



Photo: A. O'Connor



Photo: A. Nelson

Seabird Monitoring in Oregon's Marine Reserves

A COMMUNITY SCIENCE PROJECT

Background

Portland Audubon, U.S. Fish & Wildlife Service and partners (listed below) are monitoring seabird nesting colonies adjacent to two of Oregon's five Marine Reserve/Marine Protected Area complexes:

- Since 2014 at Cape Perpetua marine Protected Area & comparison area (Yaquina Head)
- Since 2016 at the Cape Falcon Marine Reserve & comparison area (Haystack Rock)

Objectives

Science: Monitoring breeding success of nearshore, piscivorous (fish-eating) seabird populations in the Cape Falcon and Cape Perpetua Marine Reserve/Marine Protected Areas and compare to nearby seabird colonies outside of the MR/MPAs.

Outreach: Promote wider recognition of Oregon's marine reserves and seabird conservation through local community participation, outreach and education.

Study Species

We monitor nests of **3 cormorant species** (see photos). Cormorants are common colonial nesters and build grass or stick nests.

At Cape Perpetua we count **Rhinoceros Auklets** and **Pigeon Guillemots** in Sea Lion Caves (except for in 2020 and 2021 due to COVID-19). These birds nest in rock crevices so we can't see their nests.



Marine Reserves are areas that prohibit any extractive uses (e.g. fishing) in order to conserve marine habitats and biodiversity.

Marine Protected Areas allow for some extractive uses.

Non-consumptive uses (e.g. kayaking, surfing) are welcome in the reserves.



Photo: J. Cruce

Double-crested Cormorant

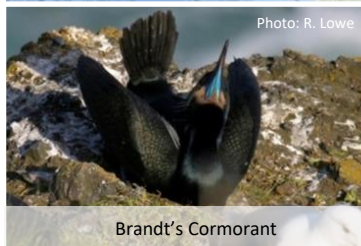


Photo: R. Lowe

Brandt's Cormorant



Photo: J. Liebezelt

Pelagic Cormorant





Photo: A. Anholt

How do we monitor seabird nests?

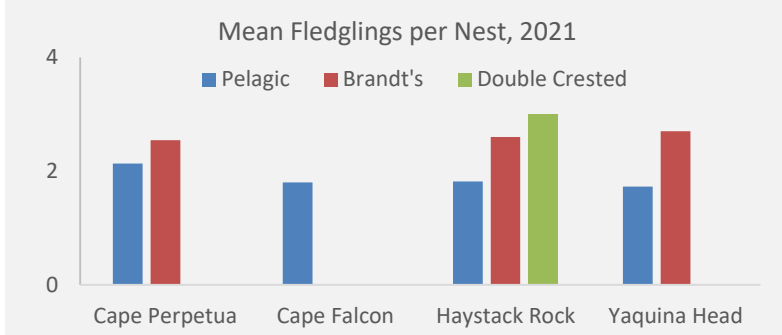
- We select a subset of cormorant nests in a colony to monitor. We label these nests on photos so they are easy to relocate.
- Colonies are monitored weekly from June to September by trained volunteers, a USFWS intern and Portland Audubon biologists.
- When adult birds get off their nests we count the eggs or chicks in the nest. Nests that fail (don't produce chicks) are recorded as well.
- We estimate chick size so we can determine the expected date they will be able to fly (fledge).
- Breeding productivity is calculated as the average number of fledglings produced per nest.
- We also monitor avian predators, whales that pass by, and weather conditions.



Photo: P. Englemeyer

2021 Monitoring Results:

- 34 trained volunteers assisted in monitoring from June through mid-September, including 12 days at Cape Perpetua and 7 days at Cape Falcon.
- At Cape Perpetua we followed 58 cormorant nests (42 Brandt's, 9 Pelagic, 7 Double-crested) and saw 147 chicks (107 Brandt's, 19 Pelagic, 21 Double-crested) fledge (can fly).
- At Cape Falcon we monitored 20 nests (all Pelagic) and saw 36 chicks fledge from our monitored nests.



Breeding productivity (average fledglings per nest) was relatively high in 2021, averaging 2.3 fledglings per nest for all three species of cormorants at Cape Perpetua and Cape Falcon. However, monitored colonies exhibited high inter-colony variability in breeding success, with most nests failing before monitoring began at the usually productive Cape Falcon. Despite the early failures remaining nests had high comparative success relative to prior years. While colony failure at Cape Falcon occurred pre-monitoring and thus not captured in monitoring data, overall colony failure is represented by the relatively low species distribution and sample size of nests monitored compared to prior years. The comparison colony at Haystack Rock exhibited slightly higher breeding success for Brandt's and Pelagic Cormorants. Sample sizes were low across the board, a combination of early-season nest failure at Cape Falcon, and COVID-related site accessibility issues at multiple plots typically monitored at both Cape Falcon and Cape Perpetua. 2022 will hopefully represent a return to relative normality.

Species and Loc.	No. Nests	Eggs / Chicks	Nests w/ Hatch Success	Nests w/ Fledge Success	Chicks per Nest (M±SE)	Fledglings per Nest* (M±SE)	No. Chicks at 25 days
Brandt's (CF)	0	0	NA	NA	NA	NA	0
Brandt's (HR)	7	NA / 15	78%	78%	2.07±0.59	2.60±0.50	13
Brandt's (CP)	42	14/123	97%	90%	2.92±0.14	2.54±0.17	50
Brandt's (YH)	33	no data	no data	87%	2.27	2.7	75
Pelagic (CF)	20	13/37	80%	65%	1.85±0.26	1.80±0.46	36
Pelagic (HR)	23	NA / 50	96%	83%	2.17±0.18	1.82±0.21	42
Pelagic (CP)	9	29/21	89%	89%	2.33±0.33	2.13±0.35	19
Pelagic (YH)	37	no data	no data	82%	2.59	1.73	64
Double-crested (CP)	7	NA / 23	100%	93%	3.2±0.18	3.0±0.00	21

Table 1. Summary Statistics from our 2021 Cape Perpetua (CP) and Cape Falcon (CF) sites and comparison colonies at Haystack Rock (HR) & Yaquina Head (YH). Egg counts are low at many sites because many nests were hard to see into.



Photo: A. O'Connor



Photo: F. Buchanan



Photo: A. O'Connor

Interannual Comparison

For all cormorants we have seen high interannual variability in breeding success. Many factors can affect breeding success including weather, climate events (e.g. El Niño), food availability and predation. The past two years the COVID-19 pandemic resulted in decreased access to sites, which also had an effect on the data as presented. In general, Double-crested cormorants have consistently had the highest breeding success compared to the other species across years. The first 2 years of this project (2014-15) the north Pacific had higher than normal surface water temps ("warm blob") which is believed to have negatively affected availability of seabird prey (forage fish). While we do see some lower productivity in those years (e.g. Double-crested Cormorants) this pattern is not consistent across species and years. Regardless, long-term monitoring could help shed light on such phenomena.



Photo: A. O'Connor

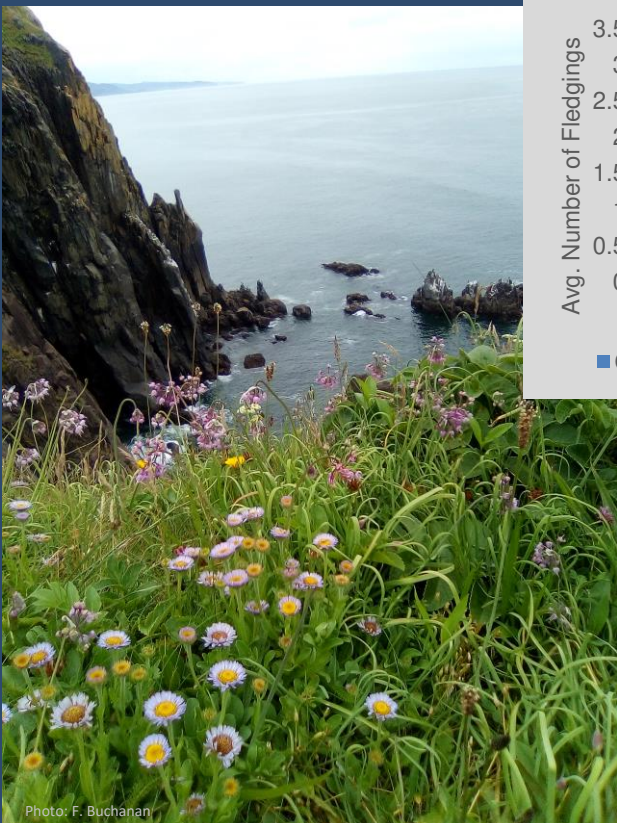
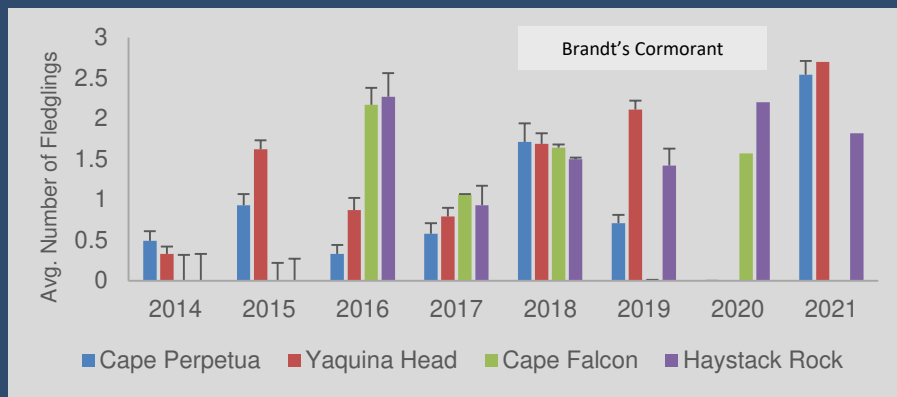
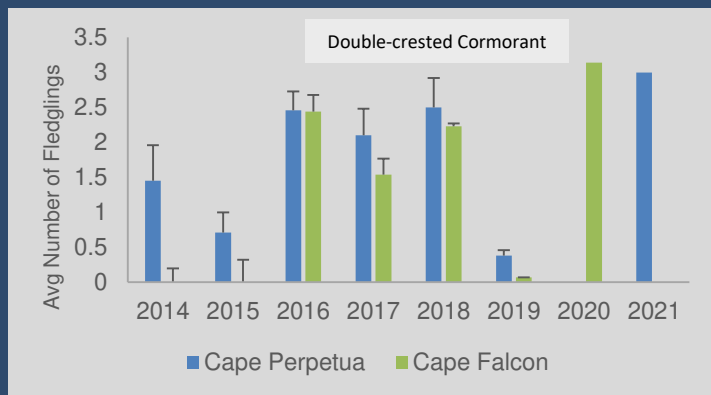
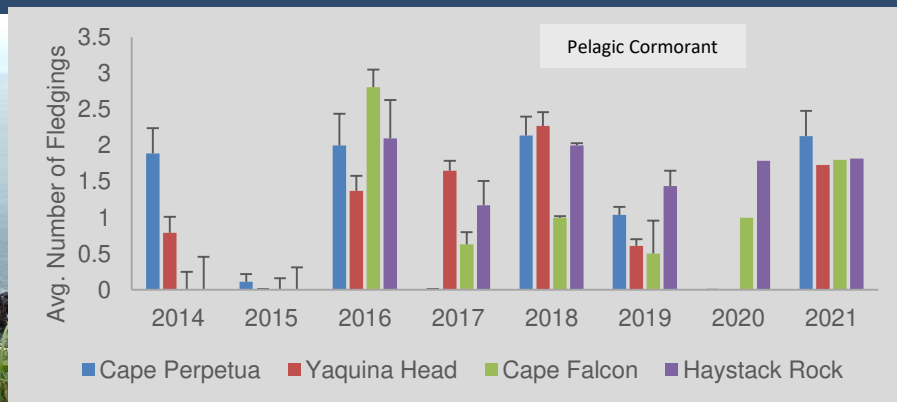


Photo: F. Buchanan



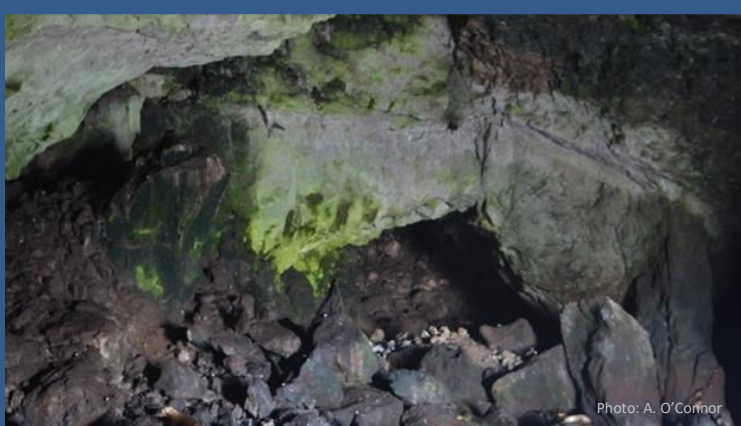


Photo: A. O'Connor

Sea Lion Cave counts (2014-19)

For the period 2014-19, Pigeon Guillemot and Rhinoceros Auklet average annual numbers in the cave were 144 and 19, respectively. Lighting in the Sea Lion Caves is dim and these birds are crevice nesters, so this is a minimum estimate of birds using the caves. Due to COVID-19, we have not been able to conduct cave counts in 2020 and 2021.

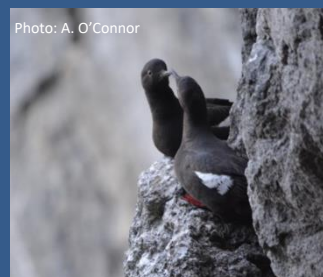


Photo: A. O'Connor



Photo: Mick Thompson

Pigeon Guillemot

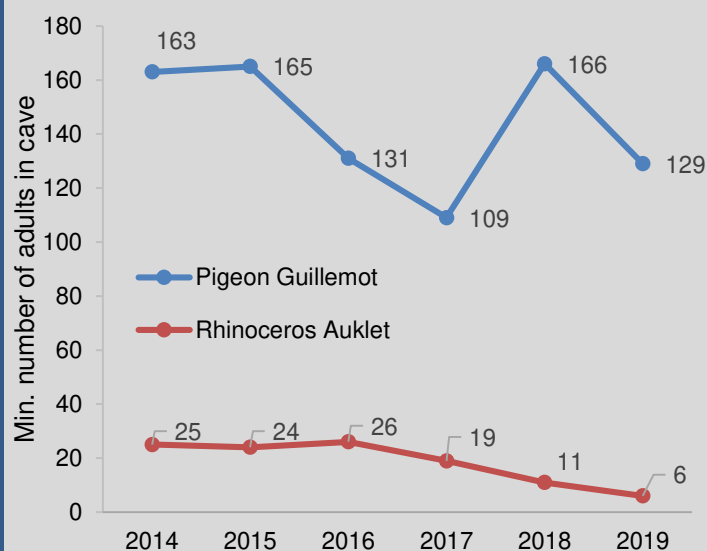
Rhinoceros Auklet



Photo: A. Nelson



Photo: P. Thompson



Conservation Impact

- In 2021 we connected with 110 visitors about seabird conservation and the Marine Reserves and had many additional contacts through social media. Due to COVID-19 we worked with smaller volunteer groups and followed COVID safety protocols.
- Long-term breeding success data collected for this project is contributing a "bird picture" to ODFW's ecological monitoring in the Marine Reserves.
- Data from this project is contributed to USFWS's long-term seabird monitoring and may help inform future seabird management.

Thank you! We plan to continue this project in 2022 and want to say a huge thank you to the 34 volunteers who helped make monitoring successful this season! Also, thanks to our partners and OSU's Seabird Oceanography Lab and Haystack Rock Awareness Program for monitoring and providing data for comparison at Yaquina Head and Haystack Rock colonies, respectively.