Washington State Snowy Plover Population Survey Report 2020 Field Season







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March 2021

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Recommended Citation:

Sundstrom, Cyndie, William Ritchie, Anthony Novack, and Scott Pearson, 2021. Washington State snowy plover population survey report, 2020 Field Season. Washington Department of Fish and Wildlife, Region 6, Wildlife Program, 48 Devonshire Road, Montesano, WA.

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PREFACE

Due to the COVID-19 pandemic, the State of Washington was directed by its Governor to implement a statewide restriction of activities to prevent the spread of disease in March 2020. Washington Department of Fish and Wildlife, along with their snowy plover surveying partners (U.S. Fish and Wildlife Service, Washington State Parks and Recreation, Shoalwater Bay Tribe) implemented additional restrictions and precautionary measures to limit the possible human-to-human transmission of disease. All coastal beach accesses were temporarily closed and citizens were directed to stay home. As a result, the 2020 survey season and monitoring efforts were reduced. Survey efforts were only performed where and when permitted by the various entity partners.



(Photo by William Ritchie)

This report reflects only the surveys and limited observations performed during the breeding season. Very limited data analysis will be offered for the 2020 season and any data comparisons of the 2020 season to previous years' data should be done cautiously.

OVERVIEW

During the 2020 western snowy plover (*Charadrius nivosus nivosus*) nesting season, the number of breeding adult snowy plovers were counted at most of the known breeding sites in Washington. Limited management activities included restriction human access to nesting sites, predator management, and restoring nesting habitat. The following is a summary of some of the 2020 activities and results:

Breeding Range

- We conducted 18 breeding surveys at 7 sites in two counties between 19 May and 19 June 2020 either to assess site occupancy status or to count the total number of adults.
- Snowy plovers were found at Copalis Spit, Connor Creek, Ocean Shores, Midway Beach, and Graveyard Spit.
- Breeding adult snowy plovers were observed at Long Beach and Leadbetter Point though comprehensive surveys were not conducted.

Breeding Window Survey

- We counted a minimum of 47 plover for the areas surveyed.
- No surveys were conducted at Graveyard Spit or the Long Beach Peninsula.

Nests

• Active nests were found or known to exist at Long Beach, Leadbetter Point, Graveyard Spit, Midway Beach, Connor Creek, and Copalis Spit. Twenty (20) nests total from all locations were discovered. No nest monitoring occurred.

Fledging Success

• A minimum of thirteen (13) locally fledged chicks (>28 days old = juveniles) were observed. Because nest and brood monitoring did not occur, the average number of chicks fledged per male cannot be calculated for the 2020 season.

Management Actions

- *Signing*: In an effort to protect nests from human activities, approximately 8.0 miles of beach at Leadbetter Point and approximately 2.6 miles of publicly owned beach (Washington State Parks Seashore Conservation Area) at Midway Beach were signed to restrict human access to critical nesting areas. The Shoalwater Bay Tribe posted approximately 15 acres of beach used by nesting snowy plover at Graveyard Spit.
- *Clam tides*: Washington Department of Fish and Wildlife allowed razor clam harvests in the early months of 2020 and cancelled all remaining digs after mid-March due to COVID-19 restrictions.
 - Long Beach: During the snowy plover breeding season (April 1st September 15th), no razor clam digging occurred. The only scheduled digs were: 13 days in January, 11 days in February, and 6 days in early March. Additional digs in mid to late March were cancelled.
 - <u>Midway Beach</u>: No razor clam digging occurred during the plover breeding season. Clam digging was allowed for 13 days in January, 11 days in February, and 6 days in early March which occurred before the nesting season begins.
- *Nest Predation:* Wildlife specialists with USDA APHIS Wildlife Services on both Leadbetter Point and Midway Beach conducted some limited Predator Management in 2020. Management actions consisted of dispersing birds or performing targeted lethal removal of known snowy plover nest and chick predators (corvids) in or adjacent to the plover nesting areas. Results typically suggest that this activity is successful in increasing nest hatching rates and fledging rates.

• *Habitat Restoration:* The Willapa National Wildlife Refuge staff worked to remove invasive plants at Leadbetter Point from January to March. Twenty (20) acres at the north end of the peninsula was cleared of beachgrass, gorse, and Scot's broom and an additional 90 acres on previously cleared portions of the Refuge and State Park were disked.

INTRODUCTION

The Pacific coastal population of the western snowy plover (*Charadrius 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 Midway Beach, 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 do not 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, introduced beachgrass (*Ammophila* spp.), and expanding predator populations have resulted in a decline in active nesting areas and in the size of the breeding and wintering populations".

Historically, five known areas supported nesting snowy plovers in Washington (Washington Department of Fish and Wildlife 1995). During the 2006 nesting season, there were four nesting locations: Leadbetter Point, Midway Beach (Grayland vicinity), Graveyard Spit, and Damon Point. During the 2007 and 2008 nesting season, three nesting sites were occupied, Leadbetter Point, Midway Beach, and Graveyard Spit. In nesting seasons from 2009-2019 Leadbetter Point and Midway Beach were occupied, and Graveyard Spit was occupied in 2012-2019, but not in 2009-2011. Nests have been found recently on Long Beach in 2018 and 2019. Nest searching on the north Willapa Bay islands was inconsistent until annual breeding season surveys were initiated in 2016. Nests have been found on several different islands in 1995-1998, 2016, and 2019. The 2020 surveys found that breeding adults are now nesting north of Ocean Shores. We observed successful nesting and fledging at Griffiths-Priday State Park (Copalis Spit) for the first time since 1984.

Both the federal and state recovery plans require monitoring of breeding adults and monitoring of fledging success to assess progress toward the recovery goals as outlined in the *Washington State Recovery Plan for the snowy plover (1995)*. During the 2020 season, we were unable to complete many of the monitoring requirements needed to determine number of nests, chicks, fledglings, and calculation of chicks fledged per male.

The primary objectives for the 2020 nesting season were to:

- Conduct winter window surveys in conjunction with a range-wide survey effort.
- Conduct adult breeding window surveys in conjunction with a range-wide survey effort.
- Conduct occupancy surveys at Copalis Spit, Connor Creek, Ocean Shores, and Damon Point/Oyhut Spit.
- Estimate snowy plover adult breeding population for Washington from limited breeding surveys.
- Identify those areas where nesting is occurring either through ongoing survey efforts or reports from independent reliable citizen scientists/enthusiasts.
- Identify potential plover predators and communicate predator observations to USDA APHIS Wildlife Services for both Leadbetter Point and Midway Beach.
- Produce this report that summarizes survey methods used, numbers of breeding adults, likely hatching success, and new areas of nesting activity.

This report summarizes the progress of these objectives.

METHODS

Study Areas

During the 2007 and 2008 nesting seasons, three sites were occupied by breeding snowy plovers, Leadbetter Point, Graveyard Spit, and Midway Beach (Table 1). From 2009-2011, snowy plovers nested at two sites, Leadbetter Point and Midway Beach. During the 2012-2018 breeding seasons, snowy plovers nested at Leadbetter Point, Midway Beach, and Graveyard Spit. During this period, nests were also discovered on two separate islands north of Leadbetter Point, one in 2016 and the other in 2019.

Leadbetter Point and Midway Beach are dune backed beaches and have an exceptionally wide area that is unvegetated or sparsely vegetated and is 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 restored habitat composted of sand and oyster shell landward of the foredune (habitat restoration area or HRA).

Graveyard Spit is located on the north shore of Willapa Bay. The nesting habitat at this site consists of a sparsely vegetated low-lying sand spit, with hummocks and swales, and unvegetated deflation plains adjacent to salt marsh communities, as well as a man-made sand berm constructed for the protection of the nearby community. Because the berm is primarily constructed of sand, the snowy plovers have found this a suitable location for nesting.

Table 1. Approximate locations and land ownership/management of the 2020 snowy plover primary nesting localities in Washington.

Site	Approximate Location	Ownership/Management
Midway Beach	46° 45' 32"N, 124° 05' 46"W	Washington State Parks and Recreation
Leadbetter Point	46° 36' 24"N, 124° 03' 25"W	Leadbetter Point State Park, Willapa National Wildlife Refuge
Graveyard Spit	46° 42' 57"N, 124° 01' 25"W	Shoalwater Bay Indian Reservation (trust and fee land), DNR/State Parks, Private

In 2020, nesting was observed at Griffiths-Priday State Park (Copalis Spit) for the first time since 1984 (USFWS, 2007). This site consists of a long sandy beach with densely vegetated dunes (primarily *Ammophila spp.*) and sparsely vegetated dunlets between the Copalis River and the Pacific Ocean.

Site Occupancy

Our goal was to determine snowy plover abundance and trend at sites that are currently occupied. For sites where we have failed to detect snowy plovers in the recent past but are most likely to become reoccupied due to suitable habitat and relatively close proximity to occupied sites, we conducted surveys to assess site occupancy status. 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 to determine if it is being used as a nesting site, and that those visits occur between early to mid-May and the end of the first week of July. Following that recommendation, there is an 87% - 99% probability of correctly determining site occupancy. Since 2012, all Washington sites conformed to a protocol of three attempted surveys per breeding season.

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 and the USFWS selects the dates for any given year. Participants follow the methods of Elliot-Smith and Haig (2006b). In 2020, the window survey was scheduled for January 14 - 21. However, due to extreme weather conditions, it was necessary to postpone some surveys. We surveyed Copalis Spit, Connor Creek, Ocean Shores to Ocean City, Oyhut Spit, Damon Point, Midway Beach, Graveyard Spit, Leadbetter Point, Long Beach, and Benson Beach between January 27 and February 11.

Breeding Window Survey

The breeding window survey occurs annually in late May along the entire U.S. Pacific coastline where snowy plovers are known to nest. The specific dates for a particular year are selected by the USFWS and all participants follow the methods of Elliot-Smith and Haig (2006a). In 2020 the window survey occurred between May 12 and 22. Only Midway Beach, Damon Point, Oyhut Spit, Ocean Shores/Ocean City, Connor Creek, and Copalis Spit were surveyed. Due to COVID-19 restrictions, none of the Long Beach Peninsula locations (Benson Beach, Long Beach, Leadbetter Point, Willapa Bay Islands) and Graveyard Spit were surveyed.

Breeding Adult Surveys and estimating breeding adult population

In addition to the range-wide breeding window survey, we conducted two additional breeding adult surveys at occupied sites identified during the first survey (Midway Beach, Ocean Shores/Ocean City, Connor Creek, Copalis Spit), two surveys at Graveyard Spit after approval by the Tribe and following COVID-19 safety protocols, and one additional survey at non-occupied sites in Grays Harbor county (Damon Point, Oyhut Spit). We completed those additional surveys between June 1 and 19. 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. We used these two to three surveys to derive estimates of breeding adult abundance which can be found in the *Results & Discussion* section.

Table 2. Starting and ending locations,	, survey types and number	of surveyors for each	<mark>ו 2020</mark>
survey site in Washington.			

Site	Starting Point	Ending Point	Number of	Survey Type
			Surveyors	
Copalis Spit	47°07'16.5", 124° 10' 59.9"	47° 08' 15.6", 124° 10' 58.4"	1	Foot
Connor Creek	47° 04' 14.2", 124° 10' 24"	47° 07' 16.5", 124° 10' 59.9"	1 to 2	Vehicle, Foot
Ocean Shores to				
Ocean City	46° 57' 12.7", 124° 10' 31.8"	47° 04' 14.2", 124° 10' 24"	2	Vehicle
Damon Point	46° 56' 05", 124° 09' 18"	46° 56' 11", 124° 06' 18"	1	Foot
Oyhut Spit	46° 56' 46.8", 124° 07' 57.6"	46° 55' 58.4", 124° 09' 12.2"	1	Foot
Midway Beach	46° 47' 38", 124° 05' 55"	46° 44' 07", 124° 05' 29"	4 to 5	Foot
Graveyard Spit	46° 43' 33", 124° 03' 07"	46° 42' 25", 124° 00' 36"	4	Foot

RESULTS & DISCUSSION

Winter Window Survey

We detected 75 adult snowy plovers at two sites during the January 2020 Winter Window Survey (Table 3).

										2020
Site	2012	2013	2014	2015	2016	2017	2018	2019	2020	Survey Date
Copalis Spit	0	0	0	0	0	0	0	0	0	Jan. 28
Conner Creek	0	0	0	0	0	0	0	0	0	Jan. 28
Ocean Shores/										
Ocean City	-	-	-	-	-	4	10	0	9	Jan. 28
Oyhut Spit	-	0	0	0	0	0	0	0	0	Jan. 30
Damon Point	0	0	0	0	0	0	0	0	0	Jan. 30
Midway Beach	22	24	22	22	31	22	28	58	66	Jan. 27
Graveyard Spit	0	0	0	0	0	0	0	0	0	Jan. 30
Leadbetter										
Point ¹	12	6	45	0	28	34	12	15	0	Feb. 11
Long Beach ¹	0	0	0	0	10	6	0	7	0	Feb. 10
Benson Beach	-	-	0	-	0	0	0	0	0	Jan. 20
Total	34	30	67	22	69	66	50	80	75	

Table 3.	Winter	Window	survey	counts by	v site and	vear.
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¹ Inclement weather conditions and severe high tides prevented these surveys from being conducted earlier

Efforts were made to perform the winter surveys within the scheduled time period, but a series of strong weather systems hampered those efforts from Washington to California. All assigned sites were eventually surveyed, with the highest priority sites surveyed first.

Breeding Window Survey

We detected 47 adult snowy plovers in Washington during the 2020 breeding window survey with a higher proportion of males than female. Snowy plovers were detected at three sites where only sporadic observations have been in the past (Table 4). There were no surveys conducted at the Long Beach sites or Graveyard Spit location. Overall counts at Midway Beach increased from 2019 and the 2020 was only the second highest count for that site.

Site	2014	2015	2016	2017	2018	2019	2020		2020 3	Survey	
							•	Date	Male	Female	Unk.
Copalis Spit	0	0	1	0	0	0	4	20-May	2	1	1
Conner Creek	0	0	0	0	0	0	4	20-May	2	2	0
Ocean Shores/ Ocean City	N/A	N/A	N/A	N/A	3	0	2	20-May	1	1	0
Midway Beach	9	20	39	35	23	28	37	19-May	23	13	1
Damon Point	0	0	0	0	0	0	0	22-May	0	0	0
Oyhut Spit	0	0	0	0	0	0	0	22-May	0	0	0
Graveyard Spit	6	3	18	17	28	32	N/A	-	-	-	-
No. Willapa Bay Islands	0	0	3	0	0	N/A	N/A	-	-	-	-
Leadbetter Point	28	41	45	32	27	19	N/A	-	-	-	-
Long Beach	0	0	0	0	0	19	N/A	-	-	-	-
Benson Beach	0	N/A	0	0	0	0	N/A	-	-	-	-
Total	43	64	106	84	81	98	47*	-	28	17	2

Table 4. Breeding Window survey counts by site, sex, and age between 2014 and 2020.

N/A =not available because area was not surveyed

* minimum count

Because breeding window surveys were not conducted at two of the major breeding locations (Long Beach and Graveyard Spit), the total count for 2020 is likely not a true reflection of the state population.

Breeding Adult Surveys

As indicated in Table 5, we conducted 18 surveys at 7 sites between May 19 and June 19, 2020. Fewer surveyors/observers were utilized during these surveys at both Midway Beach and Graveyard Spit than in previous years' surveys due to COVID-19 safety restrictions and staffing availability.

Site occupancy

We conducted occupancy surveys at five sites to assess snowy plover presence/absence on suitable and/or historically occupied sites (Table 5). Snowy plovers were found at three of the five sites and were observed nesting or locally hatched/fledged chicks or juveniles were observed.

Site	Type of Survey	#	#	Walking or	Survey Dates			
		Surveys	Surveyors	Driving	-			
Copalis Spit	Window/Occupancy	3	1	foot	5/20, 6/02, 6/16			
Connor Creek	Window/Occupancy	3	1-2	foot/drive	5/20, 6/01, 6/16			
Ocean Shores/Ocean City	Window/Occupancy	3	1-2	drive	5/20, 6/01, 6/16			
Oyhut	Window/Occupancy	2	1	foot	5/22, 6/03			
Damon Point	Window/Occupancy	2	1	foot	5/22, 6/03			
Midway Beach	Window/Breeding Adult	3	4-5	foot	5/19, 6/02, 6/17			
Graveyard Spit	Window/Breeding Adult	2	4	foot	6/05, 6/19			

Table 5. Snowy plover survey dates, number of surveys and surveyors and type of survey by site during the 2020 nesting season.

Estimating Number of Adult Snowy Plovers

We used the mean from the two to three surveys conducted in 2020 to estimate trends in the breeding adult population, rounding all estimates to the nearest whole bird (Table 6). Adult population counts declined precipitously from 2006 to 2011 then began increasing. The total population from 2011 through 2019 estimate has increased steadily. However, the population appears to have increased only slightly since 2015. Counts at Midway Beach remain relatively stable since 2015 while Graveyard Spit counts have increased dramatically since 2012 and there has been a decline in the number of birds at Leadbetter Point.

Year	Midway Beach	Graveyard Spit	Leadbetter Point	Long Beach	N. Willapa Bay Is.	Ocean Shores/ Ocean City	Connor Creek	Copalis Spit	Total
2006	21 (14-28)	2 (0-5)	35 (26-45)	N/A	N/A	N/A	N/A	N/A	59 (48-70) ¹
2007	18 (14-21)	2 (0-4)	25 (20-30)	N/A	N/A	N/A	N/A	N/A	44 (36-53)
2008	14 (10-19)	1 (0-2)	32 (23-40)	N/A	N/A	N/A	N/A	N/A	47 (33-60)
2009	15 (13-17)	0	17 (10-24)	N/A	N/A	N/A	N/A	N/A	31 (23-39)
2010	14 (11-18)	0	21 (17-26)	N/A	N/A	N/A	N/A	N/A	36 (33-38)
2011	19 (8-30)	0	12 (6-19)	N/A	N/A	N/A	N/A	N/A	31 (15-47)
2012	14 (5-23)	2 (0-3)	18 (6-29)	N/A	N/A	N/A	N/A	N/A	33 (15-52)
2013	20 (16-24)	4 (1-6)	20 (19-20)	N/A	N/A	N/A	N/A	N/A	43 (41-45)
2014	11 (9-13)	7 (6-8)	24 (21-28)	N/A	N/A	N/A	N/A	N/A	41 (40-43)
2015	24 (19-33)	8 (3-11)	43 (34-54)	N/A	N/A	N/A	N/A	N/A	77 (65-98)
2016	37 (33-40)	21 (18-25)	33 (25-32)	2 (0-2)	3	0	0	1	93 (85-103)
2017	36 (35-36)	21 (18-24)	21 (14-32)	13 (0-13)	0	0	0	0	78 (70-86)
2018	31 (23-40)	35 (28-42)	21 (13-29)	1 (0-1)	0	1 (0-3)	1 (1-2)	0	87 (80-91)
2019	33 (28-40)	31 (30-32)	16 (7-21)	11 (7-19)	1	1	0	0	93 (78-100) ²
2020	33 (29-37)	33 (30-35)	N/A	N/A	N/A	2	4 (3-4)	4 (2-6)	65 (47-76)*

Table 6.	Mean counts (range) o	f the breeding a	adults at nesting	sites in Washington	and the total
populati	on estimate for the Stat	e, 2006-2020.	-	-	

¹ 2006 total includes 1 adult (range 0-2) encountered at Damon Point

² 2019 total includes 1 adult (range 0-1) encountered at Ocean Shores

N/A = not available because area was not surveyed * incomplete survey data

With no surveys conducted at the Leadbetter Point and Long Beach areas, the total number of plovers detected in 2020 is a minimum count and does not accurately reflect the entire Washington breeding population due to incomplete survey effort.

Clutch Initiation Dates and Breeding Phenology

The nesting season typically occurs between late April and mid-September each year. COVID-19 restrictions and the suspension of nest monitoring since 2018 by WDFW results in incomplete information needed to estimate annual fecundity or breeding populations. Shoalwater Bay Tribe personnel at Graveyard Spit and Biologist William Ritchie at USFWS Willapa National Wildlife Refuge continue to monitor nests and chicks post-hatching but usually at a reduced level since 2019.

Nest success

Twenty (20) nests were found, either during surveys or by actual nest searching (Graveyard Spit only). Nest monitoring did not occur for any nest. Fifteen nests were discovered at Graveyard Spit and 1 nest each at Leadbetter Point, Long Beach, Midway Beach, Connor Creek, and Copalis Spit. We don't know if the single nests at Long Beach, Connor Creek, and Copalis Spit did not hatch due to predation, or abandonment. The 15 nests at Graveyard Spit and the single nests discovered at Midway Beach and Leadbetter Point had unknown outcomes.

Fledging Success

Fledging success is defined as the number of chicks fledged per adult male. Given the incompleteness of surveys at all known nesting locations and the inability to conduct nest searches and monitor broods, there is a lack of data to calculate fledging success (chicks fledged/male).

However, from anecdotal and observed fledglings/juveniles, we know chicks did fledge from most locations. The following observations were noted for the 2020 breeding season:

- Leadbetter Point: observation of one brood consisting of 2 juveniles
- Graveyard Spit: 10 chicks observed with a minimum of 5 juveniles known to have fledged
- Midway Beach: observation of 1 fully fledged juvenile during a survey
- Ocean Shores to Ocean City: anecdotal information from a citizen scientist observing 2 juveniles with a tending adult (1 brood)
- Connor Creek: anecdotal information from same citizen scientist observing a brood of 2 almost fledged juveniles with a tending adult
- Copalis Spit: observation and confirmation by WDFW Biologist and Washington State Parks employees of 5 juveniles (3 broods) – 2 broods with 2 juveniles each and 1 brood with 1 juvenile; 1 brood with 2 juveniles was tended by a banded adult that was observed during all 3 surveys at Midway Beach. As a result, it is unclear where the accompanying juveniles originated.

Based on these observations, it suggests that seventeen (17) chicks may have fledged. At a minimum thirteen (13) chicks >28 days old fledged. The observations at the Ocean Shores/Ocean City and Connor Creek sites made by the citizen scientist on July 9th & 10th, although credible, were made nearly a month and a half before the confirmed banded adult with 2 juveniles were observed on August 26 at Copalis Spit. It is possible that at least 2 of the 4 juveniles observed by the reporting party may be the same juveniles. Consequently, we estimate fifteen (15) chicks fledged from all known sites.

Predator Management

Predator management began at Leadbetter Point in 2013 and at Midway/Grayland Beach in 2014. Activities of the USDA APHIS Wildlife Service Specialist is focused on identifying predators that are most likely preying on plovers or their eggs and then either dispersing or lethally removing the targeted predator species (Table 7).

Predator management occurred at Midway/Grayland Beach and Leadbetter Point in 2020. Typically refuge staff and WDFW biologists who work during the active plover nesting season would communicate with Wildlife Service Specialists to focus management activities on locations and individual predators that were apparently causing the most plover depredations but that was not possible this season. Without the specific knowledge and observations of staff, Wildlife Services management activities were solely

based on their observations of predator activities at plover nesting sites, then conducting targeted dispersal or lethal removal as appropriate (Table 8).

		Leadbet	ter Point		M	idway/Gra	yland Beac	h
	American Crow Common Raven		America	n Crow	Commo	n Raven		
Year	Dispersed	Killed	Dispersed	Killed	Dispersed	Killed	Dispersed	Killed
2013	60	32	13	18	-	-	-	-
2014	63	30	16 11		248	25	11	13
2015	33	11	15	8	16	2	2	8
2016	35	9	11	4	33	2	8	4
2017	38	11	11	11 7		12	6	3
2018	3	1	17 5		19	8	9	6
2019	42	9	9	5	22	7	2	6

Table 7. Number of avian predators dispersed or killed by year (2013- 2019).

Table 8. Avian and mammal predators or perceived threats/disturbances to snowy plovers dispersed or killed, 2020.

Leadbetter Point							
American Crow		Common Raven		Gull spp.	Bald Eagles	Turkey Vultures	Coyotes
Dispersed	Killed	Dispersed	Killed	Dispersed ONLY			
69	1	20	4	1317	40	12	9
Midway/Grayland Beach							
American Crow		Common Raven		Gull spp.	Bald Eagles	Turkey Vultures	Coyotes
Dispersed	Killed	Dispersed	Killed	Dispersed ONLY			
14	0	0	0	0	0	0	0

2020 MANAGEMENT ACTIONS

A number of the management actions that occurred in 2020 involved minimizing some human activities near active snowy plover nesting sites during the nesting season. Human related disturbance negatively affects hatching success of snowy plovers (Warriner et al. 1986, Schulz and Stock 1993) and snowy plover chick survival by as much as 72% (Ruhlen et. al. 2003). Disturbances to wintering snowy plovers are 16 times higher at a public beach than at a protected beach. Humans, dogs, American crows, and other birds are the main sources of disturbance (Lafferty 2001). In addition, snowy plover feeding rates declined in response to disturbance (Lafferty 2001). Human disturbance negatively affects hatching rates and chick survival for various plover species (Flemming et al. 1988, Buick and Paton 1989, Dowling and Weston 1999).

Management

• *Nest site protection* – In an effort to protect nests from human activities suitable habitat is closed to public entry during the breeding season.

- Approximately 8.0 miles of public beach at Leadbetter Point were demarcated with signs and PVC posts to restrict human access onto the upper, dry sand portions of the beach, thus protecting nesting birds. In an effort to protect nests at Midway Beach, approximately 2.6 miles were posted and signed to restrict human access on the upper portions of the beach. Access restrictions on private land occurred at one parcel on Midway Beach were permitted by the landowner. Approximately 15 acres of nesting habitat was signed at Graveyard Spit along with nearly 8,000 feet of roping to restrict human activities. Shoalwater Bay Tribe worked with a private landowner on the spit to provide a walking path through the protected area to minimize human disturbance to nesting plovers.
- *Clam Tides* Recreational razor clam digs occurred at both Long Beach, which includes Leadbetter Point, and Twin Harbors, which includes Midway Beach. None of those digs occurred during the plover breeding season.
 - There were 30 recreational razor clam days at both Long Beach and Twin Harbors in 2020. Because of the governors COVID-19 order to 'Stay Home, Stay Healthy', all subsequent tentative razor clam digs were cancelled and all beach entrances along the Washington coast were barricaded and closed to all public vehicle access. Portable toilets were placed on the beach for the two April dates.
 - Due to the beach closures and cancellation of upcoming clam digs, it was not necessary to place portable toilets on the beach at Long Beach.
 - There were no Tribal clam harvests permitted at Graveyard Spit.
 - Outreach In past seasons, public outreach has been done to promote plover conservation and information prior to and during the nesting season. Those efforts included radio advertising during razor clam digs, a public radio program "Willapa Nature Notes" produced by The Friends of Willapa NWR, a shorebird ambassador program conducted by The Friends of Willapa NWR, media posts about plover activities, brochure distributions by WDFW to recreational clam diggers ("Razor Clamming and Nesting Birds"), and the annual 'Wings over Willapa' birding festival were all cancelled due to COVID-19. However, one public outreach messaging did occur:
 - Radio public service announcements promoting the protection of nesting plovers were aired during the July 4th holiday
- Predator Management
 - Wildlife specialists with USDA APHIS Wildlife Services on both Leadbetter Point and Midway Beach conducted predator management in 2020. Management actions began in March and continued until the end of May. Predator management consisted of dispersing birds or performing targeted lethal removal of known nest and chick predators (primarily corvids) in or adjacent to the plover nesting areas in order to improve nest and fledging success.
- *Vehicle Restrictions* –Beach accesses in Pacific County were closed to all vehicle traffic on March 22nd following orders of the governor. Re-opening of those accesses varied by area and jurisdiction, but most were re-opened May 18. In a typical year, vehicular beach access is permitted as:
 - Coastal beaches at Willapa NWR and Leadbetter Point State Park are closed to vehicle traffic year-round. However, driving is allowed on the wet sand portions of these beaches during razor clam harvests.

- The Midway Beach area is open to vehicle traffic <u>year-round</u> except during and just prior to the July 4th holiday. There are vehicle <u>beach</u> access points at Cranberry Beach Road to <u>the north</u> and Warrenton-Cannery Road to the south.
- Graveyard Spit is closed to all motorized vehicles from April 15th through Labor Day each year.
- Overnight camping and fires are prohibited on the Refuge and the State Park at Leadbetter Point. Fireworks are prohibited at Midway Beach and Leadbetter Point during and preceding the July 4th holiday. Campfires on State Park managed beaches are not permitted in driftwood or within 100 feet of the dunes.

Habitat Restoration

Leadbetter Point

The Willapa National Wildlife Refuge equipment operators concluded another successful season in March working to remove invasive plants at Leadbetter Point. Twenty acres (20) at the north end of the peninsula was cleared of beachgrass, gorse, and Scot's broom. Ongoing disking of previously cleared portions of the Refuge and State Park covered more than 90 acres. It typically takes three to four years to complete habitat restoration from when an area is initially cleared of beachgrass.

DISCUSSION

The Recovery Unit snowy plover population continues to grow and emigration (primarily from Oregon) is increasing the Washington population. Prospecting young birds were observed along the north Oregon coast and have re-colonized at least one of the most northerly historical nesting sites along the Washington coast; these areas that have not seen nesting plovers for decades. Although overall, federal Recovery Unit goals have been met and the Washington adult population appears to trend upward, the productivity in Washington may be showing early signs for concern. Emigration from the south could help explain an increasing Washington population while productivity lags behind Oregon.

Due to a lack of nest monitoring, it is unclear if Washington's population is being maintained by local production or immigration from the south. As a result, we cannot assess the effectiveness of local predator management.

Due to the pandemic, this was a challenging season to gather the data needed to assess the status of Washington's breeding population.

Washington State Parks has taken a proactive approach to protect the re-populated historical nesting habitat at Griffiths-Priday State Park in Copalis. Beginning in 2021, the Park intends to post and sign a designated perimeter of nesting habitat to exclude human activities in hope that breeding snowy plovers will return to nest. A discussion amongst a larger group of all land managers may be needed to address what, if anything, should be done regarding monitoring and protection of plover nests at new and historic locations as the potential for further northward nesting locations is sought. It may be advisable for managers to conduct a landscape-scale assessment of potential suitable habitats and identify critical beaches that can serve as long-term population source locations. We recommend defining what constitutes a "secure site" and determine the number and location of sites considered "secure" to sustain a viable population in Washington.

ACKNOWLEDGMENTS

We would like to thank those who participated in surveys, monitoring, and anecdotal observations during this difficult season. Members of WDFW staff who assisted in surveys were: Cyndie Sundstrom, Anthony Novack, Warren Michaelis, Derek Stinson, Lauren Bauernschmidt, and Taylor Cotton. Shoalwater Bay Tribe surveyors included Larissa Ritzman, Richard Ashley, and Savannah Walker. Others who assisted during this season were Hope Rieden (Confederated Tribes of the Chehalis Reservation), Washington State Parks personnel Joseph Fernandez, Linda Kunze, Miles Wenzel, and Evan Roberts. Volunteer Russ Lewis cleaned trash from nesting beaches at Leadbetter and Jim Danzenbaker, citizen scientist, who provided anecdotal plover sightings on the north Washington coast. Martha Jensen has been extremely helpful with advice, funding assistance, logistics, and helping us comply with Endangered Species Act requirements. Brook Zscheile Wildlife Services (USDA APHIS) provided effective and professional predator management support. Thank you all!

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