

# Preliminary report on progress in earplug-based age determination of sei whales collected during 2002 to 2013 JARPNII surveys

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## ABSTRACT

Counting the number of growth layers in earplugs is the standard method for age determination of sei whales. The objective of this note is to report the progress of age determination of sei whales collected during 2002 to 2013 JARPNII surveys. Earplugs were collected carefully from all whales sampled and laboratory work was carried out to count growth layers. Readability of sexually-immature sei whale earplugs was 52.8% for males and 49.2% for females. Readability of mature animal was higher than immature, 71.0% and 64.5% for males and females, respectively. Readability of all samples was 63.0%. Studies on spatial and temporal segregation, feeding ecology and population dynamics of western North Pacific sei whales will be conducted in the future, based on age data.

## SAMPLES AND METHOD FOR AGE DETERMINATION

Earplugs were collected from 1,084 sei whales (513 males and 571 females) sampled during 2002 to 2013 JARPNII surveys. The method of collection of earplugs and age determination for sei whale is almost the same as that used for common minke whale (Maeda *et al.*, 2016: SC/F16/JR53). The left and right earplugs were collected carefully, and immediately fixed in 10% formalin solution until age determination. In the laboratory, the flat along the central axis of the earplug was cut using a sharp blade, then it was ground on a wet stone to expose the neonatal line and growth layers. Growth layers were counted under water using stereoscopic microscope.

A year of age was defined as one pair of the light and dark laminae in the core. Earplugs collected during 2002 to 2011 were read by one reader (Ishikawa), and samples collected in 2012 and 2013 were read by another reader (Maeda). An inter-reader calibration experiment, following the method of Kitakado *et al.* (2013), is planned for the near future.

## AGE READABILITY

Readability of immature sei whale earplugs was 52.8% for males and 49.2% for females. Readability of earplugs in mature animal was higher, 71.0% and 64.5% for males and females, respectively (Table 1). Readability of all samples was 63.0%, which was higher than 44.1% observed in common minke whale (Maeda *et al.*, 2016: SC/F16/JR53). Figure 1 shows readability of earplugs by body length class and sex. Readability gradually increased with body length.

## ANALYSIS TO BE CONDUCTED

As mentioned above an inter-reader calibration exercise will be conducted. Biological parameters such as age distribution, growth curve and age at sexual maturity will be estimated based on the new age data. Furthermore, studies on spatial and temporal segregation, feeding ecology and population dynamics will be conducted in the near future based on age data.

## REFERENCE

- Kitakado, T., Lockyer, C. and Punt, E. A. 2013. A statistical model for quantifying age reading errors and its application to the Antarctic Minke whales. *J. Cetacean Res. Manage.* 13(3): 181-190.
- Maeda, H., Bando, T., Kishiro, T., Kitakado, T. and Kato, H. Basic information of earplug as age character of common minke whales in western North Pacific. Paper SC/F16/JR53 presented to the JARPNII special permit expert panel review workshop, Tokyo, February 2016 (unpublished). 10pp.

Table 1. Number of samples and age readability of sei whales collected during 2002 to 2013 JARPN II surveys.

	Sex	Number of whales	Number of whales with readable earplugs	Readability (%)
Immature	Male	161	85	52.8
	Female	132	65	49.2
Mature	Male	352	250	71.0
	Female	439	283	64.5
Combined	Male	513	335	65.3
	Female	571	348	60.9
Total		1084	683	63.0

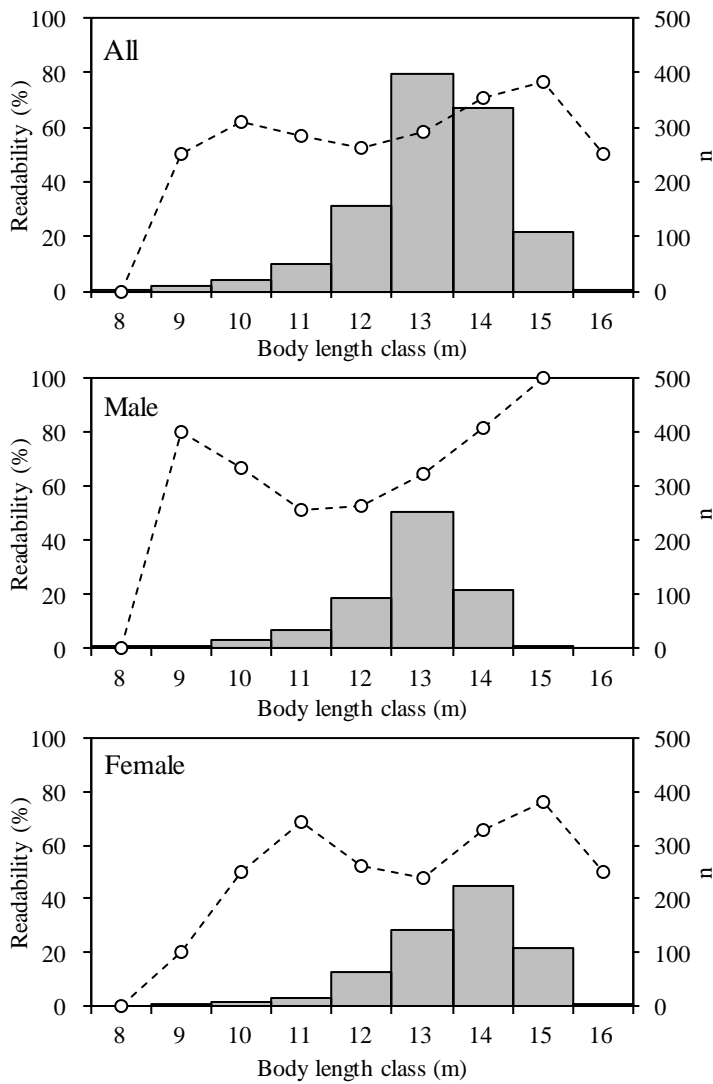


Figure 1. Age readability of sei whales collected during 2002 to 2013 JARPNII surveys by body length class and sex.