

CDFW-OSPR Seabird Program Annual Report 2021



Photo Credit: Laird Henkel (CDFW)

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BACKGROUND AND OBJECTIVES

The essential functions of the California Department of Fish and Wildlife (CDFW) Office of Spill Prevention and Response (OSPR) Seabird Program are to investigate and monitor the health and pathology of marine birds to support to the best achievable care of oiled wildlife and detect emerging threats to seabird populations. This includes coordination with beached bird monitoring programs and wildlife rehabilitation organizations to monitor the trends and causes of mortality of seabirds. We investigate the occurrence and cause of unusual mortality events of seabirds and shorebirds through scientifically structured postmortem exams at the OSPR Marine Wildlife Veterinary Care & Research Center (MWVCRC), sometimes in coordination with the CDFW Wildlife Health Lab and the USGS National Wildlife Health Center. The CDFW-OSPR Seabird Program includes: Seabird Program Leader: Cori Gible, MS, PhD; MWVCRC Veterinary Pathologist: Melissa Miller DVM, MS, PhD, and MWVCRC Facility Director: Laird Henkel, MS.

In addition, we monitor the effects of chronic and unusual oiling events for marine wildlife. We coordinate these investigations with the the Oiled Wildlife Care Network (OWCN), and the OSPR Petroleum Chemistry Laboratory. The Seabird Program also maintains veterinary supplies and inventory related to oiled marine bird stabilization at the MWVCRC, coordinates with the OWCN, and assists in oil spill readiness and response for oil spills in California.

ANNUAL SUMMARY

Health and Pathology Studies

In 2021, the COVID-19 pandemic continued and prompted laboratory closures and disruptions in collection efforts at some times. Shipping and receiving of carcasses was often slowed and delayed. Collection and reporting of seabird carcasses by beach survey organizations (BeachCOMBERS and Beach Watch) were intermittently delayed due to canceled surveys depending on local and federal volunteer restrictions for the ongoing pandemic.

Twenty-eight seabirds and shorebirds received postmortem exams at the MWVCRC in 2021 (Table 1), additional information on most of these exams is listed below. Postmortem exams were completed via systematic necropsy, which includes external examination, morphometrics, photographs, internal

examination, sampling of organs and tissues, and if warranted, radiographs, histopathology, and/or sample testing. Necropsy reports are available upon request.

Northern Fulmars (Early 2021 and Late 2021)

There were two northern fulmar (*Fulmarus glacialis*) mortality events with birds examined in 2021. The first event involved birds recovered in early 2020 (March - May) from Monterey and Santa Cruz Counties. Delayed necropsies were conducted in January 2021 due to the ongoing pandemic and associated restrictions in 2020. The birds examined ranged in age class and sex, and were all in emaciated condition body condition (Table 1.). The cause of the observed emaciation is unknown, but starvation due to low prey availability and/or inclement weather conditions is possible. Northern fulmars feed primarily on cephalopods (Donnelly-Greenan et al. 2014). No gross evidence of disease was found.

The second mortality event began in December 2021. These birds were recovered during a mass stranding event at Manchester Beach in Mendocino County. International Bird Rescue admitted over 40 northern fulmars from this event (<https://www.birdrescue.org/puzzling-influx-of-northern-fulmars/>). Some birds examined in care were found to have a novel gyrovirus, although this may not have been attributed to the stranding event (R. Duerr, pers. comm.). The majority of the birds in care were noted to be severely underweight and did well in care after feeding. Over half of the birds were released. Birds examined via necropsy at MWVCRC did not have gross signs of the novel gyrovirus or any other disease. All birds were juvenile and severely emaciated (Table 1). The cause of the mass stranding event is unknown.

Clark's and Western Grebes and Brandt's Cormorants (Spring 2021)

During the Spring of 2021 (March through May)-Clark's and western grebes (*Aechmophorus clarkii/occidentalis*) and Brandt's cormorants (*Urile penicillatus* in care at the Santa Barbara Wildlife Care Network (SBWCN) and the Society for the Prevention of Cruelty for Monterey County (MSPCA) were noted to have neurological signs. At the time of intake, weekly harmful algal bloom sampling at Stern's Wharf and Monterey Wharf both indicated the presence of *Pseudo-nitzschia* sp. in the water samples. This chain forming diatom produces the neurotoxin domoic acid (DA), which causes known interactions with seabirds. We examined 5 grebes at 2 cormorants at the MWVCRC (Table 2). All examined birds were adult age class and in good body condition, with the exception of 2 birds (21-0127,

21-0130) that were considered to be in thin body condition. There was vascular congestion noted in all examined birds. Because *Pseudo-nitzschia* sp. were present in the marine environments and gross signs were indicative of potential DA interactions, the livers (n=7) of examined birds were tested for DA at the University of California, Santa Cruz, Kudela Laboratory. Domoic acid was found in 85% of tested birds (6/7; Table 2.). The cause of the observed emaciation is unknown; however, the vascular congestion may be attributed to presence of domoic acid in the body (Gibble et al. 2018, Gibble et al. 2021). No other gross evidence of disease was found.

Common Murres (UCSC Collaboration)

Four common murres (*Uria aalge*) were examined in 2021 at the MWVCRC in collaboration with the University of California, Santa Cruz (UCSC). These birds were originally collected in 2020 after they were admitted to rehabilitative care at the MSPCA. Birds submitted for examination were recovered from Monterey County (Table 1.). Two were female, 2 were male, 3 were juvenile and one was adult. All examined birds exhibited signs of emaciation, including completely depleted subcutaneous and internal adipose, and atrophied skeletal muscle, characterized by a concave pectoral muscle complex, atrophied internal organs and empty gastrointestinal tracts. Marked intestinal melena was also common. The cause of the observed emaciation is unknown, but starvation due to low prey availability, and/or foraging inexperience due to younger age class (for 3 of 4 examined birds) are possibilities. No gross evidence of disease was found. Sami Michishita, a MS student at UCSC, used stomach samples from these birds to complete her thesis project, which evaluated the potential for microplastics to be found in the gastrointestinal tracts of common murres. We worked collaboratively with Sami on this task and participated in necropsy and tissue sampling as part of our role. This work was completed in 2022. Sami's thesis was entitled: Presence and the potential hormonal disrupting capacity of microplastics in a coastal system and has been submitted for publication. Michishita et al. (in press) found one quarter (23%) of particles from murre digestive tracts (3 out of 13) contained microparticles that exhibited estrogenic activity.

Snowy Plovers (Year-round 2021)

Six western snowy plovers (*Charadrius nivosus*; SNPL) were submitted for necropsy in 2021. Examined birds were collected from various locations throughout the state ranging from Hayward Regional Shoreline (Alameda County) in the north to Oceano Dunes State Vehicular Recreation Area (ODSVRA; San Luis Obispo) in the south. Birds varied by sex (male and female) and age class (Table 1. 21-0238, 21-

0239, 21-0240, 21-538, 21-539, 21-0540) Presumptive cause of death included unknown (presumptive: congenital disease), acute trauma (presumptive: predation), acute crush trauma (presumptive: vehicular), acute trauma (presumptive: human interaction). Final reports are available upon request.

Least Terns (Summer 2021)

Two California least terns (*Sternula antillarum*; LETE) were submitted for necropsy in 2021. Both examined LETE were submitted from Oceano Dunes State Vehicular Recreation Area (ODSVRA), and both were chicks from known nests (21-0241, 21-0242), one chick was banded (21-0242 I:w/o). Both chicks were found to have a presumptive cause of death attributed predation events where evidence of abrasions, bruising, hemorrhage, and fractures were present. Final reports for these two birds are available upon request.

Individually Oiled Birds (year-round)

We worked directly with two beach survey programs, BeachCOMBERS (Moss Landing Marine Laboratories and US Fish and Wildlife Service, Beach Coastal Ocean Mammal and Bird Education and Research Surveys) and Beach Watch (Greater Farallones National Marine Sanctuary), to better document oiled seabirds statewide. Each month each organization reported all oiled birds found on their monthly beach surveys to help us better track frequency of oiled birds in California in real time (Table 3.). A total of 30 oiled birds were reported in 2021 from the BeachCOMBERS program and 0 from Beach Watch. The greatest number of oiled birds was reported in May (n=13), and no oiled birds were reported from either program in January, February, March, August, September, November, or December.

TECHNICAL REPORTS, PUBLICATIONS AND PRESENTATIONS

Although most in person meetings continued to be curtailed in person, Cori was able to virtually attend the California Seabird Coordination Annual Meeting in February 2021, where she discussed updated findings.

Two major publications were published in 2021.

Gibble, C.M., Kudela, R.M., Knowles, S., Bodenstein, B. and Lefebvre, K.A., 2021. Domoic acid and saxitoxin in seabirds in the United States between 2007 and 2018. *Harmful Algae*, 103, p.101981.
<https://doi.org/10.1016/j.hal.2021.101981>

Gibble, C.M., Neuman, K.K. and Beck, J., 2021. Demography, morphometrics, and stomach contents of common ravens examined as a result of controlled take. *Human–Wildlife Interactions*, 15(3), p.15.

LITERATURE CITED

Donnelly-Greenan, E.L., Harvey, J.T., Nevins, H.M., Hester, M.M. and Walker, W.A., 2014. Prey and plastic ingestion of Pacific northern fulmars (*Fulmarus glacialis rogersii*) from Monterey Bay, California. *Marine Pollution Bulletin*, 85(1), pp.214-224.

Michishita, S., Gibble, C.M., Tubbs, S., Felton, R., Gjeltmad, J., Lang, J., and Finkelstein, M., (in press). Microplastic in northern anchovies (*Engraulis mordax*) and common murrelets (*Uria aalge*) from the Monterey Bay, California USA: insights into prevalence, composition, and estrogenic activity. *Environmental Pollution*.

Table 1. CDFW OSPR Seabird Program Necropsies Completed in 2021. For age classes HY = hatch year (chick), J=juvenile, Ad=Adult, U = Unknown. For sex classes, F = female and M = male.

Necropsy Number	Date Found	Species	Age / Sex	Collection Location	County	Presumed COD
21-0024	4/10/2020	northern fulmar	J / F	Carmel Beach	Monterey	emaciation
21-0025	3/28/2020	northern fulmar	A / F	Del Monte Beach	Monterey	emaciation
21-0026	5/9/2020	northern fulmar	J / M	Seaside State Beach	Monterey	emaciation
21-0027	3/9/2020	northern fulmar	U / U	Carmel Beach	Monterey	emaciation
21-0028	3/6/2020	northern fulmar	A / F	Greyhound Rock SB	Santa Cruz	emaciation
21-0126	5/12/2021	Clark's grebe	A / F	Hollywood Beach	Ventura	HAB interaction
21-0127	5/7/2021	western grebe	A / M	Dear Creek Beach	Ventura	HAB interaction
21-0128	5/11/2021	western grebe	A / M	Ventura Harbor	Ventura	HAB interaction
21-0129	5/11/2021	western grebe	A / M	Mussel Shoals Beach	Ventura	HAB interaction
21-0130	5/10/2021	western grebe	A / F	Point Mugu	Ventura	HAB interaction
21-0131	3/22/2021	Brandt's cormorant	A / F	San Carlos Beach	Monterey	HAB interaction
21-0132	3/23/2021	Brandt's cormorant	A / M	Fisherman's Wharf	Monterey	HAB interaction
21-0238	4/29/2021	snowy plover	HY / U	Fort Ord State Beach	Monterey	acute trauma
21-0239	4/29/2021	snowy plover	HY / U	Fort Ord State Beach	Monterey	acute trauma
21-0240	6/15/2021	snowy plover	HY / U	Oceano Dunes SVRA	San Luis Obispo	congenital
21-0241	7/14/2021	least tern	HY / U	Oceano Dunes SVRA	San Luis Obispo	crush trauma
21-0242	7/6/2021	least tern	HY / U	Oceano Dunes SVRA	San Luis Obispo	crush trauma
21-0357	11/25/2020	common murre	J / F	Monastery Beach	Monterey	emaciation
21-0358	10/2/2020	common murre	J / M	Pacific Grove	Monterey	emaciation
21-0359	10/2/2020	common murre	J / F	Del Monte Beach	Monterey	emaciation
21-0360	9/28/2020	common murre	A / M	Cannery Row	Monterey	emaciation
21-0538	5/4/2021	snowy plover	A / M	Hayward Shoreline	Alameda	acute trauma
21-0539	9/22/2021	snowy plover	A / U	Oceano Dunes SVRA	San Luis Obispo	crush trauma
21-0540	10/3/2021	snowy plover	J / F	Oceano Dunes SVRA	San Luis Obispo	crush trauma
21-0541	12/12/2021	northern fulmar	J / F	Manchester Beach	Mendocino	emaciation
21-0542	12/12/2021	northern fulmar	J / M	Manchester Beach	Mendocino	emaciation
21-0543	12/12/2021	northern fulmar	J / M	Manchester Beach	Mendocino	emaciation
21-0544	12/12/2021	northern fulmar	J / M	Manchester Beach	Mendocino	emaciation

Final reports and gross necropsy reports are available upon request.

Table 2. Results of liver samples tested for domoic acid (DA). Toxin analysis was performed at the University of California, Santa Cruz, Kudela Laboratory.

<u>Necropsy ID</u>	<u>Species</u>	<u>Toxin Analyzed</u>	<u>[DA] ng/g</u>
21-0126	Clark's grebe	domoic acid	1.681
21-0127	westerngrebe	domoic acid	0
21-0128	westerngrebe	domoic acid	0.7
21-0129	westerngrebe	domoic acid	1.965
21-0130	westerngrebe	domoic acid	2.781
21-0131	westerngrebe	domoic acid	3.136
21-0132	Brandt's cormorant	domoic acid	5.151

Table 3. Individual oiled birds found on systematic beach surveys from the BeachCOMBERS program in 2021.

Month	Species	Location	County	Organization
April	common murre	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
April	Brandt's cormorant	McGrath State Beach	Ventura	BeachCOMBERS
April	northern fulmar	McGrath State Beach	Ventura	BeachCOMBERS
April	common murre	La Selva Beach	Santa Cruz	BeachCOMBERS
April	pigeon guillemot	McGrath State Beach	Ventura	BeachCOMBERS
April	western grebe	McGrath State Beach	Ventura	BeachCOMBERS
May	northern fulmar	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
May	common murre	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
May	unidentified loon	McGrath State Beach	Ventura	BeachCOMBERS
May	northern fulmar	McGrath State Beach	Ventura	BeachCOMBERS
May	unidentified loon	McGrath State Beach	Ventura	BeachCOMBERS
May	common loon	McGrath State Beach	Ventura	BeachCOMBERS
May	Clark's/western grebe	McGrath State Beach	Ventura	BeachCOMBERS
May	Clark's/western grebe	McGrath State Beach	Ventura	BeachCOMBERS
May	Clark's/western grebe	McGrath State Beach	Ventura	BeachCOMBERS
May	common loon	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
May	common murre	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
May	rhinoceros auklet	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
May	red-throated loon	Moss Landing State Beach	Monterey	BeachCOMBERS
June	common murre	Morro Bay Sandspit	San Luis Obispo	BeachCOMBERS
June	northern fulmar	Manresa State Beach	Santa Cruz	BeachCOMBERS
June	Brandt's cormorant	Hollywood Beach	Ventura	BeachCOMBERS
June	Sooty Shearwater	NBVC Holiday Beach	Ventura	BeachCOMBERS
June	northern fulmar	Silver Strand Beach	Ventura	BeachCOMBERS
June	red-throated loon	Moss Landing State Beach	Monterey	BeachCOMBERS
July	brown pelican	McGrath State Beach	Ventura	BeachCOMBERS
July	western grebe	McGrath State Beach	Ventura	BeachCOMBERS
October	brown pelican	McGrath State Beach	Ventura	BeachCOMBERS
October	northern fulmar	McGrath State Beach	Ventura	BeachCOMBERS
October	unidentified cormorant	McGrath State Beach	Ventura	BeachCOMBERS