



COMMITTEE ON HUNTING METHODS

18 October 2016

DOCUMENT METHODS FOR COLLECTION OF TTD DATA

Submitted by Secretariat

Action required

to decide how to proceed with the task given by Council on alternative methods for collecting standardised TTD data

Background

Council at NAMMCO 24 asked CHM to:

“to organise a workshop on alternative methods for collecting standardised TTD data that are less expensive, thus making it easier to compare TTD between countries.”

The Secretariat was asked to make an overview of the different methods and how collection of TTD takes place today for different species. The following is taken from the NAMMCO expert groups on TTD that has been held on large and small cetaceans.

COLLECTION OF TTD DATA FOR DIFFERENT SPECIES – overview NAMMCO countries

NORWAY

Collection method:

“The Norwegian method” – described in appendix 1.

A designated person – usually veterinary – take measurements and note specific signs when the kill is taking place. Followed by post mortem examination. Measurement of TTD is done with a watch and in addition behavioural information, hit area, detonation site, shooting angle etc is reported.

Species:

Minke whale

Seals – NO COLLECTION OF TTD published but Kathrine Ryeng has collected TTD in 2013, 2014 and 2015.

ICELAND

Same method as in Norway with respect to minke whale and with some modifications for the fin whale.

Seals – NO COLLECTION OF TTD

GREENLAND

Collection method:

TTD reporting is based on information from hunters on the mandatory catch report form. The hunters use the IWC TTD criteria: No movements by flippers or whale, including when sunk and no movement in harpoon line or float. Death within 1 minute is recorded as Instantaneous Death. No post-mortem examinations.

Species:

Minke, fin, humpback and bowhead whales – TTD COLLECTED

From Expert group meeting 2011 – small cetaceans – page 27

Beluga and Narwhale

“Some preliminary data on TTD using different hunting methods on beluga and narwhal were presented by Greenland. These data had been sampled by hunters according to the suggested data collection set up by the chair of the Expert Group and circulated prior to the hunting season (see appendix 2).

The Expert Group very much welcomed the presented material. However the data presented were too preliminary, although very promising, to be discussed or concluded upon during the meeting. The Expert Group encouraged Greenland to continue the data sampling and to further

process the data already gathered for presentation to the NAMMCO Committee on Hunting Methods at a later stage. “

Could not find any information on collection of TTD for these species :
Killer whale, Pilot whale, White-sided dolphin, White-beaked dolphin, Harbour porpoise

Seals – NO COLLECTION OF TTD

FAROE ISLANDS

From Expert group meeting 2011 – small cetaceans – page 16

Systematic recordings of TTD have been carried out in the Faroe Islands, and the killing of the pilot whale has been divided in two phases. The first phase is the time from which the whale is secured with the iron hook or the newer blunt hook. The second phase is the actual severing of the spinal cord and the surrounding blood vessels. When estimating TTD using the iron hook both phases are included in the estimate, while only the second phase counts when the blunt hook is used, the assumption being that the hook does not wound the whale.

The average TTD estimate found when using the traditional whaling knife was 65.4 s (range 8.0 - 290 s), of which securing the whale on average took 29.3 s (range 0 - 132 s) while cutting the spine took 36.1 s (range 3,5 - 195 s). When using the blunt blowhole hook the average securing time was 20.1 s (range 6 - 211 s).

The average cutting time with the new spinal lance and the blunt blowhole hook was approximately 1-2 s. Consequently, the total time from the insertion of the blowhole hook until the animal was dead was on average around 22 s.

Monitoring the killing time for the spinal lance by using a stop watch has been considered. However due to the very short TTD (1 – 2 s) quantification of the exact time is difficult, as the killing time using the spinal lance is the time from the start of the thrust of the lance until the spinal cord and the surrounding vessels are cut.

Discussion:

Comments were made with respect to the presented statistics, and the underlying assumption that the blunt hook is not painful for the animal. The Expert Group could not accept this assumption as the blowhole like nostrils in terrestrial mammals probably are sensitive to stretching and strain. The general opinion of the Expert Group was that TTD should be recorded from the time the blunt hook is inserted into the blowhole, as is the case with the iron gaff until further investigations (i.e. gross post mortem and histological examination of affected tissues in the blowhole) have been undertaken and shown the opposite. TTD calculated from hooking to the time that the animal is dead still shows great improvements (65.4 s versus 22 s).

From page 31

Monitoring and systematic reporting of the hunt takes place in the Faroe Islands through the district administrators report to the Ministry of Fisheries. In the Faroe Islands each drive hunt reports data such as when and where the hunt occurred, total killing time for the school, number of whales, size and sex, number of participating boats, number of hunters on shore and in boat and any breaches of the regulations governing the hunt.

Possible Questions

Do FO still do some kind of recording of TTD?

Would it be an option to do so if not on a whole pod but on random individuals?

Could not find any information on collection of TTD for these species :

Bottlenose dolphin, White beaked dolphin, White sided dolphin and Harbour porpoise. shot

Seals – NO collection of TTD

**PROTOCOL FOR
THE COLLECTION OF TTD DATA IN WHALE HUNTS WITH DECK MOUNTED
HARPOON GUN**

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Collecting TTD data in whaling

Background

Time to death (TTD) or Survival time (ST) and the Instantaneous death rate (IDR) are terms that are used to measure and to quantify the killing efficiency and the state of art of current killing methods and practices used in whaling operations.. Collection and analysis of TTD/ST and IDR data in a standardised manner with covariates that may influence TTD/ST and IDR make it possible to compare how rapid whales are killed using different techniques and gears. Standardised collection methods and analyses of TTD makes it possible to calculate impacts on TTD and IDR of new developments, modifications or changes in hunting practices and the impact also on efficiency of systematic training of hunters.

In Norway (1981-2012) TTD of more than 5000 minke whales killed using different types of hunting gears were collected and analysed with the covariates animal size, shooting distance and angle of harpoon gun shot, hit region and detonation area. The results were used to document the need for innovations like development of new and improved weapons, consecutive modifications and testing of gears and hunting techniques and practices, training of hunters etc. During these 21 years IDR increased by 65% from 17% to 82% and the average TTD was reduced from 11.5 min to 1 min.

The NAMMCO Expert Group Meeting on Assessment of Large Whale Killing Data in 2010 underscored the importance of recording TTD/ST/IDR and recommended the use of the Norwegian way of collecting and analysing for all hunts to identify needs for improvements.

Why record TTD

To document killing efficiency

To discover potential ways to improve the killing

To follow improvements or other issues relevant for killing over time

How to sample TTD data – “the Norwegian Way”

It is very important that the personnel collecting data are independent and are able to concentrate on data collection and not have other tasks to attend to in the killing and flensing (butchering) phase.

Who should sample/collect – required qualifications prioritised

1. Veterinarians
2. Large mammal biologist and large whale physiologist
3. Hunt- and fisheries inspectors

The profession of the veterinaries, make them able to better understand and assess the behaviour of the animal when hit, and relate the animals reaction to the death criteria. Large mammal biologists and physiologist may also have this understanding. Anatomical and pathological knowledge is important when assessing damage to organs and gross (macroscopic) changes in vital organs, which can be studied during flensing

If it is not possible to have dedicated personnel that only collect TTD data, scientists/hunt-fisheries inspectors (preferably with biological background) carrying out research/inspection on board but with necessary time off from his/her own research/inspection during killing and flensing may be used.

Generally, all personnel should receive special training PRIOR to collecting TTD data for whales – category 3 above will generally need more training than category 1 and 2. Such a training course should cover *inter alia*:

A general introduction on whales, whaling and management of whales (abundance estimates, quota setting, national and international management systems)

National laws and regulations – implications for the hunting practise with respect to

- equipment (review of gear and equipment – functions and correct use and maintenance
- the hunt itself (searching for whales , shot, hauling, flensing and correct treatment of edible products)
- criteria of death

Description of why data is collected and how it is collected

Utensils: watch for measuring TTD

- anatomy and physiology relevant for estimating TTD
- examination of detonation area
- reporting: how to fill out the forms and how to deliver them

Reporting form

The attached form with guidelines is the one used in the Norwegian minke whale hunt.

For practical reasons the form should be limited to one page. To the extent possible the form should be designed with only “yes/no/unknown” options to tick off.

Comments or circumstances not covered by the form and which the inspector want to inform about may be written either on the back of the form or on a separate sheet.

It is a prerequisite to fill out the report immediately after the kill has taken place and observations of organ damages have been identified. It is very easy to forget details after a short while.

The form shall cover information on I. Primary observations/findings and II. Secondary observations/findings.

I. Primary observations/finding are factors that are used directly to determine or that upon review may be used to support, nuance or disprove the given TTD estimate in the report.

Important primary observations are (but not excluding other):

- a. Reaction patterns in whales in connection when struck/hit (whale dives, sinks, turns over on its back, swims etc)
- b. Slackening or movements in mouth, flipper or tail
- c. Hit area (harpoon)
- d. Detonation site (grenade)
- e. Gross organ damages - bleedings
- f. Estimated TTD

II. Secondary observations/findings are related to aspects of the hunt that may impact the TTD (like but not excluding other):

- g. Animal size
- h. Weapon type
- i. Shooting distance
- j. Shooting angle

Criteria of death

The International Whaling Commission in 1980 recognized that it is difficult to decide exactly the moment of death of a whale as it is more or less under water when it happens. It was therefore recommended the use of behavioural cues as indicators of death. These diagnostic criteria of death in whales, known as the “IWC criteria”, were set to “...the time taken for the mouth to slacken, the flipper to slacken or all movements to cease”. These signs, which can be observed during practical whaling, are to be used in conjunctions with pathological findings made during necropsy. It has been recognised that when TTD are solely determined on the basis of IWC criteria, a significant portion of animals will be recorded as being sensible or alive when they are actually unconscious or dead.

Quality control of data

The importance of filling out the form *immediately* during the hunt cannot be stressed enough. The likelihood of remembering details and circumstances correctly after time has passed is low and may normally result in invalid and incorrect information.

Before statistically analysing the data each separate reporting form must be examined closely with respect to errors and possible falsifications of facts.

When in doubt it may be necessary to acquire additional information through interviewing the inspector and hunters, or checking catch data from the existing reporting systems.

To be able to carry out this kind of quality control satisfactory it is a prerequisite to have the necessary biological knowledge in addition to detailed knowledge of, and experience from, whaling.

GUIDELINES FOR THE COMPLETION OF THE CATCH FORM

Fill out all questions as thoroughly as possible.

If uncertain what to write or if information is missing, note this down. Likewise, give additional comments of any kind.

Death criteria are slackened mouth, flippers slackened (along the sides) and that whales are at rest. It is not always that all of these criteria are present even though the whale is dead. For example, the jaw will not be open when the animal is on its back. Currents and waves can provide movements of the tail. Flippers will not immediately lie completely along the side when the whale dies.

If the whale is conscious or waking up again, it will try to straighten up, move the flippers outwards, close the jaw and give blow and try to dive. Movements in the tail will be clear and coordinated with the other consciousness symptoms.

Survival time/ TTD: The time it takes from firing the shot to the whale is dead. Instantaneous kill is specified as 0 or instantaneous in the form. If one is unsure of the time, for example if not all criteria are fulfilled, indicate why and what kind of uncertainty in the form.

In order to verify stated survival time in retrospect, it is very important that the following information are noted as accurately as possible:

- did the grenade work normally?
- place for recoveries of any grenade remnants,
- shot reactions,
- organ damages,
- mark the harpoon hit area in the figure
- shot angle information.

Shot direction indicates the direction where the harpoon comes from in relation to the whale's long axis. The direction is indicated by the numbers 1-5:

- 1 = directly from the front (0°)
- 2 = diagonally from the front (above 0° to 45°)
- 3 = sideways (45° to 135°)
- 4 = diagonally from the back (135° to 180°)
- 5 = directly from the back (180°)

Shot Distance is estimated without any technical aid.

Grenade detonated: It is very rare that the grenade does not detonate due to technical error. If the grenade did not detonate this may be because the harpoon has not penetrated far enough into the whale body (65-70 cm minke whale) or that the trigger line is cut off. In the case of malfunctioning, indicate probable cause for the malfunction, grenade production number and year.

Loss notes loss of struck and dead or hurt whale. The cause(s) are described under comments. If possible note where the harpoon hit the whale and if the grenade detonated or not.

Reaction harpoon hit/detonation: This information is important for the assessment of the effects of shot/detonation, and are used as when evaluating the survival time.

Visible organ damages after the detonation

This is important information when assessing final survival time.

The grenade detonates approximately 65-70 cm inside the whale (minke whale). Often there will be remains of the grenade on the detonation site such as residual from the aluminium capsule and one or more pieces of black polyethylene. Damage to organs are observed during flensing or when organs are removed. In the area where the grenade exploded, the tissues and organs will be torn up and there are substantial accumulation of blood in the area. Detonation in the musculature causes massive injuries to muscle tissue and transforms it into a jellylike mass without normal tissue structure up to 20 – 30 cm from the detonation site.

REPORTING FORM NORWEGIAN MINKE WHALING (YEAR)

Date: Vessel: Whale no in hunting logbook:

Survival time:

Harpoon in (Figure 1-9): Harpoon out (Figure 1-9): Shot through: Yes/No

Shot direction (1-5): Shot distance: Grenade detonated: Yes/No

Lost animal: Yes/No

Reshot canon: Yes/No Gunshot: Yes/No Alongside of boat
(time):

Reaction from harpoon shot (mark X):

Turned over/ sank Dived and sank Swimming movements in tail: Yes/No

Mouth: open/closed Flippers: laying by the side/stood partly out/completely out

Visible grenade damages to organs taken when flensing :

Hearth: Yes/No Lung(s): One lung Yes/No /both lungs: Yes/No

Large veins in chest cavity: Yes/No Large veins in abdominal cavity: Yes/No

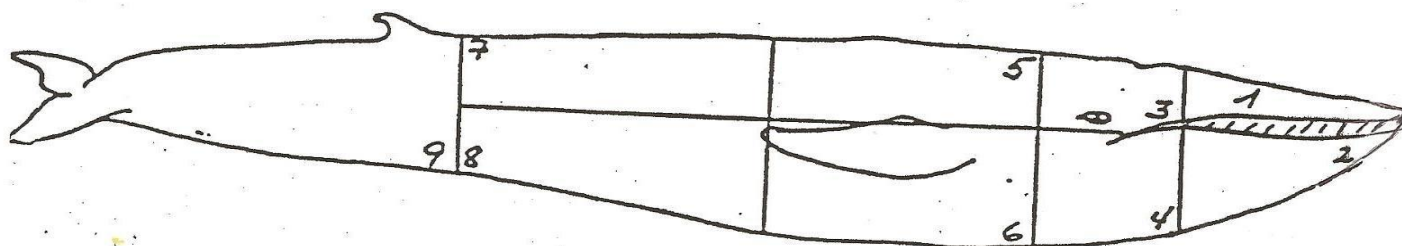
Spine/neck/skull: Yes/No Indicate damage area:

Organs in abdominal cavity: Yes/No Indicate organ(s) damaged:

Blubber/muscles: Yes/No Indicate damaged area (Figure 1-9):

Remains of grenade: Yes/No Indicate area of discovery:

Inngang harpun ⊕
Utgang harpun ⊙
Harpunbane -----



Comments (use back of form or separate sheet)

Data collection in preparation for the Expert Group meeting on assessing hunting and whale killing data for small cetaceans 15 - 17 November 2011

Background: To facilitate that the expert group on small cetaceans will have the essential and necessary data to do an assessment of the killing methods it is suggested that the listed data may be collected in the coming season.

It is a prerequisite that the hunters are informed that all information they give will be treated with confidentiality.

NB! A practical method is to define death as the moment the mouth is slackened or open, the flippers are slackened/lie along the sides and/or all movements have ceased.

For any given species the following data would be of interest:

1. Weapons, ammunition and equipment/gear used or combinations of weapons/gears for the different species or in the different hunts
2. Number of animals that are struck with harpoons/rifle shots/combo of harpoon and rifle shots/gaffed (pilot whales) and retrieved
3. Number of animals that are struck with harpoons/rifle shots/combo of harpoon and rifle shots/gaffed (pilot whales) and lost 1) dead or 2) alive
4. If whales were lost, the most probable reasons for losses
5. If harpooned and shot ; Where the animal was hit with harpoon and rifle shot(s) (Please, mark as exactly as possible on a figure)
6. How many shots and/or harpoons were used before the animal died
7. If available measured Time to Death (TTD) (**using watch**): Time measured from the first harpoon/shot/gaff to the animal is perceived as dead
8. In the absence of measured TTD (point 7) report estimated TTD, (**without using watch**): Estimated time from the first struck of harpoon /shot/gaff to the animal is perceived as dead

In addition the following information would be acknowledged:

- Is training of hunters mandatory?
If YES what kind of training and how is it transmitted/given to the hunters
- If there are control mechanisms, to describe these
- How are data reported