

and two anonymous reviewers for improving the manuscript.

LITERATURE CITED

- MCINTYRE, J. W. 1983. Nurseries: a consideration of habitat requirements during the early chick-rearing period in Common Loons. *J. Field Ornithol.* 54:247–253.
- MCINTYRE, J. W. 1988. The Common Loon: spirit of northern lakes. Univ. of Minnesota Press, Minneapolis.
- YONGE, K. S. 1981. The breeding cycle and annual production of the Common Loon (*Gavia immer*) in the boreal forest region. M.S. thesis, Univ. of Manitoba, Winnipeg.

Wilson Bull., 111(1), 1999, pp. 116–117

Territorial takeover in Common Loons (*Gavia immer*)

James D. Paruk¹

ABSTRACT.—Breeding Common Loons (*Gavia immer*) are well known for vigorously defending their territory from conspecifics. Territory holders are not previously known to be supplanted by loons during the breeding season. I observed a pair of adult Common Loons displace a resident pair from their territory shortly after a territorial conflict; the takeover coincided with the death of the resident loons' chick caused by an adult Bald Eagle (*Haliaeetus leucocephalus*). Received 27 Feb. 1998, accepted 7 Sept. 1998.

Common Loons (*Gavia immer*) are philopatric, but territory switching occurs infrequently (Piper et al. 1997; Evers, Reaman, Kaplan, and Paruk, unpubl. data). Our understanding of territory switching in Common Loons remains largely unknown (Piper et al. 1997). In 1995–1997, while coordinating studies of parental effort and social flocking in Common Loons at the Turtle Flambeau Flowage in northern Wisconsin (46° 00' N, 90° 10' W), I observed a territory takeover.

The Turtle Flambeau Flowage is a large impoundment (5798 ha) that contains 24–26 loon territories. Territories are generally well delineated by coves or islands, but there are several places where the presence of small islands makes it difficult to distinguish individual territorial boundaries.

On 26 July 1996, at 10:30 CST a pair of unbanded loons entered the territory (Long Is-

land, LI) of an established color-banded pair. All four birds moved behind an island and were out of sight for 2 min. A territorial bird (sex could not be determined because of an obstruction) "surface rushed" one of the intruders driving it onto an island with repeated bill thrusts. At 10:42, the territorial pair was reunited and the intruders were no longer in sight.

At 10:58, an adult Bald Eagle (*Haliaeetus leucocephalus*) killed the resident pairs' 15 day-old chick (Paruk et al. 1999). At this age, loon chicks are still dependent upon adults for food and protection from predators (Dulin 1988, McIntyre 1988). The LI pair remained near the location where the eagle killed the chick until 12:25, at which time they swam to the other side of their territory. I searched the territory for the banded loons from 15:25–16:00, but did not observe them. Instead, I observed two unbanded loons in the territory.

On 27 July, I observed two unbanded, paired adults in the LI territory. The original pair was not observed on 27 July, but on 28 July an assistant spotted them several hundred meters south of their former territory. Throughout the rest of the summer, until 18 August, several observations ($n = 9$) confirmed that the original territorial pair had been supplanted by two unbanded individuals. The unbanded birds were observed foraging, resting and preening in the LI territory until the end of the observation period on 18 August.

Prior to the takeover, a pair of unbanded

¹Dept. of Biological Sciences, Idaho State Univ., Pocatello, ID 83209; E-mail: parujame@isu.edu.

loons engaged the territorial pair on four consecutive days (22–25 July), with several agonistic encounters. On both 24 and 25 July the LI pair left their chick and engaged in ritualized behavior (jerk diving, facing away) with conspecifics for 20 and 26 min respectively. Whether these were the same individuals that took over the territory is unknown. It seems likely that there was a territorial dispute prior to the death of the LI pair's chick and the subsequent takeover.

Common Loons do not typically abandon their territory after the loss of a chick, although they will often show less aggression towards conspecifics and may wander more frequently than loon pairs with chicks (Evers, pers. comm.; pers. obs.). Thus, it is unlikely that the resident LI pair simply abandoned their territory after the loss of their chick.

In 1997, the former LI pair remained together and occupied a new territory 400 m south of their original territory. Two unbanded loons nested in the former LI territory. Zack and Stutchbury (1992) proposed that non-breeders are likely to acquire territories they visit frequently and Piper and coworkers (1997) proposed that mid- to late seasonal movements observed in loons may be partly explained by their searching for new or unoccupied territories (reconnaissance hypothesis). The lack of distinct physical barriers separating loon territories and the high number of nonbreeders present on the Turtle Flambeau Flowage (Belant 1989, pers. obs.) may result in higher intrusion rates and more interterritorial interaction, lowering territorial stability (Strong and Bissonette 1988; Belant 1991; Piper et al. 1997; Evers et al., unpubl. data). The timing of the observed supplanting/takeover supports the reconnaissance hypothesis for loon movements during mid- to late sum-

mer, and suggests that Common Loons may actively engage in territory acquisition during the breeding season. To what extent this takeover was precipitated by the death of the resident pair's chick remains unknown.

ACKNOWLEDGMENTS

The behavioral project, of which this observation was a part, was funded by Earthwatch and Biodiversity Research Institute. I am particularly indebted to all the volunteers for their assistance in gathering the data, but especially so to P. Hart, M. Lockman, T. Mack, D. Seefeldt, A. Turpen and M. Wiranowski. J. Wilson provided logistical and moral support throughout the investigation. I also thank T. Ford, T. Gerstell, J. McIntyre and an anonymous reviewer for their comments and suggestions on this manuscript.

LITERATURE CITED

- BELANT, J. L. 1989. Common Loon productivity and brood habitat use in northern Wisconsin. M.S. thesis, Univ. of Wisconsin, Stevens Point.
- BELANT, J. L. 1991. Territorial activities of Common Loons on single-pair lakes. *Passenger Pigeon*. 54: 115–118.
- DULIN, G. S. 1988. Pre-fledging feeding behavior and sibling rivalry in Common Loons. M.S. thesis, Central Michigan Univ., Mt. Pleasant.
- MCINTYRE, J. W. 1988. The Common Loon: spirit of northern lakes. Univ. of Minnesota Press, Minneapolis.
- PARUK, J. D., D. SEANFIELD, AND T. MACK. 1999. Bald Eagle predation on Common Loon chick. *Wilson Bull.* 111:116–117.
- PIPER, W. H., J. D. PARUK, D. C. EVERS, M. W. MEYER, K. B. TISCHLER, M. KLICH, AND J. J. HARTIGAN. 1997. Local movements of color-marked Common Loons. *J. Wildl. Manage.* 61:1253–1261.
- STRONG, P. AND J. BISSONETTE. 1988. Territorial activities of Common Loons on multiple-pair lakes. Pp. 19–24 in *Papers from 1987 conference on loon research and management* (P. Strong, Ed.). North American Loon Fund, Meredith, New Hampshire.
- ZACK, S. AND B. J. STUTCHBURY. 1992. Delayed breeding in avian social systems: the role of territory quality and "floater" tactics. *Behaviour* 123:195–219.