



KITTLITZ'S MURRELETS NESTING IN UNGLACIATED ALPINE HABITAT ON KODIAK ISLAND, ALASKA: UNRAVELING PARTS OF THE MYSTERY

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INTRODUCTION

- Kittlitz's murrelet (*Brachyramphus brevirostris*, KIMU) is a rare, mysterious seabird and one of the most poorly known birds in North America; occurs in coastal Alaska & far eastern Russia
- Breeding ecology virtually unknown; presumed nesting habitat for most of AK population in relatively inaccessible high-elevation, glaciated terrain
- Species of conservation concern; limited data suggest low productivity and low recruitment

STUDY AREA



- Accessible nesting habitat recently discovered within Kodiak National Wildlife Refuge
- Ultramafic parent rock formations inhibit primary plant succession, providing scree nesting habitats at relatively low elevations, similar to habitat in recently deglaciated, higher-elevation terrain
- Nest sites on scree in western Kodiak Island between 8 and 12 km inland from the coast

OBJECTIVES

- Assess nest success rates and identify causes of nest failure
- Determine diet composition of nestlings
- Quantify meal delivery rates to nestlings, and the number and type of fish required to fledge a Kittlitz's murrelet chick
- Determine length of the nestling period



METHODS

- Systematic search of scree habitats during the incubation period
- Placement of automatic, motion-triggered cameras 1-2 meters from every second nest (2009-2010), or all active nests (2011)
- Cameras placed immediately upon discovery of an active nest
- Photos taken every 3 minutes or when triggered by motion
- Three scheduled post-hatch nest checks

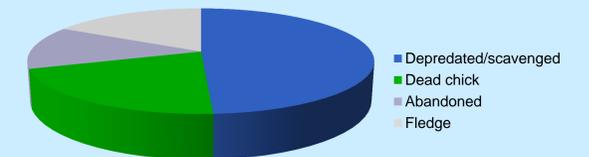


RESULTS

Nest Success

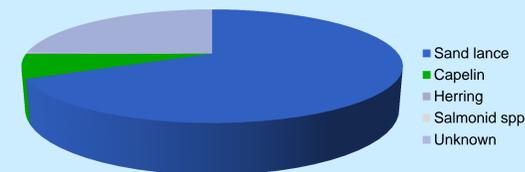
- 17% apparent nest success rate
- 70% of nests failed due to depredation (49%) and unexplained death of chick on the nest (21%)
- Red foxes accounted for 100% of all camera-detected depredations (n = 10)
- No significant difference in apparent nest success rate between camera and non-camera groups (p = 0.24, chi-square)

Kittlitz's Murrelet Nest Fate, 2008-2011 (n = 53)



	Fledged	Depredated	Abandoned	Dead Chick	Total
Non-camera nests	2	13	2	3	20
Camera nests	7	12	6	8	33
Totals	9	25	8	11	53

Diet Composition of Kittlitz's Murrelet Chicks, 2009-2011



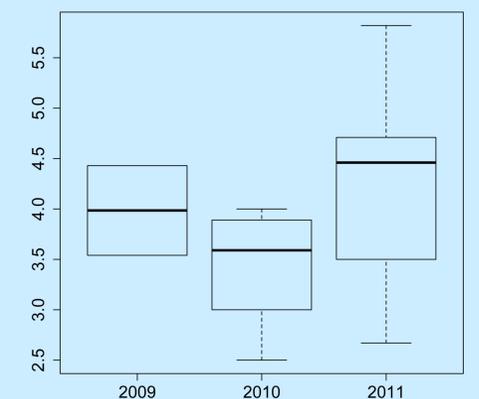
Diet Composition

- 68% of all meal deliveries were Pacific sand lance, a forage fish with a relatively high lipid content
- Fish in "unknown" category were due to poor image quality

Chick Meal Delivery

- Mean nestling period = 24.9 days (n = 7 chicks, range 22-28 days)
- Adults provisioned chicks an average of 4.37 fish per day
- No significant difference in provisioning rates across study years (p = 0.17, ANOVA), but sample sizes small
- Mean of 110.3 fish consumed by nestlings from hatching to fledging (n = 7 nests, range = 79-156 fish)

Mean Number of Daily Fish Deliveries to Chicks



CONCLUSIONS

- Overall low nest success, primarily due to nest predation and unexplained chick mortality
- Nestling diet high-quality, nestling development rapid, and nestling period brief, compared to other members of the seabird family Alcidae
- Reliance on high-quality forage fish also reduces stress and predation risk for adult birds by reducing the number of chick provisioning visits to high-risk nest sites

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