Routine assessment of Namibian orange roughy 2008

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The routine assessment of the individual orange roughy aggregation was done using the code for the intermittent aggregation model described in Brandão and Butterworth (2004, 2005). This assessment method and code was developed under the contract between MARAM and the Ministry of Fisheries and the Industry. The data used in the assessments is given in Table 1.

Table 1: Summary of data included in the model. The CPUE data is obtained from Brandão and Butterworth (2007).

	Catches	Acoustic survey	Swept-area	CPUE
Hotspot				
1994	2169			6.038
1995	897			2.067
1996	477			1.094
1997	482			0.584
1998	358			0.314
1999	226			0.208
2000	224			0.089
2001	106			0.162
2002	336			0.201
2003	129			0.089
2004	52			0.155
2005	30			0.52
2006	39			0.242
2007	22	4 965		-
Johnies				
1994	1145			6.411
1995	3773			1.006
1996	2062			1.382
1997	7539	55757(0.28)	57650(0.27)	1.827
1998	1917	6267(0.48)	6980(0.25)	0.662
1999	1367		2137(0.4)	0.296
2000	667		4365(0.35)	0.256

2001	452		11544(0.46)	0.142
2002	376		10148(0.59)	0.179
2003	430		943(0.18)	0.151
2004	123		5865(0.73)	0.067
2005	298		2132(0.64)	0.456
2006	311		1117(0.16)	0.166
2007	93		2910 (79)	-
Frankies				
1995	2291			1.354
1996	8736			4.797
1997	4817	29567(0.38)	30995(0.37)	1.499
1998	650	8478(0.49)	2400(0.60)	0.715
1999	40	2934(0.38)	3055(0.35)	0.325
2000	11	6294(0.44)		-
2001	214	7805(0.34)		0.474
2002	155	25839(0.37)		0.167
2003	158	10126(0.41)		0.474
2004	51	6720(0.41)		0.024
2005	4.4	8667(0.59)		-
2006	65	4914(0.27)		0.171
2007	24	2264 (35)		-
Rix				
1995	323			0.518
1996	1861			0.676
1997	3836	21579(0.15)		4.415
1998	3921	7572(0.19)		1.914
1999	444		1006(0.59)	0.379
2000	307			0.393
2001	183			0.28
2002	350			0.282
2003	124	2133(0.63)		0.144
2004	8			
2005		3514(0.43)		
2006	3	2422(0.64)		
2006	1	2439 (0.73)		

Table 2: *Summary of deterministic projection information, giving MSY estimates and approximate medium term sustainable yield (SY) estimates for the intermittent aggregation model.*

	Current depletion	Intermittent aggregation model	
	B_{2008}/B_0	MSY	MSYL
Johnies	0.50	562	0.25
Frankies	0.62	639	0.25
Rix	0.13	153	0.25
Hotspot	0.19	112	0.24

A summary of deterministic projection information, giving current depletion, MSY and MSYL estimates for the intermittent aggregation model are presented in Table 2. Figure 1 shows the modelfits of the various aggregations. Figure 2 shows depletion trajectories under the policy of constant catch.

For Hotspot and Rix the model does fit the observed data very well and it is estimated that the stock is depleted to very low levels on both grounds. For Johnies and Frankies the model fails to fit the high observed data points and that is why the assessment estimates the stock to be still above the MSY level for these grounds.

Rix has been closed since August 2004 due to extremely low catch rates. The objective of this closure is to allow time for the stock to reaggregate as to increase the catch rates in the future.

The dynamics of orange roughy is very unclear and therefore using the results of a model might not be the ideal tool for management. Rotational closure of QMA's should continue and minimum TAC's on the remaining grounds should be allocated. Effort should also be kept at a minimum, i.e. as few boats as possible.

References:

Brandão, A and Butterworth, D.S. 2005. Updated assessment of Namibian orange roughy populations given further data. DWFWG/WkShop/Mar05/Doc2. 32pp.

Brandão, A and Butterworth, D.S. 2005. Updated GLM standardized CPUE abundance indices for orange roughy off Namibia including records from 1994 to 2004. DWFWF/WkShop/Mar05/Doc1. 18pp

Brandão, A and Butterworth, D.S. 2005. Updated stock assessment of Namibian orange roughy populations under the assumption of intermittent aggregation. DWFWG/WkShop/Mar04/doc2.

Brandão, A and Butterworth, D.S. 2007. Updated GLM standardized CPUE abundance indices for orange roughy off Namibia including records from 1994 to 2004. DWFWF/WkShop/Mar05/Doc1. 15pp

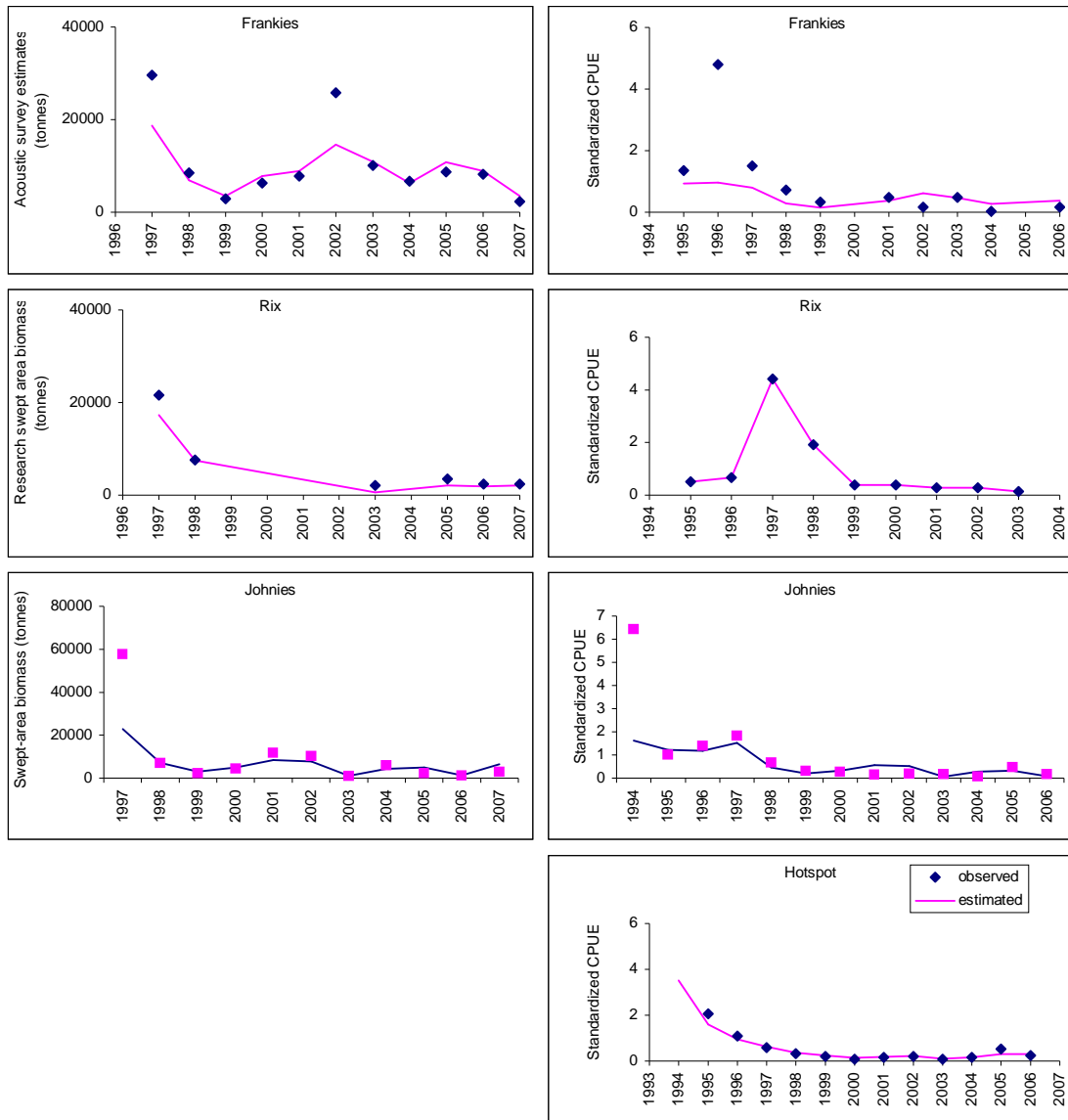Hampton, I. 2006. Comments: Acoustic survey of orange roughy in Namibia, July 2005. 2pp.

Figure 1: *The modelfit to the swept-area, acoustic and CPUE data by all 4 models, Johnies, Frankies, Rix and Hotspot*
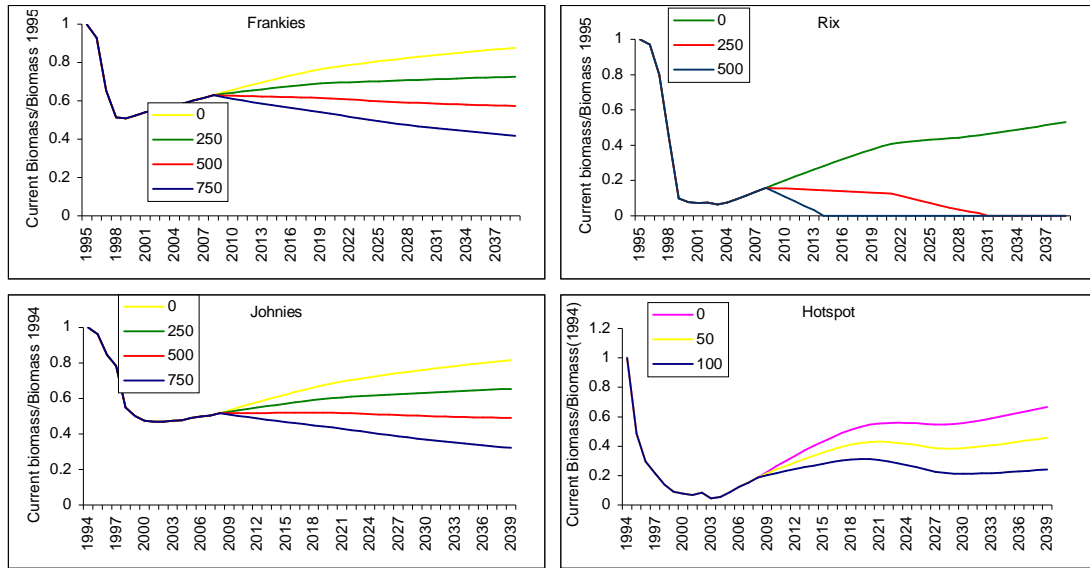
Figure 2: *Future depletion trajectories under constant catch policy for the Johnies, Frankies, Rix and Hotspot aggregation.*