

INTERNATIONAL EFFORTS TO UNRAVEL MYSTERIES OF MOVEMENT PATTERNS OF SNOWY OWLS

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As an Arctic top predator, the Snowy Owl (*Bubo scandiacus*) is an enigmatic and iconic bird, catching the imagination and attention of both ornithologists and non-birders alike. In North America, snowy owls breed in Arctic tundra above the treeline but their movements during autumn and fall have long been a mystery. We now know that some individuals remain in the high Arctic all winter,^{1,2} while other owls travel south and overwinter in such places as the Canadian prairies, or along the eastern coast of the US.³ Densities of snowy owls wintering in the south show great annual variation⁴ with periodic irruptions. For example, the

marked irruptions of snowy owls the last two winters (2011/2012 and 2012/2013) across North America, made headline news in TV and newspapers. Breeding primarily in the high Arctic tundra, it is a hard bird to study on the breeding grounds in the high Arctic all year.

However, around the globe there are a few enthusiastic scientists who are trying to unravel the biology and migration patterns of snowy owls. To improve the quality of data collected and to speed up efforts, an *International Snowy Owl Working Group* (ISOWG) was formed during the fourth *International World*

Owl Conference in The Netherlands in November 2007. The aim was to bring together the people who study this elusive bird, and to establish a network for cooperation and the exchange of information, ideas and research results.

Three years later, the ISOWG came together during its first workshop in Saskatoon in February 2010. This gathering was hosted by the late Dr. Gary Bortolotti at the University of Saskatchewan, with participants from Canada, USA, Russia, Germany, Switzerland and Norway. During the workshop's field trip to the southern part of Saskatchewan more than 20 wintering snowy owls were sighted, of which two were caught and banded.

At the end of the workshop, the Saskatchewan and Norwegian participants joined forces to start a cooperative study. Banders in Saskatchewan had been trapping and observing wintering snowy owls since 2000, and have handled more than 450 snowy owls. These experienced banders had plenty of wintering snowy owls, but no funds for satellite transmitters which

allow for continuous tracking of birds over distances that span continents. On the other hand, the Norwegian group had a snowy owl satellite tracking project running since 2005 and funds for transmitters, but few snowy owls in the field. The Norwegians agreed to provide transmitters for use in Saskatchewan, and sent two transmitters to Canada after the workshop. We chose to focus primarily on catching male birds, since most of the other satellite tagged snowy owls in the Arctic have been females. In March and April 2010, the transmitters were placed on two male snowy owls which later flew north along the western side of Hudson Bay up to the Gulf of Boothia, before heading south again in fall 2010. One of the males was found dead in Saskatchewan, and the transmitter retrieved and recycled on another male. During late spring 2011, the two males flew north following a more western route, crossing the northern taiga forest belt. They ended up on Victoria Island, where they both stayed during summer. In autumn, during migration southwards, the oldest working transmitter

steadily gave positions from an area S-SW of Hudson Bay, indicating that the male either had died there or lost the transmitter.

We had two more transmitters available in autumn 2011, and two new males were tagged in late December but one owl did not survive the winter and died shortly before spring migration. In spring 2012 there were therefore two males with transmitters, and both flew north following the same route as the two males did the previous summer. Both owls also stayed on Victoria Island during the summer, heading towards southern Saskatchewan in late autumn, but those transmitters went silent during the winter of 2012-2013.

We thus had winter and summer areas and migration routes of four males before the winter of 2012-13, when eight more transmitters became available. In late February 2013, three of the Norwegians were able to go to Saskatchewan once again, to join up for a week of intensive fieldwork. Five of the transmitters had already been deployed by the Canadian crew, and two

more owls were marked during the Norwegians' visit. Shortly after, the last transmitter was put on the eighth male this winter. Two of the males were caught and marked in Alberta by Mike Blom, and one male was marked by Erhardt Pletz near Edmonton, Alberta.

Since the batteries of the transmitters should last for 4-5 years, we hope to follow these males for several more years, in order to understand how, and why, owls choose certain breeding and wintering grounds and migration routes. Two of the transmitters attached in winter/spring (2013) are solar-powered with GPS positioning devices, giving more accurate locations that also can be used for studies on habitat/territory use on both the breeding and wintering grounds. In May 2013, all eight males flew north to the Arctic, ending up from Southampton Island north of Hudson Bay, to Banks and Victoria Islands. In December 2013, at least six of these males were back in the same areas where they were banded. We are curious to see if some of these males later will choose to stay all winter in the high Arctic, as found in females

marked on Bylot Island in 2007,² and in both males and females marked as breeding birds in northern Norway the same year. (Solheim unpubl. data)^{5, 6}

By using molt patterns in the birds' wings, snowy owls can be aged at least up to and including the winter after their third wing feather molt.⁷ This method gives us an opportunity to age young birds with precision up to the age immediately before their fifth summer. Five of the males marked during February-March 2013 could be aged as younger birds. These owls are probably the most valuable because they may reveal whether snowy owls change migration strategies as they age, and whether they are philopatric to the same wintering grounds they initially chose as young birds.

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Photo 1 - The Canadian-Norwegian Snowy owl team with a male snowy owl ready for release. From left: Karl-Otto Jacobsen, Roar Solheim, Marten Stoffel (with owl), Karen Wiebe, Dan Zazelenchuk and Ingar Jostein Oien. Tomas Aarvak did not participate during the field work in March 2013.
-Roar Solheim



Photo 2 - Satellite transmitter is mounted as a backpack. Dan Zazelenchuk is making the last adjustments while Marten Stoffel holds the male snowy owl. Karen Wiebe watches the process.
-Roar Solheim



Photo 3 - Male owl takes off with the transmitter on its back. This “old” male flew to Southhampton Island where it stayed during summer 2013, and returned in December to the region where it was caught on March 2.
-Roar Solheim



Photo 4 -The flat, open field and prairie landscape southwards from Saskatoon are very good winter habitats for snowy owls.

-Roar Solheim



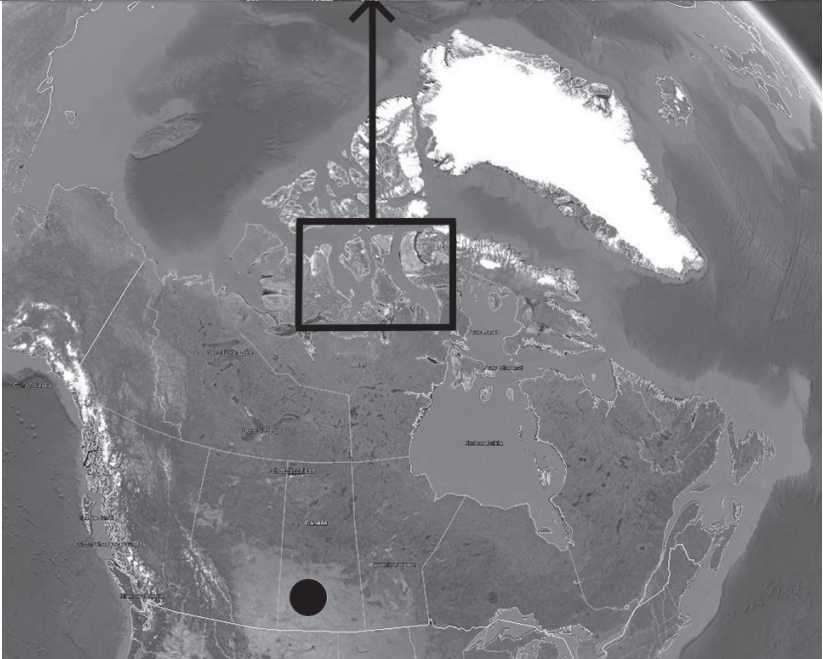
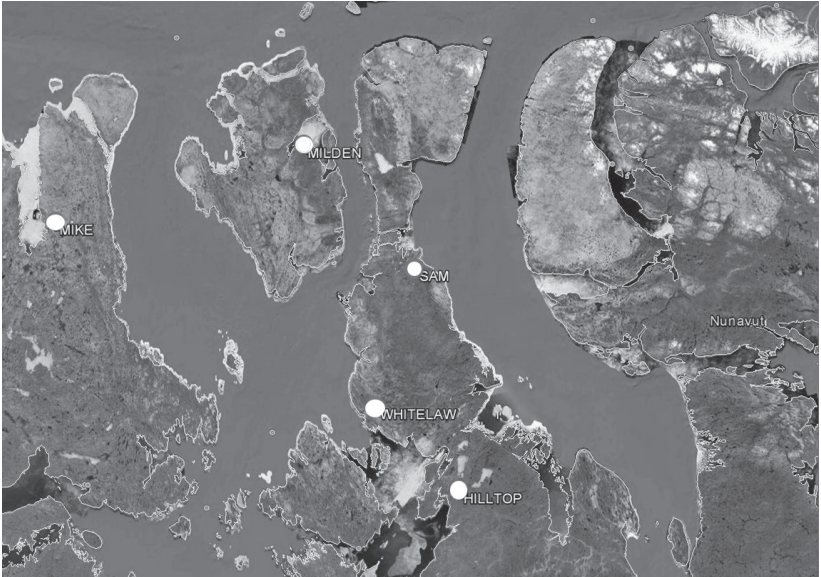
Photo 5 - Snowy owls are caught with bownets or balchatri traps. Here Dan is freeing a young snowy owl male from the net.

-Roar Solheim



Photo 6 - An "old" female snowy owl takes off after being banded, March 8, 2013.

-Roar Solheim



Top: Location of the five male Snowy Owls still transmitting signals (white spots with names) by the end of August 2014. Names we have used to easily identify the birds. Map from Google Earth, showing location of detailed map from Arctic Canada. Bottom, black spot: area where Snowy Owls are captured and marked during winter.

