of 8 chicks at or close to fledging age were observed ([Appendix A: Map 5](#)).

One lost chick that was 2-3 days old was rescued from the Arnold Rd beach access road. It was observed for 30 minutes, during this time no parents were present and it was being attacked by a sparrow. It was taken to the Santa Barbara Zoo where it initially appeared to be doing well, but it lived for just a week. An autopsy revealed head trauma.

## Comparison to previous years

Nest numbers and outcomes for WSP have been carefully tracked and recorded since 2003 (table below). The number of WSP nesting attempts in 2018 was similar to 2017 (35 vs 36). This is a continuation of an upward trend in nest numbers since 2014 when there were just 10 nests, which was the season with the lowest recorded nest numbers. The year before this had a high number of nests, but most failed (36/37) primarily due to raven predation.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>No. Nests</b>	<b>26</b>	<b>22</b>	<b>22</b>	<b>28</b>	<b>19</b>	<b>43</b>	<b>33</b>	<b>27</b>	<b>32</b>	<b>41</b>	<b>38</b>	<b>10</b>	<b>24</b>	<b>21</b>	<b>36</b>	<b>35</b>
Hatch	16	13	15	24	14	38	18	19	18	20	1	5	19	13	24	24
Fail	10	9	7	4	5	5	15	6	11	20	37	5	5	8	12	11

## California Least Tern Breeding Outcome

### Season Chronology: Population, Nests and Fledglings

Adult Population Abundance: California least terns were first observed flying high over the north end of Ormond Beach in the vicinity of Ormond Lagoon on May 4, but they did not display interest in nesting for the next two weeks. Then on May 18, 10 CLT were observed landing and beginning to make scrapes in the dunes. The adult population increased over the next 3 weeks until reaching a steady number that fluctuated at just over 100 individuals through early July. The maximum survey count was 106 individuals on June 22. Following the survey on July 17, when 90 adult CLT were seen, their numbers quickly decreased. The last adults were seen on July 29 and by July 31 all CLT had left the area. For detailed population chronology see [Appendix B- 4](#).

Nests: The first nests were found on May 30. Nest number peaked at a maximum of 71 concurrent nests on June 21. The last nest hatched on July 16.

Fledglings: Fledglings were first observed on July 5 and for the last time on July 29. Fledglings were only seen for 24 days (3.4 weeks)., it is estimated that 40 CLT fledged, based on the highest count which occurred on July 23.

For a graph see [Appendix C. 5](#)

#### *Pair Estimate*

A total of 77 CLT pairs are estimated to have nested on Ormond Beach. June 29 was selected as the cut-off for the second wave of nesting. There were no known broods that failed before 6/29. The off-roading incident that we believe killed pre-flight chicks did not occur until mid-July when nesting was nearly over.

$$\text{Total Pairs} = \text{Total\# Nests} - (\# \text{ unsuccessful nests prior 6/29} + \# \text{ broods lost prior 6/29})$$

$$\text{Total Pairs} = 84 - (9+0) = 77$$

#### *Nest and Egg Fates*

Nests: The first 2 nests were found on May 30. A total of 84 nests were located, out of those 64 were determined to have hatched, 18 failed had 2 had unknown outcomes. Out of the 18 failed nests, 8 were predated, 6 were abandoned before term and 3 were non-viable (incubated to term but embryos stopped developing at various stages of develop) and 1 nest was abandoned/buried in a wind event. Two chicks were found dead after hatching, one was covered with ants. A third chick was observed as a squirrel predated it but the body was not found. (See [Appendix C. 6](#))

Eggs: A total of 158 eggs were laid, of those 115 hatched and 43 eggs failed. Of the failed eggs 11 failed at some point of development although they were incubated full term, 9 eggs were abandoned prematurely, 15 were predated and 2 eggs were buried in a wind event and abandoned.

For detailed nest and egg chronology see [Appendix B- 5](#) and [Appendix B- 6](#).

## Nest Locations

All CLT breeding activity occurred on the north end of Ormond Beach by Ormond Lagoon where the adults foraged for fish. Initially nests were established inside the northern end of the north habitat fence. This year nests were also established south of the fence, outside of the protective habitat fences. A fence extension was added to enclose this area, but nests continued to expand south and one nest was placed outside of the new extension. (Appendix A: Map 6) Occasionally CLT were observed flying over the south habitat or foraging in the canal adjacent to the salt pan. However, at no time were CLT observed to land in the south habitat or show any interest in the area.

## Chick and Fledgling Observations

A total of 82 newly hatched downy chicks were observed in 47 nests. There were an additional 15 nests that had evidence of hatching. Once chicks left their nests, they moved in the direction of the lagoon. In general, we were unable to see many feathered or pre-fledge chicks because at this stage of development they hide in the low dunes southeast of the lagoon. After reaching flight age, fledglings moved out of the fences and gathered on the beach berm to the north of the habitat fences and were easier to observe and track.

A total of 44 CLT are estimated to have fledged, based on the survey with the highest number of fledglings (fledglings were only seen for 23 days, between July 5 and July 28).

## Comparison to previous years

This year had the greatest number of CLT nests since 2005 ([Appendix C. 8](#)), continuing an upward trend in CLT nesting on Ormond Beach since 2015 when there were zero nesting attempts. In addition, the 3 previous years to the (2012-2014) also had very poor nesting outcomes.

Ten years ago, in 2008, total nest numbers on Ormond Beach were very close (80 vs. 84), however in that year nest locations were split between the north and south habitats in equal numbers. This year, and since 2014, all the nests were in the north habitat. Nest numbers in the north habitat were twice as high in 2018 compared to 2008. The closest nest number in the North Habitat occurred in 2011 with 60 nests ([Appendix C. 9](#)).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total No. Nests	27	53	52	80	44	48	60	6	7	22	0	18	38	84
North Habitat	26	27	24	39	41	38	60	1	3	22	0	18	38	84

## Predators

Many predators of WSP and CLT were observed during surveys. Twelve avian predators were observed. Several non-avian predators were present, primarily evident from tracks.

Ravens caused the most nest losses this year. Ravens were seen often in the area from May through July and caught on camera harassing nests that had predator exclosures. A raven was caught on video predating a nest by a trail camera, and at another nest during the same week eating a newly hatched chick. A squirrel predated 1 nest, evidenced by broken shells, squirrel tracks at the nest and nearby squirrel dens. One nest likely had the eggs taken by a human, as the scrape was found empty with kneel marks not made by the monitors next to it only two weeks after it had been found.

Two other nests were predated, large shell fragments were found in and around the nest and chicks were never seen, but no predator tracks could be identified. One was in the salt panne on hard substrate so it was possible a squirrel since the nest had a predator exclosure and there was a squirrel den in the area. The other was in the north habitat and close to several squirrel dens, although a variety of predators were present in the nesting habitat.

One nest was found with a single egg outside of the scrape for unknown reasons, possibly moved by a raven or squirrel. This egg was taken to the Santa Barbara zoo and hatched out, although it was still recorded as a failure since it did not hatch naturally.

American Crow ( <i>Corvus brachyrhynchos</i> )	Opossum ( <i>Didelphis virginiana</i> ) - tracks
Common Raven ( <i>Corvus corax</i> )	California Ground Squirrel ( <i>Otospermophilus beecheyi</i> )
Great Blue Heron ( <i>Ardea herodias</i> )	Coyote ( <i>Canis latrans</i> ) - tracks
Great Egret ( <i>Ardea alba</i> )	Long Tail Weasel ( <i>Mustela frenata</i> )
Horned Lark ( <i>Eremophila alpestris</i> )	Raccoon ( <i>Procyon lotor</i> ) - tracks
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	Rattlesnake ( <i>Crotalus atrox</i> )
Northern Harrier ( <i>Circus cyaneus</i> )	Domestic dog ( <i>Canis lupus familiaris</i> )
Peregrine Falcon ( <i>Falco peregrinus</i> )	Domestic cat ( <i>Felis catus</i> )
Red-tailed Hawk ( <i>Buteo jamaicensis</i> )	Human trespasser
Snowy Egret ( <i>Egretta thula</i> )	
Turkey Vulture ( <i>Cathartes aura</i> )	
Western Gull ( <i>Larus occidentalis</i> )	

## Threats to Nesting Success

Up until the mid-2000's, off road vehicles have been an ongoing problem for nesting birds on Ormond Beach. This year was the first time in 10 years that this has been a problem. Motorcycles illegally accessed the beach on at least two occasions, July 8<sup>th</sup> and 17<sup>th</sup>. Tracks were discovered during routine nest monitoring. Motorcycles entered through TNC property, and the road throughout the open dune area between the north and middle habitat fences (Photo 3). One plover nest was in the middle of the motorcycle tracks, but was not run over (Photo 4). This nest hatched on July 28. Pre-fledgling CLT chicks had been observed in the open dunes in this location on nest surveys conducted on July 5. After the motorcycle incident on July 8, CLT were not seen in the area again and it is presumed the chicks were run over.

or scared off and separated from their parents, although we never were able to verify this by finding the bodies of chicks.

Pictures on Instagram were posted by the perpetrators, including Instagram ID's ([Photo 5](#)). Police were able to track one of the individuals to their home and spoke to them about the incident, although no other action was taken.

On weekends the end of McWane Blvd is a popular location for groups to gather and ride motorcycles on the street. The motorcycles that entered the beach on July 8 and 17 probably entered TNC property at this location. On Saturday July 21 a group of motorcyclists with dirt bikes were encountered at the end of McWane Blvd ([Photo 6](#)), although it was never verified if they were the same group that rode on the beach the week previous. On Sunday July 22<sup>nd</sup> Dial Security encountered a group of motorcyclists on TNC property and turned them away. USFWS provided additional funding to pay for Dial Security to spend an extra hour a week patrolling this area. No more off-roading occurred on the beach the remainder of the season.

## **Trespassing in North Fence Habitat**

Every year Ventura Audubon has collected nesting data at Ormond Beach, trespassing through the north fenced area has been a problem. One of the recurrent issues is that someone cuts the habitat fence to allow entry of a bicycle which is then walked across the nesting area. For the third year in a row a footpath with a bike track could be seen crossing within feet of several CLT nests. When approached one individual consistently behaved belligerently. CAL-tips was called on several occasions and the local warden, Dennis Rosenberg has come out and talked with trespassers when they can be caught. Other than this, and attempts by nest monitors and students, there has been no intervention with these activities.

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## **Discussion**

WSP nest numbers were consistent this year compared to 2017 (34 in 2018 vs. 35 in 2017), and number of hatching nests were the same (24 nests hatched both years). This year we had an increase in problems with ravens, which were the biggest cause of nest failures. Trail cameras captured ravens harassing multiple nests with predator exclosures, and several nests without exclosures were depredated. We also captured a raven eating a newly hatched snowy plover chick on video. Raven issues occurred primarily in the south habitat and salt panne, although one CLT nest was depredated by a raven in the north habitat. We benefited from the Pt. Mugu predator management program which eliminated several ravens and after mid -July ravens were no longer seen. Chick survival improved in the salt panne after ravens disappeared.

CLT in contrast had the greatest number of nests we have recorded in 16 years. In the north habitat we had many more nests compared to the next highest year (84 in 2018 vs. 60 in 2011). Because of the large number of nests, the CLT colony expanded south outside of the



habitat fences. Neighboring Pt. Mugu experienced a CLT colony failure due to a predation event in early June, so the nesting on Ormond Beach may represent a second wave of nesting from this colony.

Ormond Beach continues to have problems with homeless encampments and individuals trespassing in nesting habitat. This has been ongoing since data on nesting CLT and WSP have been collected. This year was the first time in 10 years that we have had issues with off-roaders on the beach. The motorcycle incident corresponded with the presence of CLT chicks in the same area. We believe chicks were lost and possibly abandoned because of this incident.

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## Recommendations and Objectives for 2018 Nesting Season

### 1. Better protection for nests and chicks

**Issue:** Changes to the nesting fences have left some nesting areas unprotected by fences.

**Solution:** Fund new fence to encompass the nesting area north of the power plant.

**Issue:** Invasive plants growing between the salt panne and the dunes in the south habitat block movement of WSP clutches to ponds in the salt panne, and sea rocket growth has become a problem by the lagoon which will also block chick movement and decrease useable habitat.

**Solution:** Working with Oxnard City Corps and CSUCI students remove invasive plant material during the off season. Seek grant funding to support invasive plant removal.

### 2. Public Education

**Issue:** Many beach goers are unaware that there are federally listed nesting birds on the beach and that their activities can cause stress and reduced reproductive success. Also, they have little or no understanding of the VAS Shorebird Recovery efforts.

**Solution:** Continue to recruit, train and deploy volunteers from the community to greet visitors at Arnold Rd on weekend days during the summer. Reconfigure existing docent manual to make it more specific to Ormond Beach.

**Issue:** Dogs continue to enter Ormond Beach from Hueneme Beach, and there are limited enforcement resources available to ensure compliance with the ordinance.

**Solutions:**

- i. Collect data on the timing and numbers of dogs entering Ormond Beach beginning in February 2018 and continue data collection through the summer
- ii. Meet with Hueneme and Oxnard enforcement representatives and City of Oxnard before nesting season to communicate the need to enforce dog restrictions



- iii. Continue Ventura Audubon's commitment to conduct public outreach through the Volunteer Naturalist program and CSUCI partnership

### 3. Predation

**Issue: Predator pressure continues to impact nesting success**

**Solutions:**

- i. Continue to use predator exclosures case by case, based on the nature of predators and nest locations.
  - ii. Deploy trail cameras pre-season, on trails and on nests that are within the habitat fences to try to determine which predators are present and which are approaching nests and predating them.
  - iii. Increase monitoring time in the colony.
- 

## Acknowledgements

I would like to thank the 'Steward of Ormond Beach' Walter Fuller, Ventura Audubon President Bruce Schoppe, my Student Undergraduate Research Fellows from CSUCI Kaitlyn O'Dea, Cassie Rogers, Jason Suddith and Matt Wells and my student helpers Tyler Campbell and Melissa Marovitz.

Our work was funded by the Rose Foundation with a Ca Wildlands grant that paid for trail cameras, the California Coastal Conservancy funded our outreach work with an Explore the Coast grant and the USFWS has provided grant funding for fencing and signs, and their staff have helped erect symbolic fencing.

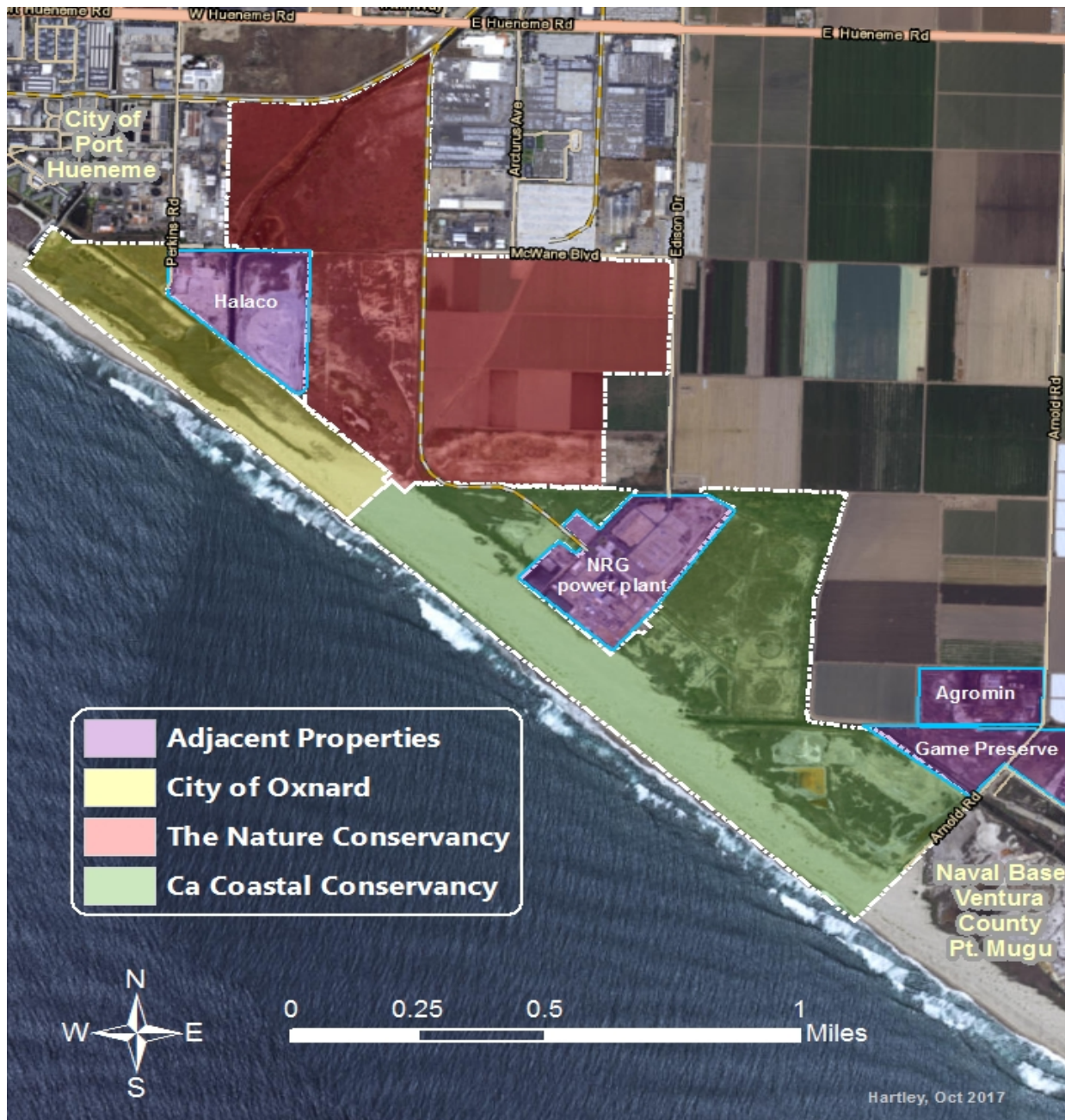
GenOn has made available access to their private contractor's parking lot which provides us safe access to the middle and north nesting habitats, as well as a storage container in the same parking lot for our north end supplies. The Nature Conservancy has made available use of an access road through their property that allows us safe passage and parking close to the least tern nesting area in the north habitat.

Finally, thank you to the Ventura USFWS office for your support and guidance as we navigate the complex landscape of Ormond Beach.

In memory of Reed Smith, our mentor and friend who began Ventura Audubon's work on Ormond Beach over 20 years ago.

## Appendix A: Maps

Appendix A: Map 1. Ormond Beach property owners and neighboring properties

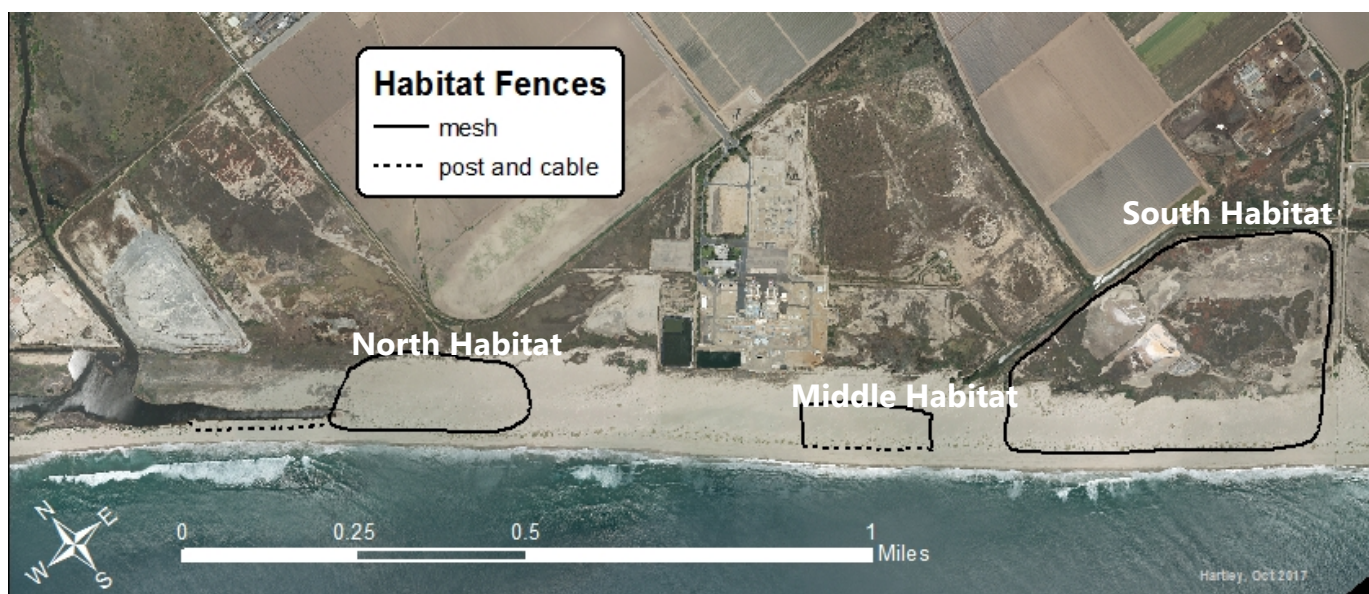


**Appendix A: Map 2.** Ormond Beach survey area: 200 acres are monitored each week during nesting season

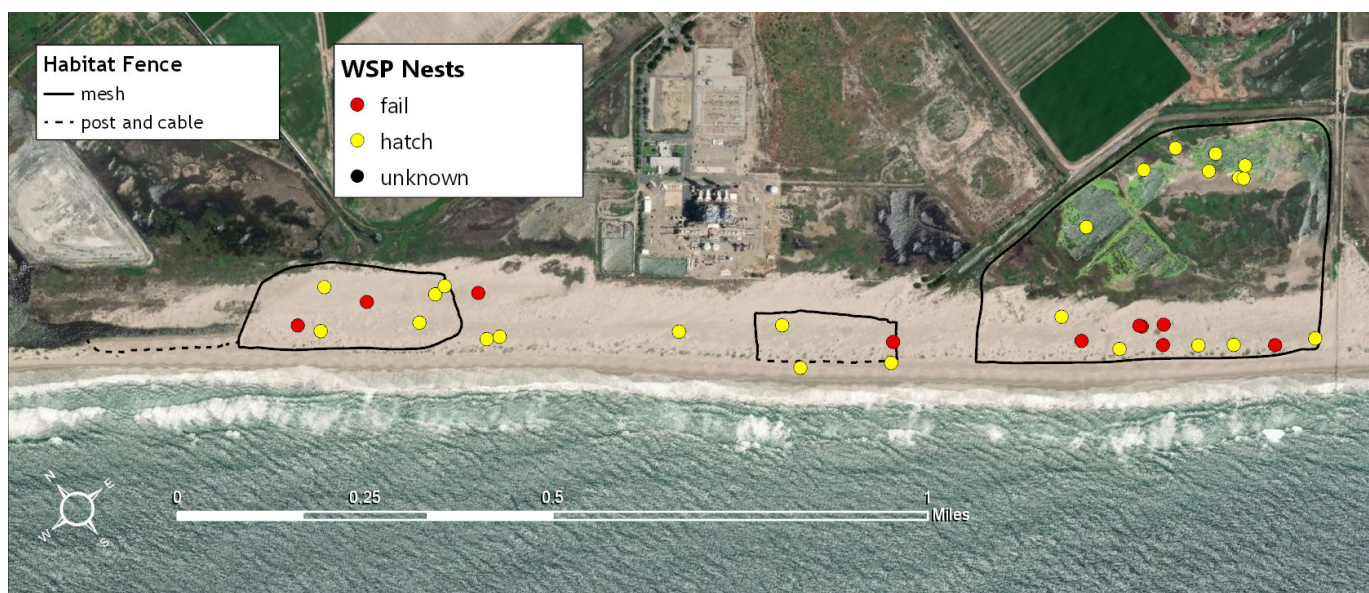




**Appendix A: Map 3.** Nest habitat fence boundaries enclose 3 habitat areas



**Appendix A: Map 4.** WSP nest locations and outcomes relative to fence boundaries



**Figure A.5** Location of WSP chicks and fledglings throughout the nesting season



**Appendix A: Map 5.** Location of WSP chicks and fledglings throughout the nesting season



**Appendix A: Map 6.** CLT nest locations



# Appendix B: Tables

Appendix B- 1.WSP population data and survey dates

Date	Last Survey of the Week	Total: adults	Total: all ages	Males	Females	Unknown	Chicks	Juveniles	# clutches	Calc Nests	breeding adults
Week 1	3/18/2018	68	68	35	33	0	0	0	0	0	0
Week 2	3/25/2018	60	60	30	30	0	0	0	0	0	0
Week 3	3/31/2018	48	48	24	20	4	0	0	0	1	2
Week 4	4/7/2018	42	42	21	18	3	0	0	0	4	8
Week 5	4/14/2018	26	26	18	8	0	0	0	0	8	16
Week 6	4/22/2018	35	35	16	11	8	0	0	0	10	20
Week 7	4/29/2018	20	25	13	7	0	5	0	2	10	22
Week 8	5/4/2018	27	33	18	9	0	6	0	3	11	25
Week 9	5/12/2018	12	12	6	6	0	0	0	0	8	16
Week 10	5/18/2018	24	28	14	10	0	4	0	3	9	21
Week 11	5/22/2018	22	27	13	8	1	4	1	4	8	20
Week 12	5/30/2018	15	17	7	8	0	2	0	0	5	10
Week 13	6/6/2018	32	33	17	15	0	1	0	0	3	6
Week 14	6/13/2018	15	17	7	8	0	2	0	1	6	13
Week 15	6/18/2018	17	17	8	8	1	0	0	0	7	14
Week 16	6/29/2018	19	19	7	12	0	0	0	0	10	20
Week 17	7/5/2018	17	22	7	10	0	5	0	2	8	18
Week 18	7/12/2018	17	28	8	9	0	9	2	4	6	16
Week 19	7/18/2018	25	27	11	14	0	2	0	0	7	14
Week 20	7/26/2018	38	41	20	18	0	3	0	0	3	6
Week 21	8/4/2018	42	50	22	20	0	8	0	0	2	4
Week 22	8/7/2018	77	79	30	47	0	0	2	0	1	2
Week 23	8/15/2018	51	54	1	0	50	3	0	0	0	0
Week 24	8/22/2018	81	82	1	n/a	80	1	0	1	0	1
Week 25	8/31/2018	60	n/a	n/a	n/a	0	0	0	0	0	0
Week 26	9/9/2018	62	n/a	n/a	n/a	0	0	0	0	0	0

Peak Breeding Activity

Spring Window Count

## Appendix B- 2. WSP nest outcome, nests 1-19

Nest #	Location	calc initiation	Estimated hatch/fail	#Eggs Laid	Predated eggs	Failed to hatch	#Eggs Hatched	Outcome	Type of Failure	Perpetrator	Comments	failed eggs	failed egg diagnosis
1	Unfenced North PP	3/31/2018	4/28/2018	2			2	hatch			saw chicks around nest		
2	South Habitat	4/10/2018	4/27/2018	3	3		0	fail	predated	raven	tracks around nest		
3	South Habitat	4/13/2018	5/11/2018	1			1	fail	unknown	unknown	found a single egg outside of scrap, took to SB zoo		
4	Middle Habitat	4/14/2018	4/28/2018	3		3	0	fail	vandalized	human	kneel marks next to scrape, not ours	3	stolen
5	North Habitat	4/1/2018	4/29/2018	3			3	hatch			saw chicks around nest		
6	Salt Panne	4/21/2018	5/19/2018	3			3	hatch			chicks may have been depredated by a raven after hatching, see nest notes		
7	South Habitat	4/22/2018	5/22/2018	3		1	2	hatch			found with 2 eggs on 4/22; just hatched chick found in nest 5/22. 1 eggs did not hatch.	1	infertile/non viable
8	Middle Habitat	4/6/2018	5/4/2018	3			3	hatch			saw chicks around nest		
9	South Habitat	5/3/2018	5/10/2018	3	3		0	fail	predated	raven	near nest 2 (ask Kat for her notes)		
10	Unfenced North PP	4/12/2018	5/10/2018	3			3	hatch			could not find pips, but a day old dead chick was found by the lagoon		
11	South Habitat	5/4/2018	5/11/2018	1	1		0	fail	predated	raven	Raven Tracks where seen leading up to nest		
12	South Habitat	4/3/2018	5/1/2018	1			1	hatch			male with 2 week old chick seen at S22		
13	Unfenced North PP	5/9/2018	5/30/2018	3	3		0	fail	predated	raven	Eggs gone, yolk, and raven track seen around nest area		
14	North Habitat	4/24/2018	5/22/2018	3			3	hatch			adult removing shells from nest		
15	South Habitat	5/11/2018	6/7/2018	2	2		0	fail	predated	raven	On top of a tall dune- raven ate eggs, caught on camera		
16	North Habitat	5/15/2018	6/5/2018	3	3		0	fail	predated	undetermined, only found large shell fragments	Under a blown out beach bur plant		
17	Salt Panne	5/5/2018	6/2/2018	3			3	hatch			hatching caught on trail cam video on 6/2		
18	Salt Panne	5/4/2018	6/1/2018	3	3		0	fail	predated	undetermined, only found large shell fragments in pred excl.	raven recorded pacing around nest on 5/28, 5/31, 6/1/18 - half shell fragments inside nest		
19	South Habitat	4/27/2018	5/4/2018	1	1		0	fail	predated	raven	suspect raven		

## Western Snowy Plover and California Least Tern, Ormond Beach 2018: Season Summary

### Appendix B- 3. WSP nest outcome, nests 1-19

Nest #	Location	calc intitiation	Estimated hatch/fail	#Eggs Laid	Predated eggs	Failed to hatch	#Eggs Hatched	Outcome	Type of Failure	Perpetrator	Comments	failed eggs	failed egg diagnosis
21	Salt Panne	6/2/2018	7/1/2018	3			3	hatch			next to nest #6: chicks seen		
22	North Habitat	6/7/2018	7/4/2018	3			3	hatch			Near CLT NEST 3 & 4 ,marked with stick, nest located within a rocky debri patch near dunes		
23	North Habitat	6/17/2018	7/10/2018	3			3	hatch			Within north hab near nest clt 18		
24	North Habitat	6/5/2018	7/3/2018	2			2	hatch			Near fence line in north habitat		
25	North Habitat	6/8/2018	6/23/2018	3	3		0	fail	predated	squirrel	near army core marker		
26	South Habitat	6/23/2018	7/21/2018	3			3	hatch					
27	Salt Panne	6/13/2018	7/11/2018	3			3	hatch			caught nest hatch after 1 day with trail cam, chicks seen running around. For some reason camera didn't record day of hatch		
28	Salt Panne	6/13/2018	7/11/2018	3		1	2	hatch			caught hatch on trail cam	1	died right after pipping through egg shell
29	South Habitat	6/22/2018	7/20/2018	3		1	2	hatch			Near fenceline	1	infertile/non viable
30	North Habitat	6/30/2018	7/28/2018	3			3	hatch			Right outside new north hab fence. Somehow this nest survived motorcycles.		
31	South Habitat	6/27/2018	7/25/2018	3			3	hatch			about 200ft from nest 26		
32	Salt Panne	7/13/2018	8/10/2018	3		1	2	hatch			Shrike may have predated chicks	1	embryo died early in development
33	Salt Panne	6/24/2018	7/22/2018	3			3	hatch					
34	Middle Habitat	7/7/2018	8/4/2018	3		2	1	hatch				2	small embryos, eggs kicked out of nest
35	Salt Panne	?	?	1			1	hatch			undiscovered nest		



#### Appendix B- 4. CLT population chronology

Season Complete new worksheet for each subcolony.			
date	num_adults	num_fledges	num_chicks_off_nest
18-May-18	10		
29-May-18	32		
30-May-18	36		
6-Jun-18	65		
12-Jun-18	98		
13-Jun-18	100		
15-Jun-18			
18-Jun-18	102		
22-Jun-18	106		2
26-Jun-18	100		2
27-Jun-18			4
29-Jun-18	90		9
3-Jul-18	80		
5-Jul-18	100	10FY	8
9-Jul-18	75		4
12-Jul-18	80	14FY+2FO	3C+5CF+2PF
17-Jul-18	90	18FY+12FO	2C+4CF+2PF
23-Jul-18		4FY+40FO	1PF
29-Jul-18	40	3FY+8FO	
31-Jul-18	0		

# Western Snowy Plover and California Least Tern, Ormond Beach 2018: Season Summary

## Appendix B- 5. CLT Nest Chronology, nests 1-42

Season Ch																					
date	nest_01	nest_02	nest_03	nest_04	nest_05	nest_06	nest_07	nest_08	nest_09	nest_10	nest_11	nest_12	nest_13	nest_14	nest_15	nest_16	nest_17	nest_18	nest_19	nest_20	nest_21
18-May-18																					
29-May-18																					
30-May-18	2E	1E											2E								
6-Jun-18	2E	2E	2E	2E	2E	2E	2E	1E	1E	2E	2E	2E	2E								
12-Jun-18	INC	INC	INC	INC	INC	INC	INC	INC	2E	INC	2E	2E	2E	2E	2E	2E	2E	1E	2E	2E	2E
13-Jun-18	2E	INC	INC	INC	2E	2E	INC	2E	2E	INC	INC	INC	2E	2E	2E	INC	INC	2E	INC	INC	INC
15-Jun-18																					
18-Jun-18	2E	2E	INC	INC	INC	2C	2E	2E	2E	2E	2E	2E	2E	2E	2E	INC	INC	2E	2E	2E	2E
22-Jun-18	2E	2E	2E	2E	2E		2E	2E	2E	2PH	2E	2E	2E	2C	2PH	2E	2E	2E	2E	2E	2E
26-Jun-18	2C	2PH	2C	2PH	2C		2E	2E	2E		2C	2P	2P			2E	INC	INC	INC	INC	INC
27-Jun-18								2C								1E/1C	INC	INC	INC	INC	INC
29-Jun-18								1C/1H								1U/1H			INC	INC	INC
3-Jul-18																	2PH	2C	INC	INC	2PH
5-Jul-18							2C		2C										2E	2NV	
9-Jul-18																			2E		
12-Jul-18																					
17-Jul-18																			2NV		
23-Jul-18																					
29-Jul-18																					
31-Jul-18																					

Season Ch																					
date	nest_22	nest_23	nest_24	nest_25	nest_26	nest_27	nest_28	nest_29	nest_30	nest_31	nest_32	nest_33	nest_34	nest_35	nest_36	nest_37	nest_38	nest_39	nest_40	nest_41	nest_42
18-May-18																					
29-May-18																					
30-May-18																					
6-Jun-18																					
12-Jun-18	1E	1E	2E																		
13-Jun-18	2E	2E	2E	2E	2E	1E	2E	1E	2E	2E	2E	1E	1E	2E	2E	1E	2E	2E	1E	2E	2E
15-Jun-18																			2E		
18-Jun-18	INC	INC	1E	INC	INC	INC	INC	2E	2E	2E	2E	1E	2E	2E	2E	2E	INC	INC	INC	2E	2E
22-Jun-18	2E	2E	1E/1C	2E	2E	INC	2E	2E	2E	2E	2E	INC	INC	2E	2E	2E	2E	2E	INC	2E	2E
26-Jun-18	INC	INC			2E	1E	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	2E	2E	1E	INC	INC
27-Jun-18	INC	2E	1NV/1H	2A	INC	INC	INC	INC											1C		
29-Jun-18					INC	INC	INC	INC		2U					1NV/1H	2E					2C
3-Jul-18	2C				2PH	1E	1E/1C	1C/1NV	2PH		2C	2E	2C	2E			INC	2PH			
5-Jul-18		2C										2E	2C				INC				
9-Jul-18							1E/1C					2E		2E		2U	INC				
12-Jul-18						1DC	1NV/1H					1NV/1C					2C			2P	
17-Jul-18														2A							
23-Jul-18																					
29-Jul-18																					
31-Jul-18																					

# Western Snowy Plover and California Least Tern, Ormond Beach 2018: Season Summary

## Appendix B- 6. CLT Nest Chronology, nests 43-84

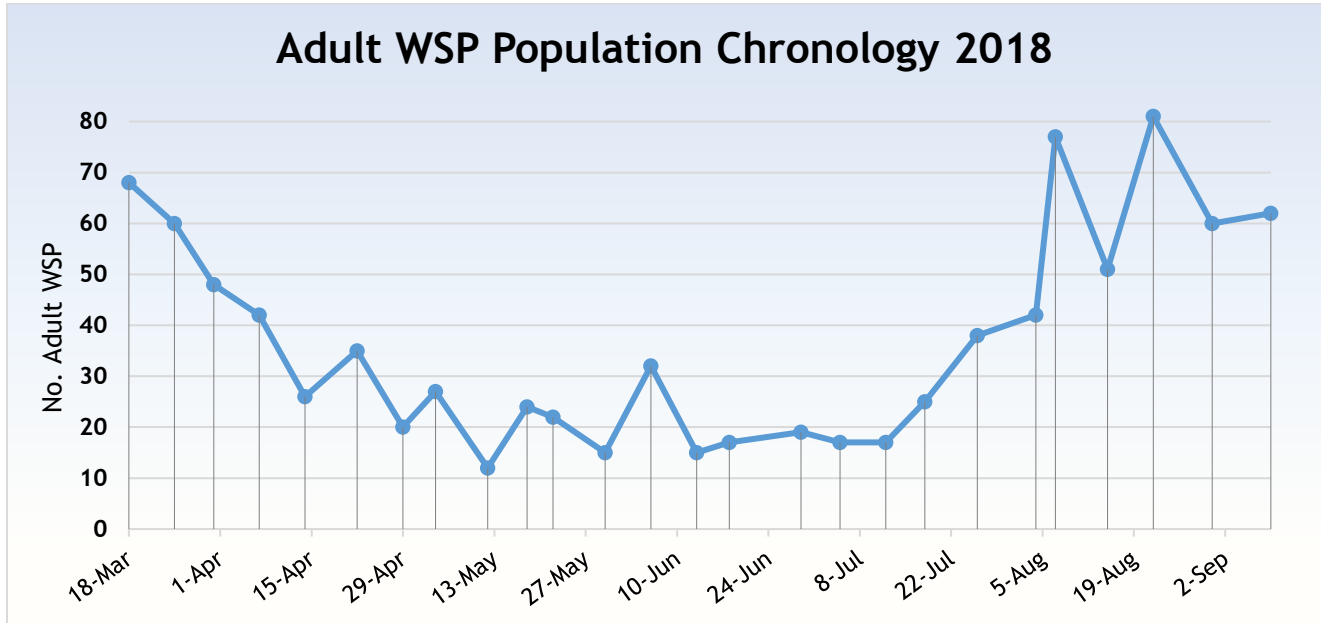
Season Ch																					
date	nest_43	nest_44	nest_45	nest_46	nest_47	nest_48	nest_49	nest_50	nest_51	nest_52	nest_53	nest_54	nest_55	nest_56	nest_57	nest_58	nest_59	nest_60	nest_61	nest_62	nest_63
18-May-18																					
29-May-18																					
30-May-18																					
6-Jun-18																					
12-Jun-18																					
13-Jun-18	2E	2E	2E	2E	1E	2E	1E	1E													
15-Jun-18									2E												
18-Jun-18	2E	2E	2B	2E	INC	INC	INC	INC	INC	2E	2E	2E	2E	2E	2E	2E	2E	2E	1E	2E	2E
22-Jun-18	INC	2E		2E	INC	2E	2E	2E	2E	2E	2E	2E	2E	2E	INC	INC	INC	INC	INC	INC	INC
26-Jun-18	2E	2A		2E	1E	2E	2E	2E	2E	2E	2E	2E	2E	2E	2E	2E	2E	2E	1E	2E	2E
27-Jun-18																					
29-Jun-18					2E					2E	2C	2PH		2C	2C						2C
3-Jul-18					2P	2C	2E	2E	INC	2C			2E			2PH	2E	1C/1U	1E		
5-Jul-18	1C/1E							INC	INC				INC				2E		1E		
9-Jul-18	1H/1E						2PH	INC	INC	1C/1H							2PH		1E		
12-Jul-18	1E			2P				2C	2C				2C						1E	2C	
17-Jul-18	1NV																		1NV		
23-Jul-18																					
29-Jul-18																					
31-Jul-18																					

Season Ch																						
date	nest_64	nest_65	nest_66	nest_67	nest_68	nest_69	nest_70	nest_71	nest_72	nest_73	nest_74	nest_75	nest_76	nest_77	nest_78	nest_79	nest_80	nest_81	nest_82	nest_83	nest_84	
18-May-18																						
29-May-18																						
30-May-18																						
6-Jun-18																						
12-Jun-18																						
13-Jun-18												2E										
15-Jun-18												INC										
18-Jun-18	2E	2E	2E	1E	2E							INC										
22-Jun-18	INC	INC	INC	2E	2E	2E	1E	2E	2E	1E	2E	2E										
26-Jun-18	2E	2E	2E	2E	2E	2E	1E	2C	2E	1E	2E	2E	1E									
27-Jun-18							1P							2E	2E	1E						
29-Jun-18								1C/1DC				2E					2E					
3-Jul-18	2E	2C		2E	2E	INC			2P	2E	2PH	2PH	1E		2E	1E						
5-Jul-18	INC			2E	2E	INC				2E			1E		INC	1E	2C	1C				
9-Jul-18	INC			2E	2C	2E				2P			1E		2C	1E						
12-Jul-18	2C		2C	2C		2C				20			1A	2C		1C			1E	1C	1E	
17-Jul-18																			1A		1A	
23-Jul-18																						
29-Jul-18																						
31-Jul-18																						

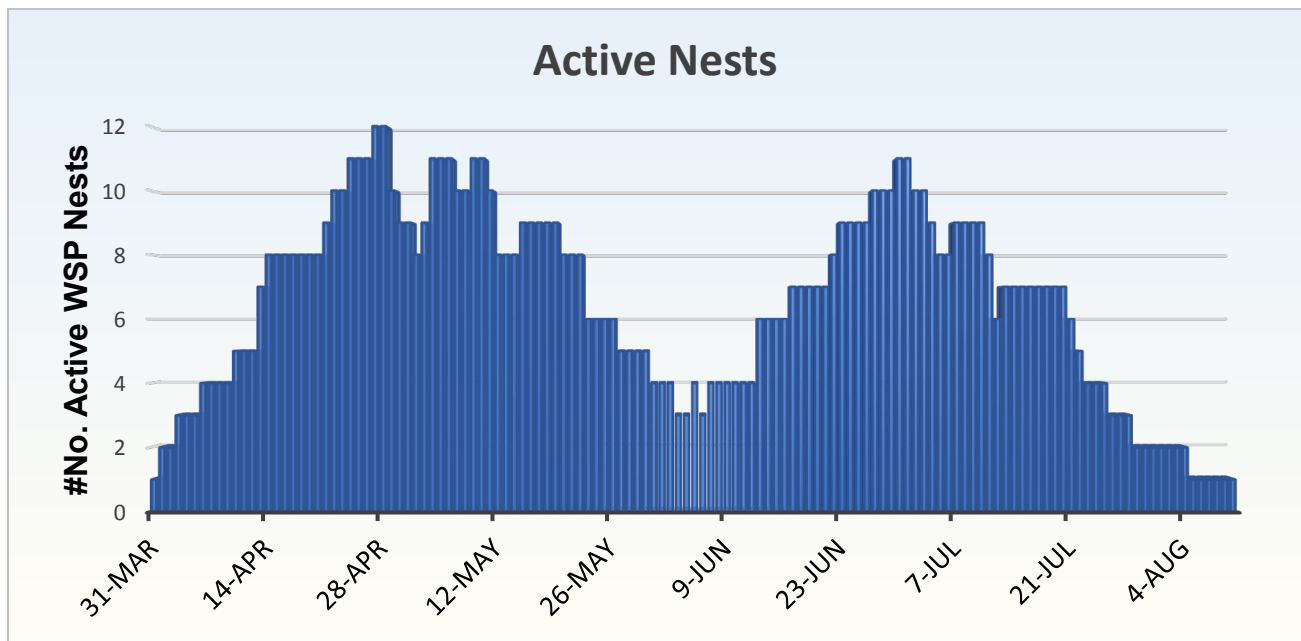


# Appendix C: Charts and Graphs

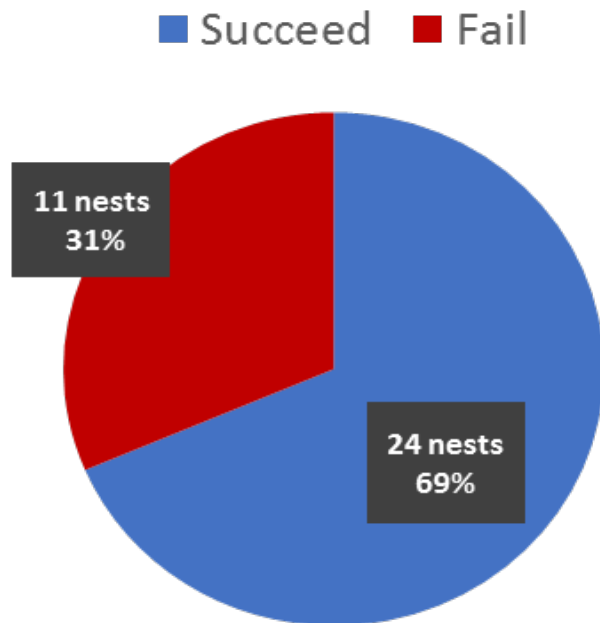
Appendix C. 1. Weekly WSP Adult Population Counts



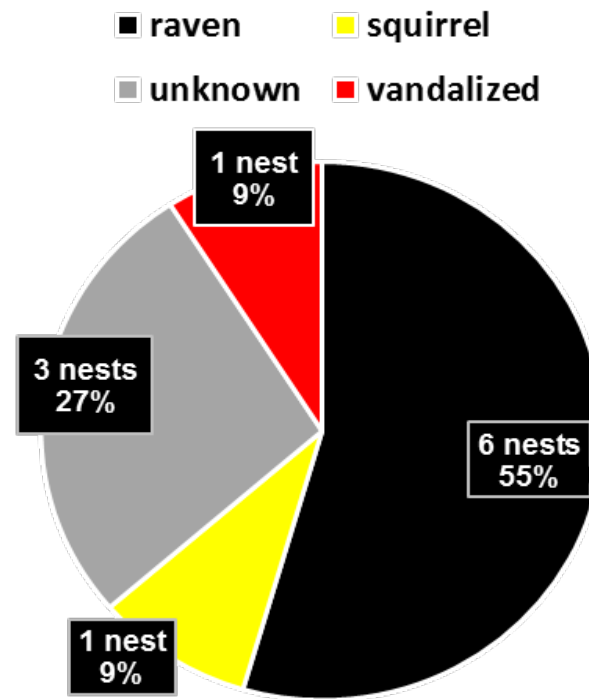
Appendix C. 2. WSP Nest Chronology



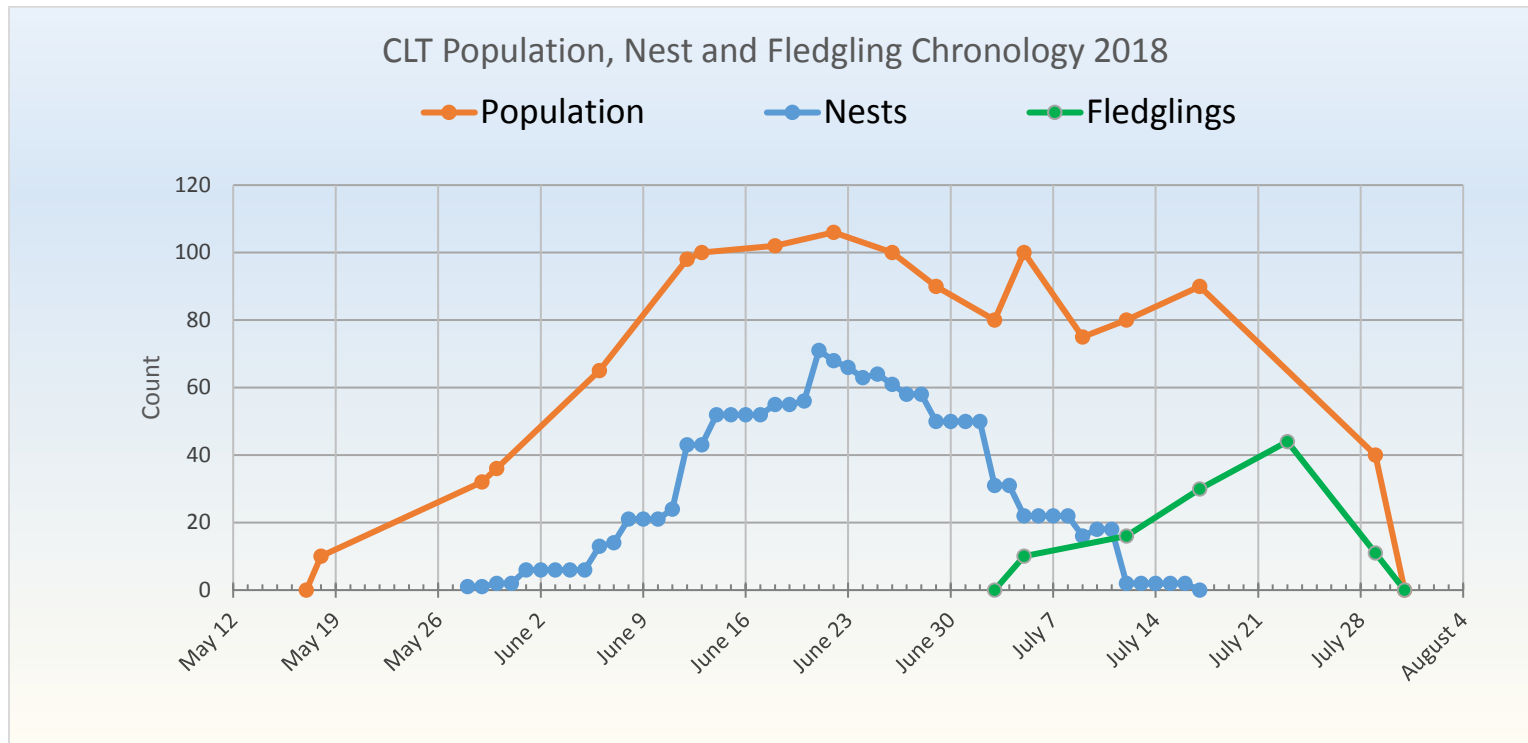
Appendix C. 3. WSP Nest Outcome



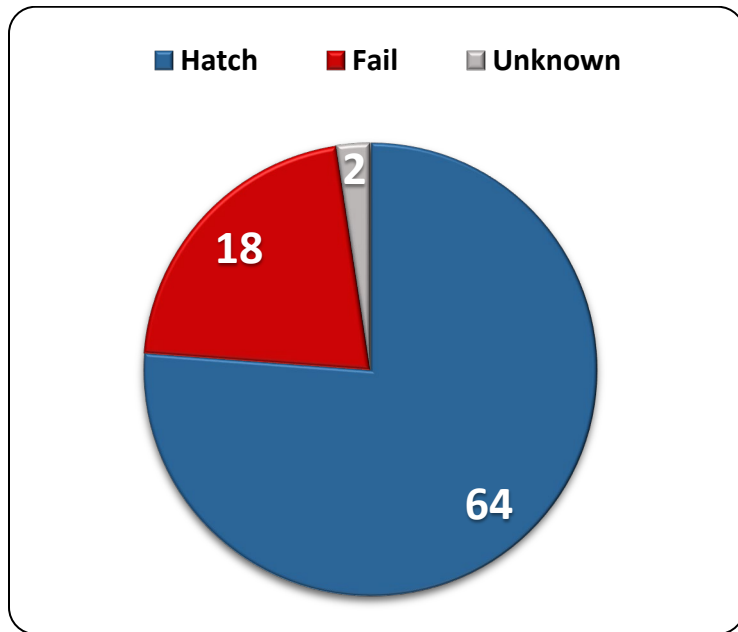
Appendix C. 4. WSP Nest Failures



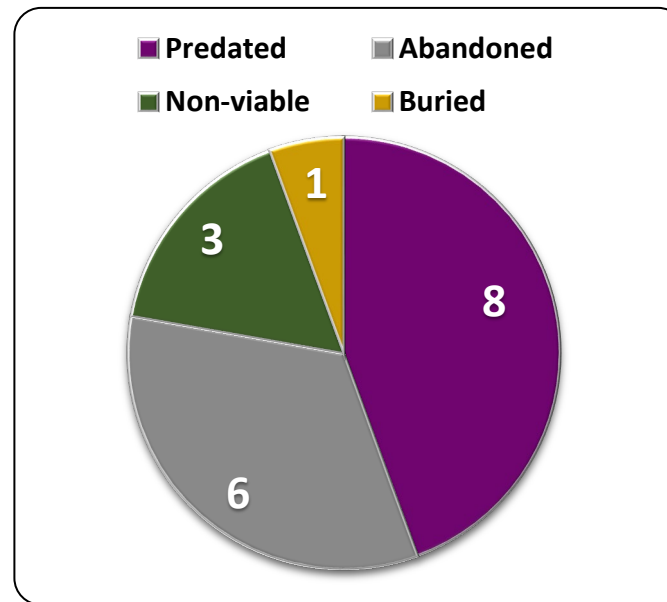
## Appendix C. 5. CLT Season Chronology



**Appendix C. 7. CLT nest outcome**

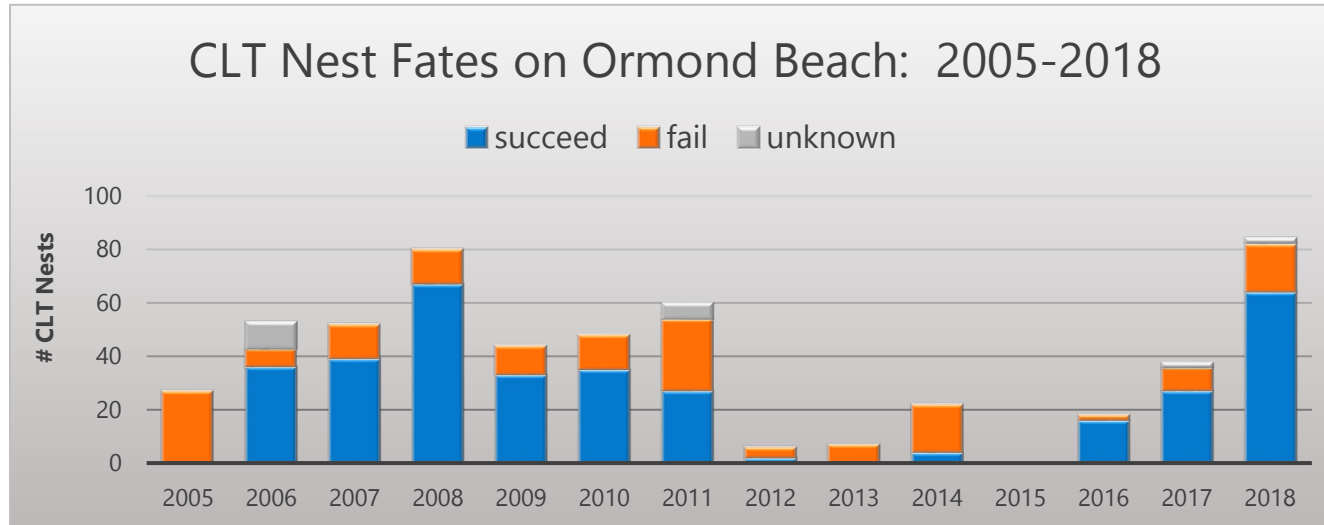


**Appendix C. 6. Reason for CLT nest failures**

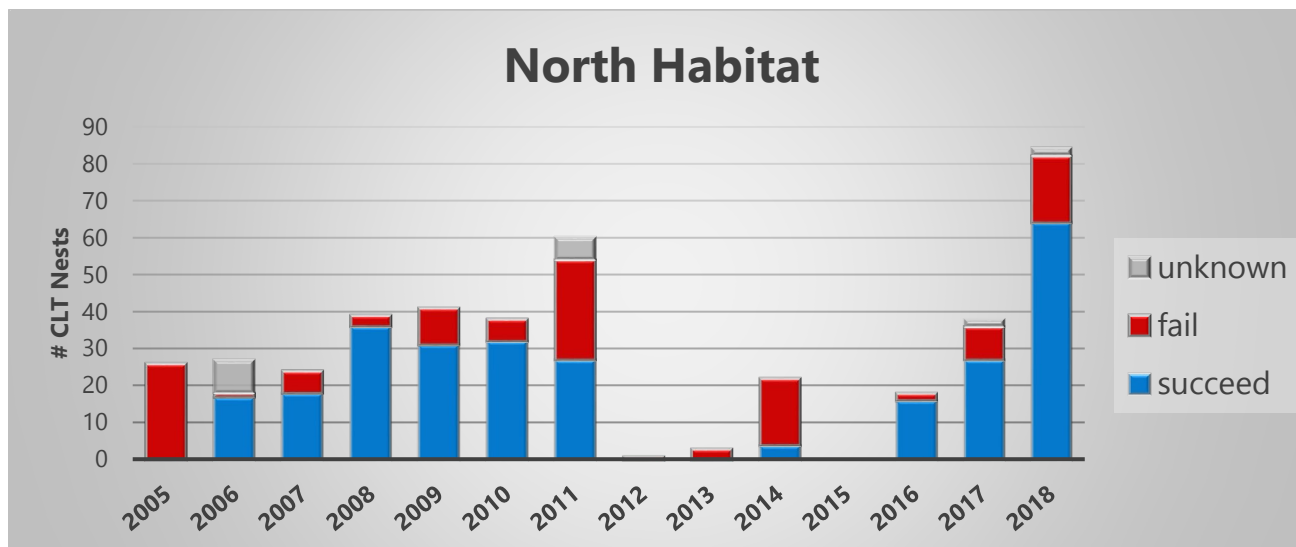




**Appendix C. 8.** History of CLT nest outcomes on Ormond Beach from 2005-2018



**Appendix C. 9.** History of CLT nesting in the north habitat from 2005-2018



## Appendix D: Photographs

**Photo 2.** Habitat Fencing



**Photo 1.** Symbolic Fencing, middle habitat fence



**Photo 3. Motorcycle tracks on Ormond Beach**





Photo 4. Snowy plover nest inside of motorcycle track

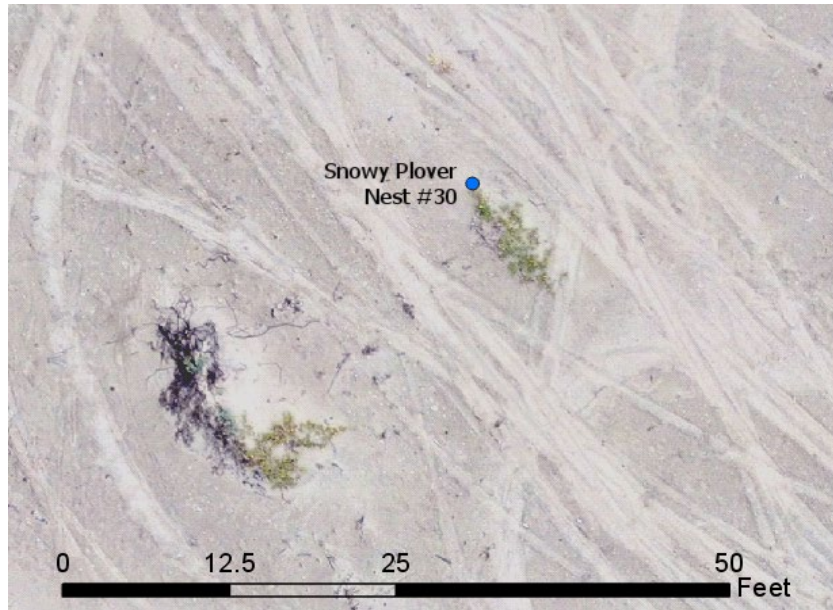


Photo 5. Instagram post by dirt bikers, Port Hueneme Beach was tagged



Photo 6. Dirt bikes at McWane Blvd on July 21



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## References

- Federal Register. (1993). Determination of Threatened Status for the Coast Population of the Western Snowy Plover. Vol. 58, No. 42, pp. 12864-12874.
- Mabee, T.J., G.W. (1997). Using Eggshell Evidence to Determine Nest Fate of Shorebirds. *Wilson Bull.* 109(2) 307-313.
- Marschalek, D. A. 2010. California least tern breeding survey, 2010 season. California Department of Fish and Game, Nongame Wildlife Program, San Diego, CA, 72 pp.
- U.S. Fish and Wildlife Service (USFWS). (1985. Revised Recovery Plan for the California Least Tern (*Sterna antillarum brownii*), original approval April 2, 1980. USFWS, Portland, Oregon. September 27.