

Nominal longline CPUE from Gough and Nightingale lobster fisheries

S.J. Johnston and D.S. Butterworth.

MARAM
Department of Mathematics and Applied Mathematics
University of Cape Town
Rondebosch, 7701

May 2008

Introduction

This document reports the nominal longline CPUE values available for Gough and Nightingale Islands from the summary sheet records. Exponential trends are fitted to the more recent data, and estimates of the annual rate of increase are presented.

Methodology

Both the catch (in kgs) and effort (in number of traps hauled) reported here are obtained from the data summary sheets recorded by the Agriculture and Natural Resources Department on Tristan da Cunha. The nominal CPUE values reported are calculated simply by dividing the summary sheet total longline catch each year¹ by the total longline effort recorded.

For each island, a log-linear regression is fitted to the nominal CPUE values for more recent years and an annual rate of increase estimated (with a 95% CI).

Results: Gough Island

Table 1 presents the summary sheet records of the total longline catch and effort for Gough Island, as well as the resulting nominal CPUE values. The nominal CPUE trend for the full 1970-2006 period is shown in Figure 1a. Figure 1b shows the nominal CPUE for the more recent period of 2000-2006 along with the fitted exponential trend. The estimated rate of increase over this 2000-2006 period is 18.0% with a 95% CI of [8.2%; 27.7%].

Results: Nightingale Island

Table 2 presents the summary sheet records of the total longline catch and effort for Nightingale Island, as well as the resulting nominal CPUE values. The nominal CPUE trend for the full 1970-2006 period is shown in Figure 2a. Figure 2b shows the

¹ Year refers to a season-year for example year 2005 refers to the period May 2005 to April 2006.

nominal CPUE for the more recent period of 1996-2006 along with the fitted exponential trend. The estimated rate of increase over this 1996-2006 period is 15.9% with a 95% CI of [10.9%; 20.9%].

Comments

The results presented here pertain to the nominal CPUE series for both islands. The next step will be to produce an adjusted CPUE series using the method described in Johnston *et al.* (2008), that has recently been applied to the Inaccessible Island data, once coding of all the logsheet data has been completed. Following that, a GLMM analysis of these adjusted CPUE data will be performed.

References

Johnston, S.J., Brandao, A., Edwards, C.T.T. and D.S. Butterworth. 2008. Standardised longline lobster CPUE from Inaccessible Island for the 1996-2005 period. MARAM document, MARAM/Tristan/08/April/01.

Table 1: Summary sheet records of longline total catch (kgs) and total effort (traps hauled) for **Gough** Island. The nominal CPUEs from these data are also reported.

	Effort	Catch	Nominal CPUE
1970	15400	123000	7.99
1971	69900	380000	5.44
1972	43400	190000	4.38
1973	29500	161000	5.46
1974	10200	182000	17.84
1975	20600	283000	13.74
1976	12400	64000	5.16
1977	16400	130000	7.93
1978	14300	110000	7.69
1979	9000	60000	6.67
1980	17100	106000	6.20
1981	14300	117000	8.18
1982	11800	85000	7.20
1983	17700	100000	5.65
1984	16300	62000	3.80
1985	18100	62000	3.43
1986	16800	73000	4.35
1987	14900	59000	3.96
1988	16600	56000	3.37
1989	27200	84000	3.09
1990	23300	69000	2.96
1991	15700	63000	4.01
1992	24000	71000	2.96
1993	16800	52000	3.10
1994			
1995			
1996			
1997	26401	50530.16	1.91
1998	34334	65987.31	1.92
1999	24466	49613.09	2.03
2000	31224	42662.52	1.37
2001	43502	55107.24	1.27
2002	37542	52765.79	1.41
2003	42336	62272.06	1.47
2004	26480	48945.81	1.85
2005	15063	41506.21	2.76
2006	8291	32930.59	3.97

Table 2: Summary sheet records of longline total catch (kgs) and total effort (traps hauled) for **Nightingale** Island. The nominal CPUEs from these data are also reported.

	Effort	Catch	Nominal CPUE
1970	24300	141000	5.80
1971	23700	98000	4.14
1972	13200	49000	3.71
1973	12900	77000	5.97
1974	13100	166000	12.67
1975	28700	245000	8.54
1976	22400	182000	8.13
1977	11000	71000	6.45
1978	5900	34000	5.76
1979	17600	114000	6.48
1980	18500	97000	5.24
1981	14100	55000	3.90
1982	13600	61000	4.49
1983	8900	34000	3.82
1984	12300	40000	3.25
1985	13600	50000	3.68
1986	18600	60000	3.23
1987	16600	45000	2.71
1988	19600	55000	2.81
1989	11700	27000	2.31
1990	12600	36000	2.86
1991	17100	51000	2.98
1992	13300	42000	3.16
1993	17500	40000	2.29
1994			
1995			
1996	7465	15573.05	2.09
1997	26316	32943.31	1.25
1998	13455	36788.75	2.73
1999	12685	35261.02	2.78
2000	7514	30513.79	4.06
2001	12900	40174.71	3.11
2002	10772	34777.11	3.23
2003	5525	32847.35	5.95
2004	10641	62088.18	5.83
2005	8264	59805.88	7.24
2006	6514	54236.13	8.33

Table 3: Annual rates of increase estimated by fitting log-linear regressions to the nominal CPUE data for more recent periods.

	Rate of Increase	
	mean	95% CI
Gough Island 2000-2006	18.00%	[8.2%; 27.7%]
Nightingale Island 1996-2006	15.9%	[10.9%; 20.9%]

Figure 1a: The Nominal CPUE series for Gough Island.

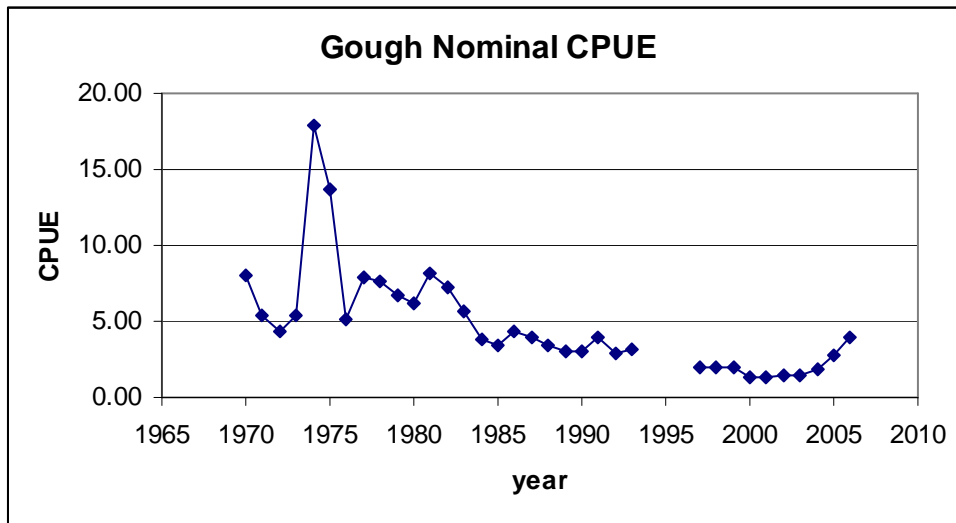


Figure 1b: The Nominal CPUE series for Gough Island for the more recent period 2000-2006, showing the fitted exponential trend.

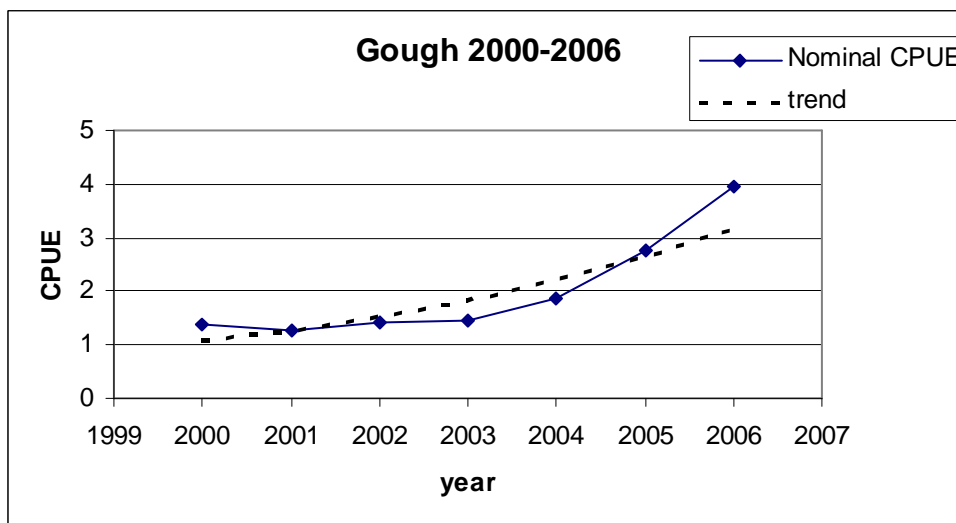


Figure 2a: The Nominal CPUE series for Nightingale Island.

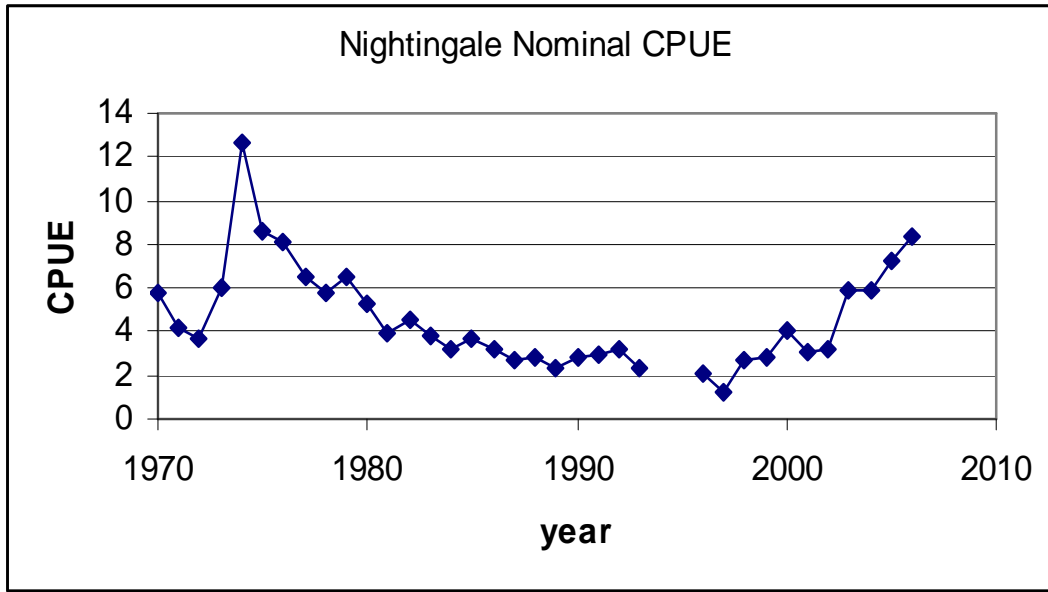


Figure 2b: The Nominal CPUE series for Nightingale Island for the more recent period 1996-2006, showing the fitted exponential trend.

