Climate Change – What Could It Mean for Arctic-Nesting Peregrine Falcons?

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The 450km^2 study area encompasses the town of Rankin Inlet, Nunavut. The Hudson Bay accounts for nearly half (44%) of the study area. It remains frozen well after egg-laying has commenced. In the spring cliffs are often snow covered which may temporarily restrict the location that peregrines choose to scrape.

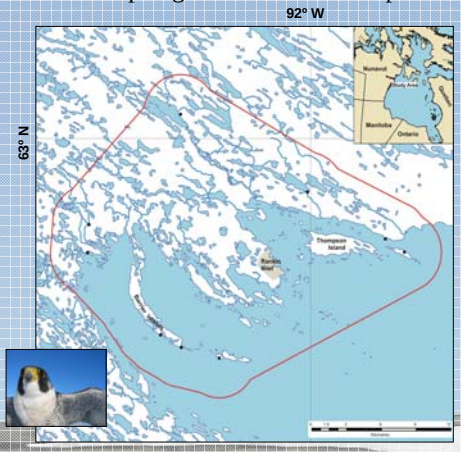

Figure 1. Rankin Inlet study area

The climate at Rankin Inlet is characterized by short, cool summers (July mean temperature 10 degrees C) and long, cold winters. Strong winds are common, and summer storms usually start after the first week of August. The Inlet freezes completely in November and does not break up again until July.

Snow cover lasts from late September to early June. The habitat is flat, treeless tundra interspersed with rocky outcrops of the Canadian Shield. These rocky outcrops have been shaped by glacial action to form a series of southwest-facing cliffs. The ledges on these cliffs provide most of the nesting habitat. Nests may be on oceanic islands, the coast, or inland. Eggs are laid in bowls scraped in the soil, or in old stick nests of Rough-legged Hawks (*Buteo lagopus*). The study population is migratory. Peregrine Falcons arrive on the study area in mid- to late May and lay eggs in the first week of June. The young fledge in mid-August and depart for the tropical Americas by late September

Figure 2. Nesting habitat

Figure 3. Occupancy and production

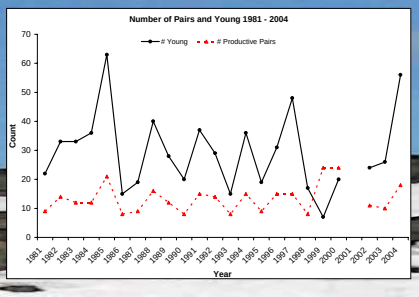

Figure 4. Typical brood

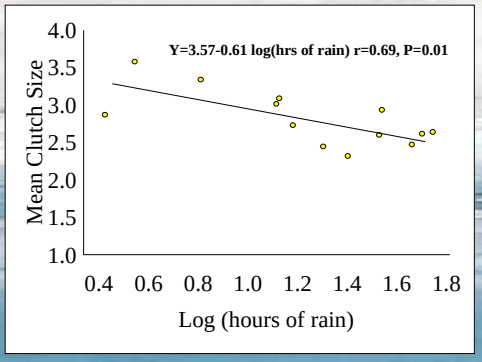

Figure 5. Relationship between clutch size and total rainfall (pre-laying)

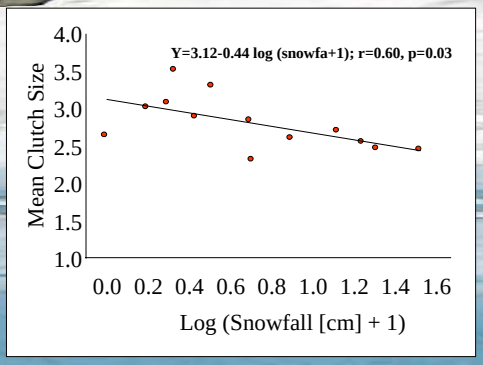

Figure 6. Relationship between clutch size and annual snowfall

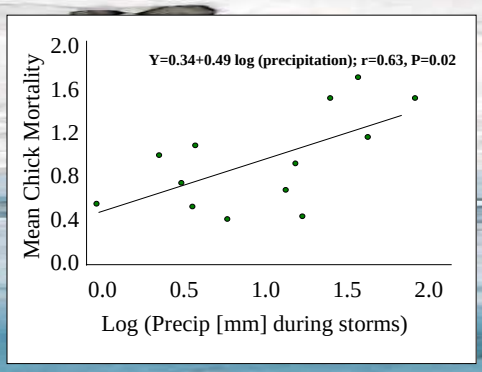

Figure 7. Relationship between chick mortality and annual precipitation

Data were derived from peregrines that breed in a climate that is harsher and less predictable than that experienced by other populations for which data are available. more closely resembles that of other species breeding at northern latitudes (Ely and Raveling 1984, Hendricks and Norment 1992) than of peregrines breeding in more benign climates.

The high variability in breeding success at Rankin Inlet was strongly associated with weather. In some years, the study population has experienced almost total reproductive failure resulting from summer rainfall and spring snow storms. Studies (Gough and Houser 2003,) on climate change have reported increased variability in weather. Assuming these trends continue, the effect of increased environmental stochasticity on productivity of Arctic-nesting peregrine falcons has the potential to decrease overall long term productivity regardless of occupancy.

References

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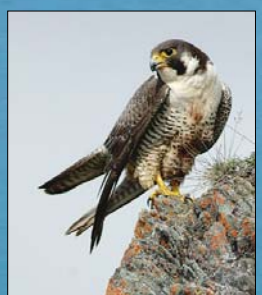

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