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Trumpeter Swan Egg Temperatures (*Cygnus buccinator*) in Relation to Cygnet Survivorship at Grays Lake National Wildlife Refuge, Idaho, USA

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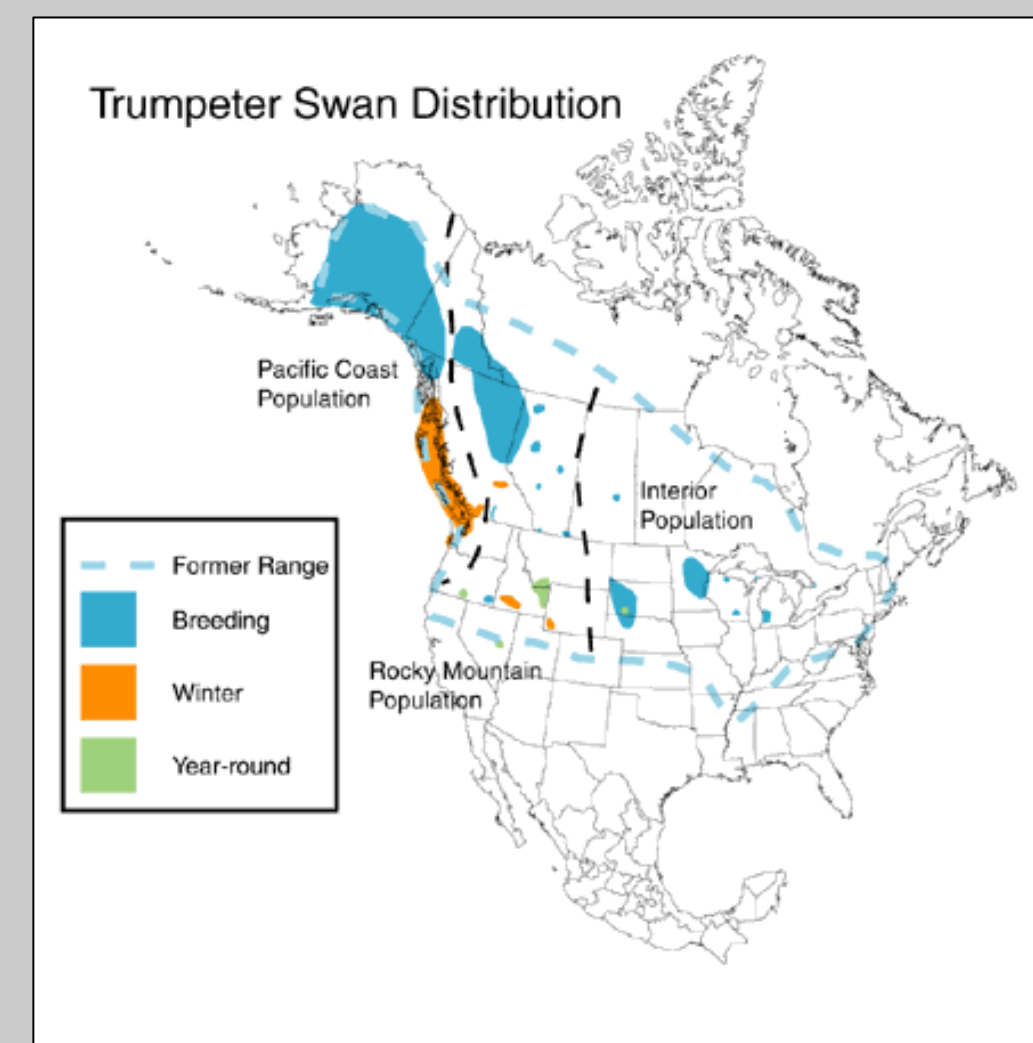
Trumpeter Swan Egg Temperatures (*Cygnus buccinator*) in Relation to Cygnet Survivorship at Grays Lake National Wildlife Refuge, Idaho, USA.

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1 Introduction

Trumpeter Swans (*Cygnus buccinator*) are the largest waterfowl in the world. They are native to North America (Banko 1960) and were once widely distributed across the continent. In the early 20th Century hunting and habitat loss combined to reduce the known population to < 70 individuals (Coale, 1915).



Despite a continent-wide recovery over the past 50 years, this historic core of the population in the Yellowstone Ecosystem has declined for reasons unknown. Current hypotheses include apparent food availability, harsh weather, diseases, abnormalities, emaciation, predation, and parasites (Shea 2013) that can influence hatching success rates through egg cooling and failure to maintain clutch/nest temperatures near hypothesized optimal 39° C (102 ° F) (Page, 1972).



- We hypothesized egg temperatures will significantly vary ($\pm 2^\circ$ degrees) from 39° C, which could influence cygnet health and survivorship.

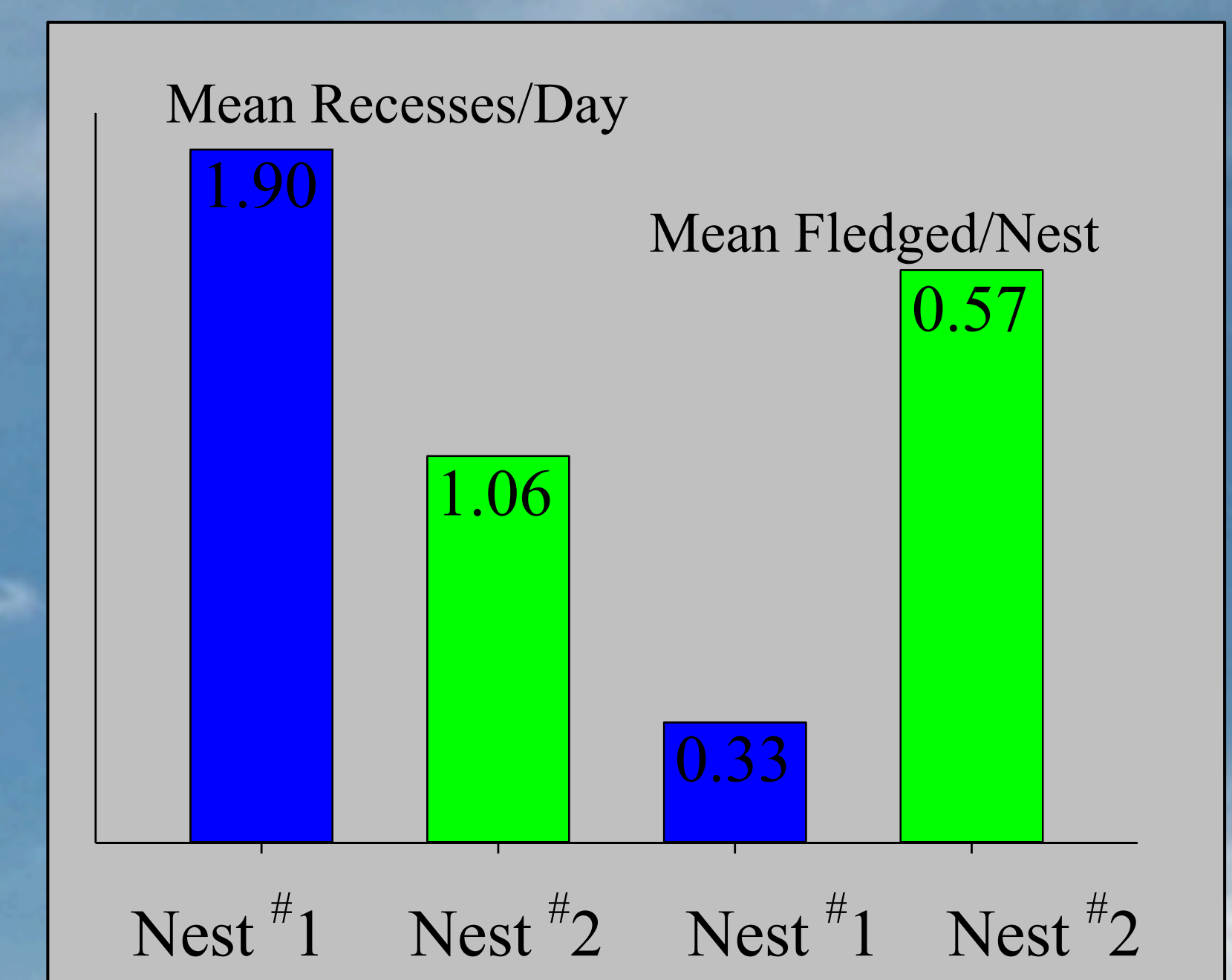
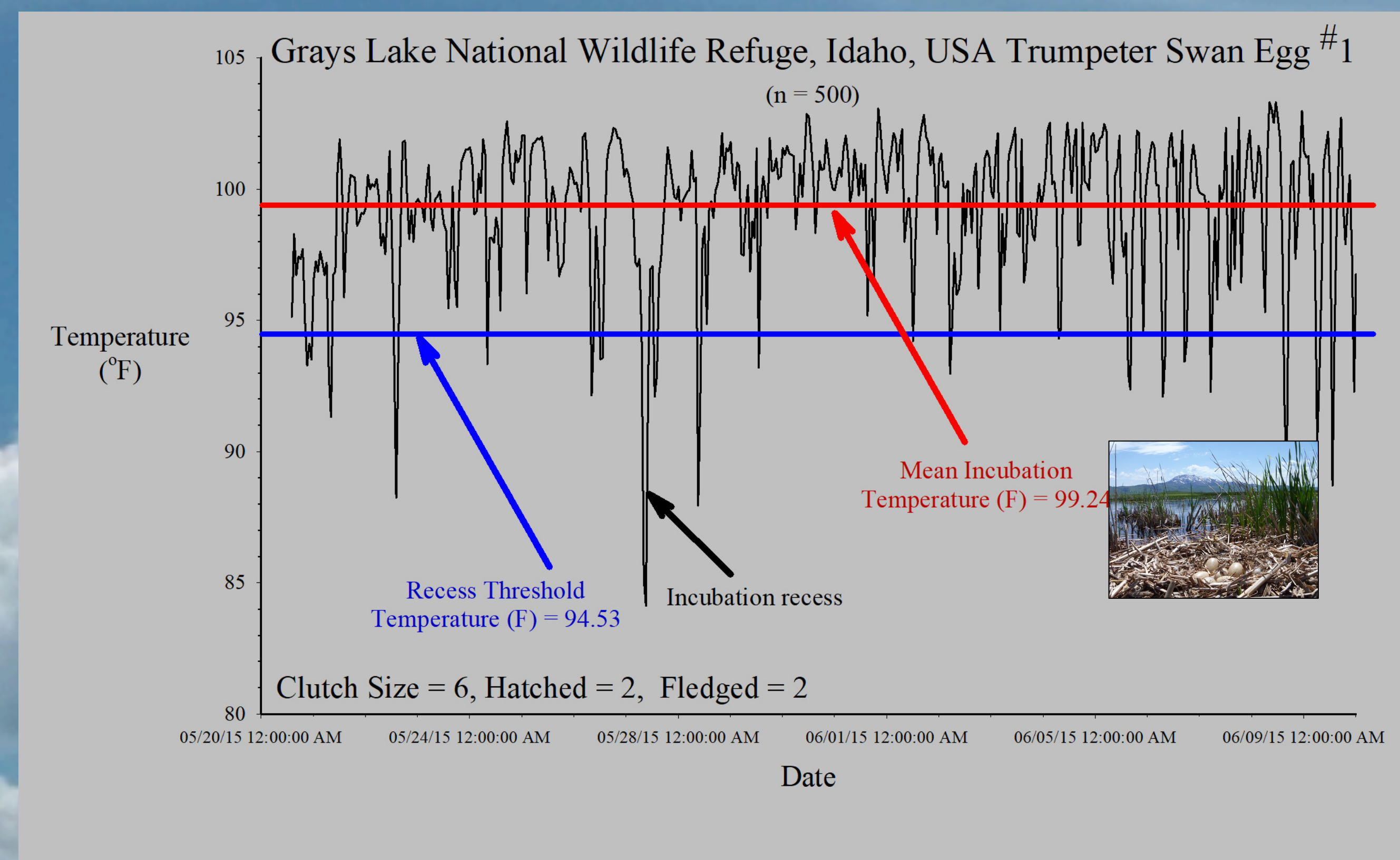
Temperature data loggers were implanted in artificial Trumpeter Swan eggs before nest placement. We placed artificial eggs in Trumpet swan nests at Grays Lake National Wildlife Refuge (NWS), USA, within the Yellowstone Ecosystem. Following hatch, eggs were collected and sent to the Wyoming Wetland Society in Jackson, Wyoming, where the egg data were uploaded onto a server. The data loggers were returned to the artificial eggs and placed in an egg incubator to establish baseline control temperatures for an additional 4 weeks.



From the incubation data we calculated the number of nest recesses, defined as a 2° C decline from mean incubation temperature (Manlove and Hepp 2000), mean incubation temperature, and nest fledgling rate.



3 Results



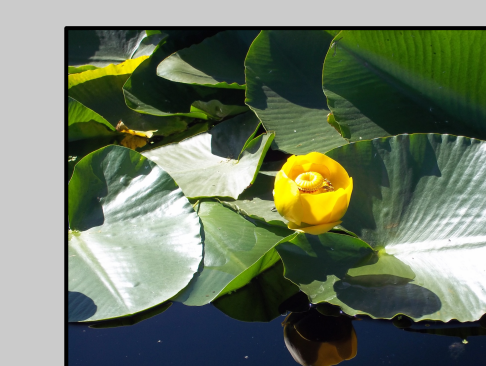
4 Discussion & Conclusions

- Mean Egg temperatures were lower than the hypothesized optimal incubation temperatures (39° C/102° F) (Page, 1972).
- Although sample size was small, increased recesses seemed to correlate with lower fledgling rate. Additional research and larger sample sizes are needed to support this preliminary finding.



5 Acknowledgements

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6 Literature Cited

Banko, Winston. 1960. The Trumpeter Swan. U.S. Department of the Interior, North American Fauna Series Number 63. 214 pp.

Coale, H. K. 1915. The present status of the trumpeter swan (*Olor buccinator*). Auk 32:82-90.

Manlove, C.A., and G.R. Hepp. 2000. Patterns of nest attendance in female Wood Ducks (*Aix sponsa*). The Condor 102:286-291.

Page, Roger, 1972. The Ecology of the Trumpeter Swan on Red Rock Lakes National Wildlife Refuge, Montana. Ph.D. dissertation. University of Montana, Missoula. 160 pp.

Shea, R. E., E. O. Garton, and I. J. Ball. 2013. *The History, Ecology, and Management of the Rocky Mountain Population of Trumpeter Swans (1931-86)*. North American Swans 34(1). The Trumpeter Society, Plymouth, MN.

Zar, Jerrold H. 1984. *Biostatistical Analysis*. Prentice-Hall. Englewood Cliffs, N. J. 718 pp.