An estimate of poaching in Area 5 using comparative catches between days of no compliance operations and when a patrol vessel was present

D. van Zyl and S.J. Johnston

Summary

Based on differences in trap catches from days with and without a patrol boat present, the annual theft by poaches from commercial traps in Area 5 is estimated to be 140 tons.

- For a 16 day period (covering 6 January 2015 -28 January 2015) catches were recorded in Area 5 (sub areas 1 and 2 – North Blinder and Brittania Blinder). During this period **no compliance** operations took place i.e. no patrol boat was operating in the area. It is known that a common poaching practice is for the poachers to operate at night removing lobsters from the commercial traps.
- Catches were similarly recorded for a two-day period (29-30 January 2015) when a patrol boat was present in the area – preventing poaching operations.
- Catches are also available for a longer time period (25/11/14-23/02/15) though this period includes the period of walkouts (after which catches dropped), and can be extracted for the period 25/11/14-28/01/15 which is before the period of the walkouts.
- Table 1 reports the resultant catch statistics obtained from the commercial trap fishery during these periods.

When patrol vessels are present, the poachers don't/can't operate overnight removing lobsters from the commercial traps. This result in the average catch and catch rates for the trap fishery being much higher than when there is no patrol vessel in operation to prevent poaching at night.

Here we compare the average catch per day (during January) between the period when the patrol boat was present (=5446 kg/day) and when there were effectively no compliance operations (=1569 kg/day). This gives an estimate of the amount of lobsters potentially poached during January = 5446-1569 = 3877 kg per day. Given that there were 16 days of commercial fishing in this area for January, this amounts to 16 * 3877kg = 62 032 kg lobsters potentially poached from this area during January.

In order to extrapolate this January estimate of poaching in Area 5 to an amount for a full season, the "month factor" (obtained from the GLM trap CPUE standardisation) must be taken into account to allow for catchability trends, as well as the average amount of effort (boat trips) each month. The number of boat trips per month varies over the season, with some boats starting later, and some ending sooner once their quota is caught. The number of boat trips for the current 2014/15 season is available for NOV-JAN. For FEB-MAY the number of boat trips from the previous season is used (FEB from 2013/14 is preferred due to the walkouts during February of the current season). From these monthly "boat trips", a scaling factor relative to the fishing effort in JAN is calculated (Rel_Effort_{month}), where:

$$P\_MONTH_{JAN} = 3877 * 16 = 62\,032 \text{ kg} \quad (1)$$

$$Rel\_Effort_{month} = \frac{\#boat\ trips_{month}}{\#boat\ trips_{JAN}} \quad (2)$$

$$P\_MONTH_{month} = P\_MONTH_{JAN}.e^{(GLM_{month} - GLM_{JAN})}.Rel\_Effort_{month} \quad (3)$$

where

P_MONTH_{month} is the poaching for that month,

GLM_{month} is the GLM month factor (Jean Glazer pers. commn),

Rel_Effort_{month} is the number of boat trips for each month relative to the number in January.

Table 2 provides further information used in calculating the final total estimate of potential poaching in Area 5.

The total estimate of poached lobsters from overnight traps for Area 5, using the extrapolation method described above, is 140 tons per season.

Note the current assessment model assumes that an amount ranging from 6.3 to 12.5 tons of poaching occurs each season for the period 1990-2008 for the combined A5+6 super-area, so that this result suggests that the overall extent of poaching may have been underestimated.

Table 1: Comparative catch statistics between “no compliance” and “patrol boat” days.

	Patrol boat (29+30/01/15)	**No compliance (6-28/01/15)**	**No compliance (25/11/14-23/02/15)**	**No compliance (25/11/14-28/01/15) [No walkouts]**
# of days	2	16	53	39
# of records	42	213	470	350
Total catch	10 891.6 kg	25 105.9 kg	52 187.9 kg	45 704.6 kg
Total traps set	1 841	9 289	20 027	14 968
Ave # traps/day	920.5	580.56	377.87	383.79
Ave catch/trap	**5.92 kg/trap**	**2.70 kg/trap**	**2.61 kg/trap**	**3.05 kg/trap**
Ave catch/day	**5 446 kg/day (se=316)**	**1 569 kg/day (se=325)**	**986 kg/day**	**1 171 kg/day**

Table 2: Further statistics used for estimating the total potential poaching in Area 5.

Month	GLM month factor ($e^{GLM_{month}}$) (Glazer pers. commn)	Effort # boat trips per month (rel to JAN)	Estimate of poaching per month (tons) [P_MONTH_{month}]
Nov	0.809	14 (0.066)	3.285
Dec	1.00	123 (0.577)	35.678
Jan	**1.004**	**213 (1.000)**	**62.032**
Feb	0.903	141* (0.662)	36.920
Mar	0.206	6* (0.028)	0.359
Apr	0.326	9* (0.042)	0.850
May	0.166	12* (0.056)	0.578
TOTAL		518	**139.702**

*# boat trips per month (effort) taken from previous season