

Effects of Off-Road Vehicle Closures and Corridors on Nesting American Oystercatchers at Cape Hatteras National Seashore

Tracy E Borneman¹, Shilo Felton¹, and Theodore R Simons² ¹North Carolina Cooperative Fish and Wildlife Research Unit, Department of Biology, North Carolina State University, Raleigh, NC

²U.S. Geological Survey, North Carolina Cooperative Fish and Wildlife Research Unit, Department of Biology, North Carolina State University, Raleigh, NC



Cape Hatteras National Seashore

Pamlico Sound

> Atlantic Ocean

Google earth

Image Landsa

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Imagery Date: 4/9/2013 35°29'14.11" N 75°41'32.49" W elev -19 ft eye alt 88.58 mi 🔘

20.7 m





American Oystercatcher (Haematopus palliatus)



- Species of conservation concern in United States
- Nest on coastal beaches on open beach, dunes, sand flats
- Incubation period 27 days

150m closure around oystercatcher nest



610 ft.

8 1993

150m closure around oystercatcher nest with shoreline drive-through corridor added



Study Design

• Treatments:

- 150m buffer closure (control)
 - No driving in closure
- 150m buffer closure with drive-through only corridor (treatment)
 - Experimental Driving
 - Drive by nests at 25 meters from nest
 - 20 passes by nest each session
 - 2 sessions each day (morning & afternoon)
 - Make sure AMOY is on nest before each pass

Experimental Unit: Breeding Pair

- Apply both treatments to a single nest
 - Alternating 3 days of each closure type until nest hatches or fails
 - Control for variation of individual pairs, location, time of year

Measuring Disturbance

Monitor incubation behavior with video cameras installed at nests



Measuring Disturbance

Monitor heart rate with microphone-embedded artifical eggs placed in nests





Behavior



Behavior



Heart Rate





Measuring Disturbance

○ Behavior

- % flushed from nest during driving
- Compared frequency of departures from nests during driving periods to control periods
- Compared length of incubation bouts during driving periods to control periods
- Heart-rate
 - Compared baseline heart rate before driving periods to average heart rate during driving passes
- Nest success
 - Compared nests with driving treatment to control nests that had no driving

Preliminary Results – Behavior - Flushing



n = 997 driving passes in 51 sessions past 7 pairs

Preliminary Results – Behavior - Departs



n = 44 paired sessions

Preliminary Results – Behavior - Departs



Preliminary Results – Behavior – Incubation Bouts



n = 44 paired sessions

Preliminary Results – Behavior – Incubation Bouts



Preliminary Results – Heart Rate



n = 17 paired sessions





Preliminary Results – Nest Success



Summary

Behavior

- Oystercatchers flushed a low percentage of the times we drove by their nests
- # departures from nest was higher and incubation bout lengths shorter during driving periods than no-driving periods
- Heart-rate
 - No change from baseline
- Nest success
 - Didn't find evidence of driving significantly affecting nest success

Acknowledgments



- Britta Muiznieks
- Randy Swilling
- Eric Frey
- Paul Doshkov
- Will Thompson
- Troy Buckle

- Emma Haskett
- Damien Hardgrove
- Nathan Dunn
- Jorel Terrell
- Micah Knabb
- Angela Trnka

- Elizabeth Gardner
- Jason Gardner
- James Yrigoyen
- Brice Sweeney
- Jennifer Haney
- Leslie Frattaroli

- Corey Smith
- Bethany Kautz
- Ken Pollock
- John Wettroth
- Wendy Moore

Questions? Suggestions?

Photo: Tracy Borneman