

Snowy Owl hunting behaviour and prey spotting distances revealed by vole lures

Uso de chamarizes para avaliar o comportamento de caça e de deteção de presas de coruja-das-neves

Roar Solheim^{1*}

¹ Natural History Museum, Agder University, P.O. Box 422, N-4604 Kristiansand, Norway

* Corresponding author: roar.solheim@uia.no



ABSTRACT

When Snowy Owls (*Bubo scandiacus*) turned up in Finnmark, northern Norway in summer 1993, a vole lure on a line was used to test if the owls would detect, approach and attack the lure in the same way that Great Grey Owls (*Strix nebulosa*) do (Nero 1980). When a Snowy Owl was spotted more than 100 m away the lure was placed on the ground some 5-10 m away from me. When the owl looked towards me, the line was pulled to make the lure move. The reaction of the owl was observed through a telescope, and noted as positive if the owl stretched and bobbed its head or negative if no obvious reaction could be seen. I was sitting on the ground (n=4) or in a car (n=7) when pulling the lure. A total of 11 tests were carried out between 11-15 July, on nine different individuals (six males, two females, one owl not sexed). All males reacted to the lures from distances up to at least 1 km. The two females did not show any detectable reaction to the lures. Two males approached from at least 500 m and more than 100 m distance and attacked the lure, while another approached from at least 350 m distance to ca 100 m away. A male which sat just over 1 km away detected the lure but did not attack. Movement distances (n=29) were noted for eight undisturbed owls hunting natural prey. These owls most often flew 50-200 m between vantage points (mean 158 m, median 100 m). Short flights of 10-40 m were linked to predation attempts, presumably on lemmings or voles.

Keywords: *Bubo scandiacus*, flight distances, prey detection, Snowy Owl, Norway

RESUMO

Quando corujas-das-neves (*Bubo scandiacus*) surgiram em Finnmark, no norte da Noruega, no verão de 1993, foi usado um chamariz puxado por uma linha, simulando um roedor, para testar se a espécie detetaria, abordaria e atacaria a falsa presa da mesma forma que a coruja-cinzenta (*Strix nebulosa*; Nero 1980). Quando uma coruja-das-neves era avistada a mais de 100 m de distância, o chamariz era colocado no chão a cerca de 5-10 m de distância do observador. Quando a coruja olhava na direção do observador, este puxava a linha de forma a mover o chamariz. A reação da coruja foi observada através de um telescópio, e anotada como positiva se a coruja se esticasse e balançasse a cabeça, ou negativa, se nenhuma reação óbvia fosse observada. O observador estava sentado no chão (n=4) ou numa viatura (n=7) ao puxar o chamariz. No total, foram efetuados 11 testes entre os dias 11 e 15 de julho, em nove indivíduos diferentes (seis machos, duas fêmeas, e um não sexado). Todos os machos reagiram aos chamarizes até distâncias de pelo menos 1 km. As duas fêmeas não apresentaram nenhuma reação detetável. Dois machos aproximaram-se a partir de cerca de 500 m e 100 m de distância, tendo atacado o isco, enquanto outro se aproximou de uma distância de pelo menos 350 m, tendo mantido uma distância ao chamariz de cerca de 100 m. Um macho que estava a pouco mais de 1 km detetou o chamariz, mas não atacou. Foram registradas as distâncias de movimento (n=29) de oito corujas não perturbadas que caçavam presas reais. Estas corujas, na maioria das vezes, voaram 50-200 m entre poisos elevados (média: 158 m, mediana: 100 m). Voos curtos de 10-40 m foram associados a tentativas de predação, presumivelmente de lemingues ou roedores.

Palavras-chave: *Bubo scandiacus*, coruja-das-neves, detecção de presas, distâncias de voo, Noruega

Introduction

Based on success with radio-tracked Boreal Owl (*Aegolius funereus*) and Ural Owls (*Strix uralensis*) (Sonerud et al. 1986, Solheim et al. 2021) I became interested in learning how to capture and radio-tracking Snowy Owls (*Bubo scandiacus*). While mist nets are used efficiently to capture Eurasian Pygmy-owls (*Glaucidium passerinum*), Boreal Owls, Northern Hawk-owls (*Surnia ulula*) and Ural Owls for banding purposes it was not obvious that they would be efficient for catching Snowy Owls. Based on Nero's (1980) method of using a vole-like lure and a fishing rod to capture Great Grey Owls (*Strix nebulosa*), and success with this method in Norway for

capturing Northern Hawk-owls (unpubl. data), I wanted to test if Snowy Owls would react, approach and attack them. In 1981 the late Norwegian nature filmmaker Hans Vide Bang (pers. comm.) observed a hunting male Snowy Owl in Abisko, Sweden. Vide Bang noted that the lemming population had crashed after the chicks had hatched, and observed the male owl start to hunt alternative prey such as waders and other wetland birds. He observed the male owl fly 600 m in a straight line to capture a Redshank (*Tringa totanus*) chick. This observation also inspired me to test the reactions of hunting Snowy Owls to a lure.

Figure 1 - Location on the Nordkynn peninsula (white circle), in Northern Norway, where an irruption of Snowy Owls was observed 11-15 July 1993.

Figura 1 - Localização na península de Nordkynn (círculo branco), no norte da Noruega, onde foi detetado um boom de corujas-das-neves em 11-15 de julho de 1993.

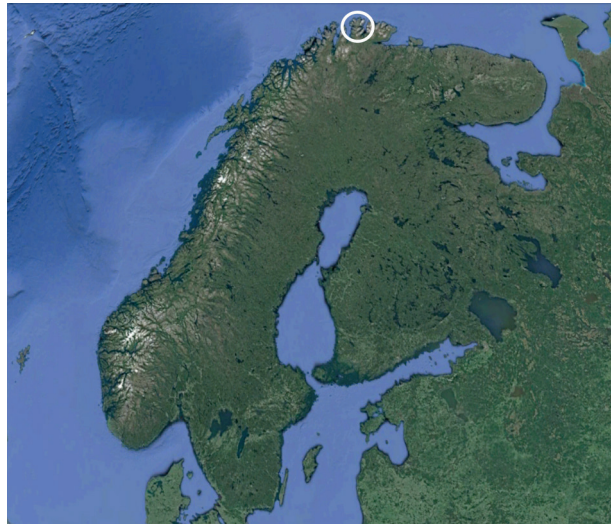


Figure 2 - Landscape along the main road across the Nordkynn peninsula, Norway, where Snowy Owls were observed hunting.

Figura 2 - Paisagem ao longo da estrada principal que cruza a península de Nordkinn, Noruega, onde foram efetuadas as observações do comportamento de caça de coruja-das-neves.



Figure 3 - Snowy Owls usually sit with their head held low, even while turning their head from side to side when scanning the landscape (left image). When an owl spots potential prey, it raises its head (right image), and bobs its head from side to side before taking flight to attack it.

Figura 3 - A coruja-das-neves normalmente permanece imóvel com a cabeça baixa, mesmo enquanto vira a cabeça de um lado para o outro para observar a paisagem (imagem da esquerda). Quando uma coruja avista uma presa potencial, levanta a cabeça (imagem da direita), e agita-a de um lado para o outro antes de iniciar o voo para atacar.



Methods

In July 1993 an invasion of Snowy Owls occurred on the Nordkynn peninsula in Finnmark, northern Norway (Fig. 1), with at least 16 individuals regularly hunting along the main road across the peninsula. The landscape was tundra-like and undulating with bare rocks, vegetation and water, but no trees or shrubs (Fig. 2). Distant Owls were sometimes approached so they could be watched through a telescope. Owls perched 100 m or closer from the road were usually watched from the car to prevent disturbing the birds. The owls were usually watched for 2-3 hours before their reaction to the lure was tested. When the owls were observed hunting, time of movement was noted, and the distance moved was estimated from the point of observation.

A *Microtus* vole-like lure was made with a wooden core with a steel clip at one end to attach the string. The core was wrapped with soft material and covered with dark brown artificial fleece fur. A short leather string was attached giving the lure a short tail.

Owls were sexed based on visual observations of plumage (Josephson 1980, and various contemporary bird guides). An owl's reaction to the lure was tested by placing it either on snow or ice some meters away from the observer only when the owl was looking away from the observer. When owls were sitting far away, their reaction was watched through a Mirador telescope. The lure was pulled towards the observer when the owl was looking in the direction of the lure. A Snowy Owl usually perches on the ground with its head low between the shoulders, even when turning the head around to search for prey. When the owl sees movement, it usually stretches its head up, and bobs the head from side to side, clearly demonstrating that something has caught the birds' attention (Portenko 1972, Höhn 1973, Fig. 3). It was thus easy to judge whether the movement of the lure caught the owl's attention or not. If the owl took off and approached, the reaction was noted as a capture attempt.

Table 1 - Response to a vole-like lure by Snowy Owls.

* Test failed halfway, ** Lure caught by Rough-legged Buzzard, *** Undetermined reaction, ¹ Same male.

Tabela 1 - Resposta da coruja-das-neves ao chamariz simulando um roedor.

DATE	SUBSTRATE	DISTANCE TO OWL (m)	SEX	RESPONSE TO LURE	
				Detected	Attacked
11 July	Snow	>500	M	+	+
12 July	Snow	>100	M	+	-
	Snow	>100	M	+	+
13 July	Snow	250-300	M	+	-
14 July	Snow	350		+	+/-*
	Veg.	>100	M	+	**
	Veg.	>450	M ¹	+	-
	Veg.	>450	M ¹	+	-
	Veg.	1000-1100	M ¹	+	-
15 July	Veg.	>100	F	-	-
	Snow	>100	F	+***	-

Figure 4 - A male Snowy Owl attacking the vole-like lure on snow covered ground 10-15 m away from the observer.

Figura 4 - Um macho de coruja-das-neves a atacar um chamariz simulando um roedor no solo coberto de neve a 10-15 m de distância do observador.



Table 2 - Distances (m) moved by hunting male Snowy Owls in July 1993.

*Behaviour after flight judged as hunting attempt, **Moved between two poles, ***Owl searching for Eurasian Golden Plover (*Pluvialis apricaria*) chicks.

Tabela 2 - Distâncias (m) percorridas por machos de coruja-das-neves a caçar em julho de 1993.

DATE	ESTIMATED DISTANCES MOVED BETWEEN PERCHES						
11 July	75	100	200	50-75	50-75		
12 July	100	150	150	50-75	200		
	50	150-175	100	250	15*	100	10*
13 July	100	1000					
	4**	200	>200				
	200	30-40*					
14 July	150	250	>500				
16 July	10***	75					

Results

Eleven trials were performed with the lure placed either on snow-covered (n=6) or on bare vegetation (n=5, Table 1). Eight trials were on males, two on females and one on an unsexed owl. In ten of 11 trials the owl clearly saw and reacted to the movement of the vole lure by stretching and bobbing its head (Table 1). In two instances the owl flew and attacked the lure. A third attack was terminated when the line came loose and the lure ceased to move. In one trial done from the car, a male Snowy Owl showed interest in the lure but a Rough-legged Buzzard (*Buteo lagopus*) flew in to grab the lure before the owl could take off.

One male owl was tested three times, and reacted positively with head-bobbing all times, although it did not approach; one trial was at a distance >1 km (Table 1). The first male tested on 11 July came in from >500 m away to grab the lure on a snow patch just a few meters away from me (Fig. 4).

On 29 occasions, an undisturbed (by me) owl was watched flying between vantage points hunting for prey. Most owls moved

50 to 200 m between hunting perches (mean 158 m, median 100 m, Table 2). Only when directly chasing prey or moving between two wooden poles did an owl move shorter distances.

Discussion

Much has been written on the diet of Snowy Owls (Portenko 1972, Potapov and Sale 2012), and on the eyes of the birds (Potapov and Sale 2012), however none of these authors described the distance at which Snowy Owls are able to detect prey. Cramp (1985) mentions an observation made by M. Robinson from Shetland where a Snowy Owl flew ca 700 m from a vantage point to attack a prey. Höhn (1973) observed four different Snowy Owls hunting on farmland in Alberta, between 21 January and 24 March 1973, over a total of 11 hrs 28 min. The average waiting time for an owl before moving to a new vantage point was 22 min.,

although sometimes an owl would sit for up to 1 hr before moving. On 12 occasions an owl moved 27 to 160 m from a perch to a strike attempt on a prey (mean 90 m). This is shorter than the mean distance which owls moved between two vantage points in this study. However, Höhn did not note the distance moved between perches when the owl did not make any strikes at prey.

One male Snowy Owl in this study spotted the lure from >1 km; further than hitherto reported. Dan Zazelenchuk and Marten Stoffel (pers. comm.) indicated that Snowy Owls in open prairie landscapes in Saskatchewan, Canada, detect and attack caged (for owl banding purposes) hamsters (Cricetinae) > 500 m away. They also report Snowy Owls able to detect moving mice and voles as far as 2 km. Snowy Owls wintering in this landscape are ideal for performing future field tests of the owls' detection distances.

In this study Snowy Owls moved on average 158 m which was far less than the observed maximum prey or lure detection distance (>1 km). The study area terrain was undulating with numerous small mounds and rocks that could hide many voles from ground perched hunting owls. Therefore the shorter distances between hunting perches observed in this study were probably required for the owls to hunt voles and lemmings in this terrain effectively.

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