CORRECTED ASSESSMENT RESULTS FOR SOUTHERN HEMISPHERE HUMPBACK WHALES FROM BREEDING STOCKS D AND G

SUSAN J. JOHNSTON, D. S. BUTTERWORTH[1]

Contact e-mail: Susan.Holloway@.uct.ac.za

ABSTRACT

Corrected Bayesian stock assessment results for breeding stocks D and G which take into account trend information from the IDCR/SOWER survey results are presented.

KEYWORDS: HUMPBACK WHALES, BAYESIAN ASSESSMENT

INTRODUCTION

At the 2006 IWC scientific meeting, the authors presented various stock assessments for breeding stocks D and G (Johnston and Butterworth 2006, IWC 2006). Some of the assessment scenarios presented involved fitting to trend information from the IDCR/SOWER circumpolar surveys which was reported in Branch (2006). The authors inadvertently used the raw abundance estimates provided which had not been adjusted for comparability with respect to areal coverage. Corrected assessment results are thus presented here, for which the appropriate IDCR/SOWER survey trend infomration for comparable areas are used.

DATA

Table 1 lists both the uncorrected and comparable-area corrected IDCR/SOWER survey estimates used for breeding stocks D and G.

RESULTS AND DISCUSSION

Breeding stock D

Table 2a compares breeding stock D model results for two model variants using both the uncorrected and the comparable-area corrected IDCR/SOWER abundance estimates. The use of the corrected estimates produce lower estimates of r and higher estimates of K. The current population levels relative to K are estimated to be somewhat lower (0.79K and 0.93K for the two variants explored compared to earlier estimates of 0.95K and 0.98K respectively). The N_{min} estimate for the second variant reported (fitting to the IDCR/SOWER recent abundance estimate) is considerably lower (3,866 corresponding to 0.17K in place of 10,189 and 0.41K) when using the corrected IDCR/SOWER estimates.

Breeding stock G

Table 2b compares breeding stock G model results for two model variants as for breeding stock D above. The use of the corrected IDCR/SOWER survey estimates produce lower estimates of r and higher estimates of K and N_{min}. The current population levels relative to K are however estimated to be somewhat lower (0.28K and 0.49K for the two variants explored compared to 0.39K and o.67K respectively).

REFERENCES

[1] MARAM, Department of Mathematics and Applied Mathematics, University of Cape Town, Rondebosch, 7701, South Africa

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Table 1

IDCR/SOWER estimates (Branch 2006) for breeding stock D and G that are used to provide information on population trend.

Year	**Breeding Stock D**	
	Uncorrected estimates	Estimates corrected for areal comparability
1978	1,033	1,219
1988	3,869	4,202
1997	17,959	17,959
Year	**Breeding Stock G**	
	Uncorrected estimates	Estimates corrected for areal comparability
1982	683	1,452
1989	1,505	2,817
1996	3,337	3,310

Table 2a

Breeding stock **D** model parameter estimates. Posterior medians with the 5th and 95th percentiles (in parentheses) are reported.

	Uncorrected IDCR/SOWER estimates	**IDCR/SOWER estimates corrected for areal comparability**
Historic Catch **Recent abundance** **Trend information**	**Core** **Paxton *et al.* (2006)** **IDCR trend**	**Core** **Paxton *et al.* (2006)** **IDCR trend**
r	0.100 [0.023; 0.124]	0.088 [0.019; 0.105]
K	12,410 [11,079; 21,868]	17,953 [16,361; 32,375]
N_{min}	693 [307; 4,227]	789 [456; 4,612]
N_{2006}	11,578 [10,587; 1,3291]	14,172 [10,987; 15,676]
N_{min}/K	0.056 [0.027; 0.193]	0.045 [0.028; 0.145]
N_{2006}/K	0.947 [0.465; 0.991]	0.789 [0.318; 0.905]
N_{2020}/K	0.999 [0.597; 1.000]	0.988 [0.906; 0.998]
N_{2040}/K	1.000 [0.964; 1.000]	1.000 [0.559; 1.000]
Historic Catch **Recent abundance** **Trend information**	**Core** **IDCR** **IDCR trend**	**Core** **IDCR** **IDCR trend**
r	0.056 [0.007; 0.117]	0.064 [0.009; 0.101]
K	20,043 [1,5624; 36,906]	22,060 [17,070; 45,594]
N_{min}	10,189 [5,860; 17,356]	3,866 [1,393; 12,936]
N_{2006}	18,795 [15,480; 22,421]	19,901 [16,758; 22,584]
N_{min}/K	0.409 [0.270; 0.861]	0.171 [0.080; 0.312]
N_{2006}/K	0.977 [0.489; 1.000]	0.933 [0.393; 1.000]
N_{2020}/K	0.997 [0.525; 1.000]	0.993 [0.440; 1.000]
N_{2040}/K	1.000 [0.939; 1.000]	1.000 [0.935; 1.000]

Table 2b

Breeding stock **G** model parameter estimates. Posterior medians with the 5th and 95th percentiles (in parentheses) are reported.

	Uncorrected IDCR/SOWER estimates	**IDCR/SOWER estimates corrected for areal comparability**
***r* prior**	***r*~ U[0, 0.126]**	***r*~ U[0, 0.126]**
Historic catch	**Fringe**	**Fringe**
Recent abundance	**SC/A06/HW13**	**SC/A06/HW13**
Trend information	**IDCR/SOWER trend**	**IDCR/SOWER trend**
r	0.092 [0.045; 0.104]	0.060 [0.023; 0.088]
K	10,594 [10285; 11947]	11,677 [10,697; 13,889]
N_{min}	150 [120; 500]	390 [150; 1,232]
N_{2006}	4,102 [2812; 5367]	3,452 [2,454; 4,682]
N_{min}/K	0.014 [0.012; 0.042]	0.033 [0.014; 0.089]
N_{2006}/K	0.385 [0.238; 0.514]	0.277 [0.185; 0.391]
N_{2020}/K	0.868 [0.466; 0.959]	0.593 [0.290; 0.849]
N_{2040}/K	0.999 [0.849; 1.000]	0.950 [0.458; 0.997]
***r* prior**	***r*~ U[0, 0.126]**	***r*~ U[0, 0.126]**
Historic catch	**Fringe**	**Fringe**
Recent abundance	**IDCR/SOWER**	**IDCR/SOWER**
Trend information	**IDCR/SOWER trend**	**IDCR/SOWER trend**
r	0.100 [0.057; 0.107]	0.062 [0.024; 0.091]
K	10,406 [10260; 11539]	11,600 [10,571; 14,018]
N_{min}	251 [159; 629]	636 [747; 264]
N_{2006}	6,973 [4845; 8624]	5,708 [3,568; 7,916]
N_{min}/K	0.024 [0.015; 0.054]	0.055 [0.025; 0.120]
N_{2006}/K	0.668 [0.429; 0.833]	0.489 [0.263; 0.725]
N_{2020}/K	0.982 [0.773; 0.995]	0.831 [0.374; 0.979]
N_{2040}/K	1.000 [0.981; 1.000]	0.990 [0.556; 1.000]