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Washington State Snowy Plover Population Monitoring, Research, and Management: 2024 Nesting Season Research Progress Report

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Photo by **Marissa Cent**

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Cover photo of snowy plover at Midway Beach by Marissa Cent

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OVERVIEW

During the 2024 western snowy plover (*Anarhynchus nivosus nivosus*) nesting season, we counted the number of adult snowy plovers at most potential nesting sites in Washington and monitored breeding phenology, nest success, and fledging success at five sites. Work was conducted by Washington Department of Fish and Wildlife, US Fish and Wildlife Service, Shoalwater Bay Indian Tribe, and Ecostudies Institute. Management activities included restricting human access to nesting sites and restoring nesting habitat.

Thirty breeding adult surveys at ten sites were conducted between 20 May and 20 June 2024 to assess site occupancy status or to count the total number of adults detected. The mean 2024 Washington breeding adult population was 123 (range: 98-152). Breeding adults were observed at Copalis Spit, Connor Creek, Ocean Shores, Midway Beach, Empire Spit, Graveyard Spit, and Leadbetter Point (Table 3).

A total of 174 snowy plover nests were observed on Washington beaches at Copalis Spit, Connor Creek, Ocean Shores, Midway, Empire Spit, Graveyard Spit, and Leadbetter Point. Nests at Copalis Spit, Connor Creek, Midway, Empire Spit, and Graveyard Spit were monitored closely in order to calculate nest and fledging success. Forty (23%) of the 174 nests were confirmed through regular monitoring to have hatched. Corvid predation was the primary cause of nest failures, with 53 nests lost to corvids. The average number of young fledged per adult male was 1.03 (range: 0.87-1.17), representing a growing population in Washington. This represents the first year since 2018 that hatch and fledge success could be evaluated for Copalis Spit, Connor Creek, and Midway, and only the second consecutive year of fledge data for Empire Spit and Graveyard Spit since 2018.

INTRODUCTION

The Pacific coastal population of the western snowy plover (*Anarhynchus nivosus nivosus*) is listed as Threatened under the Endangered Species Act and is listed as Endangered by Washington State. The current Pacific coast breeding population extends from Copalis Spit, Washington to Bahia Magdalena, Baja California, Mexico. The snowy plover winters in coastal areas from southern Washington to Central America. This coastal population nests above the high tide line on a variety of beach and dune types including coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and bluff-backed beaches (U.S. Fish and Wildlife Service 2007). In winter, snowy plovers are found on many of the beaches used for nesting as well as on beaches where they are not known to nest (U.S. Fish and Wildlife Service 2007).

According to the U.S. Fish and Wildlife Service (2007), "Habitat degradation caused by human disturbance, urban development, invasive beachgrass (*Ammophila arenaria, Ammophila brevigulata*), and expanding predator populations have resulted in a decline in active nesting areas and in the size of the breeding and wintering populations." In Washington specifically, predators eating snowy plover eggs or chicks, adverse weather, shoreline modification, dune stabilization, and disturbance caused by recreational activities have been attributed to reduced nest success and have been cited as the causes of local population declines (Stinson 2022).

Washington and Oregon comprise Recovery Unit 1 in the federal Recovery Plan for the western snowy plover (U.S. Fish and Wildlife Service 2007). The primary recovery criterion for this unit is maintaining 250 breeding adults for 10 years and a 5-year average productivity of at least 1.0 fledged chick per adult male (U.S. Fish and Wildlife Service 2007). The federal recovery plan calls for the development and implementation of mechanisms to assure long-term protection and management of breeding, wintering, and migration areas in Recovery Unit 1 (U.S. Fish and Wildlife Service 2007).

According to the Washington State Recovery Plan (1995) for the snowy plover, the plover will be considered for down-listing to Threatened when the state supports a 4-year average of at least 25 breeding pairs that fledge at least one young per pair per year at two or more nesting areas with "secure" habitat. Delisting will be considered when the "average" population reaches 40 breeding pairs at three or more secure nesting areas. A periodic status review was completed in 2022 (Stinson 2022).

Both the federal and state recovery plans require monitoring of breeding adults and monitoring of fledging success to assess progress toward these recovery goals. Monitoring is also necessary to evaluate the impact of conservation actions on snowy plover populations such as predator management and the effectiveness of habitat restoration efforts. To provide the information needed to assess recovery progress and to assess the effectiveness of conservation actions, the U.S. Fish and Wildlife Service (USFWS) is conducting demographic monitoring at Leadbetter Point and coordinating its population monitoring efforts with Washington Department of Fish and Wildlife (WDFW), the Shoalwater Bay Indian Tribe (SBIT), and the Oregon Biodiversity Information Center (ORBIC). This coordinated effort was initiated in 2006, although Washington-specific monitoring was initiated years before.

This report serves, in part, to meet our reporting obligations under Recovery Sub-permit, WNWR-15, Amendment 15 (SPITS TE-007497-15) and for USFWS Section 6 grant number WA F22AP03263.

The primary objectives of our monitoring and management in 2024 were to:

- Conduct winter-window surveys in conjunction with the range-wide survey effort.
- Conduct breeding-window surveys in conjunction with the range-wide survey effort and two subsequent breeding adult surveys at Copalis Spit, Connor Creek, Midway Beach, Graveyard Spit, Empire Spit, and Leadbetter Point.
- Conduct surveys of recently unoccupied breeding sites such as Ocean Shores at Ocean City, Oyhut, Benson Beach, and Long Beach.

- Estimate current population size of adult snowy plovers in Washington.
- Estimate nest success rates and sources of nest mortality during the egg laying/incubation stage for all nest locations at Empire Spit, Graveyard Spit, Connor Creek, Copalis Spit, and Midway Beach.
- Estimate brood success rates at Copalis Spit, Connor Creek, Midway Beach, Empire Spit, and Graveyard Spit.
- Attempt to increase nest success through habitat restoration efforts (not Section 6 funded).
- Minimize human disturbance to nesting plover to increase breeding success.
- Begin a 3-year study to collect data to understand predation and human disturbance impacts on plover nesting success.
- Produce a report that summarizes methodology, numbers of breeding adults, hatching success, and management actions.

This report summarizes progress on all these objectives, although hatching and fledging success data are incomplete for some sites.

METHODS

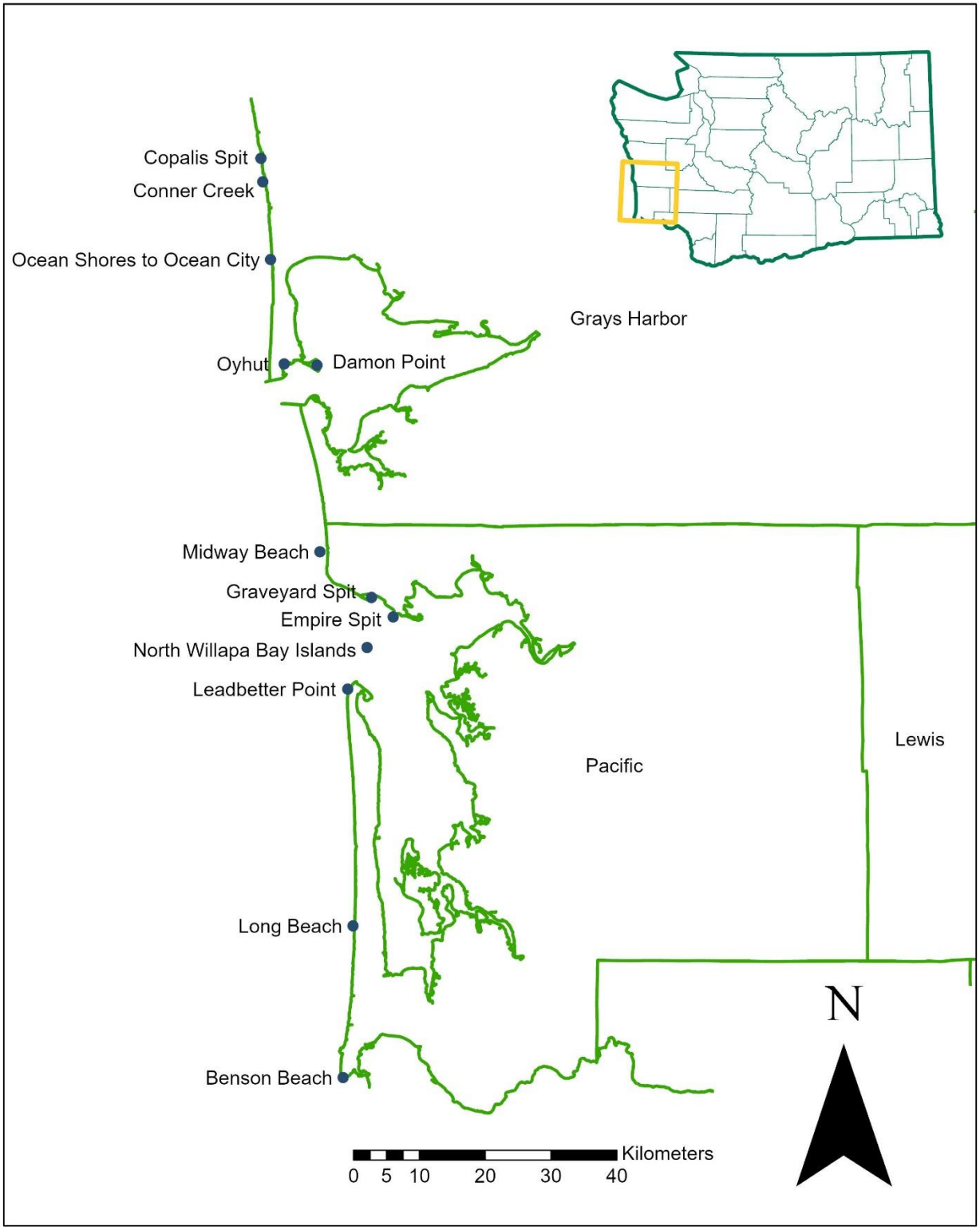
Survey and Activity Areas

Historically, Washington was home to five known breeding areas for snowy plovers: Cape Shoalwater, Leadbetter Point, Damon Point, Westport Spit, and Copalis Spit (Washington Department of Fish and Wildlife 1995). Of these five areas, Damon Point (which also included Oyhut) and Westport Spit no longer provide adequate habitat to support nesting snowy plovers. Cape Shoalwater (now broken into two nesting areas: Graveyard Spit and Empire Spit) and Leadbetter Point have remained active and important nesting areas since they were first discovered, while Copalis Spit began supporting nesting plovers again after decades without activity.

Since WDFW began monitoring snowy plovers during the breeding season, plovers have been discovered nesting at additional sites: Midway Beach, Long Beach, Ocean Shores, various sand islands in Willapa Bay, Copalis Spit and Connor Creek (just south of Copalis Spit). The first sightings of snowy plovers at Midway Beach, now one of the primary nesting areas for Washington's population, occurred in 1994 (Washington Department of Fish and Wildlife 1995). Nests were discovered at Long Beach (south of Leadbetter Pont) in 2019 and 2021 (Ritchie et al. 2020, Ritchie et al. 2022). Nests have been discovered in recent years (2016, 2019, 2023) on two separate islands in Willapa Bay, an area where nesting plovers hadn't been observed since the 1990s (Pearson et al. 2017, Ritchie et al. 2020). Nests have been found at Connor Creek every year since 2020 (adults were first documented exhibiting breeding behavior in 2018) and at Copalis Spit in 2024. 2024 also saw the first nest since monitoring began in Ocean Shores/Ocean City. Additionally, adults have been observed at Benson Beach (the southern-most point of Washington's coast) during the breeding season, though no nests have been discovered to date. For approximate locations of current dedicated survey sites, see Figure 1.

Leadbetter Point and Midway Beach are dune-backed beaches and have exceptionally wide areas that are unvegetated or sparsely vegetated and are located between the mean high tide and the foredune. Snowy plovers also use the sparsely vegetated foredunes and areas behind the foredune. The snowy plover habitat at Midway Beach consists of swales, sparsely vegetated foredunes, and a large deflation plain with ephemeral dune ponds. Leadbetter Point is part of a very long sand spit or peninsula. The habitat at Leadbetter Point consists of unvegetated beach above the summer high tide line, sparsely vegetated foredunes, blowouts, and human-modified habitat of sand and oyster shell landward of the foredune (habitat restoration area or HRA).

Figure 1. General locations of snowy plover survey sites. While included on the map, Damon Point has not been surveyed in the past three years.



Graveyard Spit and Empire Spit (formerly consolidated into one site: Graveyard Spit prior to 2023) are located on the north shore of Willapa Bay across from Leadbetter Point. The nesting habitat at these sites consist of a sparsely vegetated low-lying sand spit with hummocks and swales and unvegetated deflation plains adjacent to salt marsh communities. Since 2012, multiple projects have been completed to combat the impacts of erosion, flooding, and sea level rise to this sensitive sand spit. The most intensive effort yet was completed in November 2022 with the purpose of renourishing the northern 4,000 feet of shoreline berm and placing a dynamic revetment at the toe to make repairs to the soft shore berm. In the year following the completion of construction, the new berm created and/or enhanced approximately 50 acres of plover habitat.

Ocean Shores to Ocean City and Connor Creek have similar features as other southwest Washington sandy, dune-backed beaches, but their width tends to be narrower than the more productive plover sites. Ocean Shores to Ocean City spans approximately 7 miles of shoreline between the two towns and is highly trafficked by the public. Connor Creek is located immediately to the north and spans approximately 3.3 miles from the Ocean City Beach Access (2nd Avenue) to the mouth of Connor Creek. North of the mouth of Connor Creek is Copalis Spit, which is formed and shaped by the outlet of the Copalis River and currently extends approximately 1.5 miles. This section of beach is closed to all vehicles except tribal razor clam harvest vehicles, and otherwise only accessible to the public by a walking path (~0.75 miles), making it less heavily trafficked than many of the other beaches that Washington's plovers use.

The North Willapa Islands are comprised of several small islands and ephemeral sand spits, including the Gunpowder Island Natural Area Preserve. They are characterized as mostly unvegetated wind-blown sandy accretions located in northern Willapa Bay between Leadbetter Point, Tokeland, and Stony Point, Washington. The more established islands have scattered clumps of sparse vegetation and woody debris. In the winter season 2023-2024, Refuge Island became partially attached at the tip of Leadbetter Point. The approximate nesting habitat area for this part of the island is 10 acres in size. A substantial amount of formerly sub-tidal and intertidal land is now also connected at the tip, hindering efforts to separate the site classification of North Willapa Islands from Leadbetter Point for data compilation and analysis in 2024.

Long Beach extends approximately 17 miles from Surfside (Oysterville Road Beach Approach) south to North Head near the southern end of the Long Beach Peninsula. These are moderately wide dune backed beaches with a series of adjacent north-south oriented stabilized dune ridges and swales that are extensively vegetated by nonnative *Ammophila* beachgrass and shore pine. Recreation is common along beaches here and is a primary purpose of the Seashore Conservation Area, which runs the entire length of this beach. Much of the beach-adjacent land consists of privately owned single-family homes, vacation rentals, and short-term occupancy hotels and resorts. There are two incorporated cities, both among the most populous in Pacific County, three State Parks, and seven public motor vehicle access points along this portion of beach.

Benson Beach lies along the Pacific Ocean shoreline between North Head in Cape Disappointment State Park and the Columbia River north jetty. The beach is narrow and prone to erosion, especially on the southern half, with the upland areas heavily vegetated by *Ammophila* beachgrass and shore pine. A large year-round, beach-adjacent campground is located at the north end of the beach.

Site Surveys

Wildlife species are rarely detected with perfect accuracy and non-detection does not necessarily mean that a species was absent from a site unless the probability of detecting the species (detectability) was

100%. This leads to a fundamental problem -- the measure of occupancy is confounded with the detectability of the species. Specifically, an observed "absence" occurs if either the species was present at the site but not detected or the species was truly absent. Pearson et al. (2008) recommended three to four visits to a site between early to mid-May and the end of the first week of July to confirm presence of breeding-aged adult plovers in order to determine if it is being used as a nesting site. With three to four visits, there is an 96% - 99% probability of accurately determining site occupancy. If that is not feasible, two visits would yield a detection probability of 89% and one visit a detection probability of 67% (Pearson et al. 2008).

We conducted occupancy surveys at historically occupied sites where we have recently failed to detect snowy plovers (Table 1), as these sites may become re-occupied due to suitable habitat and proximity to occupied sites. We endeavored to conduct at least two occupancy surveys of recently unoccupied sites to ensure a detection probability of 89% or more.

Adult Population Surveys

Winter window survey

The winter window survey occurs annually in January along the entire U.S. Pacific coastline where snowy plovers nest, have historically nested, or where there is potentially suitable habitat between nesting sites. All sites are surveyed during a specific week selected by the USFWS each year. Participants follow the methods of Elliot-Smith and Haig (2006b). In 2023, the window surveys occurred from 26 January to 2 February. Sites surveyed include Copalis Spit, Connor Creek, Ocean Shores to Ocean City, Oyhut, Midway Beach, Graveyard Spit, Empire Spit, Leadbetter Point, Long Beach, and Benson Beach.

Breeding window survey

The primary intent during breeding window surveys is to count the adult population at recently occupied sites and historically (though not recently) occupied sites that would still provide suitable habitat for snowy plovers. The breeding window survey occurs annually in late May along the entire U.S. Pacific coastline in historic or potentially suitable nesting habitat for snowy plovers. Specific dates for a particular year are selected by the USFWS, and all participants follow the methods of Elliot-Smith and Haig (2006a). In 2024, the window survey occurred from 18 to 26 May. Copalis Spit, Connor Creek, Ocean Shores to Ocean City, Oyhut, Midway Beach, Graveyard Spit, Empire Spit, Leadbetter Point, Long Beach, and Benson Beach were surveyed. Due to the recent recolonization of our northernmost sites of Connor Creek and Copalis Spit and recent sightings of adult plovers during the breeding season in British Columbia (M. Ashford, pers. comm), there is a renewed interest in assessing the presence of plovers in Washington's northern sandy beaches. In 2024, Quileute tribal biologists conducted the first adult survey on Second Beach (Clallam County).

Breeding adult surveys and estimating breeding adult population

In addition to the rangewide breeding window survey, two additional surveys were conducted at recently occupied sites (Copalis Spit, Connor Creek, Midway Beach, Empire Spit, Graveyard Spit, Leadbetter Point, and Long Beach). All surveys were completed between 20 May and 20 June following the breeding window methods (USFWS 2007 Appendix J-1). These surveys are conducted at a time of year when there was the least amount of immigration and emigration into and out of the Washington breeding sites. Breeding window survey and two additional surveys are used to estimate observed adult abundance within the breeding season. In the Results section, the average and the range of these three surveys are presented. All estimates are rounded to the nearest whole bird. Table 1 provides sites, survey types, survey effort, and dates.

Table 1. Snowy plover sites surveyed during the 2024 breeding season. All sites had a breeding window survey, which was the first survey of the season.

Site	Type of Survey(s) Conducted	# Surveys	# Surveyors	Survey Dates
Second Beach	Occupancy	1	1	6/5
Copalis Spit	Breeding Adult	3	2	5/23, 6/5, 6/17
Connor Creek	Breeding Adult	3	2	5/20, 6/5, 6/17
Ocean Shores/ Ocean City	Occupancy	3	2-3	5/22, 6/5, 6/17
Oyhut	Occupancy	1	2	5/23
Midway Beach	Breeding Adult	3	4-6	5/24, 6/6, 6/20
Graveyard Spit	Breeding Adult	3	1	5/20, 6/05, 6/18
Empire Spit	Breeding Adult	3	5	5/20, 6/06, 6/20
North Willapa Bay Islands	Occupancy	0	-	not surveyed
Leadbetter Point	Breeding Adult	3	7-8	5/23, 6/7, 6/18
Long Beach	Breeding Adult	3	1	5/21, 6/6/, 613
Benson Beach	Occupancy	3	1	5/22, 6/6, 6/13

Nest Phenology and Success

We conducted nest monitoring to determine phenology and nest success at five monitoring sites: Graveyard, Empire Spit, Midway Beach, Connor Creek, and Copalis Spit. While nesting activity was confirmed at Leadbetter Point, USFWS biologists did not actively look for nests in 2024. Any nests located outside of these five intensively monitored sites were found opportunistically during breeding adult surveys. In these cases, nest locations were marked with a GPS and checked by staff, time permitting, or during the next breeding adult survey.

Shoalwater Bay Tribe (SBIT) biologists conducted active nest searching and monitoring at Graveyard and Empire Spit, WDFW biologists at Midway Beach, and Ecostudies Institute (ESI) biologists at Connor Creek and Copalis Spit. SBIT staff visited beaches 3-7 times per week from late March to the middle of September to locate and monitor snowy plover nests, broods, and fledges. WDFW biologists visited Midway Beach 2-6 times per week from early April to mid-September. ESI and WDFW biologists visited Connor Creek and Copalis Spit 2-5 times per week from mid-April to mid-August. ESI work was funded by USFWS Recovery Implementation Funds, but to present a holistic picture of snowy plover recovery efforts in the state, the results are reported on here as well.

Biologists located nests by following snowy plover tracks, observing scrape building by males, locating adults incubating eggs, or flushing incubating adults. Date, nest status, and number of eggs were recorded on every monitoring visit to a nest. When adults were documented at or near a nest, biologists recorded their presence and bands (if any). If the nest was found to be no longer active, evidence for potential cause of failure or hatching status was recorded. Unless observed directly, biologists calculated clutch

initiation date by backdating from known laying or hatching dates or via egg floating to backdate the initiation date. Biologists used the following time intervals from California and reported in Page et al. (1995) to calculate clutch initiation dates: egg laying = 2.5 days between laying egg 1 and 2, and 2.3 days between laying eggs 2 and 3; incubation = 27 days or 32 days from the first egg laid until hatching. Nest outcomes were recorded as the number of successful (hatched) nests or failed nests. Failures were attributed to predation, abandonment, drifting sand, human activities (vehicles, walking, horseback riding, etc.), tidal inundation, or undetermined causes of failure. We will use these encounter histories for an ongoing nest survival analysis.

Oregon continues their nest monitoring efforts, and their results are included in the *Progress on Recovery Objectives* section.

Fledging Success

Snowy plover chicks are precocial, leaving the nest within hours after hatching to search for food. Chicks fledge (i.e., are capable of sustained flight) at 28 to 33 days post hatching (Warriner et al. 1986). The federal Recovery Plan considers chicks fledged at 28 days post hatching (U.S. Fish and Wildlife Service 2007). According to the Recovery Plan, the productivity information most useful to determine recovery is the annual number of young fledged per adult male. Because males are responsible for post-hatching parental care (Warriner et al. 1986) and because modeling exercises on population trends were conducted on only males during the writing of the recovery plan females are not used in determining this metric of reproductive success (U.S. Fish and Wildlife Service 2007). Population modeling by Nur et al. (1999) indicates that productivity of at least 1.0 chick fledged per breeding male per year should result in a stable population and productivity of 1.2 or more chicks fledged per breeding male should increase population size.

Determining the number of chicks fledged requires a strong understanding of resident males on site as determined through nesting efforts and adult breeding surveys, as well as following broods from hatch date to 28 days post hatching and determining their fate. Due to the great effort needed to estimate fledging success, Washington did not produce estimates between 2019 and 2022. Shoalwater Bay Tribe (SBIT) was able to resume comprehensive monitoring efforts for the second breeding season at Empire Spit and Graveyard Spit. A full-time seasonal biologist also added capacity and allowed for comprehensive monitoring efforts at Midway Beach. Ecostudies Institute conducted a separately-funded comprehensive monitoring effort at Copalis Spit and Connor Creek, allowing for the determination of the number of chicks fledged/adult male at five total sites.

To identify and follow individual broods, biologists at all sites attempted to identify hatch dates for successful nests, which they checked daily or every other day around predicted hatching dates. In cases where a banded adult male accompanies the chicks, biologists are able to assign broods to a specific nest and hatch date and to more easily follow that brood through time to fledging. For some nests, biologists can determine the outcome of the brood because no other chicks of a similar age are along a particular stretch of beach. When the adult is unbanded, biologists can use chick plumage and size to estimate chick ages. In 2024, these established methods were supplemented by chick-banding efforts at all five sites. Whenever possible, permitted banders banded chicks on their hatch dates, allowing for the ease of following clutches and allowing for an ongoing brood survival analysis.

To estimate the number of young fledged per male, we divided the number of young fledged by the number of breeding adult males (an estimate that is derived from the breeding adult surveys).

RESULTS

Site Surveys

Ten sites were visited during the winter window survey in 2024 (Table 2). These same sites, with the addition of Second Beach, were also visited during the breeding season to count breeding adults or determine occupancy (Table 4).

Adult Population Surveys

Winter Window Survey

We counted 47 snowy plovers at four Washington sites during the January 2024 winter window survey: Ocean Shores to Ocean City, Midway Beach, and Leadbetter Point, and Long Beach. This is less than half the number of plovers we observed in 2023 (Table 2, Cent et al. 2024). The reason for this decline is unknown, however one possible reason is that we missed some of the plovers. USFWS staff were unable to survey parts of Leadbetter Point due to terrain and other logistical constraints. Plovers may have been located on the section that was unable to be surveyed. Additionally, one of the former North Willapa Bay Islands unexpectedly connected to the tip of Leadbetter Point just prior to this survey, but was not able to be surveyed. Eleven years of nonbreeding survey count totals are reported by site in Table 2.

Breeding Window Survey

We detected 98 adult snowy plovers at six sites in Washington during the 2024 rangewide breeding window survey, with 45 males, 46 females, and 7 adults whose sex could not be determined during the survey. Plovers were observed at Copalis Spit, Connor Creek, Midway Beach, Empire Spit, Graveyard Spit, and Leadbetter Point (Table 3). Although the North Willapa Bay Islands were considered "not surveyed" in 2024, some of their land mass was absorbed into the Leadbetter Point count due to the connection of Refuge Island to the mainland in fall/winter 2023/2024.

Table 2. Washington snowy plover rangewide winter window survey adult counts by site and year. "ns" indicates no survey was conducted that year. Prior to 2023, Empire Spit was surveyed as a part of Graveyard Spit.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024 Survey Information			
Site												Survey Date	Adult Males	Adult Females	Adult Unk
Copalis Spit	0	0	0	0	0	0	0	0	0	0	0	29-Jan	0	0	0
Connor Creek	0	0	0	0	0	0	0	0	18	18	0	29-Jan	0	0	0
Ocean Shores/ Ocean City	ns	ns	ns	4	10	0	9	0	0	8	8	29-Jan	0	0	8
Oyhut	0	0	0	0	0	0	0	0	ns	0	0	29-Jan	0	0	0
Damon Point	0	0	0	0	0	0	0	ns	ns	ns	ns	-	-	-	-
Midway Beach	22	22	31	22	28	58	66	52	41	55	30	30-Jan	2	0	28
Empire Spit	-	-	-	-	-	-	-	-	-	0	0	2-Feb	0	0	0
Graveyard Spit	0	0	0	0	0	0	0	0	1	0	0	2-Feb	0	0	0
Leadbetter Point	45	0	28	34	12	15	0	111	39	18	7	4-Feb	2	2	3
Long Beach	0	0	10	6	0	7	0	4	0	0	2	1-Feb	1	1	0
Benson Beach	0	ns	0	0	0	0	0	0	0	0	0	2-Feb	0	0	0
Total	**67**	**22**	**69**	**66**	**50**	**80**	**75**	**167**	**99**	**99**	**47**		**5**	**3**	**39**

Table 3. Washington snowy plover rangewide breeding window survey adult counts by site and year. "ns" indicates no survey was conducted that year.

												2024 Survey Information			
													Adults		
Site	2014	2015	2016	2017	2018	2019	2020*	2021	2022	2023	2024	Survey Date	Male	Female	Unk
Copalis Spit	0	0	1	0	0	0	4	5	2	5	12	23-May	6	4	2
Connor Creek	0	0	0	0	0	0	4	2	5	2	14	20-May	6	7	1
Ocean Shores/ Ocean City	-	-	-	-	3	0	2	0	0	0	0	23-May	0	0	0
Oyhut	0	0	0	0	0	0	0	0	0	0	0	23-May	0	0	0
Damon Point	0	0	0	0	0	0	0	ns	0	ns	ns	-	-	-	-
Midway Beach	9	20	39	35	23	28	37	29	20	10	28	24-May	12	14	2
Empire Spit	-	-	-	-	-	-	-	-	-	21	26	20-May	13	11	2
Graveyard Spit	6	3	18	17	28	32	ns	35	22	0	1	20-May	0	1	0
No. Willapa Bay Islands	0	0	3	0	0	ns	ns	ns	1	1	ns	-	-	-	-
Leadbetter Point	28	41	45	32	27	19	ns	17	8	15	17	23-May	8	9	0
Long Beach	0	0	0	0	0	19	ns	4	0	0	0	21-May	0	0	0
Benson Beach	0	ns	0	0	0	0	ns	0	0	0	0	22-May	0	0	0
Total	**43**	**64**	**106**	**84**	**81**	**98**	**47**	**92**	**58**	**54**	**98**		**45**	**46**	**7**

[1] Breeding population total for 2020 is considered a minimum count since several primary breeding sites were not surveyed due to coronavirus pandemic restrictions.

Breeding Adult Surveys

As indicated in Table 1, we conducted 28 total surveys at 11 sites between 20 May and 20 June 2024. WDFW staff visited Damon Point prior to the start of surveys to assess the habitat and concluded that the site continues to provide unsuitable nesting habitat for snowy plovers.

Site occupancy

Occupancy surveys were conducted at four sites: Second Beach, Ocean Shores to Ocean City, Oyhut, and Benson Beach. Second Beach and Oyhut were surveyed once, Ocean Shores to Ocean City and Benson Beach were each surveyed three times. A female plover incubating a nest was found on the Ocean Shores-Ocean City site on the last of the three surveys. In 2025, this site will be monitored three times as a known breeding location.

Estimating Number of Adult Snowy Plovers

We visited seven sites to estimate breeding abundance: Copalis Spit, Connor Creek, Midway Beach, Graveyard Spit, Empire Spit, and Leadbetter Point. Each were surveyed three times. The North Willapa Bay Islands were not surveyed in 2024 by boat, but some of the island's footprint was absorbed into the Leadbetter Point surveys due to connection of the island to the mainland in fall/winter 2023/2024.

Biologists did not detect snowy plovers on Long Beach during breeding adult surveys. Adult plovers were observed at all other surveyed sites (Table 4). The 2024 mean count of observed adults across all Washington sites was 123 (range: 98-152). This far exceeds any mean count so far. Numbers of breeding adults at Empire Spit were consistent to last year's results, but counts were approximately doubled at Copalis Spit, Connor Creek, and at Midway Beach. While biologists observed the highest number of snowy plovers at Leadbetter Point Since 2016, the 2024 counts are not directly comparable to prior years due to the addition of one of the North Willapa Bay Island to the mainland for this breeding season.

Figure 2. Breeding adult snowy plover counts from 2006 to 2024. The circles represent the average count from that year's abundance surveys. Leadbetter Point was not surveyed in 2020. Without data from Leadbetter, we were unable to estimate an average for 2020.

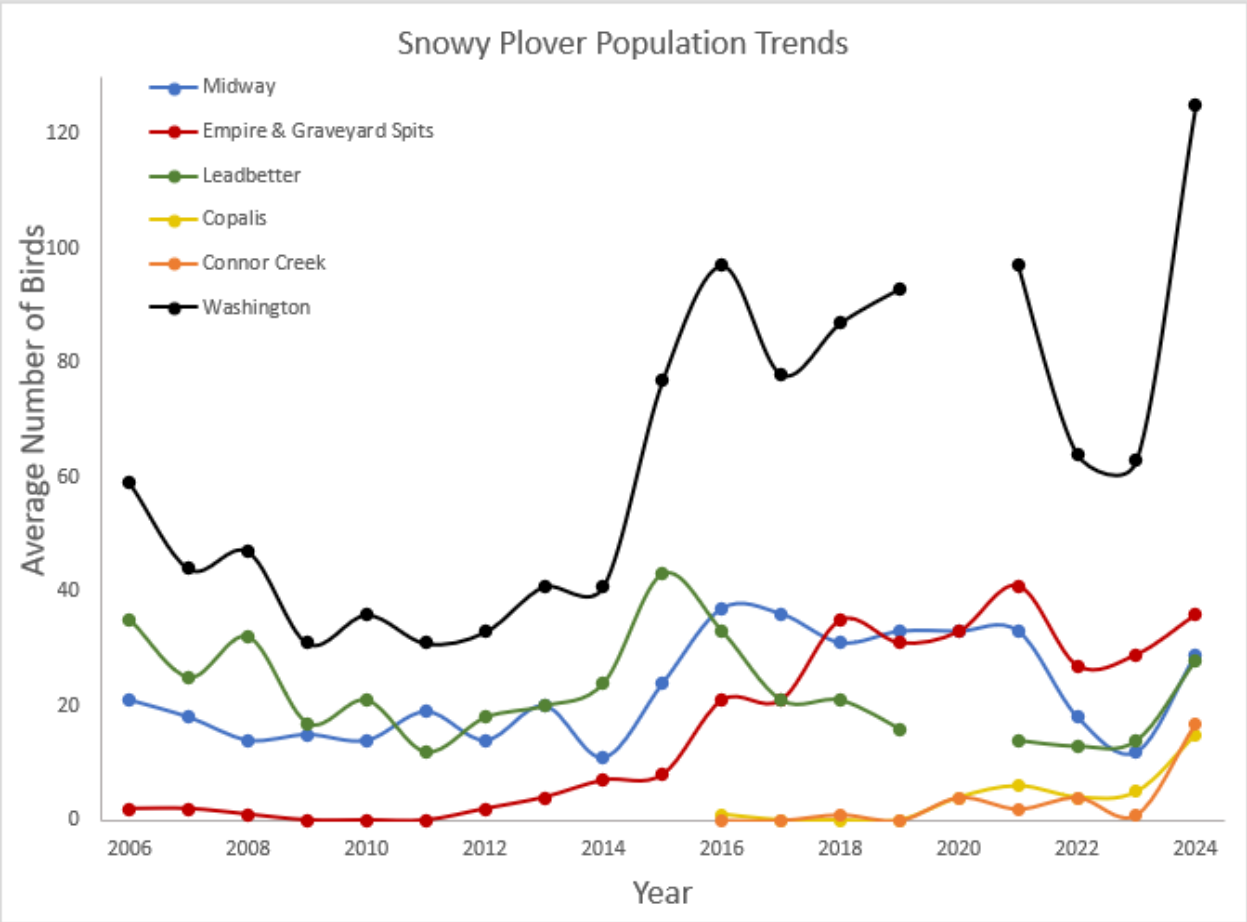


Table 4. Mean counts (range) of the breeding adults at nesting sites in Washington and the total population estimate for the State, 2006-2024. Plovers haven't been observed during a survey at Oyhut or Benson Beach since prior to 2006. "ns" indicates no survey.

Year	Copalis Spit	Connor Creek	Ocean Shores/ Ocean City	Damon Point	Midway Beach	Graveyard Spit[1]	Empire Spit[1]	No. Willapa Bay Is.	Leadbetter Point	Long Beach	Total
2006	ns	ns	ns	2 (0-2)	21 (14-28)	2 (0-5)	-	ns	35 (26-45)	ns	59 (48-70)
2007	ns	ns	ns	0	18 (14-21)	2 (0-4)	-	ns	25 (20-30)	ns	44 (36-53)
2008	ns	ns	ns	0	14 (10-19)	1 (0-2)	-	ns	32 (23-40)	ns	47 (33-60)
2009	ns	ns	ns	0	15 (13-17)	0	-	ns	17 (10-24)	ns	31 (23-39)
2010	ns	ns	ns	0	14 (11-18)	0	-	ns	21 (17-26)	ns	36 (33-38)
2011	ns	ns	ns	0	19 (8-30)	0	-	ns	12 (6-19)	ns	31 (15-47)
2012	ns	ns	ns	0	14 (5-23)	2 (0-3)	-	ns	18 (6-29)	ns	33 (15-52)
2013	ns	ns	ns	0	20 (16-24)	4 (1-6)	-	ns	20 (19-20)	ns	43 (41-45)
2014	ns	ns	ns	0	11 (9-13)	7 (6-8)	-	ns	24 (21-28)	ns	41 (40-43)
2015	ns	ns	ns	0	24 (19-33)	8 (3-11)	-	ns	43 (34-54)	ns	77 (65-98)
2016	1	0	0	0	37 (33-40)	21 (18-25)	-	3	33 (25-32)	2 (0-2)	97 (85-103)
2017	0	0	0	0	36 (35-36)	21 (18-24)	-	0	21 (14-32)	0	78 (70-86)
2018	0	1 (1-2)	1 (0-3)	0	31 (23-40)	35 (28-42)	-	0	21 (13-29)	1 (0-1)	87 (80-91)
2019	0	0	1 (0-1)	0	33 (28-39)	31 (30-32)	-	1	16 (7-21)	11 (7-19)	93 (78-100)
2020	4 (2-6)	4 (3-4)	2	0	33 (29-37)	33 (30-50)	-	ns	ns[2]	ns	65 (47-76)
2021	6 (5-7)	2 (2-3)	0	ns	33 (29-36)	41 (35-44)	-	ns	14 (12-17)	1 (0-4)	97 (92-100)
2022	1 (0-2)	4 (3-5)	0	0	18 (15-20)	27 (22-36)	-	1	13 (8-21)	0	64 (58-69)
2023	5	2 (0-4)	0	ns	12 (10-14)	0	29 (21-42)	1	14 (5-22)[3]	0	68 (54-76)
2024	15 (13-18)	15 (12-20)	1 (0-1)	ns	29 (28-31)	1 (0-2)	30 (26-50)	ns	32 (17-36)	0	123 (98-152)

[1] From 2006-2022, Empire Spit was surveyed as part of Graveyard Spit. In 2023, the two were separated into two distinct nesting areas.

[2] Incomplete survey effort due to SARS CoV-2 pandemic restrictions.

[3] Third visit to Leadbetter Point had reduced survey effort (2 surveyors) likely leading to an underestimated count.

Nest Phenology and Success

Surveys to determine nest phenology and nest success began on April 1st on Empire Spit, April 3rd on Graveyard Spit, April 5th at Midway Beach, and April 18th at Connor Creek and Copalis Spit. Surveys were conducted weekly in April and approximately every 1-3 days in May at the latter three sites. Survey effort was consistent at Empire and Graveyard Spits throughout the breeding season. Some nests at Graveyard and Empire Spit were protected using exclosures. A total of 19 nests were protected from June 20th onward, representing 28% of total nests at these two sites.

Clutch Initiation Dates

Clutch initiations and breeding phenology are typically calculated based on when the first and last nest is known to have been initiated and when the last hatched chick has fledged. The consistent monitoring that is needed to calculate this information only occurred at Empire Spit. Clutches were initiated between March 25 and July 13 in 2024.

Nest Success

WDFW, USFWS, SBIT, and ESI staff located 174 nests at seven survey locations in Washington: Copalis Spit, Connor Creek, Ocean City-Ocean Shores, Empire Spit, Graveyard Spit, Midway Beach, and Leadbetter Point (Table 5). All nests except the one found incidentally at the Ocean Shores/Ocean City were monitored every 1-3 days. Unknown fates were due to the nest disappearing without strong evidence of predation within 3 days of the calculated hatch date. In all cases of unknown fate, there were no unbanded chicks of unknown provenance found, suggesting failure either before hatching or immediately after. Chicks were documented at the third breeding survey at Leadbetter, but it is not known whether these came from earlier documented nests. In total, 23% of nests found were confirmed to have hatched, while 68% were confirmed to have failed.

Table 5. Nest outcomes by snowy plover nesting locality in 2024. Outcomes include hatched, failed, or unknown.

		Nest Outcome		
Site	# Nests Located	Hatch	Fail	Unknown
Copalis Spit	15	4	10	1
Connor Creek	24	3	19	2
Ocean Shores/Ocean City	1	0	0	1
Midway Beach	58	10	44	4
Empire Spit	63	20	43	0
Graveyard Spit	5	3	2	0
Leadbetter Point	8	0	0	8
Totals	174	40	118	16

Regular monitoring at five sites allowed for a robust look at the causes of nest failure across five sites: Copalis Spit, Connor Creek, Midway Beach, Empire Spit, and Graveyard Spit. As previously noted, 28% of nests at Empire and Graveyard Spits were protected by exclosures.

Table 6. Sources of snowy plover nest failure in 2024 for nests that failed to hatch at regularly monitored sites. Sources of failure included predators eating eggs, disturbance from human activities, wind and water, and abandonment.

		Outcome			Nest Failures										
					Predator					Other					
Site	# Nests	Hatch	Fail	Unknown	Crow	Raven	Corvid	Coyote	Undetermined	Human	Abandon	Overincubated	Sand	Tidal	Undetermined
Copalis Spit	15	4	10	1	0	0	1	1	0	0	2	0	1	4	1
Connor Creek	24	3	19	2	3	0	0	0	0	2	1	0	1	2	10
Midway Beach	58	10	44	4	0	0	6	0	4	3	6	1	0	2	22
Graveyard Spit	5	3	2	0	0	2	0	0	0	0	0	0	0	0	0
Empire Spit	63	20	43	0	0	29	13	0	0	0	1	0	0	0	0
Totals	**165**	**40**	**118**	7	**2**	**31**	**20**	**1**	**4**	**5**	**10**	**1**	**2**	**8**	**33**

Fledging Success

Fledging success is defined as the number of chicks fledged per adult male. We were able to calculate fledging success at Copalis Spit, Connor Creek, Midway Beach, Empire Spit, and Graveyard Spit. Across these sites, we estimated 53 fledged chicks (Table 7). Most chicks fledged at Empire Spit (30), followed by Midway (14). Only Copalis Spit showed 0% fledge success. Most fledges were banded with unique color bands, allowing for a more precise estimate of fledge success.

The recovery plans call for a 5-year average of 1.0 chicks/fledged male. Our statewide average figure is 1.03 chicks/fledged male. The proximity of Empire Spit and Graveyard Spit suggests that these two sites should be considered together when considering fledging success. On a site-by-site basis, Midway Beach and Graveyard and Empire Spits reached this goal.

Table 7. Fledged chicks per male for each monitored site.

		Fledging Success				
		# Males				
Site	# Fledges	Survey 1	Survey 2	Survey 3	Average	Fledges/ Male
Copalis Spit	0	6	9	6	7	0
Connor Creek	4	6	6	6	6	0.7
Midway Beach	14	12	9	14	12	1.2
Graveyard and Empire Spits	35	13	22	12	15.6	2.24
Totals	**53**	**37**	**46**	**38**	**10.15**	**1.035**

Predator Management

In 2024, WDFW initiated a 3-year study to understand the impacts of predator management strategies on plover nest and fledging success. As part of this research, Midway Beach was selected as a treatment site, and Empire Spit was selected as a control site. Conner Creek and Copalis Spit were also monitored using the same methodology for potential inclusion as control sites. The study design requires that we alternate years where predator management occurs on the treatment site. Midway Beach was the only site where predator management occurred in 2024. Between 26 April and 25 July, USDA removed one common

raven and nine American crows, and they dispersed at least 32 crows. Results for the three-year study will be available in 2026.

Habitat Restoration and Vegetation Sampling

At Leadbetter Point, 21 acres of beach were cleared of *Ammophila* beachgrass using a bulldozer and disk prior to the start of the breeding season. An additional 266-acres on refuge and state park lands that had previously been cleared and treated with herbicide was disked to reduce the density of resprouting beachgrass. Herbicide was applied to reduce *Ammophila* on 150 acres of refuge land and 33 acres of State Park land at Leadbetter Point.

Habitat restoration work on Empire Spit was minimal and restricted to the new berm by hand removal of all non-native vegetation. Six pink sand verbena plants were transplanted from seed propagation containers to randomly selected areas of the berm. All plants grew to flowering maturity.

At Copalis Spit, nine acres of *Ammophila* beachgrass was treated with herbicide. This is part of a larger restoration project (by State Parks) that aims to remove nonnative beachgrass at the north end of Copalis Spit to expand available nesting habitat for snowy plovers. 2024 was the second year that work was completed on this project.

PROGRESS ON RECOVERY OBJECTIVES

Federal Recovery Objectives

Objective 1: 250 breeding adults in Recovery Unit 1

The 2024 Washington nesting population was 123 (range = 98-152), while the historically monitored Southern Oregon nesting population reached 470 (Lauten et al. 2024) for a total of 593 nesting adult snowy plovers in Recovery Unit 1 (Table 8).

Table 8. **Estimated number of breeding adult snowy plovers in Recovery Unit 1 by year.**

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
526 (514-547)	622 (614-632)	546 (538-554)	589 (582-591)	595 (580-602)	532 (514-543)	623 (616-628)	572 (566-577)	538 (529-543)	593 (440-640)_

Objective 2: A 5-year average productivity of at least 1.0 fledged chick per adult male

The average number of chicks fledged per adult male in Oregon's southern sites traditionally monitored by ORBIC was 0.76 in 2024, which gives the state an average of 0.66 chicks fledged per adult male over the past five years (Table 9). This estimate (and fledging rates in Table 9) does not include data from more newly occupied sites in central and northern Oregon, nor from Washington, as we did not produce productivity estimates from 2019 to 2022. While 2024 estimates from Washington are not comprehensive since they do not include Leadbetter Point figures, the state's average number of fledged chicks per male is 1.03.

Table 9. **Estimated number of chicks fledged per breeding adult male in southern Oregon by year.**

	2015	2016[1]	2017	2018	2019	2020	2021	2022	2023	2024
Chicks fledged/male	1.51	0.60	0.90	1.03	1.07	0.79	0.62	0.35	0.79	0.76

[1] In 2016, Oregon changed their methodology for estimating fledging success, moving to a sampling strategy.

Washington State Recovery Objectives

Downlisting objective 1: A 4-year statewide average of at least 25 breeding pairs

We estimated there were 123 (range = 98-152) adult nesting snowy plovers in Washington during the 2024 nesting season and approximately 45 of these birds were males. Assuming all of these males were paired, we estimate there were 31-34 breeding pairs in Washington (Table 10). As each of the last four years has exceeded 25 breeding pairs, we are clearly meeting this recovery objective.

Table 10. Estimated number of paired breeding males in Washington (2015-2021).

	2015	2016	2017	2018	2019	2020[1]	2021	2022	2023	2024
Breeding males	35-55	43-57	28-51	34-37	36-62	-	47-53	28-32	31-34	37-46

[1]We do not have an estimate for 2020 due to reduced survey effort on account of COVID-19 restrictions.

Downlisting objective 2: Fledge at least one young per pair per year, at two or more nesting areas with secure habitat.

Table 11 presents the average number of young fledged per adult male in Washington. While the 2024 results do not include the primary nesting area at Leadbetter Point, the average number of young fledged per adult male is calculated for the nesting sites of Empire and Graveyard Spits, Midway Beach, and Conner Creek and Copalis Spit. WDFW's resumption of productivity monitoring in 2024 at Midway Beach, and ESI's monitoring at newly re-occupied sites at Copalis Spit and Connor Creek provide new insight, but future years of monitoring, including at Leadbetter Point, are still required to assess the status toward this recovery goal.

Table 11. Estimated number of chicks fledged per adult male in Washington (2013-2018, 2024).

	2013	2014	2015	2016	2017	2018	2024
Fledge rate	1.04 (0.92-1.18)	1.88 (1.67-2.13)	1.74 (1.24-2.2)	0.96 (0.74-1.21)	1.70 (1.55-1.83)	0.76 (0.65-0.93)	1.03 (0.87-1.17)

Delisting objective 1: The average population reaches 40 breeding pairs at three or more secure nesting areas.

None of the current breeding areas have reached this objective population threshold. Without clear definition on what constitutes a "secure nesting area", we cannot determine when this objective has been achieved.

2024 MANAGEMENT ACTIONS

Management actions that occurred in 2024 involved minimizing human activities near active snowy plover nesting sites during the nesting season, outreach, habitat restoration, and predator management. Human activity can lead to direct and indirect mortalities of eggs, chicks, and adults. Pedestrians and vehicles may crush eggs or chicks and push adults off nests, exposing their eggs to extreme temperatures, blowing sand, and predators (US. Fish and Wildlife Service 2007, Stinson 2022). Heavily trafficked sections of a beach may discourage use of otherwise-suitable nesting habitat (U.S. Fish and Wildlife Service 2007). Restricting access to dry sand portions of the beach where nesting occurs during the breeding season can help reduce the impacts of human disturbance on nesting activity.

Many predators, notably corvids in Washington, have increased in numbers along the coast, attracted by trash, offal from fish and shellfish harvests, and other waste left by human beachgoers. Removing or dispersing corvids near plover nesting areas can mitigate the impacts of artificially augmented predator populations and increase plover nesting and fledging success (U.S. Fish and Wildlife Service 2007, Stinson 2022).

Encroachment of invasive beach grasses (*Ammophila arenaria, Ammophila brevigulata,* and their hybrid) and other invasive vegetation has been one of the main drivers of snowy plover habitat degradation. *Ammophila* spp. outcompete native beach grasses, changing the geomorphology of Washington's beaches (U.S. Fish and Wildlife Service 2007, Stinson 2022). Removal of invasive vegetation through mechanical and chemical methods can restore or enhance nesting areas, though regular management is necessary to maintain restored beaches.

Nest Site Protection

In an effort to protect nests from human activities, suitable habitat is closed to public entry during the breeding season. Sites that are not listed below did not have any nest site protection.

- Copalis Spit
    - Approximately 1.0 miles of upper beach were signed to prohibit public access along the north end of the Copalis Spit, the primary nesting area of plovers at this site.
- Connor Creek
    - Signs were installed at the north end of Connor Creek to restrict human access on the upper portions of the beach where plovers nest. Approximately 0.85 miles of upper beach were signed. No driving is allowed at this site except limited shellfish harvest dates for tribal members.
- Midway Beach
    - An estimated 2.7 miles were posted and signed to prohibit public access on the upper portions of the beach. On two occasions, when nests were located outside of these signed areas, land managers allowed us to place signage around individual nests.
- Empire Spit
    - 1.9 miles of beach was signed to prohibit public access to approximately 230 acres of plover habitat.

  Graveyard Spit
    - Nearly 20 acres of nesting habitat was signed prohibiting entrance by the public; all signage was located on tribal reservation land.
- Leadbetter Point
    - Approximately 8.0 miles of public beach were demarcated with signs on PVC posts to restrict human access onto the upper, dry sand portions of the beach where plovers nest.
    - During a 26-week period, symbolic fencing, totaling over 1,500 feet in length, was placed along three hiking trails that access the beach to prohibit public access.

Vehicle and Recreation Restrictions

- Copalis Spit
    - Fireworks are prohibited year-round.

  - Motor vehicles are prohibited year round, except authorized vehicles and Tribal members on tribal clam dig days.

- Connor Creek
  - From 2nd Avenue to Heath Road, motor vehicles are prohibited between 15 April and the day after Labor Day, except during authorized razor clam dig hours.
  - North of Heath Road, the beach is closed to vehicle traffic year-round, except authorized vehicles and Tribal members on tribal clam dig days.
  - Fireworks are prohibited year-round on sections of the beach where State Parks is the upland landowner.
- Midway Beach:
  - Fireworks are prohibited year-round on sections of the beach where State Parks is the upland landowner.
- Leadbetter Point:
  - Coastal beaches in the National Wildlife Refuge are closed to vehicle traffic year-round except during recreational clam harvests. Driving is allowed on the wet sand portions of these beaches during spring and winter recreational razor clam harvests. Driving is restricted in the Seashore Conservation Area from Oysterville Road to Leadbetter Point State Park from 15 April to the day following Labor Day.
  - Dogs are not permitted on Refuge lands.
  - Overnight camping and fires are prohibited on the Refuge and the State Park at Leadbetter Point. Campfires on State Park managed beaches are not permitted in driftwood or within 100 feet of the dunes.
  - Fireworks are prohibited at Leadbetter Point all year round.

Predator Management

- Predator management occurred only at Midway Beach in 2024.
- Between 26 April and 25 July, USDA removed one common raven and nine American crows, and dispersed at least 32 crows.

Habitat Restoration

- Copalis Spit
  - Nine acres of *Ammophila* beachgrass was treated with herbicide on the northern tip.
- Empire Spit/Graveyard
  - Minimal habitat restoration activities were conducted in 2024, with the exception of hand-pulling *Ammophila* beachgrass on the dike at Empire Spit. In addition, 6 pink sand verbena plants were planted.
- Leadbetter Point:
  - Twenty-one acres were disked and bulldozed to treat *Ammophila* beachgrass prior to the start of the breeding season.
  - An additional 266 acres on Refuge and State Park lands that had previously been cleared was disked to reduce the density of resprouting beachgrass.

    - Herbicide was applied to reduce *Ammophila* on 150 acres of National Wildlife Refuge land and 33 acres of State Park land.

- No habitat restoration was conducted with Section 6 funds.

Clam Tides

- Washington Department of Fish and Wildlife coordinated most law enforcement activities, especially during clam tides.
- Washington State Parks and US Fish and Wildlife Service provided additional law enforcement patrols.
- Eight days in April and four days in May were open to recreational clamming at Midway Beach.
- Twelve days in April and 6 days in May were open to recreation clamming on the Long Beach Peninsula (Leadbetter Point, Long Beach, and Benson Beach).
- Six days in April and three days in May were open to recreation clamming from Ocean Shores north to Copalis Spit.
- Outreach material focused on Snowy Plovers was provided at the Long Beach Clam Festival in May 2024.

Law Enforcement

- Washington Department of Fish and Wildlife coordinated law enforcement activities with State Park rangers and U.S. Fish and Wildlife law enforcement officers.
- Refuge law enforcement patrols were conducted periodically during the nesting season.
- WDFW staff patrolled nesting areas during holidays and clam digging tides

Outreach

- Willapa NWR social media posts and website content included information about snowy plovers at Leadbetter Point.
- Trailside shorebird interpretive signs were previously installed at locations around the Long Beach Peninsula and Willapa Bay.
- WDFW paid for public service announcements (PSAs) leading up to Earth Day with information on how to avoid disturbing nesting snowy plovers while recreating on Washington beaches. These PSAs coincided with dates and times when large numbers of recreational clam diggers were expected to be located on beaches where nesting plovers are found.
- WDFW staff presented at a Fireside Chat at Grayland Beach State Park for the seasonal campers.

DISCUSSION

The estimated number of breeding adults (123) in 2024 far exceeds any prior estimate since monitoring began in Washington. Leadbetter Point and Midway Beach both returned to average numbers seen over a decade ago. Additionally, the newly altered habitat at Empire Spit continued to attract large numbers of plovers for the second year. Finally, the increase of plovers in Grays Harbor County at Copalis Spit and Connor Creek surely contributed to this high total.

Robust monitoring efforts at five sites offers new insights as to the status toward recovery metrics. For the first time since 2018, we were able to estimate fledging success for all occupied sites with the exception

of Leadbetter Point and Ocean City/Ocean Shores. Biologists banded most chicks at five monitored sites, allowing for precision and confidence in our fledging rate estimates. This fledging success rate, 1.03, partially meets our federal and state recovery objectives, though more years of monitoring are required to assess the five-year average. In addition, this level of monitoring allowed us to collect sufficient data to contribute to an assessment of nest success and brood survival in response to predator management strategies. This work will be completed at the end of three years of monitoring.

While monitored sites showed a high number of breeding adults and met our recovery objective for fledging success, hatch success was still quite low at only 23% of nests confirmed to have hatched. The hatch rate was highest at Empire and Graveyard Spits (31% and 60%, respectively), which can be partially explained by the use of nest exclosures on some nests at each site. Nest monitoring reveals that corvids have the highest contribution to nest failure of any failure type across all sites.

Finally, increased presence due to these monitoring efforts provided some insights as to human disturbance issues at these sites, including at sites not previously monitored for nest or brood success at Copalis Spit and Connor Creek. Five total nests were confirmed to have failed due to human intervention. Three of these were due to drivers running over the nests in vehicles, and another from an e-bike or cart. One was due to the removal of driftwood adjacent to the nest. All nest failures attributed to human disturbance occurred in areas signed for nesting area closures. In 2025, WDFW will provide additional funds to increase signage and outreach based on these observations in 2024.

Recent documentation of snowy plover activity as far north as the northwestern Olympic Peninsula and Vancouver Island, British Columbia indicates that plovers could be breeding further north, outside of our current survey area. We attempted in 2024 to work with partners further north to assess plover distribution throughout other available habitat in Washington. As a result, we were able to incorporate surveys conducted by Quileute biologists at one additional site outside of known traditional plover nesting habitat in Washington, at a site that offers potential nesting habitat. In 2025, WDFW and partners with the U.S. Navy, Quileute and Hoh tribes will further expand our plover monitoring efforts, covering at least four additional potential sites in Grays Harbor and Clallam Counties.

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APPENDIX

Starting and ending locations of Washington's snowy plover surveys.

Site	Starting Point	Ending Point
Second Beach	47.892513, -124.629210	47.880963, -124.610122
Copalis Spit	47.12125, -124.183306	47.137667, -124.182889
Connor Creek	47.070500, -124.177296	47.12125, -124.183306
Ocean Shores to Ocean City	46.965668, -124.175174	47.070611, -124.177167
Oyhut	46.946333, -124.132667	46.940389, -124.154778
Damon Point	46.947458, -124.129992	46.939395, -124.106865
Midway Beach	46.793751, -124.103754	46.745019, -124.093880
Graveyard Spit	46.727794, -124.044786	46.723772, -124.031169
Empire Spit	46.722478, -124.029036	46.704367, -123.987911
Willapa Bay Islands	46.659108, -124.033663	46.675329, -123.963650
Leadbetter Point	46.627972, -124.0715	46.647361, -124.053778
Long Beach	46.548333, -124.061333	46.367722, -124.056778
Benson Beach	46.271541 -124.074397	46.296730, -124.075963