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The traceability/trackability of illegal trade in whale products: a proposal to evaluate the technical functionality of DNA registers

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*FOR CONSIDERATION BY THE SCIENTIFIC COMMITTEE OF
THE INTERNATIONAL WHALING COMMISSION
AGADIR, MOROCCO 31 MAY – 11 JUNE 2010*

**The traceability/trackability of illegal trade in whale products:
a proposal to evaluate the technical functionality of DNA registers**

C. Scott Baker¹, R.L. Brownell Jr.²,

ABSTRACT

The Government of Japan, through the Institute for Cetacean Research (Tokyo), has established a DNA register for whales taken under special permit or otherwise destined for commercial markets (IWC 2005; IWC 2010a). The functionality of this DNA register, for the purposes of traceability/trackability, is critical to the current negotiations on the future of the IWC (IWC 2010b). Here we request access to the DNA register for 3 species of whales (fin, sei and Antarctic minke) for the purposes of tracking the origins of whale products purchased at commercial outlets in Seoul, South Korea and Santa Monica, US, as described in the Baker et al. (2010). The attached proposal was included as Supplementary Material to this published article and submitted for consideration to the IWC Data Availability Group (DAG) on 12 April 2010. However, the DAG declined to forward the proposal to the data holders, recommending that we “wait until the Scientific Committee has reviewed the proposed DNA register/market sampling text in the draft Consensus Decision in accordance with the Commission’s instructions and then reported to the Commission itself” (email 16 May 2010). We assume that this will take place at SC/62 in Agadir and request that this proposal be considered for endorsement by the DNA subcommittee.

Baker, C. S., D. Steel, Y. Choi, H. Lee, K. S. Kim, S.-K. Choi, Y.-U. Ma, C. Hambleton, L. Psihoyos, R. L. Brownell, and N. Funahashi. 2010. Genetic evidence of illegal trade in protected whales links Japan with the U.S. and South Korea. *Biology Letters* doi: 10.1098/rsbl.2010.0239.

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	<h2>International Whaling Commission: Data Availability</h2> <h3>Conditions for use of Data</h3>
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NOTE: 1 FORM PER USER IF MORE THAN 1 PERSON

With respect to the data received from

Insert name of data provider and short description of data here

Data provider: Institute of Cetacean Research, Tokyo

Requested data: Access to the DNA register (mtDNA control region sequences, sex, microsatellite genotypes) for fin whales, sei whales and Antarctic minke whales taken under special permit or otherwise destined for commercial markets, as described in (IWC 2010a).

I agree to abide by the following rules and conditions:

- (1) Data shall not be transmitted to third parties.
- (2) Papers may only be submitted to a Committee meeting in accordance with the following time restrictions:

- Novel methods – 3 months before the Scientific Committee
- Standard methods - 2 months before
- Alternative analyses submitted in response to earlier papers - 1 month before

Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.

- (3) Papers must carry a restriction on citation except in the context of IWC meetings.
- (4) Data owners are offered co-authorship.
- (5) Publication rights remain strictly with the data owner.
- (6) Data shall be returned, to the data owner immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.

Name	C. Scott Baker R. L. Brownell Jr.		
Signature		Date	26 May 2010
Address	Marine Mammal Institute Hatfield Marine Science Center Oregon State University 2030 SE Marine Science Drive Newport OR 97365, USA Office: 541-867-0255; Fax: 541-867-0345 email: scott.baker@oregonstate.edu		

Application for data access: revised 26 May 2010

Procedure B

Title of the research	The traceability/trackability of illegal trade in whale products
Investigators	C. Scott Baker ¹ and Robert L. Brownell Jr ²
Institution and Address of Investigators	1) Marine Mammal Institute, Oregon State University, Newport Oregon 2) Southwest Fisheries Science Center, Monterey, California
Objective of the study	<p>The Government of Japan, through the Institute for Cetacean Research (Tokyo), has established a DNA register for whales taken under special permit or otherwise destined for commercial markets (IWC 2005; IWC 2010a). The functionality of this DNA register, for the purposes of traceability/trackability, is critical to the current negotiations on the future of the IWC (IWC 2010b). Here we request access to the DNA register for 3 species of whales for the purposes of tracking the origins of whale products purchased at commercial outlets in Seoul, South Korea and Santa Monica, US, as described in the attached manuscript (Baker et al. 2010).</p> <p>The DNA profiles of whales in the Japanese DNA register will be compared to DNA profiles from the restaurant products, including mtDNA control region sequences (400-550 bp), sex and up to 7 microsatellites [SupMat1]. To ensure that the transparency of the matching, the DNA profiles of the products will be lodged with a third party, the Southwest Fisheries Science Center, La Jolla, US, as well as with the Cetacean Conservation and Genetic Laboratory and the Conservation Genome Resource Bank, University of Seoul. The market dataset will be transferred to the Japanese Ministry of Fisheries for reciprocal verification, once the DNA register has been received by the third-party laboratory. This will avoid any perception of a conflict of interest in the interpretation of the matching and provide for resolution of any disputes. We acknowledge that the comparison is likely to encounter some technical obstacles, including inter-laboratory standardization of allele binning and estimation of genotype errors (Palsbøll et al. 2006). We commit to a ‘good faith’ effort to resolve such difficulties in an effort to improve the functionality of observation and inspection schemes.</p>
Data requested	<p>We are requesting access to the DNA registers for whales taken under special permit or otherwise destined for commercial trade, as described in (IWC 2010a), for the following species:</p> <ol style="list-style-type: none"> 1) sei whales 2) fin whales 3) Antarctic minke whales <p>We understand that the DNA registry would include, at a minimum, the following</p> <ol style="list-style-type: none"> 1) sample code 2) source, as special permit or bycatch 3) date – month, day, year – of take 4) sex 5) mitochondrial DNA sequence for approximately 500 bp of control region 6) haplotype code (if available) 7) microsatellite genotypes (allele sizes) for a variable number of loci

Methods	The DNA register will be used for matching to the DNA profiles of the restaurant products on a species by species basis. The first step will be to compare the mtDNA control region of the products to the register to find an exact match or the closest matching sequence. The second step will be to compare the size range of alleles at each microsatellite loci in the register to consider differences in binning of alleles. The DNA profiles of the product can then be compared to the register to establish potential matches on a locus by locus basis or as a complete profile using the program <i>CERVUS</i> (Marshall et al. 1998), allowing for potential mismatching due to difference in binning or genotype error (e.g., allelic drop out).
Output of the study	The proposed matching will contribute to the ‘technical audit’ of the Japanese DNA registers and allow an evaluation of the functionality of this register for traceability/trackability of whale products in international trade.
Condition for data access	We agree with all the conditions established in the SC data access protocol for Procedure B and also agree that the data are used only for the investigation of traceability/trackability. We agree to acknowledgment section of the paper(s) resulting from these data we will thank the people that collected these samples during JARPN/JARPN II and those that conducted the laboratory work.

Literature Cited

- Baker, C. S., D. Steel, Y. Choi, H. Lee, K. S. Kim, S.-K. Choi, Y.-u. Ma, C. Hambleton, L. Psihoyos, R. L. Brownell, and N. Funahashi. 2010. Genetic evidence of illegal trade in protected whales links Japan with the U.S. and South Korea. *Biology Letters* doi: 10.1098/rsbl.2010.0239.
- IWC. 2005 Report of the Specialist Group on the DNA Register/Market Sampling Scheme Approach (SGDNA). In *IWC57/RMS/RMS3-Annex II.E.*: available from the Secretariat, International Whaling Commission, The Red House, 135 Station Road, Impington, Cambridge, CB4 9NP UK.
- IWC. 2010a Annex N: Report of the Working Group on DNA. *Journal of Cetacean Research and Management* **12 (Suppl.)**, in press.
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- Marshall, T. C., Slate, J., Kruuk, L. E. B. & Pemberton, J. M. 1998 Statistical confidence for likelihood-based paternity inference in natural populations. *Molecular Ecology* **7**, 639-655.
- Palsbøll, P. J., Berube, M., Skaug, H. J. & Raymakers, C. 2006 DNA registers of legally obtained wildlife and derived products as means to identify illegal takes. *Conservation Biology* **20**, 1284-1293.