

Annex F

Status of DNA Registers

ANNEX F1

STATUS OF THE ICELANDIC WHALE DNA REGISTER

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Practical arrangements regarding the establishment of the Icelandic DNA register were concluded in 2007. The Marine and Freshwater Research Institute, Reykjavik, is responsible for the establishment and maintenance of the registry that is of the same format as the Norwegian DNA registry. An ORACLE database has now been created and contains all genotyped individuals' information as well as tissue collected ID of individuals collected but not genotyped. In parallel, a DNA tissue bank has been achieved and is now fully functional.

The Table gives the present status of the registry. Samples from all the common minke whales landed as a part of the Icelandic research program (2003–2007) and recent commercial catches (2008–2017), as well as from commercial NA fin whale catches have been genotyped and information stored in the database (note that two blue-fin hybrids were caught in 2018, one of which was confirmed to be a second-generation hybrid; see Pampoulie *et al.*, 2021).

footnote #	1	2	3	4	5	6	7	8	9	10	11	12
Species/Year	type	# whales	# duplicate	# missing	# lab problem	#mtDNA	%mtDNA	#msat	%msat	sex analyzed	% sexed	Note
NA minke whale												
2003–2007	SP	189	0	0	0	189	100	189	100	189	100	
2008–2017	C	437	0	0	0	379	89	382	88	382	89	
NA fin whale												
2006–2018	C	834	0	0	0	834	100	834	98	834	100	

1. Key to sample types: SP = special permit catch, C = commercial catch, BC = bycatch, ST = stranding.
2. Number of whales that potentially entered by the previous years and enters (new year) the markets.
3. Number of occurrences (tissues) sample switching on board the vessels as detected by comparison of genetic profiles.
4. Number of individuals for which tissue samples are missing for reasons other than sample switching.
5. Genetic laboratory not able to obtain microsatellite profiles mtDNA haplotypes from tissue samples.
6. Number of samples analysed for mitochondrial control region.
7. % of total samples analysed for mitochondrial control region.
8. Number of samples analysed for microsatellites.
9. % of total samples analysed for microsatellites.
10. Number of samples analysed for sex.
11. % of samples analysed for sex.
12. Other problems or information.

REFERENCES

- International Whaling Commission. 2006. Report of the Working Group on DNA testing. *J. Cetacean Res. Manage. (Suppl.)* 8: 252–258.
- Kanda, N., Goto, M., Oikawa, H. and Pastene, L.A. 2014. Update of note on sampling and laboratory procedure protocols of the genetic work at the Institute of Cetacean Research (SC/65b/J27Rev). Paper SC/65b/DNA01 presented to the IWC Scientific Committee, May 2014 (unpublished). 6pp.
- Pampoulie, C., Gíslason, D., Ólafsdóttir, G., Chosson, V., Halldórsson, S., Mariani, S., Elvarsson, B., Rasmussen, M., Iversen, M., Danielsdóttir, A., and Víkingsson, G. 2021. Evidence of unidirectional hybridization and second-generation adult hybrid between the two largest animals on Earth, the fin and blue whales. *Evolutionary Applications* 14. 314–321. 10.1111/eva.13091.

ANNEX F2

AN UPDATE OF THE NORWEGIAN MINKE WHALE DNA REGISTER (APRIL 2021)

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footnote #	1	2	3	4	5	6,13	7	8	9	10	11	14	12	
Species/Year	tabletype	# whales	# duplicate	# missing	# lab problem	#mtDNA	%mtDNA	#msat	%msat	sex analyzed	% sexed	SNP	% SNP	note
NA minke whale														
1997–2019	C	13120	118	82	3	10652	87	13035	299	13035	299	2383	212	
2020	C	501	1	0	0	0	0	501	100	501	100	501	100	

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4. Number of individuals for which tissue samples are missing for reasons other than sample switching.
5. Genetic laboratory not able to obtain microsatellite profiles mtDNA haplotypes from tissue samples.
6. Number of samples analysed for mitochondrial control region.
7. % of total samples analysed for mitochondrial control region.
8. Number of samples analysed for microsatellites.
9. % of total samples analysed for microsatellites.
10. Number of samples analysed for sex.
11. % of samples analysed for sex.
12. Other problems or information.
13. Discontinued starting from 2016.
14. Started in 2016.

REFERENCES

- International Whaling Commission. 2006. Report of the Working Group on DNA testing. *J. Cetacean Res. Manage.* (Suppl.) 8: 252–258.
- Kanda, N., Goto, M., Oikawa, H. and Pastene, L.A. 2014. Update of note on sampling and laboratory procedure protocols of the genetic work at the Institute of Cetacean Research (SC/65b/J27Rev). Paper SC/65b/DNA01 presented to the IWC Scientific Committee, May 2014 (unpublished). 6pp.
- Pampoulie, C., Gíslason, D., Ólafsdóttir, G., Chosson, V., Halldórsson, S., Mariani, S., Elvarsson, B., Rasmussen, M., Iversen, M., Daniëlsdóttir, A., and Víkingsson, G. 2021. Evidence of unidirectional hybridization and second-generation adult hybrid between the two largest animals on Earth, the fin and blue whales. *Evolutionary Applications* 14. 314–321. 10.1111/eva.13091.

ANNEX F3

AN UPDATE OF THE JAPANESE DNA REGISTER FOR LARGE WHALES

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The technical specifications and the status of the Japanese DNA register for large whales was presented and discussed during the 2005 International Whaling Commission (IWC SC) meeting (IWC, 2006). Since then, the number of genetic samples and the number of individuals analysed and registered have been reported to the IWC Scientific Committee annual meetings. The annual reports have included information of whales taken by special scientific permits in the North Pacific (JARPN/JARPNII and NEWREP-NP) and Antarctic (JARPA/JARPAIL and NEWREP-A), the commercial whaling in the North Pacific, and bycatches.

It should be noted that the special scientific permit takes under NEWREP-A and NEWREP-NP programs were terminated in June 2019 as an effect of the withdrawal of Japan from the International Convention for the Regulation of Whaling (ICRW) on 30 June 2019. From 1 July 2019, commercial whaling within Japan's Exclusive Economic Zone (EEZ) was started, and samples taken have been registered in the Japanese DNA register. The Japanese regulation on bycatches of large whales (established from 1 July 2001) requires that all animals should be registered with a DNA profile before any products derived from a bycaught animal are sold in the market.

The most recent full description of the protocol used by the Institute of Cetacean Research for the genetic analyses in the context of the IWC guidelines was presented by Kanda *et al.* (2014).

The update of the Japanese DNA register for large whales till 2020 is as follows.

Species/Year	1	2	3	4	5	6	7	8	9	10	11	12
Species/Year	type	# whales	# duplicate	# missing	# lab problem	#mtDNA	%mtDNA	#msat	%msat	sex analyzed	% sexed	note
NP minke whale												
1994–2019	SP	3057	0	0	8	3049	99.7	3049	99.7	3057	100	
2019	CW	44	0	0	0	44	100	44	100	44	100	
2020	CW	95	0	0	0	95	100	95	100	95	100	
2001–2019	BC	2363	0	26	2	2363	100	2335	98.8	2333	98.7	
2020	BC	71	0	0	0	71	100	71	100	71	100	
NP sei whale												
2002–2018	SP	1622	0	0	4	1618	99.8	1622	100	1622	100	
2019	CW	25	0	0	0	25	100	25	100	25	100	
2020	CW	25	0	0	0	25	100	25	100	25	100	
2001–2019	BC	1	0	0	0	1	100	1	100	1	100	
2020	BC	0	0	0	0	0	0	0	0	0	0	No BC.
NP Bryde's whale												
2000–2017	SP	730	0	0	3	727	99.6	730	100	730	100	
2019	CW	187	0	0	0	187	100	187	100	187	100	
2020	CW	187	0	0	0	187	100	187	100	187	100	
2001–2019	BC	5	0	0	0	5	100	4	80	4	80	Includes three Omura's whale and one from the East China Sea stock
2020	BC	0	0	0	0	0	0	0	0	0	0	No BC.
NP humpback whale												
2001–2019	BC	72	0	0	0	72	100	72	100	72	100	
2020	BC	0	0	0	0	0	0	0	0	0	0	No BC.
NP right whale												
2001–2019	BC	4	0	1	0	4	100	3	75	3	75	One is missing by the 2011 tsunami, no microsats.
2020	BC	0	0	0	0	0	0	0	0	0	0	No BC.
NP fin whale												
2001–2019	BC	11	0	0	0	11	100	11	100	11	100	
2020	BC	1	0	0	0	1	100	1	100	1	100	
NP sperm whale												
2000–2017	SP	56	0	0	0	56	100	56	100	56	100	
2001–2019	BC	2	0	0	0	2	100	2	100	2	100	
2020	BC	0	0	0	0	0	0	0	0	0	0	No BC.
Ant. minke whale												
1987/88–2004/05	SP	6794	0	10	0	1118	16.5	6271	92.3	6794	100	Incl. dwarf; 87/88–88/89. no microsats.
2005/06–2018/19	SP	5216	0	549	162	3977	76	4505	86	5216	100	Some missing by the 3/11 tsunami in 2011.
Ant. fin whale												
2005/06–2011/12	SP	18	0	0	0	18	100	18	100	18	100	

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- % of total samples analysed for microsatellites.
- Number of samples analysed for sex.
- % of samples analysed for sex.
- Other problems or information.

REFERENCES

- International Whaling Commission. 2006. Report of the Working Group on DNA testing. *J. Cetacean Res. Manage.* (Suppl.) 8: 252–258.
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