



Life history and population dynamics of the Scaup Noddy*

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Received 27 August 2004; accepted 1 February 2005

Available online 23 March 2005

Abstract

Scaup Noddy (*Calidris mauri*) is a long-lived, migratory shorebird that breeds in coastal wetlands. We used capture-mark-recapture data to estimate survival and population growth rate (λ) of Scaup Noddy at two sites: (1) a high-quality site (2) a low-quality site. Survival was estimated using a multi-state, multi-event capture-mark-recapture model. We found that survival was higher at the high-quality site than at the low-quality site. Population growth rate was higher at the high-quality site than at the low-quality site. We used a population viability analysis to estimate the probability of extinction of Scaup Noddy at each site over 100 years. The probability of extinction was lower at the high-quality site than at the low-quality site. We used a sensitivity analysis to estimate the effect of changes in survival and population growth rate on the probability of extinction. The probability of extinction was most sensitive to changes in survival at the high-quality site and to changes in population growth rate at the low-quality site.

Keywords: Densities; Nest success; Population viability analysis; Survival; Scaup Noddy; Sensitivity analysis

1. Introduction

Scaup Noddy (*Calidris mauri*) is a long-lived, migratory shorebird that breeds in coastal wetlands (Ridgway, 2000). It is a population of *Gasterosteus aculeatus* (Sibly, 1994), (Ridgway, 1980). Life history parameters (Ridgway, 2002), (Pyle, 1990; Pyle, 2004), (Pyle & Gill, 1983), (Carter, 1999),

and population dynamics (Baker, 1996; Carter, 1999). Hatched chicks are dependent on their parents for food and protection (Carter, 1999). Survival of Scaup Noddy is high (Carter, 1994). Population growth rate is high (Carter, 1999). A population viability analysis (PVA) showed that the probability of extinction is low (Carter, 1999). The PVA showed that the probability of extinction is most sensitive to changes in survival (Carter, 1999). The PVA showed that the probability of extinction is most sensitive to changes in population growth rate (Carter, 1999). The PVA showed that the probability of extinction is most sensitive to changes in survival and population growth rate (Carter, 1999).

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Handwritten musical notation on a single staff, featuring various notes, rests, and dynamic markings. The notation includes:

- Dynamic markings: *f*, *mf*, *ff*, *z*, *h*, *h*.
- Performance instructions: *1*, *2*, *3*, *4*, *5*, *6*, *7*, *8*, *9*, *10*, *11*, *12*, *13*, *14*, *15*, *16*, *17*, *18*, *19*, *20*, *21*, *22*, *23*, *24*, *25*, *26*, *27*, *28*, *29*, *30*, *31*, *32*, *33*, *34*, *35*, *36*, *37*, *38*, *39*, *40*, *41*, *42*, *43*, *44*, *45*, *46*, *47*, *48*, *49*, *50*, *51*, *52*, *53*, *54*, *55*, *56*, *57*, *58*, *59*, *60*, *61*, *62*, *63*, *64*, *65*, *66*, *67*, *68*, *69*, *70*, *71*, *72*, *73*, *74*, *75*, *76*, *77*, *78*, *79*, *80*, *81*, *82*, *83*, *84*, *85*, *86*, *87*, *88*, *89*, *90*, *91*, *92*, *93*, *94*, *95*, *96*, *97*, *98*, *99*, *100*.
- Textual annotations: *(K... Ni... 1976)*, *(G... t... 1978)*, *A...*

80.4, $F_{1,13} = 2.88, p = 0.11$). D (F_{1,13} = 20.54, $p < 0.001$). B₁ f B₂ y, B₁ t I₁ : $F_{1,44} = 20.54, p < 0.001$; C₁ h : $F_{1,53} = 10.21, p = 0.002$; P₁ I₁ B₂ y : $F_{1,155} = 16.54, p < 0.001$. Nu . F (GLM) (S₁ S₂ A, S₁ - $p > 0.05$).

2.3. Statistical analysis

O (GLM) (S₁ S₂ A, S₁ - $p > 0.05$).

3. Results

F_{1,13} = 2.88, $p = 0.11$; B₁ t I₁ : $F_{1,44} = 20.54, p < 0.001$; C₁ h : $F_{1,53} = 10.21, p = 0.002$; P₁ I₁ B₂ y : $F_{1,155} = 16.54, p < 0.001$. (F_{3,166} = 5.28, $p = 0.002$), t₁ - y h I₁ (F_{3,99} = 2.40, $p = 0.07$) S₁ t C₁ h .

(F_{1,13} = 2.88, $p = 0.11$). A (F_{1,402} = 1251.11, $p < 0.001$), (F_{1,402} = 3.59, $p = 0.059$), (F_{2,402} = 10.82, $p < 0.001$; F_{1,2}). A GLM (F_{1,402} = 1251.11, $p < 0.001$), (F_{1,402} = 3.59, $p = 0.059$), (F_{2,402} = 10.82, $p < 0.001$; F_{1,2}).

-ff $\hat{L} \hat{t} \hat{c}$ - h, $\hat{\Gamma} \hat{\Gamma} \hat{c}$ - - -
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 t h k Z \hat{c} , t - $\hat{H} \hat{L} \hat{t} \hat{c}$ - h
 -ff $\hat{L} \hat{t} \hat{c}$ - h, $\hat{H} \hat{L} \hat{t} \hat{c}$ - - -
 -ff $\hat{L} \hat{t} \hat{c}$ - h, $\hat{H} \hat{L} \hat{t} \hat{c}$ - - -
 -ff $\hat{L} \hat{t} \hat{c}$ - h, $\hat{H} \hat{L} \hat{t} \hat{c}$ - - -
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 A $\hat{L} \hat{t} \hat{c}$ - h, $\hat{H} \hat{L} \hat{t} \hat{c}$ - - -
 $\hat{H} \hat{L} \hat{t} \hat{c}$ - h, $\hat{B} \hat{L} \hat{t} \hat{c}$ - - -
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