

Analysis of some 2026 Norwegian Minke hunt video data in relation to animal welfare

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1.0 Introduction and background

The common minke whale (*Balaenoptera acutorostrata*), is found primarily in the Northern Hemisphere with distinct regional subspecies. The minke whale is the smallest of the baleen whales, reaching lengths of 7 to 10 meters and weighing 5 to 10 tons, with a lifespan of up to 50 years in the wild. Minke are streamlined and active swimmers with swimming speeds, in bursts, of over 20 knots. For much of their lives, minke whales travel alone or in pairs, but they may come together in larger numbers when there is an abundance of their food, krill or small fish. Norway hunts minke whales despite the International Whaling Commission's commercial-whaling moratorium because Norway maintains a formal objection to the moratorium.

Minke whales are mammals, and are sentient. The RSPCA give a working definition of sentience as *"Evidence from multiple scientific studies has helped us to understand that a wide range of animals are sentient beings. This means they have the capacity to experience positive and negative feelings such as pleasure, joy, pain and distress that matter to the individual."* (RSPCA, 2026, <https://science.rspca.org.uk/sciencegroup/sentience>).

Article 13 (a founding article on the functioning of the EU, 2016) (European Union Consolidated version of the Treaty on the Functioning of the European Union PART ONE - PRINCIPLES TITLE II - PROVISIONS HAVING GENERAL APPLICATION Article 13 https://eur-lex.europa.eu/eli/treaty/tfeu_2016/art_13/oj/eng)

Article 13 - In formulating and implementing the Union's agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage.

In relation to the minke whale hunt, the area of sentience which matters most is likely to be 'the capacity to experience pain and distress' during the hunt and during the time between harpoon impact and death.

The Norwegian hunt uses a harpoon equipped with an explosive grenade, and sometime rifles (to use the description of Øen 2015);

"Norwegian fishermen hunt minke whales from small (50 feet) or medium sized (60-120 feet) fishing boats that are rigged for whaling in the spring and summer season. The weapons are 50 mm and 60 mm harpoon guns (Fig. 1) and back-up rifles calibres .375 and .458 using full

metal jacket, round nosed bullets. The harpoon is equipped with a penthrite grenade (Whale grenade-99) developed in Norway in 1997-1999. The grenade is loaded with 30g pressed penthrite as the explosive. A triggering device, a twin hook connected to the firing pin in the grenade with a strong synthetic cord, triggers the detonation when the harpoon has travelled about 65-70 cm inside the whale body. The harpoon line, the fore-runner, made of synthetic materials, runs through a spring system to a winch used to haul the whale in to the boat immediately after it has been shot."

In previous studies, and as a measure of 'how long does it take the animal to die' - Time to death (TTD), Survival time (ST) and Instantaneous death rate (IDR) are terms which have been used to describe the interval between impact of a projectile and the 'last movements' of a hunted animal. These measures are blunt tools because, an animal may be 'still' but not dead, and the potential for suffering may remain in an animal which is immobile. For the purposes of this report we report TTD, using 'stillness' or 'no further movement' as an indicator of a stage in the animals movement towards death, but note that the 'blunt tool' TTD is likely to give a shorter estimate of the potential time in which the animal remains alive (and therefore the potential time when we cannot exclude the possibility that the animal is suffering pain and distress). In the case of human death assessment or in animals where it would be possible to make measurements by being in close proximity to the animal, it might be possible to make more accurate measures using metrics including heart rate (ECG electrocardiogram), blood pressure or EEG (brain activity electroencephalogram) - however, these methods are not practical in the case of a harpooned whale, and so we are left with the 'blunt' and potentially misleading measure TTD.

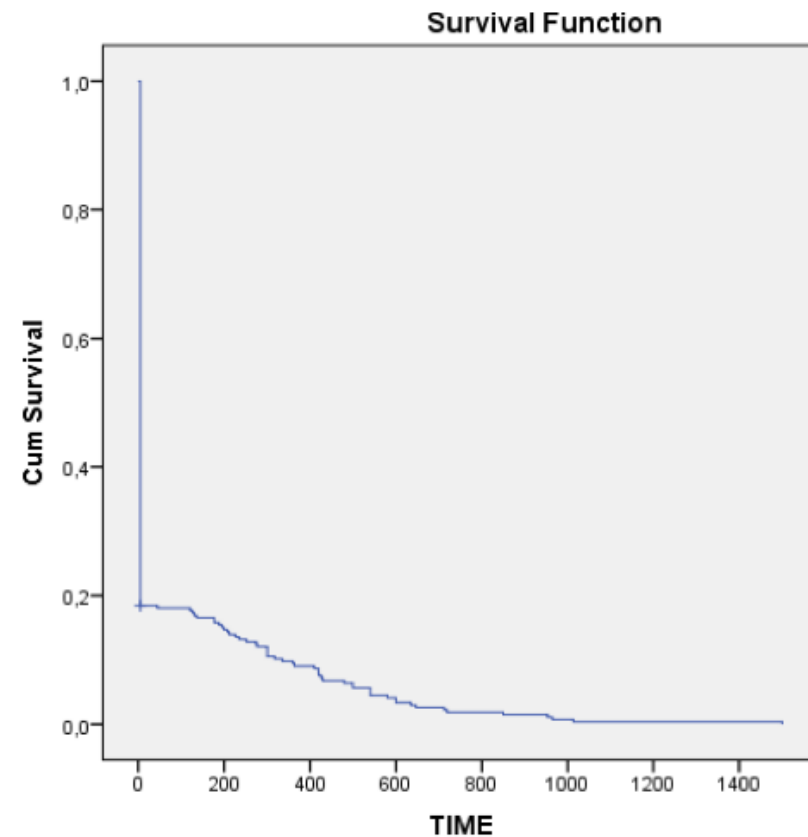
In this paper we make comparisons between the data from 24 recent minke hunts (ESPA Endangered Species Protection Agency whale hunt monitoring 2026) (All video material and images collected by, and copyright © of, Endangered Species Protection Agency (ESPA) whale hunt monitoring 2026) with data published by Øen (2015) in his analysis of Norwegian whaling, which was prepared and presented at a NAMMCO North Atlantic Marine Mammal Commission meeting to assess TTD in large whales held on 4 – 6 November 2015, in Copenhagen, Denmark;

"The results of the survival plot for the 271 minke whales are shown in Fig. 4. Instantaneous death was recorded for 222 whales (82 %) with an average TTD of 1min. The median TTD for the 49 whales not registered instantly dead was 6 min. One whale that had only been wounded was reshot and died after 20-25 minutes. No whales were lost alive. (Øen, 2015)"

Figure 1. From Øen (2015), Kongsberg harpoon gun with Whale Grenade 99



Figure 2. From Øen (2015), Survival curve for 222 whales. *"The median TTD for the 49 whales not registered instantly dead was 6 min. One whale that had only been wounded was reshot and died after 20-25 minutes."*



In the current analysis, video footage from 24 animals is reviewed. We ask two data focussed questions;

How does our analysis compare in terms of TTD and assessment of events with the 2015 Norwegian industry data?

Does our analysis show that Norway meets its own requirements for animal welfare, and avoidance of suffering, at the time of their hunt and killing ?

In the discussion part of the paper we address some further questions;

Minke whales are mammals with highly developed senses and sentience - the ability to feel and suffer. Does the method used present the potential to protect the welfare of these animals, the high risk of intense pain and suffering, for relatively prolonged times around the time of their death.

How does the method used (grenade harpoon) compare, in relation to animal welfare and suffering, with other methods which are used to kill animals ?

If we, as wider society (ie people with a conscience, global observers, peoples social awareness through social media) compare the minke hunt with, for example, an elephant hunt, or slaughter of farm animals - would we find that the minke hunt can stand up to any degree of social and human scrutiny when the question is asked - What do we, as caring humans, consider and expect as a humane death for a large commercially hunted wild mammal ?

2.0 Current analysis

Assessing the timing of events from video made remotely using Sony FX2 and FX3 cameras and DJI drone cameras. All video material and images collected by, and copyright © of, Endangered Species Protection Agency (ESPA) whale hunt monitoring 2026. The video assessment is presented as timelines. An 'example' is presented in Figure 3 to illustrate the terms used, and how the timing marks on the timeline are used.

Figure 3. 'Example timeline' for Minke whale hunt video footage, to illustrate the terms used, and how the timing marks on the timeline are used.

All video material and images collected by, and copyright © of, Endangered Species Protection Agency (ESPA) whale hunt monitoring 2026

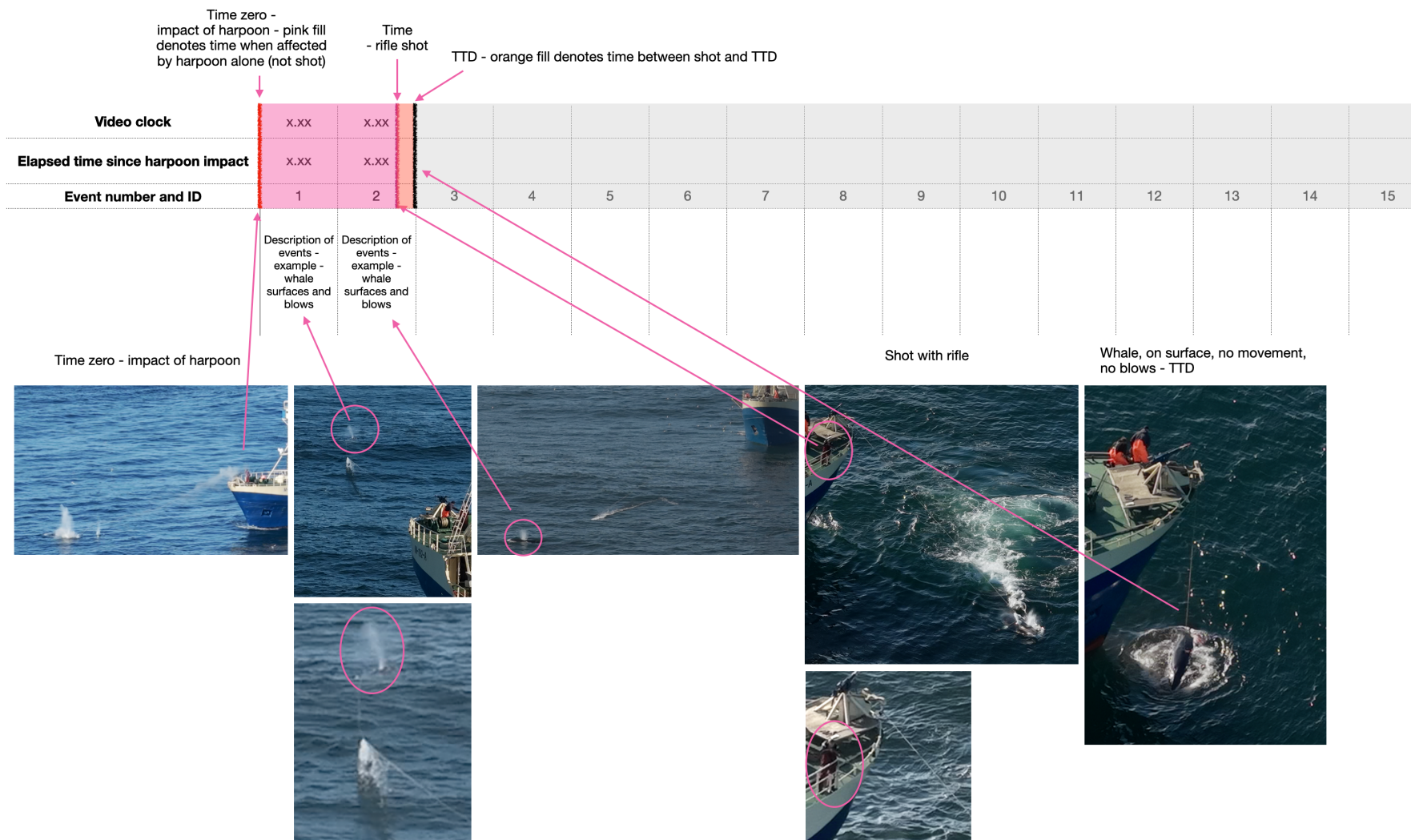


Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	10.02	11.09	12.40	13.56											
Elapsed time since harpoon impact	0	1.07	2.44	3.54											
1. 2026/05/30 Vardo	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Whale visible on side and dives close to boat	Winching in Shot number 1 at 12.40 TTD appears to be 2.44 minutes	Whale surfaces and on surface from 13.56 no 'blows', no movements											
Video clock	14.47				19.47										
Elapsed time since harpoon impact	0				5.00										
2. 2026/05/ 31 Kiberg	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Harpoon impact 14.46, whale dives, immediate winching in	Whale still quite deep, crew looking to see whale No attempt to shoot whale with rifle	Whale deep	Whale not yet at surface	Whale winched to surface, no visible blows No visible movement in the whale TTD appears to be 5.02 (or less as not visible under the surface)						Whale at surface, no fin or fluke movements				

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	1.12		5.09	5.21+	5.11		8.42+	9.41+	10.14+	11.15+		13.14			
Elapsed time since harpoon impact	0		3.97	4.09			7.30	8.29	9.02	10.03					
3. 2026/05/31 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			Line allowed out, whale goes ahead and to starboard, whale surface and blows at 3.97	Whale surfaces and blows 4.09 Whale surfaces 4.20 Whale surfaces and blows 4.31 Whale surfaces and blows 4.89	Whale surfaces 5.11		Whale surfaces and then dives 7.30 Whale surfaces and blows 7.36 Whale surfaces and blows 7.55	Whale surfaces then dives 8.29 Whale surfaces and blows 8.45 Whale surfaces and dives 8.55	Whale surfaces and blows 9.02 Whale surfaces and blows 9.08 Whale surfaces and blows 9.16 Whale surfaces and blows 9.28 Whale surfaces and blows 9.35 Whale surfaces and blows 9.55	Whale surfaces and blows 10.03 Whale very active, fluke thrashing on surface 10.08 Whale very active, fluke thrashing on surface 10.12 Seamen do not make any attempt to shoot with a rifle Whale attempt to jump from water but held by the line 10.38 Whale surfaces and blows 10.44 Whale surfaces and blow 10.55 Whale shot with rifle 10.55		Whale at surface near bow, no blows, no movement 12.03 TTD appears to be 12.03			
Video clock	3.35			7.39			10.14								
Elapsed time since harpoon impact	0			4.04			6.79 (6 minutes 47 seconds)								
4. 2026/06/02 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				Whale appears at surface near bow of boat, no movement, no blows			Crew gathered on bow of boat, examine whale and shoot at 6.5 Because crew considered the whale required shooting at this point - assume TTD is at this shot (6 minutes 47 seconds)								

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	0.46			5.44												
Elapsed time since harpoon impact	0															
5. 2026/06/ 04 Olavson	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
				Whale appears at surface at bow of boat, no movement, no blows 4.55 TTD appears 4.04 (before this time underwater)												
Video clock	0.18		2.05	3.43	5.19											
Elapsed time since harpoon impact	0															
6. 2026/06/04 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Whale dives	Winching in	Whale surfaces, blows	Whale clearly actively swimming under surface as line is moving from side to side Whale surfaces, blows and thrashes tail 3.31 Whale surfaces opening and closing mouth 3.36 Whale is close to boat, shot twice from crows nest at 3.49	Whale visible just under surface, not moving, no blows TTD appears 5.01 (before this time underwater)											

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	1.20														
Elapsed time since harpoon impact	0														
7. 2026/06/07 Batsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Whale appeared to have escaped from harpoon after approximately 5 seconds														
Video clock															
Elapsed time since harpoon impact															
8. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TTD unclear														
Video clock	0	1.03	2.46	3.07	4.21	6.03									
Elapsed time since harpoon impact	0	1.03	2.46	3.07	4.21	6.03									
9. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Whale surfaces and blows 1.03 Whale surfaces and blows 1.34	Whale splashes on surface (active) 2.46	Whale surfaces and blows 3.07	Whale surfaces and blows 4.21 Whale surfaces and blows 4.40 Shot with rifle 4.42	Whale at surface at the bow of the boat, no movement, no blows 6.03 TTD 6.03 (before this time underwater)									

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	0.23														
Elapsed time since harpoon impact	0														
10. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Harpoon fired and missed														
Video clock	4.01														
Elapsed time since harpoon impact	0														
11. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Harpoon fired and missed														
Video clock	0.56														
Elapsed time since harpoon impact	0														
12. 2026/06/10 Kato	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Whale breaks surface with tip of rostrum, no movement, no blows	TTD Immediate													
Video clock															
Elapsed time since harpoon impact															
13. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TTD unclear as whale not clearly visible due to camera angle														

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock															
Elapsed time since harpoon impact															
14. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TTD unclear as whale not visible at surface due to camera angle														
Video clock	7.46														
Elapsed time since harpoon impact	0														
15. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Whale seen stationary on surface and no blows at 0.08 TTD immediate														
Video clock	2.03														
Elapsed time since harpoon impact	0														
16. 2026/06/11 Kato	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TTD immediate														

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	4.37	5.06		8.88											
Elapsed time since harpoon impact	0														
17. 2026/06/11 Vardo	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Whale surfaces and blows 0.5			Whale surfaces and blows 4.01 Whale at surface 4.30 TTD 4.30											
Video clock	0.56			3.58											
Elapsed time since harpoon impact	0			3.02											
18. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				Whale surfaces, tail movement, and small blow Shot with rifle 3.02 TTD 3.02											
Video clock	5.05	6.08													
Elapsed time since harpoon impact	0														
19. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Whale blows 0.02	Whale surfaces, no movement, no blows 1.03 TTD 1 minute (before this time underwater)													

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	7.06														
Elapsed time since harpoon impact	0														
20. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Harpoon fired and missed														
Video clock	0.13														
Elapsed time since harpoon impact	0														
21. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Harpoon fired and missed														

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	0.18		3.13	3.28	5.04	5.18									
Elapsed time since harpoon impact	0		2.50		4.86	5.01									
22. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			Whale surfaces and spectral fin appears to show movement, no clear blow 2.50	Whale actively surfaces Whale surfaces again and blows 3.15 Whale surfaces and actively dives 3.27	Whale surfaces and dives 4.86	Whale surfaces and blows 5.01 Whale surfaces and blows 5.11 Whale very active swimming and surfaces and blows 5.25 Whale very active on surface, shot with rifle 6.06 Whale on back 6.13 Appears to be shot again 6.38 After second shot no further movement or blows TTD 6.38									

Figure 3. Timelines for video analysis of Norwegian Minke whales hunted in 2026, with commentary on events (times are in minutes and seconds m.s) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

Video clock	0	1.02													
Elapsed time since harpoon impact	0	1.02													
23. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Whale actively splashing on surface, blows 1.02 Whale active on surface 1.26 Whale splashing on surface 1.32 Shot with rifle 1.37 Tail fluke visible and not moving, no blows 1.50 TTD 1.50													

Video clock	0														
Elapsed time since harpoon impact	0														
24. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Whale surfaces close to bow of boat, shot 1.11	Whale at surface close to bow of boat, second shot 2.54 TTD 2.54												

2.1 Summary data

Figure 4. Timeline without commentary for events where a TTD is calculable (ie the harpoon impacted the whale, and the animal is seen to be dead)(times are in minutes) - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

1. 2026/05/30 Vardo	1	2	3	4	5	6	7	8	9	10	11	12
2. 2026/05/ 31 Kiberg	1	2	3	4	5	6	7	8	9	10	11	12
3. 2026/05/31 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12
4. 2026/06/02 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12
5. 2026/06/ 04 Olavson	1	2	3	4	5	6	7	8	9	10	11	12
6. 2026/06/04 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12
9. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12
12. 2026/06/10 Kato	1	2	3	4	5	6	7	8	9	10	11	12
15. 2026/06/10 Vardo Lighthouse	1	2	3	4	5	6	7	8	9	10	11	12
16. 2026/06/11 Kato	1	2	3	4	5	6	7	8	9	10	11	12
17. 2026/06/11 Vardo	1	2	3	4	5	6	7	8	9	10	11	12
18. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12
19. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12
22. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12
23. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12
24. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12

Figure 5. Events ranked with increasing TTD - pink fill denotes time when affected by harpoon alone (not shot), orange fill denotes time between shot and TTD.

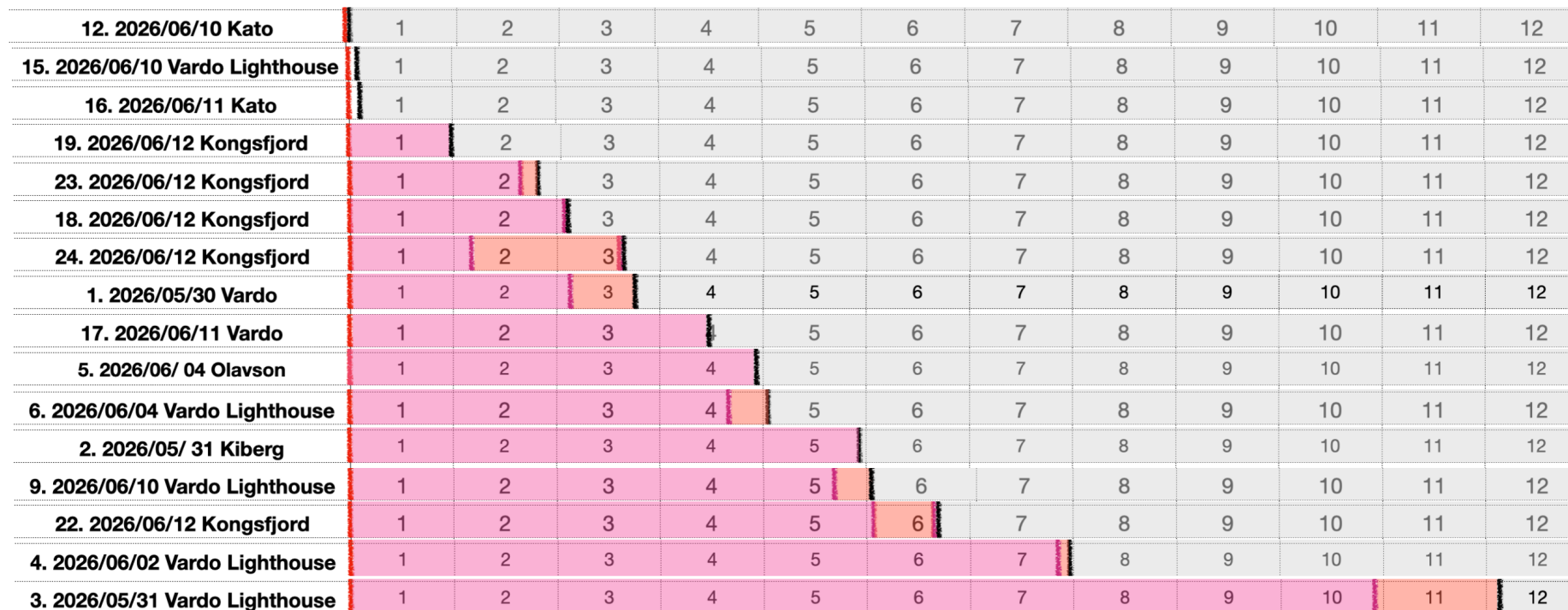


Table 1. Summary, average TTD time (Minutes & seconds) for the 16 events in which the whale can be observed dead, and summary data on rifle usage.

Number of events	TTD	Rifle use
16 events in which the whale can be observed dead	Average TTD 3 minutes 51 seconds	0.69 rifle shots per event (or rifle is used, on average, 69 times in 100 hunts)

This analysis (Table 1) contrasts with the data presented in Øen (2015) (Table 2).

“The results of the survival plot for the 271 minke whales are shown in Fig. 4. Instantaneous death was recorded for 222 whales (82 %) with an average TTD of 1min. The median TTD for the 49 whales not registered instantly dead was 6 min. One whale that had only been wounded was reshot and died after 20-25 minutes. No whales were lost alive. (Øen, 2015)”

Table 2. Summary, average TTD time for 271 minke whale events (Øen, 2015).

Number of events (Øen, 2015)	TTD
271 whales	82% of whales reported with average TTD 1 minute The median TTD for the 49 whales not registered instantly dead was 6 min. One whale that had only been wounded was reshot and died after 20-25 minutes.

3.0 How does the summary data relate the Norwegian legislative requirements in relation to animal welfare during whale hunts ?

The harpoon weighs about 15kg, and is reported to travel at about 75ms⁻¹. It is unclear from the film evidence whether or not the harpoon's grenade detonated reliably within the whales because it is not possible to see the activity under water. It is clear however, that the combined energy of the harpoon and the grenade were not sufficient to bring about a rapid death in many of the animals observed in this analysis of video, and that the average TTD was over 3 minutes, with a maximum of 12 minutes and 3 seconds.

From the time that the harpoon was fired to the last visible sign of life, the whale was always tied to the boat by the hooked barbs of the harpoon. Despite this, in many of the observed animals, the whales were actively diving, surfacing, breathing (as observed by blows), and moving around the limits of the line and around the boat. The vessels were seen to make turns to keep up with the direction of the whale, and the whale was seen on both the starboard and port sides of the vessel.

Please see Appendix 2 for the full text of the Norwegian Regulations on the practice of hunting minke whales, FOR-2022-04-01-511, as amended by FOR-2024-02-02-195

§ 4.Hovedregel

Det skal brukes fangstmetoder som beskytter dyrene mot fare for unødige påkjenninger og belastninger.

§ 4. Main rule

Capture methods shall be used that protect the animals from the risk of unnecessary stress and strain.

This requirement from the Norwegian Regulations on the practice of hunting minke whales, FOR-2022-04-01-511, as amended by FOR-2024-02-02-195, hangs on the words "protect the animals from the risk of unnecessary stress and strain". These words mimic the phrases used widely in animal welfare legislation in other areas - for example, in the EU and in the UK the words used are;

Directive EC 98/58 requires that farmed animals are kept with reasonable steps to ensure they are not caused "unnecessary pain, suffering or injury"

Regulation EC 1099/2009 requires that, during slaughter, measures are in place "to avoid pain, and minimise distress and suffering"

The Norwegian legislative requirement lacks realistic detail so that any meaningful judgement can be made regarding;

- A) Is the 'stress and strain' necessary
- B) Are the animal being protected from stress and strain
- C) What is stress and strain ? (this is not defined in the legislation)

One way to assess whether a whale during hunting with a harpoon is protected (as required) from 'unnecessary stress and strain' (Norwegian legislative requirement) would be to ask two comparative scenario based questions;

Scenario 1. If an elephant was to be hunted with a harpoon attached to a rope line, and hoisted using a rope whilst alive, and took 12 minutes to be visibly dead (TTD), in the modern world of social media, nobody would be surprised if there was widespread outrage and public debate.

What is the difference between this scenario and the reality (from video evidence) of the situation for some of the whales in the Norwegian Minke whale hunt?

Scenario 2. If a bull in a slaughterhouse took 12 minutes to die after stunning, if the slaughterhouse operated, for example, to the European slaughter requirements in EC 1099/2009, nobody would be surprised if the slaughterhouse was prosecuted for animal welfare infringements, and there would also be the potential for significant public interest.

What is the difference between this scenario and the reality (from video evidence) of the situation for some whales in the Norwegian Minke whale hunt?

In a survey of Norwegian public opinion about animal welfare in relation to whaling (WDC 2026), it was found that 65% considered non-instantaneous death unacceptable in both 2021 and 2024, and also reported a movement in thinking toward greater precaution and less support for commercial whaling.

3.1 Do the timelines indicate that the Norwegian legislative requirements are being met?

The timelines derived from the video analysis indicate that 'immediate death' was not common. What was more commonly observed was that there was a period of time during which the behaviour of the whales - diving, surfacing breathing (as observed by respiratory blows), thrashing and movements of the tail fluke - was seen before the animal died.

The average time before death (TTD) for the animals observed in this video material was 3 minutes 51 seconds, during which the animals were, without much doubt, subject to "stress and strain" (the words used in the Norwegian Regulations on the practice of hunting minke whales, FOR-2022-04-01-511, as amended by FOR-2024-02-02-195).

In more than half (0.69) of the hunts, the animal was winched alive close enough to the boat for a rifle shot to be used.

Whilst this might be considered as a 'humane act' - the fact that it was necessary, indicates that the harpoon is not a guaranteed method for killing whales rapidly. The observed use of two methods (Harpoon followed by rifle) might suggest that the primary method, the harpoon, quite often creates 'unnecessary stress and strain' because, if the primary method (the harpoon) was properly effective, then the use of the rifle would be 'unnecessary'.

3.2 Does the video of missed harpoon shots tell us anything ?

Some of the harpoon shots missed. Some people might consider this a good thing because the animal escaped. However, this is a 'risky thing' for animal welfare because it is quite possible that some of the animals are hit by the harpoon, or a wounded by a grazing shot of the harpoon, but the harpoon does not 'hold' the animal escapes injured.

Figure 6 shows a sequence of still images from the video, and shows the track taken by the harpoon. The harpoon does not 'hold' the whale, ie. It does not penetrate the animal and leave it attached by the line, but the harpoon clearly passes very close to animal and may have wounded it. It is not known what happens next to this animal, but it is possible that it has been damaged by this - in the worst case, struck or injured and lost. This is additional potential 'welfare cost' of this hunt which is currently not recorded or reported.

Figure 6. Track of harpoon, passing very close to the whale, with the potential to injure the animal but not 'hold' it.
 All video material and images, collected by, and copyright © of, Endangered Species Protection Agency (ESPA) whale hunt monitoring 2026.

Video clock	0.13													
Elapsed time since harpoon impact	0													
21. 2026/06/12 Kongsfjord	1	2	3	4	5	6	7	8	9	10	11	12	13	
	Harpoon fired and missed													



4.0 Discussion

Neither instantaneous death nor insensibility was achieved through use of the harpoon in many of the observed minke hunt events. The animals showed behaviours and activity which indicated consciousness, avoidance, distress movements, and vitality - and therefore, in the face of profound body injury from a harpoon, the likelihood of extreme pain, distress and suffering. The time during which this suffering was present was, on average, over 3 minutes. The average TTD of 3 minutes 51 seconds would not be tolerated in any humane slaughter process for commercial meat production.

The use of the rifle is only effective when used close to the animal, and therefore the whales are 'wound in' on the tether line to bring them closer to the boat after harpooning.

Being towed by a rope attached to an object (the harpoon head) embedded in flesh in a wounded body would create extreme pain, distress and suffering. In the hunts assessed, a rifle was used in 69% of the events. This in itself highlights that the harpoon alone is not a guaranteed method for killing whales rapidly. The observed use of two methods (Harpoon followed by rifle) indicates that the harpoon, quite often creates 'unnecessary stress and strain' because, if the primary method (the harpoon) was properly effective, then the use of the rifle would be 'unnecessary'.

The key welfare concern is that the time taken to die can be long, and that during this time, the animal is, without much doubt, subject to pain, distress and suffering (global welfare terms) and well as to 'stress and strain' (Norwegian welfare legislation terms). This is a very severe way for an animal to be killed, and subject to a high risk that the animal is not immediately killed. Whether the method can consistently meet the requirements of the Norwegian legislation in regard to welfare, "protection from stress and strain" is unclear. Comparison with some global requirements for "avoidance of unnecessary pain, suffering or injury", it seems improbable that harpoon hunting can achieve this. The findings of this video analysis support the proposition that there should be an independent mechanism for investigating welfare breaches, strengthening of international reporting and scrutiny, address potential conflicts of interest between those reporting and those doing the killing, and increased account of Norwegian public opinion regarding animal welfare when shaping future policy.

Appendix 1 - Materials and methods

All video material and images collected by, and copyright © of, Endangered Species Protection Agency (ESPA) whale hunt monitoring 2026

Materials - Cameras Sony FX2 / Sony FX3

DJI Drone cameras

For viewing and editing the footage the masters were assessed using Final Cut Pro. The high definition produced by the camera enabled the frames to be zoomed, revealing more detail.

Appendix 2 - Norwegian Regulations on the practice of hunting minke whales, FOR-2022-04-01-511, as amended by FOR-2024-02-02-195

Forskrift om utøvelse av fangst av vågehval FOR-2022-04-01-511

Regulations on the practice of hunting minke whales, FOR-2022-04-01-511, as amended by FOR-2024-02-02-195.

§ 1. Formål

Formålet med forskriften er å sikre dyrevelferdsmessig forsvarlig avliving av vågehval.

§ 1. Purpose

The purpose of the regulations is to ensure the proper killing of minke whales in accordance with animal welfare.

§ 2. Virkeområde

Forskriften gjelder fangst av vågehval fra norsk fartøy.

§ 2. Scope

The regulations apply to the capture of minke whales by Norwegian vessels.

§ 3.Definisjoner

«Forløper» er tau mellom harpun og vinsj, som brukes til å trekke påskutt hval inn til fartøysiden.

§ 3. Definitions

"Precursor" is the rope between the harpoon and the winch, which is used to pull the shot whale to the side of the vessel.

§ 4.Hovedregel

Det skal brukes fangstmetoder som beskytter dyrene mot fare for unødige påkjenninger og belastninger.

§ 4. Main rule

Capture methods shall be used that protect the animals from the risk of unnecessary stress and strain.

§ 5.Kompetanse og opplæring

Den som skal delta i utøvelse av fangst av vågehval må gjennomgå teoretisk og praktisk opplæring.

Skytter må årlig avlegge godkjente skyteprøver med harpuncanon og rifle. Skyteprøve med rifle må avlegges med samme våpen og type ammunisjon som skal benyttes under fangsten.

Fiskeridirektoratet fastsetter nærmere bestemmelser om krav til skyteprøvene, kurs og praktiske prøver.

§ 5. Competence and training

Anyone who is to participate in the practice of capturing minke whales must undergo theoretical and practical training.

Shooters must annually take approved shooting tests with a harpoon gun and rifle. Shooting tests with a rifle must be taken with the same weapon and type of ammunition that will be used during the capture. The Directorate of Fisheries shall lay down further provisions on requirements for shooting tests, courses and practical tests.

§ 6.Forbud

Det er forbudt

- a. å bruke harpun uten påmontert armert harpungranat.
- b. å ha om bord andre granater enn godkjent harpungranat (Hvalgranat-99).
- c. å bruke ammunisjon med ekspanderende kule.
- d. å jakte på ny vågehval før påskutt hval er avlivet.

- e. å pumpe luft eller komprimerte gasser inn i vågehvalkroppen.
- f. å legge til kai før granaten er tatt av harpunen og harpunen er tatt ut av kanonen.

§ 6. Prohibitions

It is prohibited

- a. to use a harpoon without an attached reinforced harpoon grenade.
- b. to have on board grenades other than an approved harpoon grenade (Hvalgranat-99).
- c. to use ammunition with an expanding bullet.
- d. to hunt for another minke whale before the whale that has been shot has been killed.
- e. to pump air or compressed gases into the body of a minke whale.
- f. to dock before the grenade has been removed from the harpoon and the harpoon has been removed from the cannon.

§ 7. Avliving av vågehval

Det skal brukes godkjent harpungranat (Hvalgranat-99) til avlivning av vågehval. Skuddet skal rettes mot hvalens brystparti i en vinkel mest mulig fra siden sett i forhold til hvalens lengdeakse. I tilfeller hvor hvalen kommer opp til overflaten nært inntil og foran fartøyets baug, kan skuddet likevel rettes ovenfra mot hvalens ryggrad i nakke-brystregionen.

Påskutt vågehval som ikke er drept ved harpunskudd skal snarest mulig avlives med rifleskudd mot hjernen, som ligger i hodets midtlinje i området like langt bak øyet som blåsehullet ligger foran øyet.

§ 7. Killing of minke whales

An approved harpoon grenade (Hvalgranat-99) shall be used to kill minke whales. The shot shall be directed at the whale's chest at an angle as close as possible to the side, seen in relation to the whale's longitudinal axis. In cases where the whale comes to the surface close to and in front of the vessel's bow, the shot may still be directed from above towards the whale's spine in the neck-chest region.

A shot minke whale that has not been killed by harpoon shots shall be killed as soon as possible with a rifle shot to the brain, which is located in the midline of the head in the area as far behind the eye as the blowhole is in front of the eye.

§ 8. Krav til våpen, ammunisjon og fangstutstyr

Fartøy som skal delta i fangst av vågehval skal ha følgende utstyr ombord:

- a. Kanon kaliber 2" (50 mm) eller større festet på et stativ som er solid festet til dekket og forsterket med kraftige stag. Fartøyets baug skal være tilstrekkelig avstivet, slik at stativet ved skuddavløsning ikke gir større svikt i overkanten enn 1/4" (6 mm).
 - b. Rifle kaliber .375 eller større med helmantlet rundneset ammunisjon med anslagsenergi på minst 350 kgm (3432 joule) på 100 m.
 - c. Harpun med to klør. I utslått posisjon skal avstanden mellom klørenes spisser være minst 15" (38 cm). Tillatt harpunvekt for 50 og 60 mm harpun er henholdsvis 13,5 kg–14,5 kg og 15,5 kg–16,5 kg. For samtlige harpuner skal harpunlegg og klør tåle en strekk på minst 5000 kg. Strekkprøvede harpuner skal være tilstrekkelig merket.
 - d. Minst 3 forløpere, hver på minst 60 m. Forløpere skal ha godkjent bruddstyrke/sertifikat. Minste tillatte diameter for forløpere av typen Spectron eller tilsvarende materiale er 10 mm. Forløper med mindre diameter kan brukes, dersom denne har dokumentert tilsvarende styrke. Minste tillatte diameter for forløpere av nylon er 16 mm.
 - e. Fjæringsanordning eller sluringsmekanisme på vinsjen som tåler strekkbelastning på minst 5000 kg og har en vandring på minst 1,5 m.
 - f. Maskindrevet vinsj til inn- og opphiving av hvalen. Vinsjen skal tåle en belastning på minst 5000 kg og ha en trekraft på minst 2500 kg.
 - g. Fartøyet skal ha en tønne festet til masten. Tønne skal være hvitmalt med et svart 30 cm bredt rundtgående belte midt på tønne. Fiskeridirektoratet kan i særlige tilfeller dispensere fra bestemmelsen.
- Skytevåpen og ammunisjon skal under fangsten alltid oppbevares lett tilgjengelig på dekk.

§ 8. Requirements for weapons, ammunition and hunting equipment

Vessels that participate in hunting minke whales shall have the following equipment on board:

- a. Cannon calibre 2" (50 mm) or larger mounted on a stand that is firmly attached to the deck and reinforced with strong struts. The vessel's bow shall be sufficiently stiffened so that the stand does not give a greater deflection at the top than 1/4" (6 mm) when fired.
- b. Rifle caliber .375 or larger with fully jacketed round-nosed ammunition with an impact energy of at least 350 kgm (3432 joules) at 100 m.
- c. Harpoon with two claws. In the extended position, the distance between the claw tips must be at least 15" (38 cm). Permitted harpoon weight for 50 and 60 mm harpoons is 13.5 kg–14.5 kg and 15.5 kg–16.5 kg, respectively. For all harpoons, the harpoon sheath and claws must withstand a stretch of at least 5000 kg. Tensile-tested harpoons must be adequately marked.
- d. At least 3 precursor lines each at least 60 m. Precursors must have an approved breaking strength/certificate. The minimum permitted diameter for precursors of the Spectron type or equivalent material is 10 mm. A precursor with a smaller diameter may be used, if it has documented equivalent strength. The minimum permitted diameter for nylon precursors is 16 mm.
- e. A suspension device or slip mechanism on the winch that can withstand a tensile load of at least 5,000 kg and has a travel of at least 1.5 m.
- f. A power-driven winch for hauling in and lifting the whale. The winch must withstand a load of at least 5,000 kg and have a pulling force of at least 2,500 kg.
- g. The vessel must have a barrel attached to the mast. The barrel must be painted white with a black 30 cm wide circumferential belt in the middle of the barrel.

The Directorate of Fisheries may grant exemptions from the provision in special cases.
During harvesting operations, firearms and ammunition must always be kept readily accessible on deck.

§ 9.Dumping

Dumping av hvalrester skal skje på en måte som ikke fører til ulempe for utøvelse av fiske eller er til allmenn sjenanse.

§ 9. Dumping

Dumping of whale remains must be carried out in a manner that does not cause inconvenience to fishing or cause a public nuisance.

§ 10.Bemyndigelse

Fiskeridirektoratet kan endre forskriften og gi nærmere bestemmelser som er nødvendige for å oppnå en rasjonell, hensiktsmessig og dyrevelferdsmessig forsvarlig utøvelse eller gjennomføring av fangst.

§ 10. Authorization

The Directorate of Fisheries may amend the regulations and provide further provisions that are necessary to achieve a rational, appropriate and animal welfare-friendly exercise or implementation of the catch.

§ 11.Straff

Den som forsettlig eller uaktsomt overtrer bestemmelser gitt i eller med hjemmel i denne forskriften straffes i medhold av havressurslova § 61, § 64 og § 65.

§ 11. Penalty

Anyone who intentionally or negligently violates the provisions given in or pursuant to these regulations shall be punished pursuant to the Marine Resources Act, § 61, § 64 and § 65.

§ 12.Ikrafttredelse

Forskriften trer i kraft 1. april 2022. Samtidig oppheves forskrift 31. mars 2000 nr. 312 om utøvelse av fangst av vågehval.

§ 12. Entry into force

The regulations enter into force on 1 April 2022. At the same time, the regulations of 31 March 2000 No. 312 on the exercise of the catch of minke whales are repealed.

Prior to the amendment, §7 read as follows:

§7. Killing of minke whales

An approved harpoon grenade (Hvalgranat-99) shall be used to kill minke whales. The shot shall be directed at the whale's chest at an angle as close to the side as possible in relation to the whale's longitudinal axis. A minke whale that has been shot and has not been killed by the harpoon firing shall be killed as soon as possible with a rifle shot to the brain, which is located in the midline of the head in the area as far behind the eye as the blowhole is in front of the eye.

That was changed to:

§ 7. Killing of minke whales

An approved harpoon grenade (Hvalgranat-99) shall be used to kill minke whales. The shot shall be directed towards the whale's chest at an angle as close as possible to the side, seen in relation to the whale's longitudinal axis. In cases where the whale comes to the surface close to and in front of the vessel's bow, the shot may still be directed from above towards the whale's spine in the neck-chest region. A minke whale shot but not killed by the harpoon firing shall be killed as soon as possible with a rifle shot to the brain, which is located in the midline of the head in the area as far behind the eye as the blowhole is in front of the eye.

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