

STRUCK AND LOST

WHAT IS S&L?¹

An animal is said to be “struck” when it is hit by a weapon, such as a harpoon, or by a projectile, such as a bullet or grenade. This can have several outcomes, not mutually exclusive:

1. Animal is injured, and continues to be pursued by the hunter;
2. Animal is injured and escapes the hunter;
3. Animal is killed but not landed, or lost during the landing process;
4. Animal is killed and landed by the hunter.

Cases 2 and 3, where the animal is “lost” to the hunter, are cases of S&L.

Strategies to address the problem of struck and lost can be divided into 2 categories: those that deal with the consequences of struck and lost to wildlife management, and those that attempt to reduce or eliminate struck and lost. This document focuses on reduction of S&L and do not consider the consequences for management.

FACTORS THAT MAY CONTRIBUTE TO REDUCING S&L

1. Anatomical and physiological features²:

- Agonal (involuntary) reflex movements – especially up and down trashing with flippers and/or tail may contribute to S&L - can be very violent and last for several minutes
- The animal’s locomotion ability makes it possible for a seal to slide off the ice, thus important to take into consideration when shooting seals that are lying near the ice edge. A wounded animal can move quickly into the sea.
- The negative buoyancy of the carcasses of many species – most marine mammals sink when dead or in a state of unconsciousness.
- The nutritional status can be decisive, i.e. fat animals float, while thin animals sink. Especially for seals but also smaller toothed whales the nutritional status affect the buoyance. For large whales this is not the case.

The above factors are given facts and not possible to influence or change. The importance and significance for the hunter is to be aware of them and to calculate these aspects into the overall considerations they have to make before taking a shot/throwing a harpoon/hakapik etc. with the aim of stunning/killing an animal. Other features can be weather conditions (wind, waves), distance and position of animal from hunter, behaviour (coming up to breath or going down) etc.

2. Hunters training /experience and technique

All NAMMCO workshops and expert group meetings related to hunting have underlined the essential importance of hunters training. Other, “external” meetings have also reported the same result. For instance, in a workshop on S&L in Nunavut they concluded that proper hunting skills and proper hunting techniques are more critical than equipment to hunting success and reducing S&L³.

This entails knowledge on where to target the animals (brain, neck, thorax (heart and lungs) and abdominal area). The preferred target area depends on species and environmental circumstances, for instance to take the shot when the probability of retrieving the animal is at

¹ NAMMCO 2006: Daniel Pike keynote presentation

² NAMMCO 2006: Siri Knudsens presentation

³ NWMB WS 2013

the most optimal (after it has taken a breath so it does not sink). The importance of the angle of the shot relative to the animal axis, to not shoot from behind, to be quiet in order not to disturb and frighten the animals, to have some knowledge on the normal behaviour of the animal, to be patient and wait for the right moment to strike an animal etc., all of this is examples of knowledge that is important to have in order to optimise the hunt.

Training on how to use the equipment, how to use explosive grenades, how to use different rifles and ammunition, bullet or harpoon placement, shooting tests – these are all examples of important elements of hunters training. Traditionally hunter's skills were transferred from generation to generation. Today societies have changed, fewer full time hunters gives less opportunities for younger generations to learn from watching the elders. This necessitates to for instance teach hunting skills in schools or as separate programs, develop instruction manuals (NAMMCO manuals) and where possible make videos (Greenland harpoon gun instruction video).

3. Hunting equipment and availability

Equipment and availability of correct equipment can be hard to find in some regions, and this will influence the efficiency of the hunt as hunters may use less optimal equipment. It is important that equipment is suited to local conditions and maintained in good condition, and hunters should ideally not hunt if they do not have proper, functional equipment available. With respect to S&L it is especially important to have equipment to secure the animal before or after it is killed, such as a harpoon, line and float or a grappling hook.

4. Technological innovation⁴

Being a marginal enterprise – relatively few hunters and not a very profitable business compared to i.e. fishermen, does not constitute a large potential market for manufacturers and developers of weapons and equipment. Consequently, the motivation for innovation and new developments are not huge. The exception is the development of reliable harpoon gun technology by Sven Føyn in the 1860 and more recently the development of the explosive grenade used in minke, fin, humpback and bowhead whale hunts. The method of harpoon guns with penthrite grenade have not only shortened TTD but also reduced S&L.

Unfortunately, there has been no development in techniques and equipment for securing and killing small whales, seals and walruses. *To develop equipment that can simultaneously secure and kill the animal is an obvious goal for technological innovation, but this would require funding.*

5. Regulation

Hunting regulations can proscribe the equipment and techniques that must be used in hunting and can therefore have a direct effect on the incidence of S&L. An example is the 2006 regulation for hunting walrus in Greenland that require the hunter to harpoon the walrus before the killing shot is made.

S&L is probably inevitable in all hunts – for some hunts more than others depending on hunting method and species. Apart from the obvious loss for the hunter when losing an animal there are the ethical considerations of animal welfare. In hunting operations human safety will always take priority to animal suffering, but it is essential to minimize animal suffering and work towards the lowest possible TTD. This being said hunters, managers and researchers should use very means available to reduce S&L and to get reliable and accurate data on S&L.

⁴ NAMMCO 2006 Daniel Pike keynote presentation

OVERVIEW – WHAT ARE THE MOST UPDATED NUMBERS OF S&L?

See appendix 1 Overview of hunts and struck and lost in NAMMCO member countries.

SEALS**Greenland⁵:**

Netting, drowned/no rifle: S&L?

Sneaking up to breathing holes, rifle: S& L

From ice edge with rifles

Open water hunt, small boats with rifles. Harps. Major harvest take place in autumn with much less S&L than in April – July when S&L are up to 33-34%.

The most significant reason for S&L is the long shooting distance, the animal sink before being secured. Seasonality, salinity of the water and locality plays a role. The loss rate due to sinking is highest when the seals body fat content and the salinity of the water is low. Locality also matters as river deltas will have less saline water.

Norway:

Ice hunt harp seals: No official numbers but a fair estimate is that the hunt of weaned pups has little to no S&L due to blubber thickness, they do not sink. Adult sink so there are probably more S&L than in the pup hunt but not a significant number

Coastal seals: The animals are hunted in shallow water so if they sink it should be possible to retrieve them. No official numbers.

Canada⁶:

Inuit open water hunt of harp seals estimated roughly to 50% (Canadian National Marine Mammal Review Committee in 1999 (DFO 2000). ICES harp and hooded WG use 59 % (ICES 2006)

WALRUS

Walrus sink when dead. When hunted in water it is therefore important to wound by shots to lungs and/or spinal cord when surfaces for air, then harpooned and killed.

Greenland:West Greenland (Baffin Bay stock:

A field study in the area in 1977/78 estimated loss rates between 15% and 25% from 34 hunts with a total of 112 landed animals (Born and Kristensen 1981), and more recent estimates by hunters indicate much lower loss rates of no more than five percent (APNN 2014; Born unpublished). The recent walrus assessment used the span of these estimates as a uniform prior from a low catch history with a loss rate of 5%, to a high catch history with a loss rate of 25%.⁷

Canada and Alaska: S&L of 42% (monitored 1952-72) and 32 % (1982-84) respectively⁸.

⁵ Greenland 2012

⁶ NAMMCO 2006

⁷ NAMMCO SC 2015

⁸ NAMMCO 2006

CETACEANS:

Small whale hunts:

Narwhal and beluga

Greenland⁹

Hunted from qayaqs and small motor boats – open water /ice cracks and close to ice edge

Both hunts: harpoon first then shoot to kill. Harpoon has floats attached

In 2011 Greenland reported S&L rate of 0 on a reported catch of 179 narwhale and 86 belugas.

Canada:¹⁰

Beluga: S&L range from 5,4 to 25 % between 1977-99 (Harwood et al, 2002) Monitoring still continues

Narwhal: S&L estimates 1983 and 1986-89 Baffin region: Open water hunt: 7.4 %, ice crack : 23,8% and ice floe edge: 31,7 %

Other small whale hunts - Greenland

Hunters assessment of S&L was reported to be from 5 % to 10%¹¹

*Pilot whale drives – Faroe Islands S&L 0%*¹²

Large whale hunts

*Harpoon gun with explosive grenade*¹³:

Greenland, Minke S&L 1% 2001-2006, Fin S%L 10,7 % 2002-2006

Humpback

Bowhead

Norway S%L 1% 1994 - 2006

Iceland

Minke and Fin

*Collective rifle hunt – Greenland*¹⁴

S&L 6.1 % 2001-2006

In Norway the reasons for struck and lost are reported to be equipment failure – harpoon line breaking.

*Darting gun/shoulder gun – bowhead hunt in Alaska, Chukotka and Canada*¹⁵

The introduction of the penthrite grenade in the darting gun combined with training programmes organised by the AEWC has resulted in a significant reduction in S&L from around 50% to less than 10%. AEWC report SL as part of their reporting to the federal government.

References:

NAMMCO 2006: Report from the Workshop on S&L in 2006

⁹ NAMMCO 2011

¹⁰ NAMMCO 2006

¹¹ NAMMCO 2011

¹² NAMCMO 2006

¹³ NAMMCO 2006

¹⁴ NAMMCO 2006

¹⁵ NAMMCO 2015

NAMMCO 2010: Report from the 1st Expert group meeting on assessing TTD in large whales in 2010
NAMCMO 2011: Report from the Expert group meeting assessing hunting methods for small cetaceans in 2011
NAMMCO 2015: report form the 2nd Workshop on assessing TTD in large whales in 2015
NAMMCO SC 2015: Report NAMMCO SC 2015
NWMB 2013: Report on Marine Mammal Struck and Loss in Nunavut, Canada March 19-21 2013
Greenland 2012: Management and utilisation of seals in Greenland 2012

Overview of hunts and struck and lost

Country	Species	Type of hunt	Platform and conditions	Dispatching mean	Included in quota	S/L rate - paperbased	S/L rates used in NAMMCO SC advice	References
Faroes	Pilot whale	Drive hunt	Boats, killing from beach	Spinal lance				
	Dolphins	Drive hunt	Boats, killing from beach	Spinal lance				
	Harbour porpoise	Recreational	Boat	Shotguns with pellets cartridges		unkown		
	Grey seal	Around fish farm	Boat/land	Rifle		unkonwn		
Greenland	Bowhead whale	3 boats	Boat	Harpoon gun				
	Fin whale	2 boats or larger boat	Boat	Harpoon gun		approx range 0 - 21 % (2007 - 2011)		APN: White paper on large whales 2012
	Humpback whale	1 boat	Boat	Harpoon gun		0%		APN: White paper on large whales 2012
	Minke whale	1 boat	Boat	Harpoon gun		approx range 0 - 4 % (2007 - 2011)		APN: White paper on large whales 2012
	Minke whale - collective	Collective, min 5 skiffs	Open motor boat	Rifle hunt		approx range 2 - 12 % (2007 - 2011)		APN: White paper on large whales 2012
	Bottlenose whale							
	Killer whale	Collective	Open motor boat	Rifle				
	Pilot whale	Collective	Open motor boat	Rifle				
	Harbour porpoise	Collective	Open motor boat	Rifle				
	Dolphins	Collective	Open motor boat	Rifle				
	Narwhal/Beluga	Collective	Open motor boat	Harpoon and rifle		0		NAMMCO expert group meeting assessing small cetaceans, 2011
	Narwhal/Beluga	2 hunters	Kayaks	Harpoon and rifle		0		NAMMCO expert group meeting assessing small cetaceans, 2011
	Narwhal, Beluga		Open water/under sea ice	Net		0		NAMMCO expert group meeting assessing small cetaceans, 2011
	Walrus (Qaanaaq) Baffin Bay stock	2 or more hunters	Open water-from floe edge	Harpoon, rifle, lance		25 %: Born ref.	15 % NAMMCO advice	34 hunts with 112 landed animals in 1997/78 (Born et al, 1995, NP meddelelser no 138 , Oslo 1995). Hunters report estimation of up to 5 % (APNN 2014: Born unpublished?) Recent assessment used the span low catch history S/L rate 5 % to high catch history S/L rate 25 %
	Walrus Baffin Bay stock					15%	15%	APN; N. Levermann - advice from NAMMCO/JCNB taking into account hunters estimation
	Walrus (East Greenland)	2 or more hunters	Open water-from floe edge	Harpoon, rifle, lance		23 %: Born ref.	11 % NAMMMCO advice	observed catches of 23 animals from 1986 to 1988 (Born et al. 1997, Meddelelser om Grønland 46). APN; N. Levermann - advice from NAMMCO/JCNB taking into account hunters estimation
	Harp seal - young of the year							
	Harp seal - adult							
	Harp seal		Boat	Rifle		0,21 - 0,26 (May - October)		APN: F. Ugarte and J. Jakobsen: questionnaire survey presented at the WS on Struck and Lost in 2006
	Hooded seal			Rifle				
Bearded seal								
Ringed seal		On the ice	Rifle					
Ringed seal		From ice edge (with kayak or small boat to haul out)	Rifle					
Ringed seal		Ice	Net					
Harbour seal	protected 2010							

Overview of hunts and struck and lost

Country	Species	Type of hunt	Platform and conditions	Dispatching mean	Included in quota	S/L rate - paperbased	S/L rates used in NAMMCO SC advice	References
Canada	Harp seal Canadien Atlantic - young of the year						5 % March and April, 50 % rest of year	Sjare and Stenson 2002: estimating struck and lost for harp seals. Hammil et al harp seal conservation in Biol cons 2015
	Harp seal Canadien Atlantic - adult						50%	Sjare and Stenson 2002: estimating struck and lost for harp seals. Hammil et al harp seal conservation in Biol cons 2015
Iceland	Fin whale		Boat	Harpoon gun	yes	range: 0 - 2,63 %, avarage 0,51 % (2009 - 2017)		Directorate of Fisheries- reporting to NAMMCO
	Minke whale		Boat	Harpoon gun	yes	range: 0 - 8,52 %, avarage 3,89 % (2009 - 2015)		Directorate of Fisheries- reporting to NAMMCO
	Grey seal			Rifle & club				
	Harbour seal		Land, in rivers' mouth	Net				
Norway	Minke whale	Boat	Boat	Harpoon gun	yes	range: 0,4 - 1, 5 % (2010 - 2015)		Directorate of Fisheries- reporting to NAMMCO
	Harp seal	Boat - ice	Boat or ice	Rifle + hakapik		unknown		Not collected. Estimat weaned pups no S/L due to blubber thickness, some insignificant S/L numbers in adult hunt.
	<i>Hooded seal</i>	<i>protected 2007</i>						Not collected
	Grey seal		Hunter laying on land or from water if retrievable	Rifle + slagkrok		unknown		S/L known to happen but no systematic surveys done in communication with Kjell T Nilssen, MRI Norway. If animals sink they should be retrievable
	Harbour seal		Hunter laying on land or from water if retrievable	Rifle + slagkrok		unknown		S/L known to happen but no systematic surveys done in communication with Kjell T Nilssen, MRI Norway. If animals sink they should be retrievable
	Ringed seal (Svalbard)		Water (16 August- 30 November), ice or land	Rifle + slagkrok		unknown		Not collected
	Bearded seal (Svalbard)		Ice or land	Rifle + slagkrok		unknown		Not collected