Annex I

Life History Models

In the past, we have assumed

P/L = G/W

where P = pregnant, L = lactating, G = gestation period (months) and W = weaning age (months).

Based on this, we estimated calving interval as the reciprocal of pregnancy rate.

However, this ignores foetal mortality (and similarly, using L to estimate weaning age ignores nursing-calf mortality).

A better model is

P/L = a(G)/b(W)

where a = average number of gestations/birth (always >1) and b = average number of complete weanings/birth (always <1).

Even if we know P, G, L and W, we cannot estimate birth rate (or calving interval), because we do not know a or b. Using pregnancy rate as a proxy for birth rate injects a positive bias (and negative bias on CI) of unknown size, depending on extent o f seasonality of breeding and time of sampling.

Annex J

Natural Mortality Coefficient for the Bryde's whale estimated from Commercial and JARPN II samples

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The method of Chapman and Robson (1960) is applied to age distribution data for commercial whaling and from JARPN II to estimate survival rate. The fishing mortality rate is assumed to be 0.015 and natural mortality estimated by subtracting this value from the logarithm of the survival rate obtained from the Chapman and Robson estimator. The sensitivity of the results to basing the estimate of (total) survival rate on ages 1+, 10+ and 15+ is examined.

Age range	Quantity	Sub-area 1E	Sub-area 2	Sub-areas 1E+2	JARPN II
1+	*M*	0.044	0.036	0.042	0.068
	SE (*Z*)	0.003	0.004	0.002	0.008
10+	*M*	0.087	0.070	0.080	0.126
	SE (*Z*)	0.006	0.006	0.004	0.018
15+	*M*	0.104	0.087	0.097	0.131
	CV (*n*)	0.088	0.009	0.006	0.027

REFERENCE

Chapman, D.G. and Robson, D.S. 1960. The analysis of a catch curve. *Biometrics* 16:354-68.