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TTD IN JAPANESE LARGE WHALE HUNTS

Report on the killing methods and TTD of whales in the Second Phase of the Japanese Whale Research Programmes in the Antarctic (JARPA II) and Northwest Pacific Ocean (JARPN II)

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ABSTRACT

This paper reports the whale killing methods and estimates of time to death (TTD) and Instant Death Rates (IDR) for whales taken during the Japanese research programmes in the North Pacific (JARPNII) and Antarctic (JARPAII), for the period 2010-2015. Explosive harpoon was used as the primary killing method for six whale species in those programmes (five baleen whale species and sperm whale). Several secondary killing methods are also used. Median and average of TTD, as well IDR are provided for the six species caught by JARPNII and JARPAII in the period above.

KEYWORDS: TTD, IDR, KILLING METHOD, JAPAN

INTRODUCTION

The lethal component of the Japanese Whale Research Program in the western North Pacific (JARPNII, 2000-2016) involves the catch of a limited number of sei, Bryde's common and sperm whales. A similar program in the Antarctic (JARPAII, 2005/06-2013/14) took Antarctic minke and fin whales. The primary method for killing the whales in those programs, is the harpoon gun with explosive attached at its head. Improvement of the whale killing method in Japan has been made based on the International Whaling Commission (IWC) Action Plan developed at the workshop on whale killing method in 1992 (IWC, 1993), 1995 (IWC, 1996), and 1999 (IWC, 1999). The Action Plan especially encouraged improving of whaling equipment and methods to reduce time to death (TTD) of whales.

JARPNII and JARPAII have recorded catch data including TTD for all whales taken by catcher boats. Data and results of killing method improvement were reported in the past to the Technical Committee of the IWC and more recently to the Hunting Committee of the North Atlantic Marine Mammal Commission (NAMMCO) (Ishikawa, 2010).

This paper updates the results presented by Ishikawa (2010) to include data on killing methods, TTD and Instant Death Rate (IDR) of whales obtained in the period 2010-2015.

WHALE KILLING METHODS

Table 1 summarises the primary and secondary (back-up) killing methods used in JARPNII and JARPAII during the period from 2010 to 2015. Explosive harpoon was used as a primary killing method for the six species involved (five baleen whale species and sperm whale). Size of the harpoon was 75mm, except for common minke whale for coastal operations (50mm) because of using small type catcher boats. Penthrite charge of the grenade varied from 27g to 60g according to target species and its body size.

Five types of fuse were utilized for the explosion of the grenade. Two types of calibre rifle were used as back-up killing method for baleen whales. As for common minke whale in the coastal component of JARPNII, lance was used as a back-up killing method.

TTD and IDR

Slackening of the jaw or flippers, or cessation of movement were the criteria used to estimate death of whales. This follows the agreement of the Workshop on Humane Killing Techniques for Whales (IWC, 1980; 1984).

Table 2 shows the results of TTD and IDR for several whale species. There was no catch of whales in the Antarctic in the season 2014/15 and no common minke and sperm whales were taken by the offshore component of JARPNII in the North Pacific in 2014 and 2015.

Table 2(a) shows the TTD and IDR for JARPAII in the austral summer seasons 2009/10 to 2013/14. For the Antarctic minke whales the median TTD was evaluated as zero in any years in this period (e.g. the IDR is higher than 50% for all the years: 56.7% - 63.1%) while the average values varied from 74 to 122 seconds over years. For the fin whales, although the number of whales caught is small, the IDR is estimated as 50% and maximum TTD was 700 sec.

Table 2(b) shows the TTD and instant death rate for JARPN II offshore component. For sei, Bryde's, common minke, and sperm whales, the median TTD varied from 0 to 180, 0 to 170, 0 to 190 and 0 to 660 seconds, respectively. The average TTD varied from 150 to 238, 81 to 271, 80 to 180 and 0 to 250 seconds, respectively. Finally the total IDR varied from 41.1 to 60.0%, 46.4 to 70.6%, 33.3 to 62.2% and 0 to 100% in those four species, respectively.

Table 2(c) shows the TTD and instant death rate for JARPN II coastal component. The median TTD for common minke whale varied from 0 to 230 seconds; the average TTD varied from 228 to 406 seconds; and the IDR varied from 35.1 to 57.1%.

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Table 1. Primary and secondary killing methods used during JARPNII and JARPAII

Target species	Killing method			Remarks
	Primary	Fuse	Secondary (Back-up)	
	Grenade harpoon			
Fin whale	75mm harpoon with 60g penthrite explosive	0.1sec. delayed	Second harpoon with 60g penthrite explosive	Rifle is not effective as the secondary killing method.
Sei whale	75mm harpoon with 60g/50g penthrite explosive	0.1/0.05/0.025sec. delayed	Second harpoon with 60g/50g penthrite, cold harpoon, or large calibre rifle (.458)	Penthrite amount and fuse was selected by estimated body length.
Bryde's whale	75mm harpoon with 50g/30g penthrite explosive	0.05/0.03/0.025sec. delayed	Second harpoon with 60g/50g penthrite, cold harpoon, or large calibre rifle (.375/.458)	Penthrite amount and fuse was selected by estimated body length.
Antarctic minke whale	75mm harpoon with 30g penthrite explosive	0/0.025sec. delayed	Second harpoon with 30g penthrite, cold harpoon or large calibre rifle (.375/.458)	
Common minke Whale (offshore operation)	75mm harpoon with 30g penthrite explosive	0/0.025sec. delayed	Second cold harpoon or large calibre rifle (.375/.458)	
Common minke whale (coastal operation)	50mm harpoon with 27g penthrite explosive	0sec. delayed	Second cold harpoon or lance	
Sperm whale	75mm harpoon with 60g/50g penthrite explosive	0.1/0.05sec. delayed	Second explosive harpoon with 60g/50g penthrite explosive	Rifle is not effective as the secondary killing method.

Table 2. Time to death (TTD) and instant death rate (IDR)

(a) For Antarctic minke and fin whales in JARPA II

Species	Season	Total number	Time to death (mm:ss)			Instant death rate (%)
			MED	MEAN	S.D.	
Antarctic minke whale	2009/10	506	0:00	1:45	2:45	56.7
	2010/11	170	0:00	2:02	4:53	62.4
	2011/12	266	0:00	1:38	2:30	59.4
	2012/13	103	0:00	1:14	1:48	63.1
	2013/14	251	0:00	1:48	2:52	57.4
Fin whale	2009/10	1	0:00	-	-	100.0
	2010/11	2	11:40	11:40	16:30	50.0
	2012/13	1	0:00	-	-	100.0

(b) For common minke, Bryde's, sei, and sperm whales taken in the offshore operation of JARPN II

Species	Season	Total number	Time to death (mm:ss)			Instant death rate (%)
			MED	MEAN	S.D.	
Sei whale	2010	100	0:00	3:05	4:00	52.0
	2011	95	3:00	3:58	4:22	41.1
	2012	100	0:00	3:31	7:56	52.0
	2013	100	0:00	2:30	3:40	60.0
	2014	90	2:05	3:26	4:40	46.7
	2015	90	0:00	3:01	3:56	53.3
Bryde's whale	2010	50	0:00	2:31	4:21	58.0
	2011	50	0:50	1:53	2:16	50.0
	2012	34	0:00	1:21	2:20	70.6
	2013	28	2:50	4:31	8:14	46.4
	2014	25	0:00	2:43	4:09	60.0
	2015	25	0:00	2:54	3:24	52.0
Common minke whale	2010	14	1:05	1:38	1:52	50.0
	2011	49	0:00	2:07	4:01	59.2
	2012	74	0:00	1:20	1:58	62.2
	2013	3	3:10	3:00	2:55	33.3
Sperm whale	2010	3	0:00	0:00	0:00	100.0
	2011	1	6:30	-	-	00.0
	2012	3	3:07	4:10	2:44	33.3
	2013	1	11:00	-	-	00.0

(c) For common minke whales taken in the coastal operation of JARPN II

Species	Season	Total number	Time to death (mm:ss)			Instant death rate (%)
			MED	MEAN	S.D.	
Common minke whale (coastal operation)	2009	119	1:20	3:48	5:43	47.9
	2010	105	0:00	3:53	6:39	57.1
	2011	77	3:50	6:46	8:09	35.1
	2012	108	2:00	4:07	5:19	44.4
	2013	92	1:40	4:57	6:18	46.7
	2014	81	2:00	6:07	8:58	39.5
	2015*	19	2:50	5:44	6:50	36.8

* Spring survey off Sanriku.