

**Enhancing our understanding of the declining population of
tufted puffins (*Fratercula cirrhata*) on the Oregon coast
through a multi-pronged non-invasive approach**

2021 Interim Report
Oregon Wildlife Foundation



Photo 1: A tufted puffin with a bill load of larval fish at Haystack Rock on August 11th, 2021. Photo: N. Dolinajec

Noah Dolinajec¹ and Rachael Orben¹

¹Department of Fisheries, Wildlife and Conservation Sciences, Oregon State University, Hatfield Marine Science Center, Newport, Oregon 97365

Project Background

Haystack Rock in Cannon Beach, Oregon is the site of Oregon's most accessible tufted puffin (*Fratercula cirrhata*) colony. The 300-foot high intertidal rock supports a population of ~100 tufted puffins – approximately 20% of the state-wide population as of the most recent U.S. Fish and Wildlife Service (USFWS) count in the summer of 2021 (519 birds). Tufted puffins nest in earthen burrows and rocky crevices on the off-shore islands of the Oregon coast. They occupy their nesting colonies from April to September. Chicks hatch in July and adults carry prey back to the colony to feed their growing chicks for a period of roughly 45 days (Piatt & Kitaysky, 2002).

The status of Oregon's tufted puffins has been fragile for decades. There were population declines from the 1980's to the early 2000's, with tufted puffins declining from nearly 5,000 birds to just 400 (Kocourek 2009). In 2020, a Species Status Assessment was published by the USFWS which identified knowledge gaps of tufted puffin ecology on the Oregon coast. Through our project we aimed to develop methods to address some of these gaps. This included sourcing genetic samples from Oregon tufted puffins, the chick diet composition of tufted puffins, and the impacts of predation on tufted puffins.

Progress and Results

We had four project objectives for 2021:

1. Coordinate tufted puffin genetic sampling.
2. Adaptation and implementation of predator disturbance protocol at Haystack Rock in coordination with USFWS and their community science volunteer observer.
3. Photograph and identify the composition of bill loads of tufted puffins delivering prey to their chicks at the Haystack Rock colony.
4. Develop "Birds with Fish", a community science program designed to source photos of piscivorous coastal birds.

Tufted Puffin Sample Coordination (Obj. 1)

Tufted puffins that are accessible for sampling in Oregon are scarce and this has prohibited genetic sampling. In collaboration with the USFWS OCNWR biologist Shawn Stephensen, N. Dolinajec contacted coastal agencies and groups that might encounter tufted puffin for sampling. These groups included Oregon Shores Conservation Coalition, Coastal Observation and Seabird Survey Team, Seaside Aquarium, Friends of Haystack Rock, Shoreline Education for Awareness, Lane County Audubon Society, Kalmiopsis Audubon Society, Portland Audubon, and Oregon Birding Association. Our project provided this collective of groups with a single contact point if a tufted puffin carcass washed ashore – allowing the USFWS to perform genetic sampling.

Haystack Rock Field Effort (Obj. 2 & 3)

Predator Disturbance Events (Obj. 2)

N. Dolinajec spent the later part of May and early June assisting the Seabird Oceanography Lab with their long term monitoring of common murrelets at Yaquina Head in Newport, Oregon. Quantifying predator disturbance is a key part of this monitoring effort, thus N. Dolinajec was able to review these protocols and follow them in the context of murrelets. This allowed him to adapt the predator disturbance protocol for the tufted puffins at Haystack Rock. N. Dolinajec spent ~101 hours over the course of 29

days on the beach from July 1st – August 31st recording predator disturbances at the Haystack Rock colony. Predator disturbances were almost exclusively caused via bald eagle approaches over Haystack Rock, but the presence of a peregrine falcon (and potential nest) and brown pelicans caused minor disturbances. Disturbances lasted on average 7-minutes and mainly targeted western gull chicks. We did not observe any direct interaction between predators and tufted puffins however, observationally we noticed that post predator disturbance event tufted puffin activity and colony arrivals declined for a limited time before returning to normal activity. Further review of the revised protocol and coordination with the USFWS is anticipated in spring 2022.

Tufted Puffin Prey Photos (Obj. 3)

N. Dolinajec was able to capture just under 13,000 photographs using a camera borrowed from the USFWS OCNWR. This camera a Canon DSLR camera with a 400mm lens operating at an aperture speed of f6.0. The majority of tufted puffin photos were taken at Haystack Rock with a very small number being collected at other colonies on the coast including Chief Kiawanda Rock and Island Rock. The review of the photos is ongoing. We intend to enumerate the number and timing of bill loads observed, count the prey items on the left and right side of the bill, and identify the photos where we can perform prey ID. We are hopefully that the number of prey loads will comprise a statistically meaningful sample (~20 bill loads). An example of an photo taken by N. Dolinajec of a tufted puffin carrying larval fishes can be seen in Photo 1 (title page).

Birds with Fish (Obj. 4)

Finally, we launched ‘Birds with Fish’, a community science initiative designed to encourage and source photographs of coastal Oregon birds carrying marine and estuarine prey via experienced wildlife photographers proved to be a popular project with substantial buy-in even at the grassroots level. In total we had 23 photographers submit ~130 photographs of tufted puffins and other coastal birds with prey (e.g. Photo 2). There was increased interest throughout the breeding season and there has continued to be communication from individuals and groups about when to alert volunteer photographers about the second season of photography. We had a professional wildlife photographer (suggested via Oregon Wildlife Foundation), Keith Wallach, join the project as a technical photography expert and his support of the project has helped less experienced photographers successfully submit quality prey photos.



Photo 2: Tufted puffin carrying California market squid near Haystack Rock, Cannon Beach, Oregon on August 9th, 2014. Submitted by Tim Halloran, photographer unknown.

Successes and Challenges

Tufted Puffin Sample Coordination (Obj. 1)

While, we were able to alert coast groups of the need for tufted puffin genetic samples none were acquired as the result of our efforts in 2021. This was likely due to the lack of birds available for sampling.

Predator Disturbance Events (Obj. 2)

Quantifying the impacts of predator disturbance on tufted puffins is not as straightforward as common murre. However, we were able to document the presence of a range of avian species that could reduce surface colony attendance time of tufted puffins. Furthermore, no predation events on tufted puffins were observed.

Tufted Puffin Prey Photos (Obj. 3)

We expected this portion of the project to be time consuming and have limited returns due to the technical challenges of photographing tufted puffins in flight at a close enough range to produce identifiable photos. Developing methods for efficient photo analysis is ongoing and has proved to be another challenge. However, we were able to observe tufted puffins bringing in prey items, photograph these birds, and in some cases we expect prey to be identifiable. The photographs submitted by professional photographers of tufted puffins at Haystack Rock indicate that with increase zoom (e.g. 800mm) more high quality photos can be obtained. We found that low tides that coincided with tufted puffin activity offered the best photographic opportunities. In 2022, we intend to develop interest in these days to encourage Birds with Fish participants to visit and photograph tufted puffins (see below).

Birds with Fish (Obj. 4)

This project relied heavily on collaborative efforts between our project team and coastal conservation organizations/communities. The participation of nearly 25 volunteer photographers provided us with widespread field support from various locations on the coast. Fostering support for the project proved to be a time-consuming task. However, building a collaborative group of coastal conservation focused organizations and individuals proved to be an effective strategy to power the project. We accomplished this through social media, word of mouth, and developed a project website. A challenge will be continuing momentum and processing photographs in order to provide meaningful feedback to participants.

Lessons Learned

We will be able to build on what was accomplished in the summer of 2021. Ideally, photos would be summarized during the summer as they are collected, but developing this data processing protocol will take additional time and effort. This ongoing photo processing would facilitate positive feedback to Birds with Fish participants. Continued effort is need to obtain tufted puffin samples and doing so in a timely manner might require catching birds. However, we will continue to work with the USFWS (Shawn Stephensen) to facilitate collection of a dead specimen. We learned more about the nature of predator disturbances at Haystack Rock and hope to refine this protocol in advance of summer 2022. We believe that there is an opportunity to engage photographers in a targeted manor that would increase our data collection capacity. In 2022, we plan to implement a 'photography meet-up' that N. Dolinajec will schedule to coincide with low morning tides when puffins are active and light is best for photographs.

Additional Information

We currently have enough funds to support continued outreach for Birds with Fish including photography meet-ups at Haystack Rock. N. Dolinajec will continue to manage and provide outreach for Birds with Fish and work on developing methods and processing photos collected in 2021 and 2022. If funding allows we will hire a dedicated field technician for the tufted puffin prey loads in summer 2022 (roughly mid-July to mid-August). This effort hinges on finding affordable housing in the Cannon Beach area and funding for an upgraded camera system. We are awaiting results of grant applications that would support a full extension of the project including upgraded camera equipment. Funding support comes from the Oregon Wildlife Foundation, the Oregon Wildlife Foundation Coastal Bird Fund, the Oregon Birding Association, OSU Marine Sciences Initiative, and the Bureau of Land Management.

References

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