REVIEW OF THE NAMMCO OBSERVATION SCHEME

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November 2018

1 INTRODUCTION

1.1 Background

The North Atlantic Marine Mammal Commission (hereinafter NAMMCO) since 1998 operates an international Observation Scheme (hereinafter often referred as the Scheme). The purpose is to monitor whether national legislation and recommendations made by NAMMCO are implemented and complied with. NAMMCO appoints international observers to monitor sealing and whaling activities in selected areas in NAMMCO member countries under the Provisions of the Joint Control Scheme for the Hunting of Marine Mammals[1].

The last review of the Observation Scheme was prepared by the Secretariat for the Committee on Inspection and Observation (hereinafter CIO) meeting in January 2005[2] (Appendix 2). In 2017, the Secretariat undertook to review the Observation scheme for the CIO February meeting 2018.

1.2 Aim and structure of the report

The aim of the report is to:

- Review the implementation process of the NAMMCO Observation Scheme;
- Evaluate the Scheme's implementation;
- Recommend possible improvements in any domains related to the implementation process.

The review and evaluation of the Observation Scheme covers the period since its initiation in 1998 until and including 2017.

The report is structured as follows:

Following the introductory section 1, the report is broken into three sections:

- Section 2 "Methodology" clarifies methods used to review and evaluate the Scheme.

- Section 3 "Results and Discussions" is further divided into five sub-sections. The first shows how the observation process is carried out, including how observers are nominated and selected, what precisely is their role and what is the scope of observation. The second gives a tabular overview of some elements of the Scheme, while the third shows which infractions have been identified so far. The fourth sub-section reviews observed hunts. It is organised per member state, in alphabetical order. Emphasis has been placed on numerically expressing the findings, where possible, then to conduct a more precise evaluation and a comparison, where appropriate, with other regional observer programmes. The final sub-section explains the rationale behind the selection of evaluation criteria for the Scheme, before considering each criterion in turn.

- Section 4 "Conclusion and Recommendations", summarises provides the findings and the Secretariat's recommendations for improving the implementation process of the Observation Scheme.

2 METHODOLOGY

The review of the Scheme is based upon assessing the related NAMMCO documents, such as Provisions of the Joint Control Scheme for the Hunting of Marine Mammals, annual Secretariat's reports on the implementation of the Scheme, observers' reports and diaries and other relevant documents. In addition, some

[1] Provisions of the Joint NAMMCO Control Scheme for the Hunting of Marine Mammals, 1997
[2] NAMMCO. 2005. Review of the NAMMCO Observation Scheme. Document NAMMCO I&O-2005-03.

more informal methods were used, such as consultations and interviews with key NAMMCO staff. The results are presented as a general overview, as well as per member country.

The evaluation relies on reviewing the implementation of the Scheme in light of criteria based on international instruments relevant to NAMMCO, as well as guidelines, standards and practices from other regional fisheries bodies practices and the Scheme objectives.

2.1 Coverage rate

An important parameter for assessing observer programmes is the level of observer coverage, in the NAMMCO case, the percentage of hunting effort observed. The observer coverage is the proportion of observed hunting effort to the total hunting effort. The level of observer coverage can be expressed in three ways:

a) As a fleet observation rate (FOR) - for on-board observation

The fleet observation rate per season, or season fleet observation rate (FOR), is the percentage of observed hunting vessels to the total number of hunting vessels in a specific season.

The fleet observation rate for observed seasons (OFOR) is the average of the fleet observation rates for all the observed seasons.

The fleet overall observation rate for all seasons since the inception of the scheme, or total fleet observation rate (TFOR), is the average of the season fleet observation rates for all seasons since the inception of the Scheme in 1998, with non-observed season having a fleet observation rate equal to 0.

The FOR is not a very precise representation of the observation coverage, as vessels are observed only part of the season and transit time to the hunting area is not accounted for. Transit time can represent several days in some hunts like minke whaling in the Barents Sea and sealing in the West Ice. A day observation rate would be a better measure for on-board observation activity. The data available from the observer reports did not allow for that to be calculated.

In the case of pilot whaling observation, a FOR could be estimated if the observers were asked to/could board some of the boats participating in a drive. However, this does not seem to have happened and has so far not been specifically asked for and is not applicable.

b) As a catching event observation rate (COR)

The catching event observation rate (COR) is the ratio of catching events under observation to the total catching events in a specific season. As the FOR above it can be calculated for observed season (OCOR) or for all hunting seasons since 1998 (TCOR).

In the case of the Norwegian sealing, the catching event is defined as every time a group of seals is targeted by the sealers, seals killed and retrieved on board, regardless of the number of seals killed. The COR is not available, as the observers have not been specifically asked to report on the number of catching events observed.

In the case of the Faroese pilot whaling, the catching event is the *grind*, or the pilot whale drive. The observed season observation rate (OCOR) and the total observation rate (TCOR) are calculated in similar ways as above.

c) As a kill observation rate (KOR)

The kill observation rate (KOR) would be the ratio of individual kill under observation to the total kill events (the total number of animals killed) in a catching event. In the case of large whale hunts, the COR and the KOR will be the same.

However, observers have not been specifically asked to report on individual kill neither for the Norwegian sealing nor the pilot whaling, so a kill observation rate is not available. This is a limitation of the Observation Scheme, as this could otherwise provide further information on the hunting process.

In the case of Greenland, the reporting requirements laid down in the Observation Scheme are quite general and do not always cover the necessary information to allow calculations of most of the different coverage rates. To be able to generate FOR, COR and KOR for all observed hunts will require more precise reporting requirements asked of the observers.

2.2 Identifying relevant sources for the evaluation criteria

NAMMCO is recognised by FAO as a regional fisheries body[3]. International legal instruments and guidelines and practices pertaining to fisheries and fisheries bodies were therefore used to identify criteria for evaluating the implementation of the NAMMCO Scheme. This sub-section describes the rationale for this.

State Parties to the Law of the Sea Convention (hereinafter LOSC)[4] have general conservation obligations and responsibilities in their capacities as coastal and flag states. These obligations have been interpreting by the following relevant instruments[5]:

- **The Fish Stocks Agreement**[6]**,** as it sets out the regime for the conservation and management of straddling and highly migratory fish stocks, by reference to LOSC Annex I. Parts of the Fish Stocks Agreement, and in particular its provisions on regional management constitute generally accepted standards which coastal States must take into account when conserving and managing the living resources in their EEZ;
- **The FAO Code of Conduct**[7]**,** whilst not a legally binding instrument, mostly reflects customary international law;
- **FAO guidelines for responsible fisheries**[8] supporting the Code of Conduct;
- **RFMO measures** pertaining to observer programmes. These measures can be argued to constitute generally recommended minimum standards;
- **Chatham House Recommended Best Practices for Regional Fisheries Organizations**[9], a document produced by an expert panel, which was set up following one of the recommendations of the ministerial-led Task Force on Illegal, Unreported and Unregulated Fishing on the High Seas.

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[3] See http://www.fao.org/fishery/rfb/nammco/en.

[4] UN General Assembly, Convention on the Law of the Sea, 10 December 1982.

[5] All parties to the LOSC (which includes the NAMMCO Member States) are under the general obligation to protect and preserve the marine environment pursuant to Art. 192 LOSC in all maritime zones, whether within or beyond national jurisdiction. This includes marine living resources (see the Southern Bluefin Tuna Case), fish as well as marine mammals. This obligation to protect and preserve has to be interpreted quite extensively, including in light of the corpus of international environmental law (see the South China Sea Award).
More specifically, states in their capacity as flag state are under specific obligations to ensure that vessels flying their flag do not undermine these responsibilities (see LOSC Article 94, and Advisory Opinion to the SRFC). This requires taking the necessary administrative measures to ensure that this is so.
States are also, in their capacity as coastal state, under the specific obligation to conserve and manage the living resources in their EEZs so as to ensure that these are not endangered by over-exploitation. In so doing, states must inter alia take into account generally recommended international minimum standards, whether sub-regional, regional or global. The LOSC is therefore a relevant source for evaluating coastal State measures to conserve and manage living resources, including for example by adopting observation schemes. Being a framework convention, the LOSC contains no specific provisions on observation. However, in fulfilment of their obligations, state parties must consider subsequent instruments that do make reference to observation schemes when these measures are part of the general corpus of environmental law (thus informing states' obligations under Art. 192 LOSC) and when these measures match generally recommended standards which coastal and flag States must take into account.

[6] Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement).

[7] 1995 FAO Code of Conduct for Responsible Fisheries.

[8] Recent trends in monitoring, control and surveillance systems for capture fisheries. Flewwelling, P.; Cullinan, C.; Balton, D.; Sautter, R.P.; Reynolds, J.E. FAO Fisheries Technical Paper. No. 415. Rome, FAO. 2002.

[9] Recommended Best Practices for Regional Fisheries Management Organizations, Report of an independent panel Michael W. Lodge, David Anderson, Terje Løbach, Gordon Munro, Keith Sainsbury, Anna Willock, The Royal Institute of International Affairs Chatham House, 2007.

These instruments contain what could be considered criteria for evaluating observer programmes of regional fisheries bodies. The relevant criteria for evaluation of the NAMMCO Observation Scheme are as follows:

Coverage rate and representativeness of observation activities

Best practices among regional fisheries bodies show that the required observer coverage rates are quite variable: in tuna RFMOs a minimum of 5% observation coverage[10] is demanded while CCAMLR's observer programmes calls for the 100%. Full coverage of fishing activities, however, does not appear to be a standard in RFMO practices.[11]

Also, coverage needs must be assessed in line with the specific objectives and issues target of each monitoring programme.

On-land observation versus on-board observation

General practices of RFMOs show a preference for on-board observation as opposed to on-land observation. The motive for this is the higher effectiveness of the on-board observation, which documents both the process and its result - and issues if any, while on-land observation only documents the result, ignoring the process and its issues[12].

Observers' competence and safety of observers

Observers must be sufficiently qualified and trained. The FAO recognises that "large measure of the success of any observer program depends on the professional competence and personal integrity of the observers"[13], and lists various criteria in this regard. Of particular relevance are the following:

- observers should not be granted enforcement powers;
- observers should receive appropriate training and evaluation;
- observers must be paid appropriately for their, often hazardous, duties.[14]

Establishing and reviewing the observer programme

Flag States should where appropriate, implement observer programmes for its vessels as part of the obligation to exercise effective monitoring, control and surveillance (MCS) measures, which include observer programmes. This obligation should be implemented by sub regional or regional fisheries management organisations and arrangements[15] and procedures should be developed to review and assess the effectiveness of compliance and enforcement measures on a regular basis[16].

Cost effectiveness of the observer programme

The obligation to implement observer programmes, where appropriate, is deriving from the Fish Stock Agreement and Code of Conduct (see discussion in the paragraph above). The implementation of the observer programme should be fulfilled in good faith, as required by the LOSC[17]. *Good faith* includes considering the cost effectiveness of a programme.

[10] Tuna longline fisheries by IATTC and WCPFC where; the ICCAT CPC observer programme which only requires 20% coverage on large pelagic trawlers, longline and baitboat vessels; and the IOTC and CCSBT scientific observer programmes which only require 5% (IOTC) and 10% (CCSBT) coverage. SPRFMO Documents Observer Programmes

[11] Overview of current RFMOs practices is available *inter alia* in SPRFMO Secretariat Document COMM-04-INF-04, Observer Programmes of RFMOs, 2016.

[12]Overview of current RFMOs practices is available *inter alia* in SPRFMO Secretariat Document COMM-04-INF-04, Observer Programmes of RFMOs, 2016.

[13] Supra note 21, p.60.

[14] Ibid, p.61.

[15] The Fish Stock Agreement Art. 18(3) and Code of Conduct Art. 7.7.3. This obligation is qualified with the text "as appropriate", however the Chatham House Recommendations note "observer programmes have long been regarded as an essential component of fisheries MCS" (p. 47 Chatham House Recommendations).

[16] Supra note 22, p. 66.

[17] See LOSC Article 300.

3 RESULTS AND DISCUSSION

3.1 Observation in practice

3.1.1 Nomination and selection of observers

Member countries nominate observer candidates which are formally appointed by the Council for each calendar year. From the pool of appointed observers, the Secretariat selects the ones that will be contracted in a specific year. As a rule, NAMMCO observers are required to have at least the same level of qualifications and training as national inspectors and must be familiar with all relevant regulations relating to the activities they observe.

3.1.2 Role of the observer

The role of the observer is to oversee hunting activities and the national inspection of these, in order to assess whether or not these are carried out in accordance with national legislation. Thus, the observers must be given access to all items of importance for the task at hand such as hunting permits, vessel logbooks, reports of catch, hunting equipment etc.

Observers are required to report immediately any violations of the national regulations but have no authority to intervene in hunting activities in any way. Actions with respect to possible infringements are the responsibility of the national control authorities.

3.1.3 Identifying the scope of the annual observation, selecting observers

When the scope and range of the observation for the year is approved by Council (usually in January/February), the Secretariat contacts the observers to find out if and when they can go and for how long.

The selection of observer has been made considering factors like:

- using as many of the approved candidates as possible
- supporting knowledge sharing between NAMMCO countries, i.e., depending on the scope, contracting observers that may benefit from acquiring knowledge on how hunts are conducted other places
- using experienced observers when the activities in question have been special, i.e. when Iceland resumed whaling a very experienced observer was selected
- the availability of observers i.e. when and for how long can the observer be contracted. The observers have as a rule been fully employed persons, who have taken time off to work for NAMMCO. In the Norwegian seal hunt the main challenge has been the potential that the observer would have to be out for up to 8 weeks.

In dialogue with the authorities, information needed for the implementation are gathered, and national contact persons identified. The relevant authorities in the member states are:

- Norway and Iceland: Directorates of Fisheries
- Faroe Islands: Ministry of Fisheries
- Greenland: Ministry of Fisheries and Hunting

Planning the observation season requires different information depending on the hunts being targeted. The time spent planning and coordinating varies according to the target and the number of actors involved, e.g., the number of licenced boats in a season. In the Norwegian minke, whale hunt the number of active vessels in the observed seasons has ranged from 34 to 16 (1998-2016), in Iceland the numbers are 4 to 2. Identifying actual observation period must be coordinated with the availability of observers, i.e. if they have time off from work in the actual period.

For the Norwegian minke whaling, the selection of vessels to observe and contact with the owner/captains has been done by the Secretariat. This also involves determining the most optimal time and place for the observer to board the vessel. The role of the Secretariat in the implementation of the Scheme for the Norwegian minke whaling compared to the other hunts has been much greater, and quite time consuming.

In Iceland, given the small number of vessels, the main issue is whether they plan to go hunting and when, and the Directorate of Fisheries has had the direct contact to the captains whereas the Secretariat has coordinated with the observers.

In Norway and Iceland, whaling vessels with harpoon gun are obliged to take an observer on-board if required. This is a condition of the licensing. This is also the case for the pack ice sealing (for Norway see footnote[18]). In Greenland there is no such condition, but hunters shall attempt to notify the wildlife officers in advance of any planned hunting trip. The wildlife officer observes from their own boat, never on-board the hunting boat itself. NAMMCO observers have observed from the wildlife officer boat, and also on-board a hunting boat.

3.1.4 Instruction and information to observers

The observer shall conduct the observation activities in accordance with the Guidelines to Section B of the Provisions – Duties and Tasks of the Observer.[19]

To ensure independence and neutrality of the implementation of the Observer Scheme the Secretariat is operating the Scheme with minimum interference from the member states. When the observers have been selected, they receive all necessary documentation and information relevant for their assignment. The Secretariat ensures by communicating with observers that they understand the procedure and what is expected from them.

For Norwegian observation activities the Secretariat coordinates all contact with captains and boat owners and is the contact person for the observers while in Norway.

For observation activities in other countries, this has for practical reasons been done by the responsible authorities in the member country in question. The observers will typically have an initial meeting with representatives from the authorities where among other things the existing regulations and the control list will be reviewed. All observers have a contact person in the country they observe in.

3.1.5 Reporting

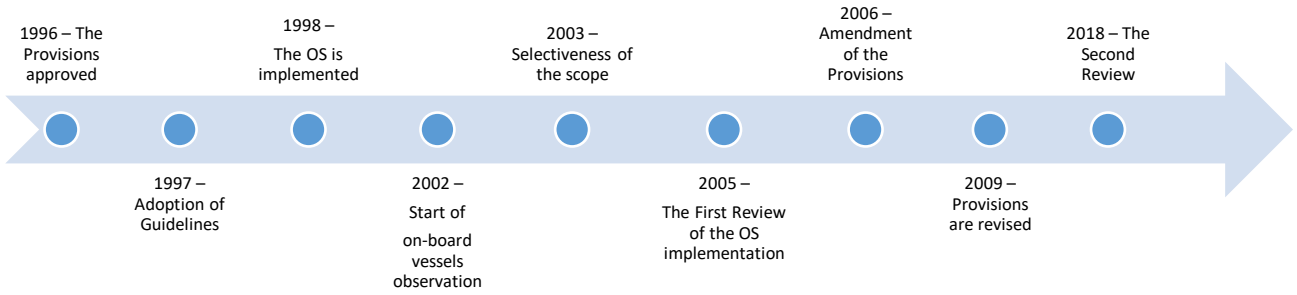
NAMMCO observers are employed by, and responsible to, NAMMCO alone. They are required to submit written reports to the NAMMCO Secretariat at the end of their assignment, using the mandatory forms (see Annex 3). They have also been asked to submit a diary for the use of the Secretariat. Otherwise it is a strict requirement for the observers to maintain the confidentiality of their observations. In the case of infringements of regulations, the observer shall send a written report with copy to flag state and owner of vessel[20]. The Secretariat compiles an overview of observation activities each year for the annual review of the NAMMCO Council. The observer reports are sent to the national authorities after the season.

[18] Norwegian annual national regulation require that observers must be admitted on-board all vessels should this be decided.
[19] Provisions of the Joint NAMMCO Control Scheme for the Hunting of Marine Mammals: Guidelines to Section B – International Observation Scheme / AD B.2.5 – Duties and tasks of the Observers
[20] NAMMCO Guidelines to Section B, 6. And 7.

3.2 Tabular overview of some elements of the Scheme

Figure 1 shows the key milestones events since the Observation Scheme came into force.

Figure 1: Observation Scheme (OS) milestone events



All milestone events chronologically

1996 – The Provisions of the Joint NAMMCO Control Scheme was approved by NAMMCO Council
1997 – Adoption of Guidelines to Section B
1998 – The Observation Scheme is implemented
2002 – Introduction of on-board vessels observation
2003 – Selectiveness, as opposed to comprehensiveness, of observation activities scope
2005 – First Review of the Observation Scheme
2006 – Provisions of the Joint NAMMCO Control Scheme text was amended
2009 – Provisions of the Joint NAMMCO Scheme were revised to incorporate new developments like electronic monitoring.
2010 – First observation of fin and minke whale hunts in Iceland
2018– Second Review of the Observation Scheme

Table 1 offers an overview of which hunts have been observed each year. The dotted line indicates the moment when on-board observation was implemented (2002), while the black line marks the period from 2003 onwards – when the scope of the observation became selective (not all regions and activities were observed each season).

Table 1: Overview of the yearly scope of observation

comperhensihve | selective
on-land observations | on-board observations (where possible)

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NO Minke whale																				
NO Harp & Hooded seal																				
IS Fin whale																				
IS Minke whale																				
FO Pilot whale																				
GL all hunts																				

*Cells marked in grey are observed events
* Pink cells are years when there was no hunt

Figure 2 shows that the frequency (number of years) of observation for each hunt observed varies very much.

Figure 2: Number of years the different hunts were observed in the period 1998-2017

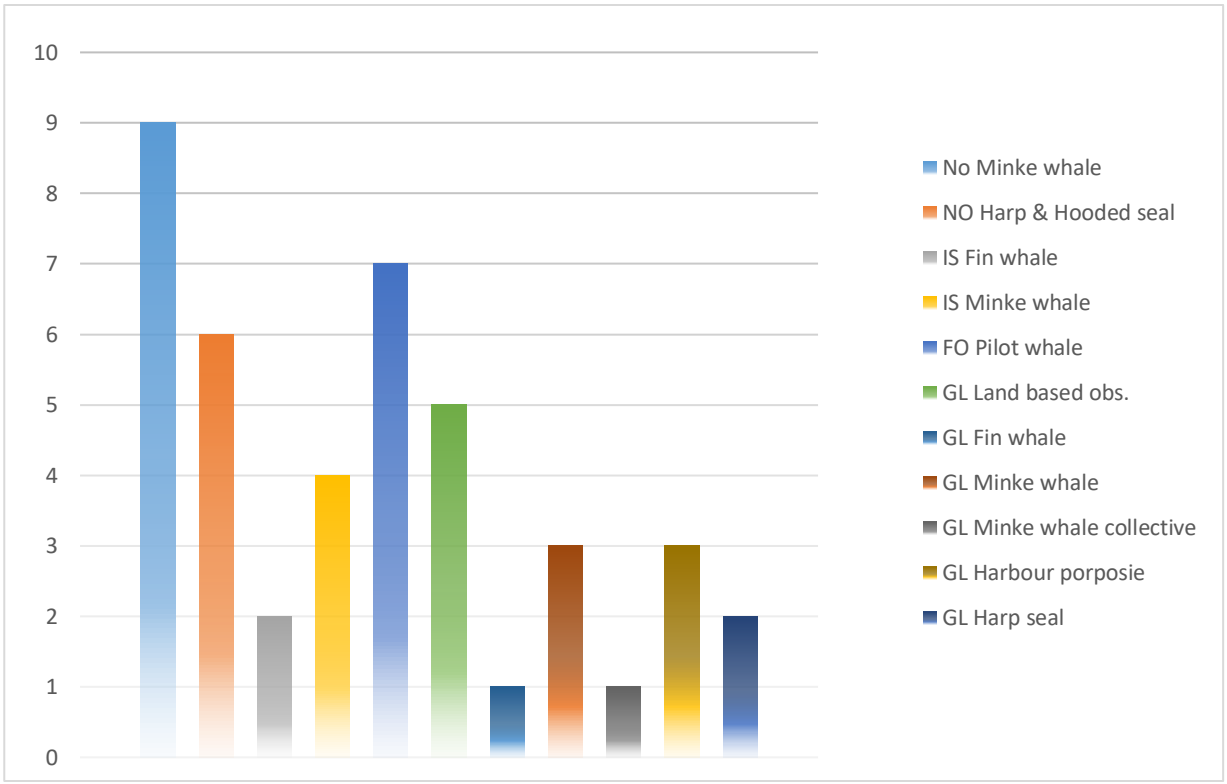


Table 2 provides a comprehensive overview of types of hunts in NAMMCO member countries.

Table 2: Overview of types of hunts in member States

Country	Species / stocks	Type of hunt	Platform*1 and conditions	Dispatching mean	Years observed *2
Faroes	Pilot whale	drive	boats, killing from beach	spinal lance	1999-2001*, 2002, 2007, 2012, 2015
	Dolphins	drive	boats, killing from beach	spinal lance	
	Harbour porpoise	recreational	boat	shotguns with pellets cartridges	
	Grey seal	reduction purposes around fish farm	boat/land	rifle	
Greenland*3	Bowhead whale	professional	3 boats	harpoon cannon	
	Fin whale	professional	2 boats or larger boat	harpoon cannon	2006
	Humpback whale	professional	1 boat	harpoon cannon	
	Minke whale	professional	1 boat	harpoon cannon	2002, 2004, 2006, 2011, 2014
	Minke whale - collective	professional	minimum 5 skiffs/open motor boats	rifle	2011
	Bottlenose whale	professional/recreational	open motor boats - collective	rifle	
	Killer whale	professional/recreational	open motor boats - collective	rifle	
	Pilot whale	professional/recreational	open motor boats - collective	rifle	
	Harbour porpoise	professional/recreational	open motor boats - collective	rifle	2004, 2006, 2014
	Dolphins	professional/recreational	open motor boats - collective	rifle	
	Beluga (North -Qaanaaq)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Beluga (Central)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Beluga (South)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Beluga (East GL)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Narwhal/Beluga	professional/recreational	open water/under sea ice	net	
	Narwhal (Inglefield Bredning and Smith Sound)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Narwhal (Melville Bay)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Narwhal (Uummannaq and Disko Bay)	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Narwhal East Greenland	professional/recreational	open motor boats/kayaks - collective	harpoon and rifle	
	Walrus (Qaanaaq) Baffin Bay stock	professional	open water-from floe edge	harpoon, rifle, lance	
	Walrus (West Greenland) Southest Baffin Island	professional	open water-from floe edge	harpoon, rifle, lance	
	Walrus (East Greenland)	professional	open water-from floe edge	harpoon, rifle, lance	
	Harp seal	professiona/recreational	boat	rifle	2011, 2014
	Hooded seal	professiona/recreational	boat	rifle	
	Bearded seal	professiona/recreational	boat	rifle	
	Ringed seal	professiona/recreational	on the ice	rifle	
	Ringed seal	professiona/recreational	from ice edge (with kayak or small boat to haul out)	rifle	
	Ringed seal	professiona/recreational	ice	net	
	Harbour seal	*protected 2010*			2006
Iceland	Fin whale	professional	boat	harpoon cannon	2010, 2013
	Minke whale	professional	boat	harpoon cannon	2010, 2011, 2013, 2017
	Grey seal	reduction purposes around fish farm	land, in rivers' mouth	rifle & club	
	Harbour seal	reduction purposes around fish farm	land, in rivers' mouth	net	
Norway	Minke whale	boat	boat	harpoon cannon (penthrite grenade)/back-up rifle	1998-2001*, 2002, 2003, 2009, 2013, 2016
	Harp seal	boat - ice	Main vessel, small boat or ice	rifle + hakapik (adults) rifle + hakapik/slagkrok (pups)	1998-2001*, 2005, 2008
	Hooded seal	*protected 2007*			1998-2001*, 2005
	Grey seal	recreational	hunter laying on land, animal on land or in water	rifle	
	Harbour seal	recreational	hunter laying on land, animal on land or in water	rifle	
	Ringed seal (Svalbard)	recreational	hunter laying on land, animal on ice, land or in water (16.08 - 30.11)	rifle	
	Bearded seal (Svalbard)	recreational	hunter laying on land, animal on land, ice or in water	rifle	

* Before 2002, observations are land based only

*1 Platforms mentioned is somtimes mandatory or the most usual platform used for that hunt

*2 Covers the whole hunting process (the chase, the kill) and not all observations resulted in successful catch

*3 1998-2001; only landbased observations, 2002 onwards a combination of land based and out at sea

3.3 Infractions reported during the 20 years of the implementation

Two cases of infractions have been reported during the 20 years the Scheme has been running. Both occurred in 2001. In Greenland, the observer noted that two vessels did not have the proper line or trawler winch on-board as required by national law, but instead were equipped with a hydraulic "power block" mounted on the boom. In Norway, the observer was denied access to a minke whaling vessel, which is contrary to the license requirement.

3.4 Review of the Scheme

3.4.1 The Faroe Islands (FO), pilot whale hunt

General

Observation in the Faroe Islands has only targeted the pilot whale drive hunt (Table 1). The Faroese pilot whale hunt has been observed seven times, or 35% of the 20 years covered by the Scheme. Hunting takes place year-round, but 67% of the drives occur in the period July – September with a peak in August. Observers were usually sent during the "peak" hunting period to maximise the likelihood of observing a drive hunt. The opportunistic nature of the pilot whale hunt makes the observation effectiveness rather low, and a "best" observation period is difficult to identify. For example, there were six drives (grinds) of pilot whales in 2015, but only one happened during the 44 days the observer was present.

Coverage rate

The observation coverage rate in the Faroes (COR) is calculated as the ratio of total grinds and observed grinds per year (table 3).

Table 3: Overview of drive hunt observation in the Faroe Islands
(observed years are marked grey - the number are based on available catch data from 1998 onwards as reported in the Annual Progress Reports to NAMMCO)

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of drive hunts	12	8	13	21	23	11	14	10	22	11	3	10	16	9	11	12	3	7	6	24
No. of pilot whale drive hunts	8	8	9	11	10	5	9	6	11	10	0	3	14	9	10	11	2	6	6	19
Catch of pilot whales	815	608	588	918	626	503	1100	302	856	633	0	310	1107	726	713	1104	48	501	295	1203
Drives occurred while the observer was in the Faroes		2	3	1	1					2					2			1		
Observed pilot whale drive hunts	0	1	2	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0
COR	0	12.5	15.38	4.762	0	0	0	0	0	9.091	0	0	0	0	9.091	0	0	14.29	0	0
OCOR - average of the COR for the observed seasons														9.3						
TCOR - average of the COR for all seasons														3.26						

The catching event observation rate for observed seasons (OCOR) is around 9% and the total catching event observation rate (TCOR) is about 3%. About 68% of the grinds occurring while an observer was in the Faroes were observed.

Comments

Most of the drive hunts taking place in the Faroes are pilot whales (around 68% since 1998), the others are mostly white sided and bottlenose dolphins[21], and only the former have been observed.

Compared to other NAMMCO observation targets, the efficiency of the Observation Scheme is lowest in the Faroes, because of the opportunistic character of the hunt, and the fact that there is only the drive hunts that are observed. Unless some of the observers 'waiting hours' are transformed to 'effective working hours' with some other tasks performed in the interests of NAMMCO, the Observation Scheme in the Faroes will remain inefficient.

[21] See whaling.fo

Only 60% of the grinds occurring while an observer was present in the Faroes were observed. The observation should be organized to increase and maximise the observation rate of the drives.

At present, it is not possible to assess the number of individual whale kill observed (KOR) or the qualification of the individual hunter as the observers have not been specifically asked to observe and report on that. Such information would be valuable and could be considered an element to be integrated in the mandate of the observer. Although, the observer will only be able to observe a few kills, due to the nature of a grind where up to hundreds of animals can be killed during a short period of time, this would increase the value of the observation activity.

3.4.2 Greenland (GL), fin and minke whale, harp seal and harbour porpoise hunt

General

Hunting in Greenland is complex with a broad mixture of hunting methods and target species (table 2). Minke, fin, bowhead and humpback whales are hunted with a harpoon gun from boats. The collective minke whale hunt is carried out in settlements without harpoon gun boats, normally by around 8 -10 skiffs. Harbour porpoise, white-sided and white-beaked dolphins, long finned pilot whales, killer whales, narwhal and beluga are shot with a rifle in a collective hunt from small, open motorboats. In East and North Greenland, hunters are allowed to hunt with nets. Seal hunters focus on hunting harp seals, ringed seals and hooded seals; the former two being by far the most dominant.[22]

Hunting activities in Greenland are the most subsistence based hunts in the NAMMCO countries. Many hunters in Greenland are both fishermen and hunters and will switch between activities pertaining to "prey" availability and needs.

Observation activities

Hunting activities in Greenland were the target of NAMMCO's observation activities nine times, or 45% of the 20 years since 1998. The rule has been that only one observer has been active during a season with the exception of 2004, where three observers were present.

From 1998 to 2001, observations in Greenland were land-based and focused on observing the landing/flensing and sale of products at "brættet" – the local market. From 2002 onwards, with the introduction of on-board observations, the observers in Greenland have observed both on land and at sea. Due to the opportunistic character of hunting activities in Greenland, observers have been instructed to observe any hunts that occurred during their stay. The following are examples of observations during some of the seasons:

In 2004, the three observers did both land based and on-board observations of whaling and sealing activities. They all observed the landings of seals and harbour porpoises. One observer also reported the chase, harpooning, and later the flensing of one minke whale.

In 2011, the observations were both land based and on-board three different vessels. The following was observed: two seal hunts, three minke whale hunts (two harpoon hunts and one communal rifle hunt involving 10 boats), flensing sites, the local markets and the landing and delivery sites [23].

In 2014, the observer participated in one hunt for minke whales, but only seals and one harbour porpoise were caught during this trip. Although the observer travelled around to different localities the overall situation was that the hunters did not go out due to bad weather conditions.[24]

[22] For detailed descriptions of hunts see White paper on Sealing in Greenland 2015, White paper on Whaling in Greenland 2018 https://www.businessingreenland.gl/da/Fiskeri,-Fangst-og-Landbrug/Publikationer-og-lovgivning/Publikationer/fangstomraadet and NAMMCO 2017. Overview of Marine Mammal Hunting Methods and Monitoring/Observation in NAMMCO Member Countries.
[23] See observer's report 2011
[24] See observer's report 2014

Coverage rate

As noted before the information available through the Observation Scheme is not sufficiently detailed to make many calculations of coverage rates for observations in Greenland. However, the catching event observation rate (COR) was calculated for minke whale hunts. Observations of successful and unsuccessful hunts by harpoon cannon and rifle hunts are included as ratio of total catch events in a year (table 4).

Table 4: Overview of coverage of minke whale hunts during the observed seasons in the period 2002 – 2017.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total catch	149		190		184					189			157			
Observed catch/event	1		4		5					4			0			
COR	**0.67**	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
OCOR -average of the COR for the observed seasons	**1.52**															
TCOR - average of the COR for all seasons	**0.48**															

The catching event observation rate for observed seasons (OCOR) is around 1,5% for all seasons (TCOR) is about 0,5%.

Comments

Amongst the 28 types of hunts identified in table 2, notably relatively few of them have been observed. The species-specific observations were limited to hunts of fin and minke whale, harbour porpoise and harp seal. With respect to the observed seal hunts, the information is not complete as some observers only reported on generic seal hunts without specifying which species they observed being caught.

In 2001, the observer noted that two vessels did not have the proper line or trawler winch on-board, as required by national law. Instead, these vessels were equipped with a hydraulic "power block" mounted on the boom.

As noted in the 2005 Review of the Scheme, the hunting scene is more complex in Greenland than in the other NAMMCO countries. An increased focus on hunting activities in Greenland, with more observers present at the same time, would likely give a better understanding of the overall situation[25] and level of compliance.

3.4.3 Iceland (IS), fin whale and minke whale hunts

General

Iceland resumed commercial whaling under its reservation to the IWC moratorium in 2006, and NAMMCO's first observation of whaling in Iceland took place in 2010.

The fin whale hunt was subjected to NAMMCO's observation activities in 2010 and 2013 and the minke whale hunt in 2010, 2011, 2013 and 2017, so both hunts were observed in 33% of the hunting years. The observations were both land-based and on-board.

Observer efficiency was fairly high, as nearly all the observation time was used related to actual observation activities. In 2017, however, the minke whale hunt was not observed 11 out of 21 days due to bad weather[26]. The observation period per season lasted from one to a couple of weeks.

Fleet (OFOR and TFOR) and catch observations (OCOR and TCOR) rate of fin and minke whale hunt in Iceland are given in tables 5 and 6.

Coverage rate for fin whale hunt

Table 5: Overview of fleet and catch observation in Icelandic fin whaling

[25] See supra note 2, 2005. Review of the Observation Scheme.

[26] Information retrieved from the observer's, S. Petersen, diary 2017.

(observed years are marked grey, year without hunting are in green)

IS Fin whale hunt, year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of vessels	0	0	0	2	2	0	0	2	2	2	0	0
No. of observed vessels	0	0	0	0	1	0	0	1	0	0	0	0
Total catch	7	0	0	125	148	0	0	134	137	155	0	0
Observed catch	0	0	0	0	13	0	0	4	0	0	0	0
FOR	0	0	0	0	50	0	0	50	0	0	0	0
COR	0	0	0	0	8.78378	0	0	2.98507	0	0	0	0
OFOR - average of the FOR for the observed season						**50**						
TFOR - average of the FOR for all season						**16.67**						
OCOR - average of the COR for the observed season						**5.88**						
TCOR - average of the COR for all season						**1.96**						

With only two whaling vessels, the observation rate for observed seasons (OFOR) and total fleet observation rate (TFOR) were about 50% and 17%, respectively.

The fleet observation rate for observed seasons (OCOR) and total fleet observation rate (TCOR) are about 6% and 2%, respectively.

Coverage rate for minke whale hunt

Table 6: Overview of fleet and catch observation in Icelandic minke whaling
(observed years are marked grey)

IS Minke whale hunt, year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of vessels	n/a	n/a	n/a	5	4	3	3	3	2	1	3	2
No. of observed vessels	0	0	0	0	1	1	0	1	0	0	0	2
Total catch	61	43	38	81	60	58	52	35	24	29	46	17
Observed catch	0	0	0	0	2	2	0	4	0	0	0	0
FOR	0	0	0	0	25	33.3333	0	33.3333	0	0	0	100
COR	0	0	0	0	3.33333	3.44828	0	11.4286	0	0	0	0
OFOR - average of the FOR for the observed season						**47.92**						
TFOR - average of the FOR for all season						**21.30**						
OCOR - average of the COR for the observed season						**4.55**						
TCOR - average of the COR for all season						**1.52**						

The fleet data was not available for all years. Based on available vessel data (2009-2017), the observation rate for observed seasons (OFOR) and total fleet observation rate (TFOR) were about 48% and 21%, respectively.

The fleet observation rate for observed seasons (OCOR) and total fleet observation rate (TCOR) in the period 2006-2017 are about 4.5%, and 1.5%, respectively.

Comments
Whaling in Iceland is small in scale with respect to actors and thus the implementation of the Scheme has been relatively easy. At the most, the number of minke whale boats have been four (2010) and in the fin whale hunt, two active boats.

3.4.4 Norway (NO), minke whale hunt, harp and hooded seal hunt

General, minke whale hunt
The targeted whale species in Norway is the minke whale.

Norwegian minke whaling has been observed for nine seasons, with therefore, 45% of the 20 hunting seasons observed. Observation activities were land-based until 2002, focusing on delivery of catches in the Lofoten area. From 2002, observations were conducted on-board whaling vessels, observing the vessels' equipment, activities and the hunt.

One to three observers were contracted per observation seasons.

The minke whale hunt in Norway generally takes place from mid-May until the end of August. The duration of the NAMMCO observations fluctuated from year to year. The land-based observations of delivery of catches were conducted for periods not longer than a week, while observations on-board vessels lasted between 20-40 days. Since 2002 when onboard observations were initiated, the average period of season observed corresponds to about 20% of the duration of the season.

Coverage rate, minke whale hunt

One observer was typically present on one whaling vessel per season. Except in 2003, when the observer changed vessel out in the open sea. This was possible because the weather was calm; one vessel was waiting for instructions from local authorities and could not hunt; and the other vessel was not moving because the crew was cutting up and processing a whale. Under normal circumstances calm weather means vessels are fully occupied in hunting operations and probably not very eager to assist an observer in changing vessels and in rough weather changing vessels is not feasible due to safety reasons[27].

Coverage rate is based on the data from the period from 2002 - 2017, as shown in table 7. In the period from 1998 to 2002 observations were land-based and were exclusively on-board vessels thereafter. Coverage rates for observation of the minke whale hunt in Norway are as follows:

- the observation rate for observed seasons (OFOR) and total fleet observation rate (TFOR) were about 9% and 3%, respectively.

- the fleet observation rate for observed seasons (OCOR) and total fleet observation rate (TCOR) were about 3% and 1%, respectively.

Table 7: Overview of fleet and catch observation in Norwegian minke whaling (observed years are marked grey, l-b: land-based

Land-based observations only 1998 - 2001																				
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of hunting vessels	34	34	33	33	34	34	34	31	28	28	27	21	18	19	18	17	21	21	16	11
Observed vessels	l-b	l-b	l-b	l-b	3	4	0	0	0	0	0	1	0	0	0	3	0	0	2	0
Total catch	625	589	487	552	634	647	544	639	545	597	536	485	468	533	464	594	736	660	591	432
Observed catch			n/a	n/a	5	25	0	0	0	0	0	21	0	0	0	7	0	0	20	0
FOR					8.82	11.76	0	0	0	0	0	4.76	0	0	0	11.76	0	0	12.5	0
COR					0.79	3.86	0	0	0	0	0	4.33	0	0	0	1.52	0	0	3.38	0
OFOR - average of the FOR for the observed seasons							9.28													
TFOR - average of the FOR for all seasons							2.92													
OCOR -average of the COR for the observed seasons							2.62													
TCOR - average of the COR for all seasons							0.87													

General, harp seal and hooded seal pack ice hunt

The harp and hooded seal hunts have been observed for six seasons, or 30% of the total hunting seasons (note that the hooded seal has been protected since 2007). Prior to 2002, the sealing was observed on land, in the Rieber port in Tromsø.

[27] See supra note 2.

In 2005 and 2008, NAMMCO observers were placed on-board sealing vessels. This shift in observation activities directly influenced the length of the observation period. While the land-based observations lasted 3 to 6 days, observing onboard vessels was significantly longer. The hunt for harp and hooded seals takes place in the West Ice and East Ice[28], and may involve a sealing vessel, and thus the observer, being away for up to eight weeks.

One observer was contracted per given season.

Observer effectiveness was high with almost all of the planned observation time utilised, for both land-based and on-board observations. On the vessel, the time spent hunting was 36% of the total period in the field (data from 24.03-27.04.2005). Bad weather and night conditions accounted for the remaining 64% of the inactive time spent in the field.[29] Thus, one observer on-board the vessel was enough to cover the hunting activities taking place.[30]

Coverage rate, harp seal and hooded seal pack ice hunt

Form 1998-2001 observations of the harp and hooded seal hunt were focused on sealing vessels upon arrival to the Rieber port in Tromsø relating to the delivery of catch and checking the hunting permits, vessel logbooks, reports of catch.

Based on the data available from 2002 onwards and as shown in the table 8, the observation coverage efforts are:

- the observation rate for observed seasons (OFOR) and total fleet observation rate (TFOR) were about 58% and 7%, respectively, with the observed vessels catching 13% and 100% of the season seal catch respectively.

As noted under 3.4.1 on observation of pilot whaling, the observers do not/are not asked to report on individual kill. This could be considered an element to be integrated in the mandate of the observer. The observer will likely only be able to observe a few kills, due to the nature of this sealing where often several seals are killed simultaneously by several sealers, but this would add to the precision of the observation.

Table 8: Overview of fleet effort/observation in Norwegian seal pack ice hunt (observed years are marked grey)

Land-based observations only 1998 -2001

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of hunting vessels	5	3	3	3	3	3	4	6	6	5	1	3	2	4	2	4	3	1	1	1
Observed vessels	3*	3*	2*	2*	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Total catch	9067	6399	20636	12012	10771	12870	14809	21597	17037	14043	1263	8035	4797	10332	5593	15939	11986	2237	1470	2001
Observed catch	n/a	n/a	n/a	n/a	0	0	0	2767	0	0	1263	0	0	0	0	0	0	0	0	0
FOR					**0**	**0**	**0**	16.6667	**0**	**0**	100	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
COR					**0**	**0**	**0**	12.812	**0**	**0**	100	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
OFOR - average of FOR for the observed seasons												**58.33**								
TFOR - average of FOR for all seasons												**7.29**								

***vessels observed delivering catch in Rieber port**

Comments – both whaling and sealing

In 2001 there was a violation of the regulations laid down by the Observations Scheme when the observer was denied access to one minke whaling vessel in Norway. The incident was a result of communication failure

[28] West Ice: the pack ice areas in the Jan Mayen fishing zone and in the ocean areas of Jan Mayen outside Greenland EEZ and southwest of Svalbard, and adjacent areas to Greenland EEZ and Iceland EEZ. East Ice: the area east of 20°E in the Russian EEZ

[29] See supra note 2.

[30] One observer per vessel for example in tuna fishery is not sufficient, as fishing takes place without a break, 24/7.

between the observer and the skipper, and perhaps also grounded in too little knowledge of the observation scheme on behalf of the skipper[31]. There are no other records of similar incident since.

Observations of Norwegian sealing may require the observer being away for up to eight weeks making it difficult to find an available observer for such a long period.

Coastal seals hunted off Norway's mainland include grey and harbour seals (targeted species), ringed and harp seals (exceptionally, do not frequently occur along the coastline of the Norwegian mainland), off Svalbard bearded and ringed seals. The hunt for those species takes place from January to September in an opportunistic manner. These have not been observed by NAMMCO because it represents small, recreational hunts taking place randomly as a game hunt (table 2).

The Secretariat reiterates its conclusion from its 2005 review that the nature of the Norwegian hunts both with regards to minke whaling and pack ice sealing makes the implementation of the Scheme relatively simple[32]. Observations of the minke whaling is time-consuming with respect to finding vessels that will accommodate the observer, but when that is accomplished, it usually runs smoothly.

3.5 Evaluation of the Scheme

3.5.1 Evaluation of observer's reports

Observers are only required to submit the basic report forms (see discussion in 3.1.5). On request from the Secretariat, more detailed written reports (diaries) have been submitted most of the times. However, these reports can vary a lot with respect to how informative they are. The practical input of this voluntary reporting has been important for this review/evaluation. Clearly the present mandatory reporting does not allow any quantitative assessment of the implementation.

Observers should be encouraged to produce more detailed reports and it is recommended that more detailed reporting templates be developed for each type of hunt and be made mandatory. At the same time, the Secretariat should be provided with the data allowing for a quantitative assessment of the implementation scheme, incl. a precise assessment of coverage and infraction rates.

3.5.2 Coverage of the Parties' hunting activities

The Provisions of the NAMMCO Control Scheme refer to the observation of *hunting activities*, hence referring to all hunting activities, both of organised and opportunistic character. As shown in table 2, hunting activities in NAMMCO Countries are multiple and varied. This is especially true in Greenland, where the number of hunting types is the highest. These factors probably explain why many Greenlandic hunts have not been observed during the 20 years the Scheme has been in place. The focus on Greenland needs to be increased in coming years to get a better overview of hunting activities in the remit of NAMMCO.

3.5.3 Coverage rate and representativeness of observation activities

The table 9 below summarises the findings from section 2 relating to coverage rates.

Table 9: Overview of observation scheme coverage rate in NAMMCO member states (grey fields are not applicable to the member state and/or activity);
Acronyms:
- fleet observation rate for observed seasons (OFOR)
- total fleet observation rate (TFOR)
- catching event observation rate for observed seasons (OCOR)
- total catching event observation rate (TCOR)

[31] NAMMCO 2001 Report of the Observation Scheme.
[32] See supra note 2.

Member state and activity	FO	GL minke whale	IS fin whale	IS minke whale	NO sealing	NO minke whale
OFOR			50%	48%	58%	9%
TFOR			17%	21%	7%	3%
OCOR	9%	1.50%	6%	4,5%		3%
TCOR	3%	0.50%	2%	1.5%		1%

The specific level of observer programme coverage depends on several factors, most importantly the observed region and activity. The specific mandate of the NAMMCO Scheme, observing all hunting activities and detecting infractions, makes it difficult to compare its coverage rate to other RFMOs' observer programmes. For example, recent measures adopted in WCPFC, ICCAT, IATTC and IOTC have established minimum observer coverage rates of 5% for observing by-catch. This level of coverage is estimated as being sufficient to identify where and when by-catch occurs for extrapolating to the entire fleet and obtaining reliable by-catch rate.

The purpose of NAMMCO observation is to observe the compliance with standards/regulations related to hunting methods. Thus, the 5% coverage rate indicator, often used as a minimum threshold of observer programmes coverage, might not be relevant in the NAMMCO case.

Although it would be ideal to have complete observer coverage of all hunting activities, this is an unrealistic expectation given the cost and other practical considerations. NAMMCO's relatively small observation budget presently do not allow for more than a partial coverage. Observing all activities and during the whole hunting seasons would require a significantly higher budget. The 2005 review concluded that this was not feasible nor desirable[33]. However, what needs to be defined more clearly to be able to evaluate the adequacy of the coverage, is the overall objective of the NAMMCO observation scheme, as this will procure guidance for evaluating and implementing a scheme in appropriation with the objective.

Evaluating the selectiveness of the target of the observation

The Secretariat suggests the scope and range of the observation activities in any given year. The selection of scope has not followed any particular rules and has been primarily based on the idea of an equal distribution between countries and hunts.

Evaluating the selectiveness and randomness of the observation (target and period)

Different factors come into play depending on country.

a) Norway

In the Norwegian minke whale the choice of the vessels to be observed depends on:

- Whether the boats have room for one more person – safety and logistic issue. Some minke whaling vessels are small, and it is not always easy to accommodate an observer on-board, especially after the planning of the whaling season has been done. Although observation has also been conducted in the smaller category.
- The planned hunting schedule of the boat – when will they go hunting and back to port so an observer can either embark or disembark.

To facilitate the selection process and to lay the ground for good cooperation between observer and crew, the Secretariat informs the Norwegian Whalers Association prior to the whaling season and contacts the captains of the target vessels prior to the arrival of the observer. The consequence of this is that it removes the "surprise element", which could be a positive aspect of the scheme. However, this was deemed necessary to maximise the efficiency of both the available budget and personnel.

[33] See supra note 2.

Several of the captains/owners of the sealing vessels were not prepared to take an observer on-board when asked if the request comes late in the planning phase of their season. Therefore, the choice of the target vessel is not random, which may compromise the representativeness of the observation. This problem should be addressed in future implementation of the scheme, as it leads to a bias sampling and thus undermines the the results of the Scheme for this hunt.

b) Iceland

In Iceland, the decisive factor has been which vessels were operating and when the vessels were going hunting, so the observation can be said to be more random.

c) The Faroe Islands

In the Faroes, the observation periods have been set to July and August as these months have been thought to be optimal for the likelihood of observing pilot whale drives. This means that only summer drives are observed, although drives in winter might be more difficult to conduct. The observation is random, only depending on if a drive hunt takes place and will be observed, if possible for the observer.

d) Greenland

In Greenland hunts take place nearly all year round and it is opportunistic by nature. The scope has therefore been to observe whatever can be observed, which in some way increases the randomness of the observation process.

Observers have only been sent in the early/late summer, although winter or ice-based hunts are different and therefore findings from the summer cannot be applied to the winter.

e) General

Generally, it has been easier to get observers (who are not permanently employed by NAMMCO) in the summer months as this often coincides with their holidays. Consequently, only spring to late summer hunting activities have been observed.

The implementation of the Scheme cannot be said to be a random process, which introduces some level of bias in different ways.

3.5.4 On-land observation versus on-board observation

In 2002, NAMMCO implemented on-board observations with a duration of more than a day. Ever since, on-board observation has become the norm, where appropriate. Land-based observations are still done in Greenland and in the Faroes, where the nature of the hunt (e.g. pilot whaling in the Faroes) makes on-board observation more problematic.

By implementing on-board observation, NAMMCO acts in accordance with established international standards.

On-board observations when appropriate are more effective and allow for better coverage of the whole hunting activity. Before the blue box, the Norwegian national inspectors were embarked for six weeks. However, it removes the 'surprise element', which could be viewed as an important aspect of an observation scheme. It is, however, also the case in fisheries, where observers are placed onboard vessels for a longer period, while surprise inspection by inspectors, retain the element of surprise.

The presence of an observer may also influence the behaviour of the captain and the crew (the crew may act in accordance with regulations *only because* the observer is on-board). Again, this issue is similar for fisheries observation programmes in general, and not only related to NAMMCO's Scheme.

3.5.5 Observers' competence

a) Enforcement powers

NAMMCO Observers have no authority and consequently cannot intervene in the hunting or other activities connected with the hunting[34].

b) Qualifications and training of observers

The observers are formally appointed by the Council for each calendar year and are selected according to their qualifications from a list of candidates nominated by member countries. As a general rule, NAMMCO observers are required to have at least the same level of qualifications and training as national inspectors and must be familiar with all relevant regulations in relation to the activities they observe.[35]

In the early years NAMMCO benefited from national courses for inspectors held by Norwegian authorities. However, after the introduction of the electronic surveillance system (Blue box), these national courses were no longer held on an annual basis. Consequently, the Secretariat in cooperation with the CIO convened a training course for observers in 2013 built upon the model of the Norwegian national courses. In so doing, NAMMCO directly contributed towards the observers' training and not the least, acted in accordance with international regulations and standards.

Nevertheless, even beside fulfilling the qualifications requirement, oversights may occur. For example, NAMMCO observers are required to check that the blue box is on[36], but in 2016 one observer did not do so. This pointed to an inadequate preparation by the observer. It is recommended that the hunt specific check lists are further developed as part of the mandatory reporting, and that these lists are developed for each observed catching event.

Another issue in the implementation of the NAMMCO observation scheme is the language barrier, particularly when observing in Greenland.

For many years it was a problem that deadlines were not kept and too few candidates were nominated. However, in connection with the 2013 training course member countries succeeded in assigning between 4 – 5 competent observer candidates each whom today represent a poll of observers from which to choose from.

c) Adequate pay

- Observers receive a daily salary of 1800 NOK for land based and 2400 NOK for on-board vessel observation per day. The salary level is a flat rate and reflects that the observer is expected to work long and odd hours without any overtime payment. In addition, an observer receives per diem 550 NOK to cover meals.
- Accommodation and travel costs are covered by NAMMCO.
- Additional costs may be reimbursed to cover extra necessary work clothing.
- The Observer will arrange for his own travel and accident insurance for the duration of his assignment as a NAMMCO Observer. Costs in this connection will be reimbursed by NAMMCO.

The payment rate is assumed to be adequate and has not been challenged by the observers.

3.5.6 Safety of observers

NAMMCO pays specific attention to the safety of the observers.

For safety reasons, the language competency of observers must be taken into consideration, especially for observer on board a hunting vessel as the observer must be able to communicate spontaneously with the crew[37].

[34] This is clearly stated in the Provisions text, B.21.

[35] B.4.1 The Council has compiled guidelines for requirements for the competence, training, etc., of observers. These guidelines are found in Appendix 2 of the Provisions text.

B.4.2 As a general rule, observers must have at least the same level of professional competence as that required of inspectors in the country where the observations are to take place. In special circumstances, exemption from this requirement can be given.

[36] Provisions, Guidelines to Section B, 2(iv).

[37] The Provisions text, B.4.3.

The Scheme stipulates that the observer should not come from the country in which he/she is doing observations. This poses a special problem for observations in Greenland as most foreigners do not speak or understand Greenlandic and the majority of hunters in Greenland do not speak English or any Nordic language. The same problem arises to a certain extent with observations out at sea in Norway.

When out at sea, it is the responsibility of the observer to ensure that he or she acquires the necessary information and knowledge related to safety issues and how to behave in an emergency[38]. Presently there has not been any check of this, and luckily no incidents either. However, this should be the object of some random check by the Secretariat.

3.5.7 Establishing and reviewing the Observer Scheme

By establishing and implementing the Observation Scheme, NAMMCO Parties have implemented the observer programme through a regional body, to monitor whether decisions made by the Commission are respected.

NAMMCO has not developed a review procedure but is undertaking its second internal review of the implementation. The first – qualitative in essence – review of the Scheme was in 2005, after seven years of implementation. This report presents the second, more comprehensive, review of the Scheme, just over a decade later. Moreover, NAMMCO is in the process of undertaking its first Performance Review carried out by a Panel of External Experts, which will *inter alia* review the compliance and enforcement mechanism of NAMMCO (NAMMCO 2017).

Nevertheless, it is recommended to define a periodicity for such reviews and to develop a review procedure, incl. a set of criteria, in order to make sure that the necessary data is collected and reported by the observer and the Parties. This should then be kept in a database at the Secretariat, to facilitate the review process.

3.5.8 Costs effectiveness of the Observation Scheme

The costs of the NAMMCO Observation Scheme are given in table 9 below.

The average annual budget for the implementation of the Scheme ranged from NOK 45,362 to 196,860, with an average of NOK 110,669.

Table 9: Price of the Observation Scheme's implementation per year

Year	2003	2004	2005	2006	2007	2008	2009	2010	2010	2011	2011	2012	2013	2013	2013	2014	2015	2016	2017
Region and hunt	NO, minke whale	GL	NO, pack ice seal	GL	FO, pilot whale	NO, pack ice seal	NO, minke whale	IS, minke whale	IS, fin whale	GL	IS, minke whale	FO, pilot whale	NO, minke whale	IS, minke whale	IS, fin whale	GL	FO, pilot whale	NO, minke whale	IS, minke whale
Price per year, in NOK	145359	196860	92469	90771	45362	123172	66782	56816		109028		64252	166367			94644	174508	163338	70301
Price per hunt, in NOK	145359	196860	92469	90771	45362	123172	66782	28408	28408	90740	18288	64252	106878	29744	29744	94644	174508	163338	70301
Vessels (grinds for FO) observed	4	n/a	1	n/a	1	1	1	1	2	n/a	1	1	2	1	1	n/a	1	5	2
Catch observed	25	n/a	2676	n/a	n/a	1250	21	2	3	n/a	2	n/a	9	4	4	n/a	n/a	20	17
Obs. days utilised	44	40	50	25	16	31	21	4	7	23	3	22	26	10	10	21	44	49	21

The costs per observed events are as follows:

[38] Ibid B.4.4.

The Faroes, pilot whale drive hunt

Average observation day price is 3,240 NOK
Average price per observed grind is 94,707 NOK.

Greenland, all hunts combined

Average observation day price is 4,251 NOK.

Iceland, minke whale hunt

Average price per observed vessel is 27,897 NOK
Average observation day price is 4,880 NOK
Average price per observed whale is 8,729 NOK.

Iceland, fin whale hunt

Average price per observed vessel is 21,974 NOK
Average price per observation day is 3,516 NOK
Average price per observed whale is 8,452 NOK.

Norway, minke whale hunt

Average price per observed vessel is 47,307 NOK
Average price per observation day is 3,482 NOK
Average price per observed whale is 7,259 NOK.

Norway, pack ice seal hunt

Average price per observed vessel is 107,821 NOK
Average price per observation day is 2,911 NOK

Clearly the budget allocated to the Observation Scheme activities changes a lot from year to year and per equivalent events. Evaluating whether the budget is appropriate is problematic without having clearly defined and stated overall objectives for the NAMMCO Observation Scheme, as this will procure guidance for assigning an appropriate budget. One would need to estimate how an increase in budget for a targeted hunt would increase the chance of increasing the number of actual observation events and the quality of the observation.

It could be envisaged, for example, to not automatically conduct the observation every year, but sometimes to focus several years budget on one country and/or hunt. Particularly in Greenland, having several observers present, targeting any hunting events might be cost-effective. In this case, a combination of non-national and national observers may help alleviating the language issue. Another, maybe more effective solution for observations in Greenland would be for the observer to always have a local assistant knowing both the language of the observer and the local situation.

4 CONCLUSION AND RECOMMENDATIONS

The purpose of the Scheme is specified in the Provisions text[39], but the objective is not defined. This lack of definition is problematic, as the implementation level should be tuned to achieve this objective. Therefore, it makes it difficult to say whether the implementation is adequate or not.

The purpose of the Scheme is to detect infractions. Thereby, a logical objective would be to estimate an infraction rate for specific hunts. The Scheme is in essence a sampling program, and as such one should be able to extrapolate from the number of infractions detected to estimate the number occurring in the hunt. However, the present infraction rate of two infractions in 20 years for a total of between 30 and 40 types of

[39] See Section B.1.

hunting activities (depending on definition) and many actors involved seems unlikely low. This could point to an inadequacy of the present implementation of the Scheme for assessing reliable infraction rates.

We know from other sources, that infractions occur, and have for example been reported to the IWC Infraction Sub-Committee.

The reasons for this apparent inadequacy of the Observation Scheme in providing infraction rates which can be assumed to be reliable are likely many, including:

- The low overall and hunt specific coverage rates. The level of observation needed to achieve a reliable infraction rate per hunt must be seen in relation to the infraction rate. If the infraction rate is very low, then a very high observation rate is needed.

- The fact that the sampling is somewhat biased. For example, in some instance the observers only observe on vessels that agree to take them, or observation only occurs in spring/summer.

- The lack of detailed and systematic reporting for many observations, which makes it difficult to assess whether the observation is in fact carried out in a faithful, efficient and comprehensive manner.

For the Scheme to be unbiased, one has to ensure as a minimum that all hunting actors submit to being observed at any time. The reasoning being that hunters who are inclined to "cut corners" or who have the wrong equipment will not agree to being observed. There are of course practical difficulties with this (as noted above in 3.1.3), but it is the only way the Scheme can produce reliable results.

To solve some of the coverage rate and logistic problems, the possibility of using technology to monitor hunts should be investigated. Security video systems, remote electronic monitoring systems (multiple videos system used on fishing vessels to observe discard and by-catch) and GoPro cameras are some ideas. There might be resistance to "spying" like this, but on the other hand it is less intrusive than a human observer and would have high practical advantages, e.g. not having to take out a human observer and no language issues. The reading of the tapes could be performed by the observers and would provide them with occupation on their many "off" days. The Norwegian blue box seems to have been well accepted so maybe something like this would be feasible for some hunts.

Recommendations

- Define more precisely the objective (desired goal of achievements) and scope of the Observation Scheme for procuring better guidance to defining the appropriate level of coverage and the appropriate budget.
- An evaluation procedure should be developed, including a periodicity and a set of criteria. A day observation rate would be for example a better measure for on-board observation activity than the fleet observation rate, as it would reflect the fact that the vessels are observed only part of the season and would account for the time lost in transit.
- Observers and Parties should collect the data necessary for evaluating the Scheme. The data should be delivered annually by the parties for inclusion in a database at the Secretariat, thus facilitating any review of the Scheme.
- Define the units of observation for the different hunts and make sure that the relevant information is collected and submitted to the Secretariat, so a more precise evaluation is possible in the future.
- Consider being more flexible by not implementing observations activities every year and making a bigger effort possible in a certain year. The budget of the observation Scheme is limited, and this could allow more comprehensive effort on some hunts in some years, giving a better cost-efficiency.
- In relevant cases the setup of the scheme should be able to compare the observation rate between the different categories.
- Develop more standardised templates for observer and member countries reports for each type of hunts so the Secretariat is provided with the data allowing for a quantitative assessment of the implementation of the Scheme.
- For all regions, consider the possibility of the observer doing other tasks when no hunting takes place.

- That the Secretariat keep a precise and updated record of hunting activities in NAMMCO countries, also in years were there is no observation, to facilitate future evaluations of the Scheme.
- The observation mandate should be better defined through the control lists (drive hunts and sealing activities, should encompass the observation of the kill of individual animals to gain some information on the compliance to the legal killing procedure).
- Compare results of the NAMMCO observation and that of the national inspection for specific hunts and season, to see whether they differ and thus indicating some possible issues.
- Encourage that observers are placed on different platforms in one season.
- Implement a random check of whether on-board observers are aware of safety issues and safety measures.

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APPENDICES

Appendix 1. NAMMCO 2018. Overview of Marine Mammal Hunting Methods and Monitoring/Observation in NAMMCO Member Countries

Appendix 2. Data (excel tables) from the Observation Scheme implementation 1998-2017.

ANNEXES

Annex 1. Provisions of the Joint NAMMCO Control Scheme for the Hunting of Marine Mammals, 1997.

Annex 2. NAMMCO. 2005. Review of the NAMMCO Observation Scheme. Document NAMMCO I&O-2005-03.

Annex 3. NAMMCO International Observation Scheme Report of Observation.