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## Population Dynamics and Trends of an Endangered Seabird: Tufted Puffins (*Fratercula cirrhata*) in Washington

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# Population Dynamics and Trends of an Endangered Seabird: Tufted Puffins (*Fratercula cirrhata*) in Washington

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## Introduction

- ❖ A critical application of modern ecological science is the identification and recovery of threatened and endangered species. Understanding population dynamics and trends is fundamentally important to inform, aid, and assess the recovery of species in danger of extinction.
- ❖ Based on rapidly declining population trends over recent decades, seabirds are considered to be one of the most threatened groups of birds globally.

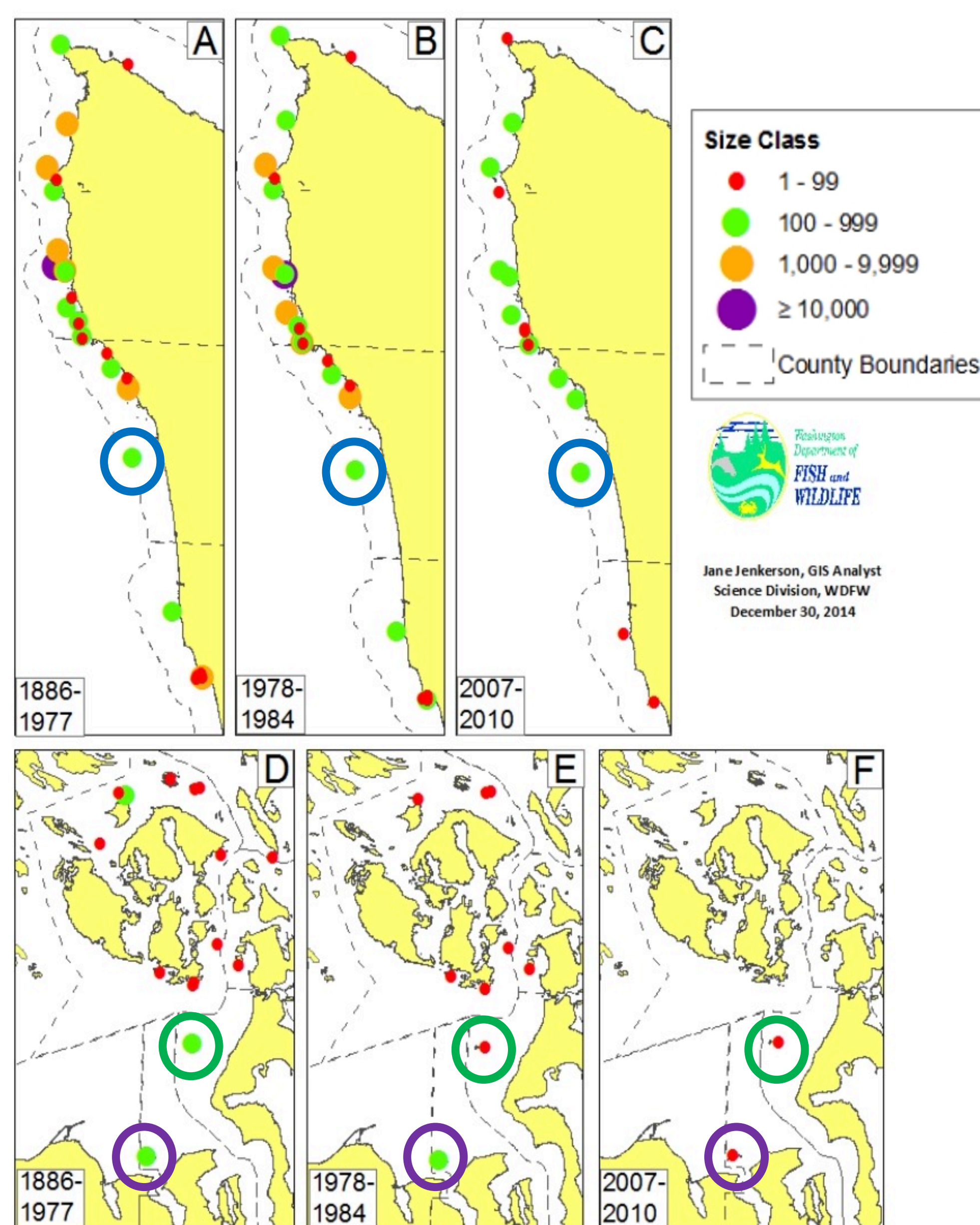


Figure 1. Locations and historical maximum population estimates for 44 TUPU historic breeding colonies documented in Washington (Hanson and Wiles 2015). Circled are the Islands covered in my study; Destruction (blue), Protection (purple), and Smith land (green).

- ❖ Tufted Puffins (TUPU; *Fratercula cirrhata*) are currently listed as Endangered by Washington State.
- ❖ TUPUs in Washington have undergone widespread colony abandonment along with an order of magnitude population decline (Figure 1).
- ❖ TUPU population trends in Washington are consistent with patterns of regional decline throughout the California Current System.

**TUPU populations are predicted to continue to decline in Washington due to ongoing threats from multiple factors and will become functionally extinct within 40 years. An understanding of population dynamics and trends is critical to developing informed conservation planning for the TUPU.**

## Research Goal and Objectives

### Primary Goal:

- ❖ Assess TUPU breeding population dynamics and trends on three active breeding sites in Washington (Destruction, Protection, and Smith islands) by conducting an inter-annual comparison of variability in colony attendance patterns, burrow occupancy, and breeding success.

### Specific Research Objectives:

- ❖ Contribute 2021 breeding season data to time series for Destruction Island and Smith Island and conduct inter-annual comparisons in reproductive parameters.
- ❖ Conduct a comprehensive survey of TUPU population on Protection Island for the 2021 season to determine breeding population size and breeding success.



## Current Progress

- ❖ Creation of a database for all previous years of DI reproductive success, colony attendance patterns and chick provisioning rates.



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### Destruction Island:

- ❖ From early June to early August, we conducted land-based surveys to determine total number of burrows, burrow occupancy rates, and breeding success of the TUPU population for the 2021 breeding season. We mapped all active burrows onto established colony photographic maps, recorded visits and the delivery of prey to individually marked burrows and used an infra-red camera system to determine contents and fates of marked burrows.

### Protection Island:

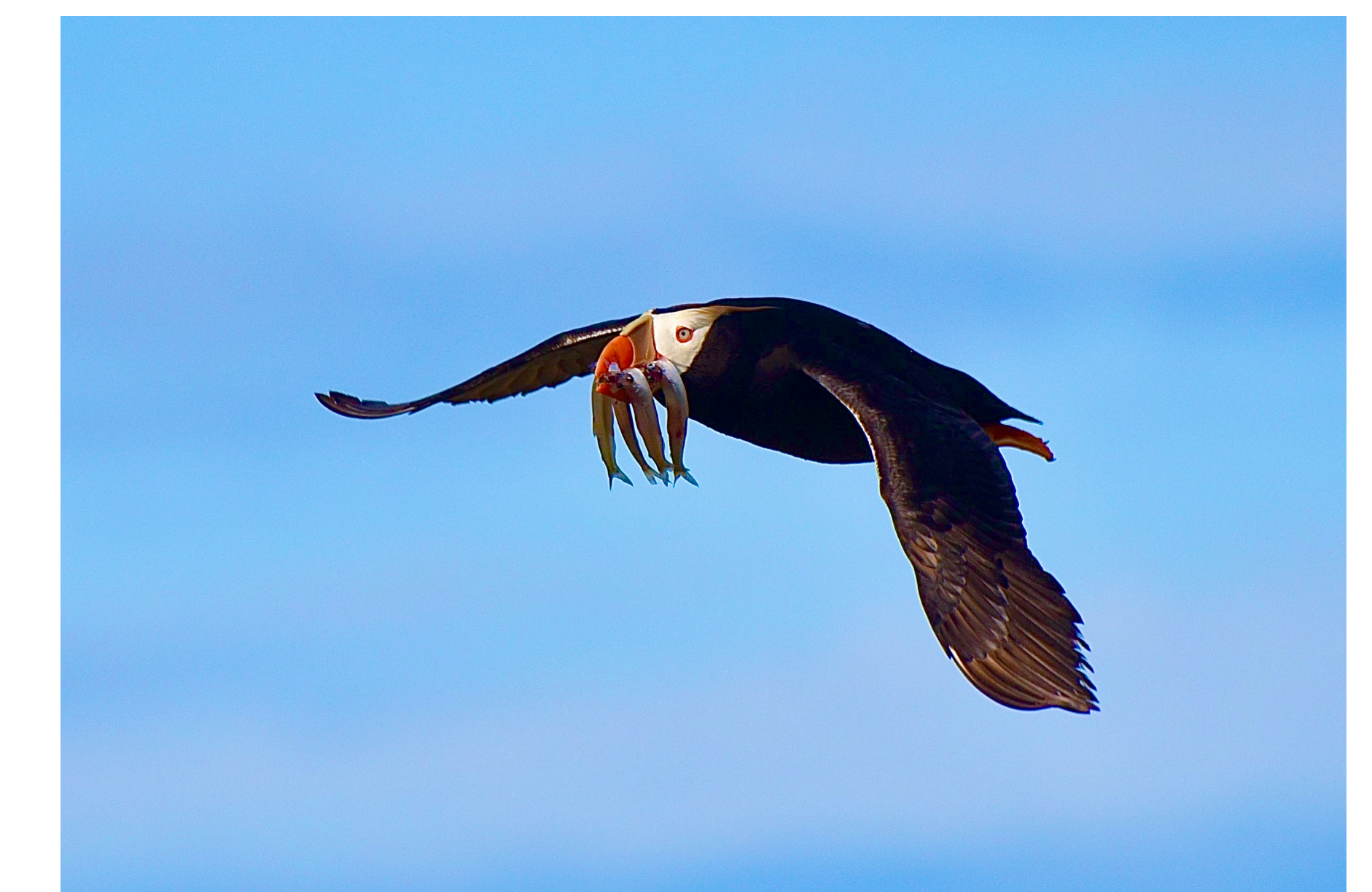
- ❖ From late May to late July, we conducted land- and boat-based surveys to determine burrow locations and burrow occupancy of the TUPU population for the 2021 breeding season.

### Smith Island:

- ❖ Similar to the method described for Protection Island, in mid-July, we conducted boat-based surveys at Smith Island to determine breeding burrow locations and burrow occupancy rates of the TUPU population.

## Future Directions

- ❖ Finish digitizing data from current and past seasons.
- ❖ Analyze and organize photos of TUPU bill loads.



I will conduct an interannual comparison of variability in Island burrow occupancy (both Destruction and Smith Islands) and breeding success data (Destruction Island only) from past seasons along with data we collected in the 2021 breeding season.

- ❖ Have burrow occupancy and breeding success changed over multiple seasons?
  - ❖ Chi-square statistical tests will analyze burrow occupancy, activity patterns, and breeding success over time.
- ❖ Information gathered in this study will contribute to the Endangered Species listing process.

## Acknowledgments

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## References

- Hanson T., and G.J. Wiles, 2015 Washington State Status Report for the Tufted Puffin (2015) - WDFW Publications | Washington Department of Fish & Wildlife. WDFW Publications.