HOME RANGE SIZE AND DISTRIBUTION IN ARCTIC PEREGRINE FALCONS: IS PRODUCTIVITY DENSITY DEPENDENT?

ALASTAIR FRANKE[1], BARRY G. ROBINSON[2], MARK PROSTOR[3], VINCENT L'HÉRAULT[4], ALEX ANCTIL[4], AND POISY ALOGUT[5]

[1]*Canadian Circumpolar Institute, University of Alberta, 1-42 Pembina Hall, Edmonton, Alberta T6G 2H8, Canada*. E-mail: Alastair.Franke@ales.ualberta.ca

[2]*Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2H8, Canada*

[3]*Falcon Research Group, Box 248 Bow, WA 98232, USA*

[4]*Département de Biologie, Université du Québec à Rimouski, C. P. 3300, succ. A, 300, Allée des Ursulines, Rimouski, Québec G5L 3A1, Canada*

[5]*Arctic Raptor Project, Box 817, Rankin Inlet, Nunavut, Canada*

ABSTRACT.—In territorial species, the size and distribution of defended home ranges can influence the breeding density of individuals and ultimately population productivity. Research on arctic Peregrine Falcons breeding in Nunavut indicates that overall productivity has slowly declined for the past 30 years, which may be driven by density dependent factors. Understanding the amount of space used and territoriality exhibited by breeding falcons will lead to a clearer understanding of the impact that breeding density is having on population productivity. During summers of 2008–2010, we deployed solar-powered Platform Transmitting Terminals (PTTs) on breeding male and female Peregrine Falcons around Rankin Inlet and Igloolik, Nunavut, to determine how home range size and territoriality changed with breeding season phenology and individual breeding status. We described home range boundaries and intensity of use within home ranges by estimating utilization distributions with kernel density estimators. Overlap among home ranges was estimated with the Volume of Intersection index, which takes into account the intensity of use within overlapping areas of home ranges. We found that although the area of overlap among male home ranges can be significant, the intensity of use within overlapping areas was quite low. We also show that productivity (fledglings/territory) of the Rankin Inlet population across years does not decrease with breeding density. We conclude that productivity is not density dependent because the territorial nature of the Peregrine Falcon prevents breeding densities from reaching a point where competition reduces per capita breeding output. *Received 2 November 2010, accepted 1 February 2011*.

Franke, A., B. G. Robinson, M. Prostor, V. L'hérault, A. Anctil, and P. Alogut. 2011. Home range size and distribution in arctic Peregrine Falcons: Is productivity density dependent? Abstract, pages 307–308 *in* R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov (Eds.). Gyrfalcons and Ptarmigan in a Changing World, Volume II. The Peregrine Fund, Boise, Idaho, USA. http://dx.doi.org/10.4080/gpcw.2011.0308