Status Report
to PIRSA Fisheries

Southern Zone Rock Lobster (*Jasus edwardsii*) Fishery Status Report 2006/07

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1 EXECUTIVE SUMMARY

- In 2006 (i.e. the 2006/07 season), the TACC in the SZRLF was 1,900 tonnes. The total reported commercial catch from logbook data was 1893.8 tonnes. A total of 1,354,305 potlifts was required to catch the TACC, which was an increase of 14.47% from 2005 (1,183,037 potlifts) when the TACC was also 1,900 tonnes. In 2006, catch was highest in December (361.8 tonnes) and lowest in May (14.8 tonnes).

- In 2006, a total of 98.5% of catch came from four Marine Fishing Areas (MFAs) i.e. 51, 55, 56 and 58. The highest catch came from MFA 55 (41%) while the lowest catch came from MFA 51 (3%).

- The CPUE in the SZRLF increased substantially between 1996 (0.92 kg/potlift) and 2002 (2.10 kg/potlift). Since then, CPUE has decreased and in 2006 it was 1.4 kg/potlift. Current catch rates do not take into account discard rates due to highgrading, which in 2006 was estimated to be at least 106 tonnes.

- The 2006 decline in CPUE was observed in all of the four major MFAs in the SZRLF. This is the fourth season in succession in which CPUE has decreased in MFAs 56 and 58.

- Over the last three seasons the puerulus settlement index (PSI) in the SZRLF has increased. In 2006 the PSI was 5 puerulus/collector, the highest on record since monitoring began.

- Standardised PRI (November-March inclusive) as calculated from voluntary catch sampling indicates that pre-recruit index (PRI) has been increasing over the last three seasons. In 2006, the PRI was 1.44 undersized/potlift, the highest on record since monitoring began.

- Biomass, as determined by the qR model, has been increasing since 1996, peaking at 6,231 tonnes in 2002. Over the last four seasons, estimates of biomass have decreased and in 2005 was 5,008 tonnes. Current estimates of biomass do not take into account the effects of highgrading.

- Egg production, as determined by the qR model, has been increasing since 1996, peaking at 699 billion eggs in 2003. In 2006, it decreased to 575 billion eggs.

- In 2006, catch rate in the SZRLF decreased for the fourth consecutive season. Likely causes of catch rate decline are the continued exploitation of inshore grounds combined with poor recruitment from low settlement in 2000 and 2001. Despite decreasing catch rates, the pre-recruit index has been increasing over the last three seasons, which is likely to reflect the high puerulus settlement observed in 2002. This cohort is expected to enter the legal sized biomass in 2007. Close monitoring in 2007 will determine the strength and magnitude of this recruitment. A more detailed spatial analysis of fishery statistics from the SZRLF will be presented in the 2006/07 Stock Assessment Report due for completion in March 2008.

2 FISHERY STATISTICS

2.1 Catch, effort and CPUE

2.1.1 Zonal catch and effort

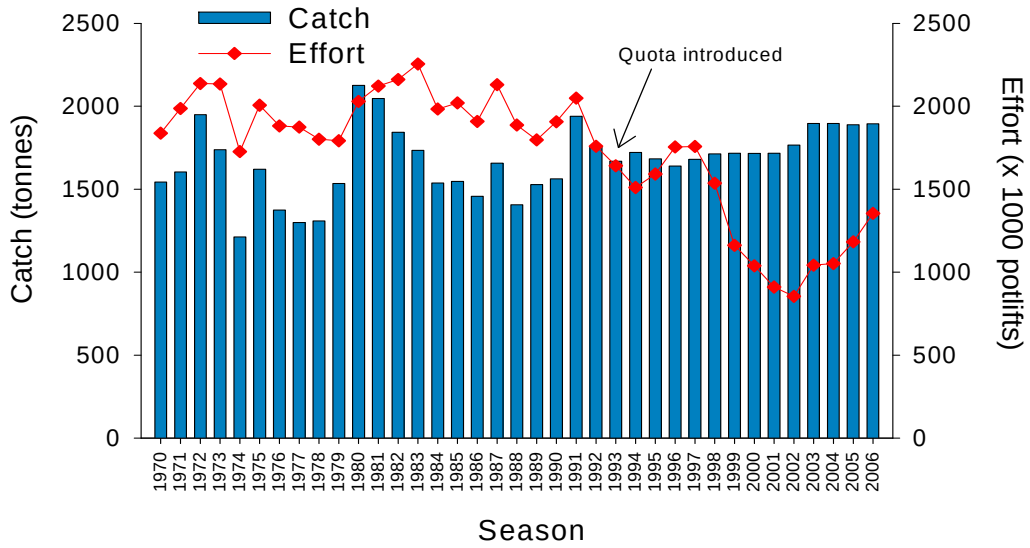

Figure 1 Inter-annual trends in catch and effort in the SZRLF from 1970 to 2006.

In 2006 (i.e. the 2006/07 season), the TACC in the SZRLF was 1,900 tonnes (Figure 1). The total reported commercial catch from logbook data was 1893.8 tonnes. Effort in 2006 was 1,354,305 potlifts, which was an increase of 14.47% from 2005 (1,183,037 potlifts) when the TACC was also 1,900 tonnes.

2.1.2 Within season trends

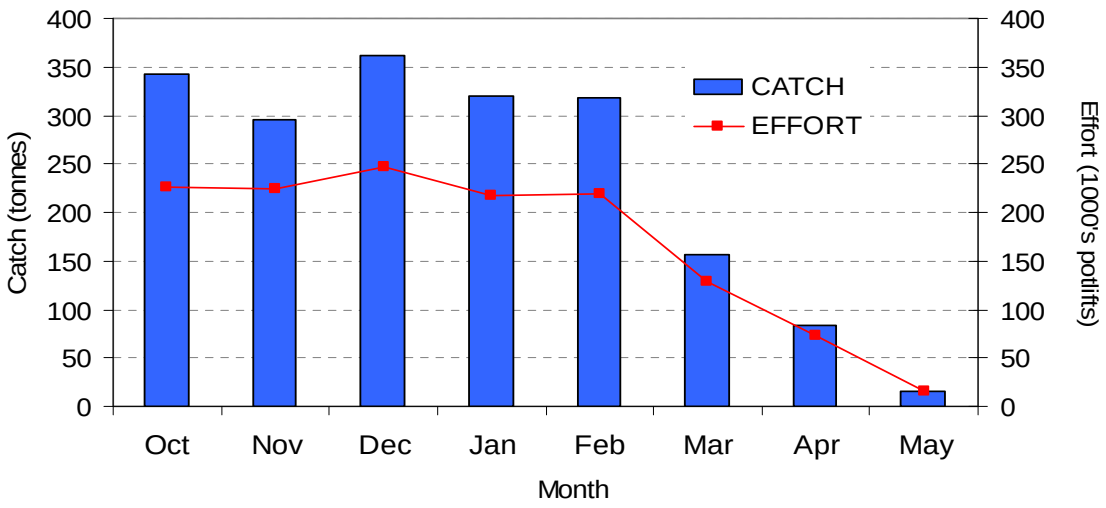

Figure 2 Within season trends in catch and effort in the SZRLF for the 2006 season.

In 2006, the highest catches were taken in the first five months of the season from October to February (Figure 2). The highest catch month was December at 361.8 tonnes while the lowest was May at 14.8 tonnes. The trend in effort reflected catch levels by month.

2.1.3 Regional catch and effort

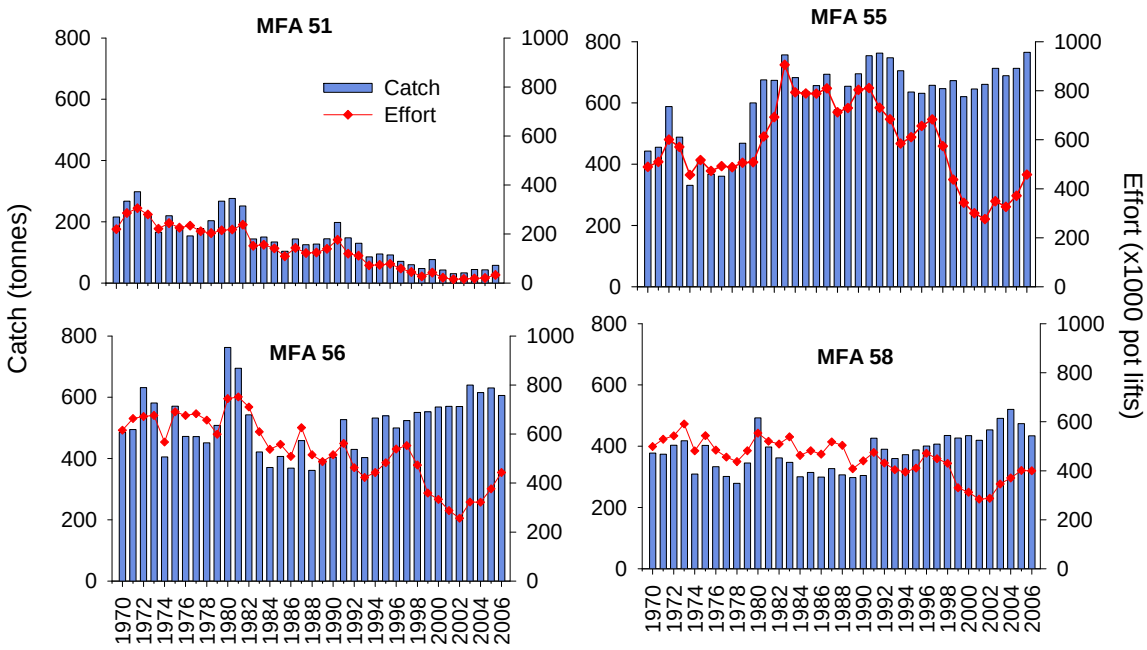

Figure 3 Inter-annual trends in catch and effort in the main Marine Fishing Areas (MFAs) of the SZRLF for the fishing seasons between 1970 and 2006 (note: alternate seasonal ticks on X-axis).

In 2006, both catch and effort increased in MFA 55 compared to 2005 (Figure 3, refer to Figure 20). In MFA 56, catch decreased despite an increase in effort while both catch and effort decreased in MFA 58. Only 57 tonnes were landed in MFA 51 in 2006, while 765, 606 and 434 tonnes were taken in MFAs 55, 56 and 58 respectively.

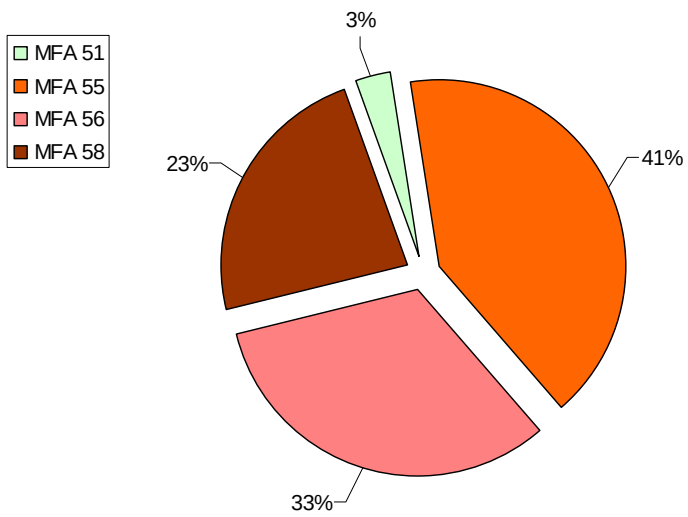

Figure 4 Percentage of total catch taken in the four major MFAs (in terms of tonnage landed) of the SZRLF in 2006.

In 2006, a total of 98.5% of catch came from four MFAs in the SZRLF (Figure 4, refer to Figure 20). The highest catch came from MFA 55 with 41% while only 3% of catch came from MFA 51.

2.1.4 Zonal CPUE

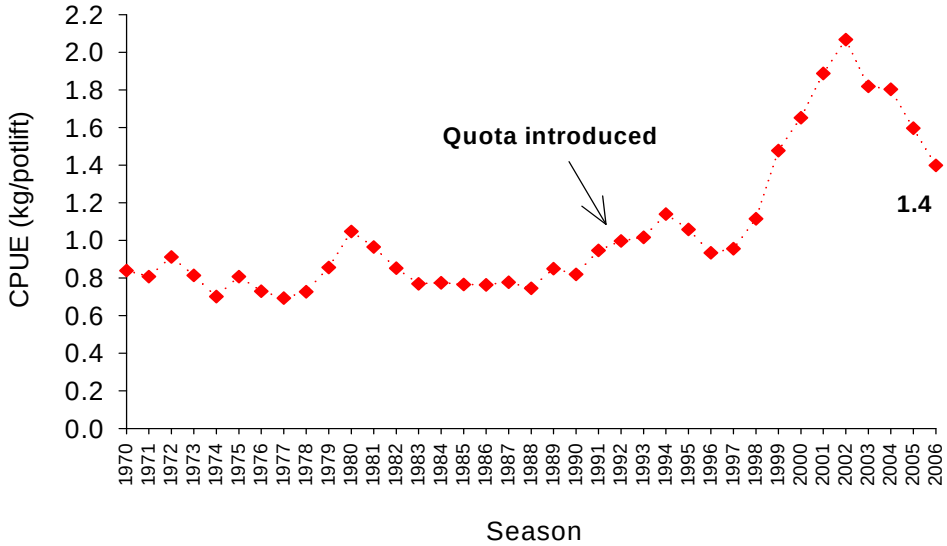

Figure 5 Inter-annual trends in CPUE in the SZRLF between 1970 and 2006.

The CPUE in the SZRLF increased substantially between 1996 (0.92 kg/potlift) and 2002 (2.10 kg/potlift) (Figure 5). However, over the last four seasons CPUE has decreased and in 2006 was 1.4 kg/potlift. Current CPUE estimates do not take into account discard rates due to highgrading (see Figure 8).

2.1.5 Regional CPUE

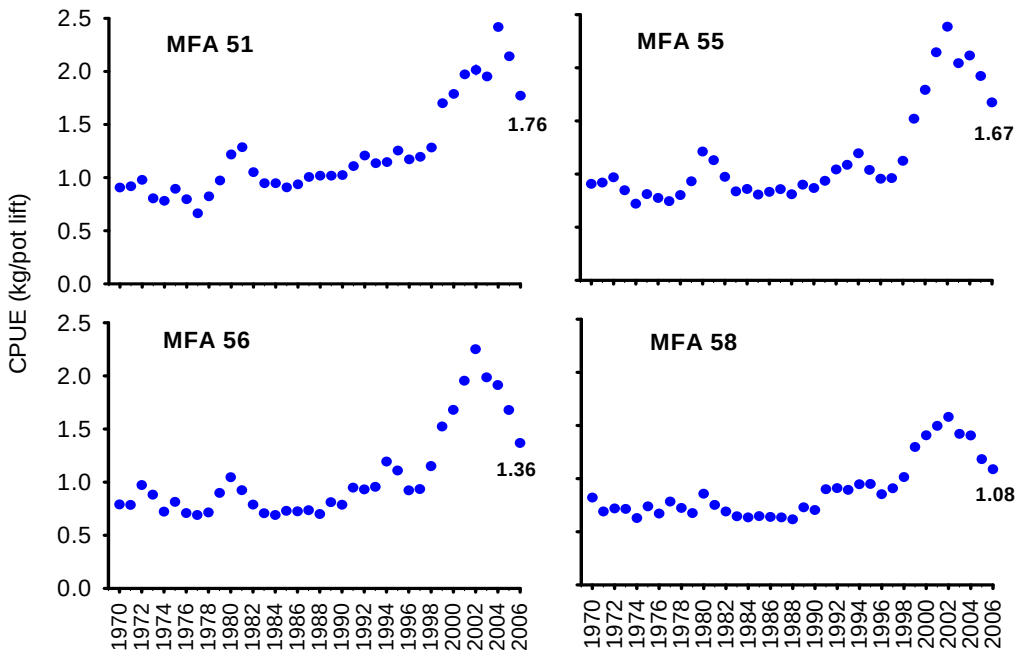

Figure 6 Inter-annual trends in CPUE in the four main MFAs of the SZRLF between 1970 and 2006 (note: alternate annual ticks on X-axis).

Catch rates in each main MFA generally reflect zonal estimates (Figure 6). Highest catch rates were observed in MFA 51 but only 3% of the total catch came from this MFA (Figures 3 and 4). In 2006, catch rates decreased in all four MFAs. This is the fourth season in succession in which catch rates have decreased in MFAs 56 and 58.

2.2 Zonal mean weight

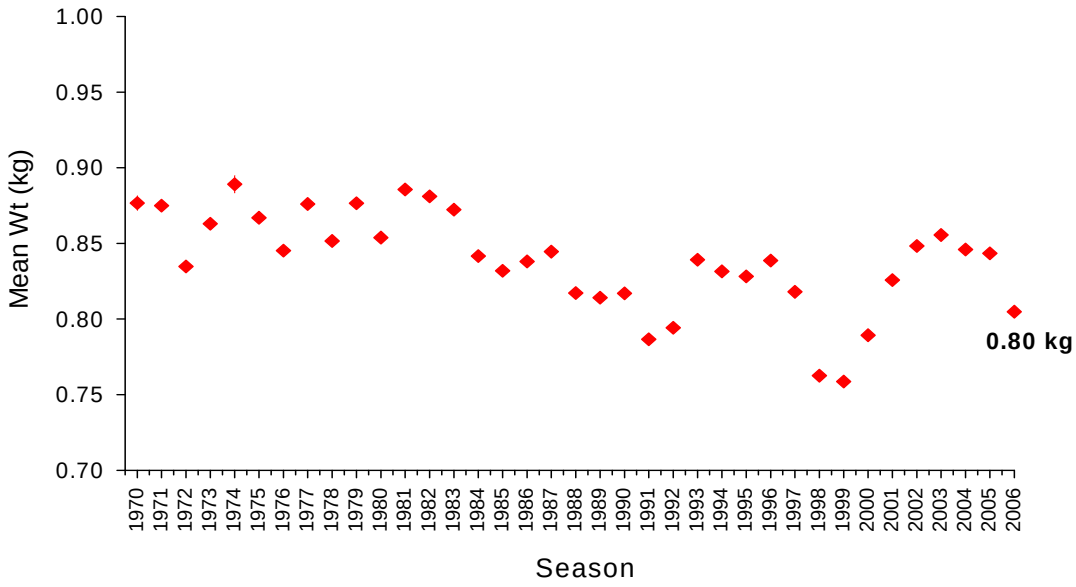

Figure 7 Inter-annual trends in mean lobster weight in the SZRLF from 1970 to 2006.

Mean lobster weight increased from 1999 to 2003 (Figure 7). Over the last three seasons it has decreased and in 2006 was 0.80 kg. As with CPUE, this estimate is largely affected by highgrading in the zone (see Figure 8).

2.3 Highgrading

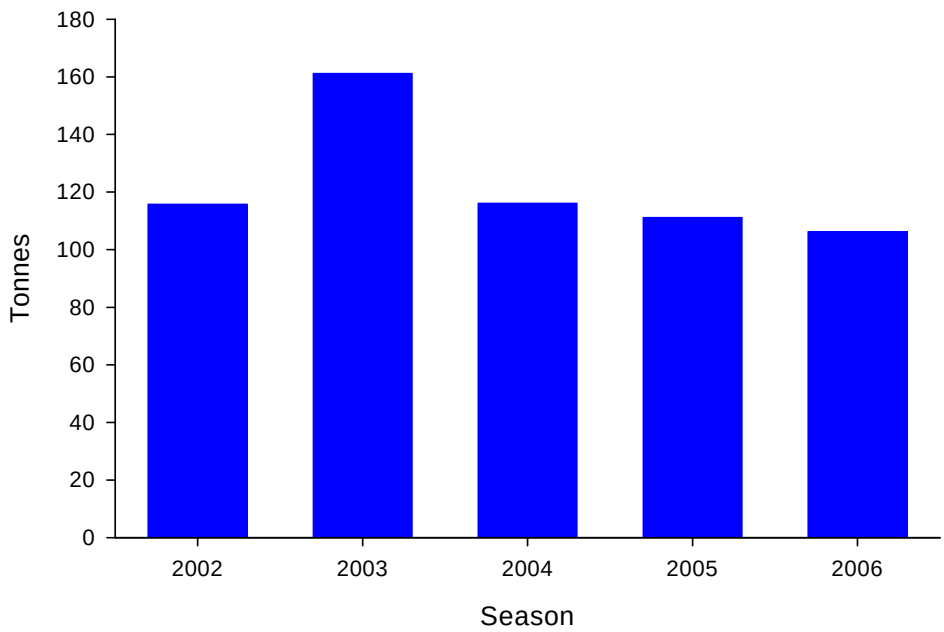

Figure 8 Estimates of highgrading in the SZRLF over the last 5 seasons (2002-2006).

Estimates of highgrading (i.e. the selection of smaller sized or non-damaged individuals due to higher unit value) have exceeded 100 tonnes over each of the last five seasons (Figure 8). As the recording of highgrades in logbooks is undertaken on a voluntary basis, this is likely to be an underestimation of true values. In 2006, a total of 106 tonnes were recorded as highgrades.

2.4 Puerulus settlement index

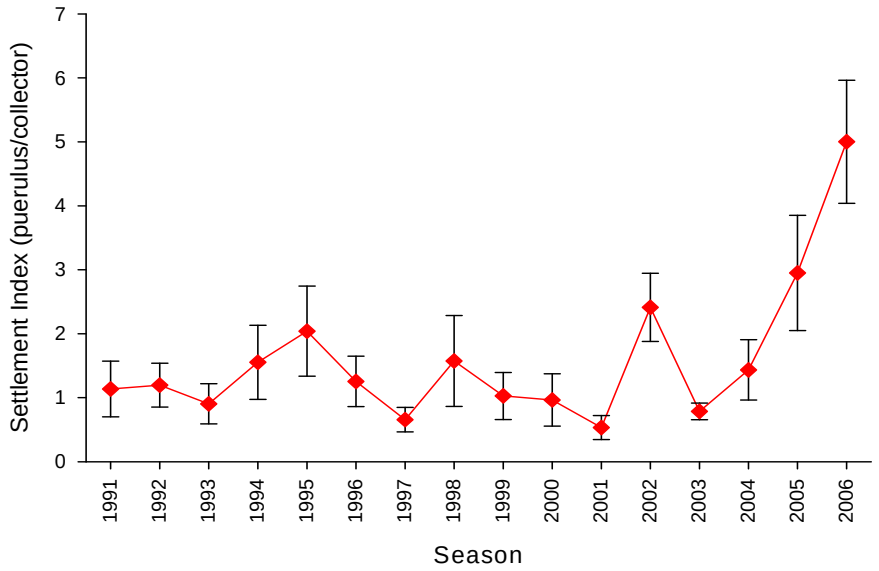

Figure 9 Puerulus settlement Index (PSI) in the SZRLF from 1991 to 2006.

The PSI in the SZRLF has been increasing since 2003. In 2006, the PSI was 5 puerulus/collector, the highest on record since monitoring began. In the SZRLF, the estimated period between puerulus settlement and recruitment into the fishable biomass is 5 years.

2.5 Pre-recruit index

2.5.1 Zonal pre-recruit index

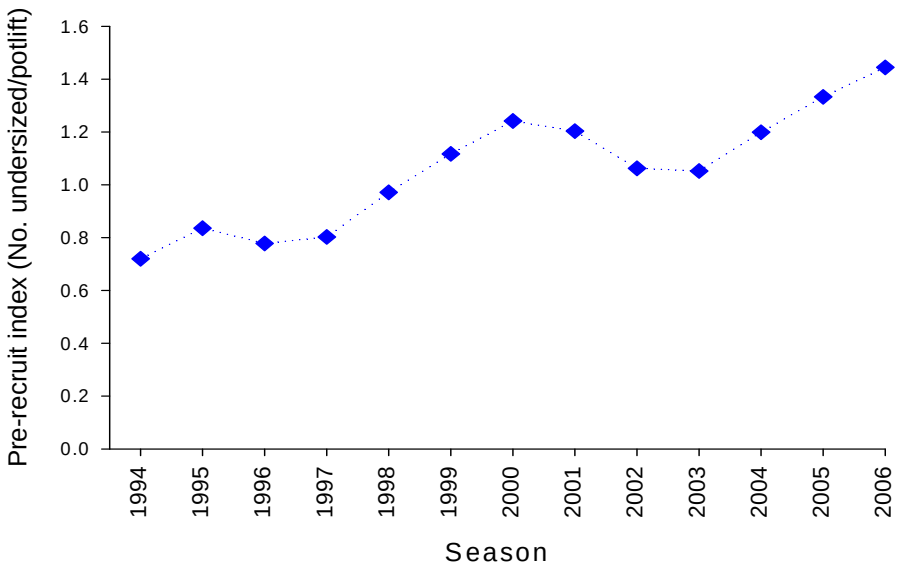

Figure 10 Inter-annual trends in pre-recruit index (PRI) in the SZRLF from 1994 to 2006 as calculated from voluntary catch sampling.

Standardised PRI (November-March inclusive) as calculated from voluntary catch sampling indicates that PRI has been increasing since 2003 (Figure 10). In 2006, the PRI was 1.44 undersized/potlift, the highest on record since monitoring began.

2.5.2 Regional pre-recruit index

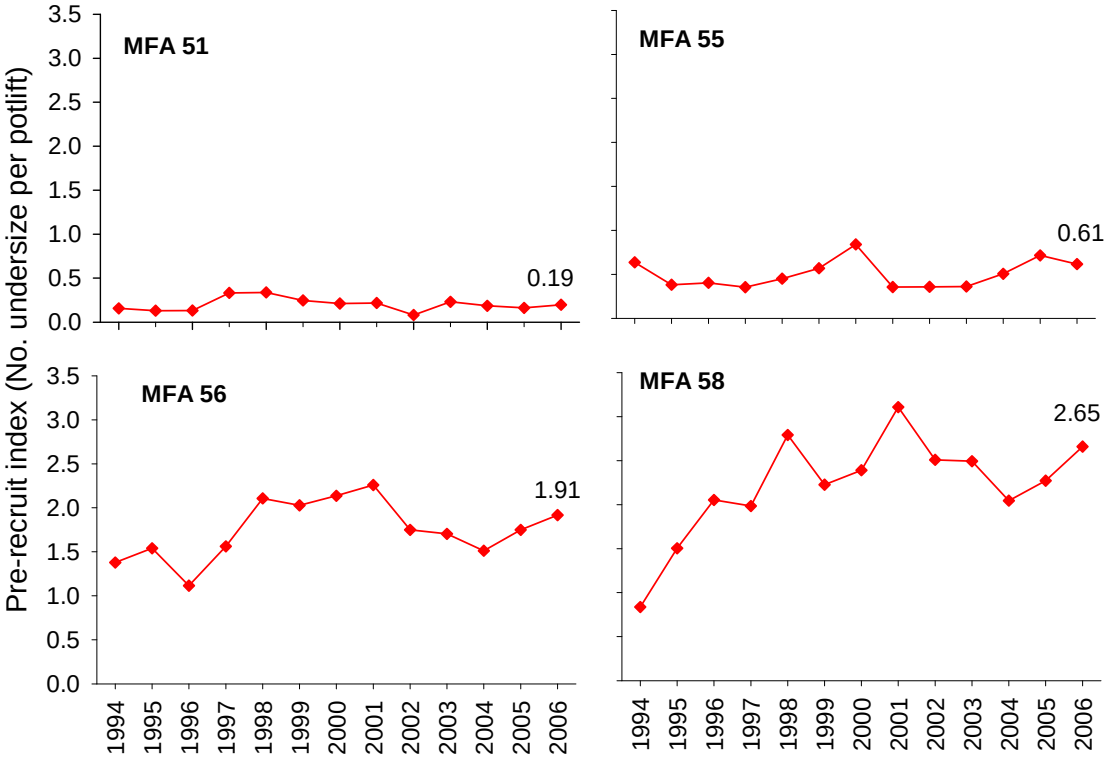

Figure 11 Interannual trends in regional PRI in the SZRLF from 1994 - 2006.

Regional estimates of PRI (Figure 11) indicate that the number of undersized/potlift is consistently lower in the northern regions of the SZRLF (i.e. MFAs 51 and 55; refer to Figure 20) compared to southern areas (i.e. MFA 56 and 58). Over the last three seasons, the PRI has remained relatively stable in MFAs 51 and 55 and has increased in MFAs 56 and 58. In 2006, estimates of PRI were 0.19, 0.61, 1.91 and 2.65 undersized/potlift in MFAs 51, 55, 56 and 58 respectively.

3 qR MODEL OUTPUTS

3.1 qR Biomass

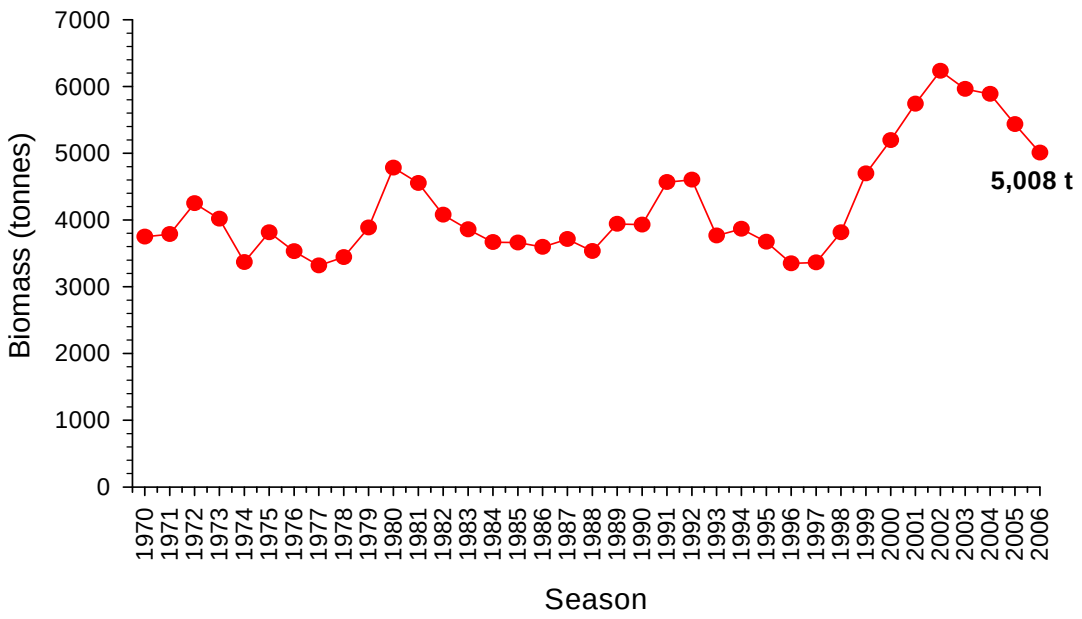

Figure 12 Estimates of exploitable biomass (1970-2006) for the SZRLF obtained from the 2006 qR model.

Biomass, as determined by the qR model, increased from 1996, peaking at 6,231 tonnes in 2002 (Figure 12). Over the last four seasons, estimates of biomass have decreased and in 2006 was 5,008 tonnes. Current estimates of biomass do not take into account the effects of highgrading (Figure 8) within the zone.

3.2 qR Egg production

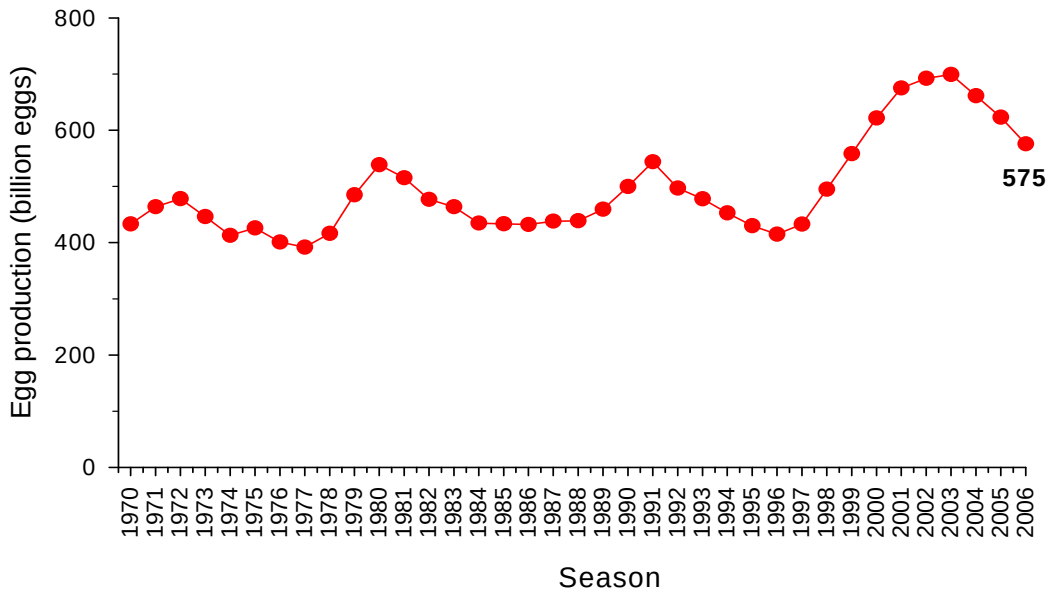

Figure 13 Estimates of egg production (1970-2006) for the SZRLF obtained from the 2006 qR model.

Egg production in the SZRLF has been increasing since 1996, peaking at 699 billion eggs in 2003 (Figure 13). In 2006, it decreased to 575 billion eggs.

3.3 Percent of virgin egg production

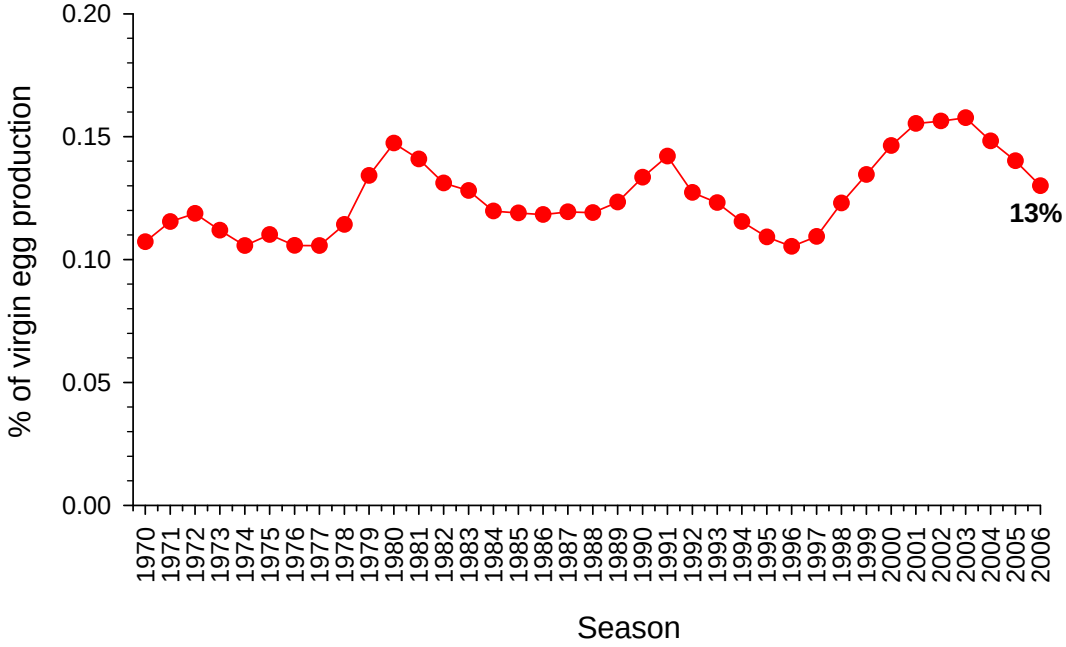

Figure 14 Estimates of % of virgin egg production for the SZRLF as obtained from the 2006 qR model.

Model outputs for the 2006 season suggest that egg production equated to 13% of virgin (Figure 14).

3.4 Exploitation rate

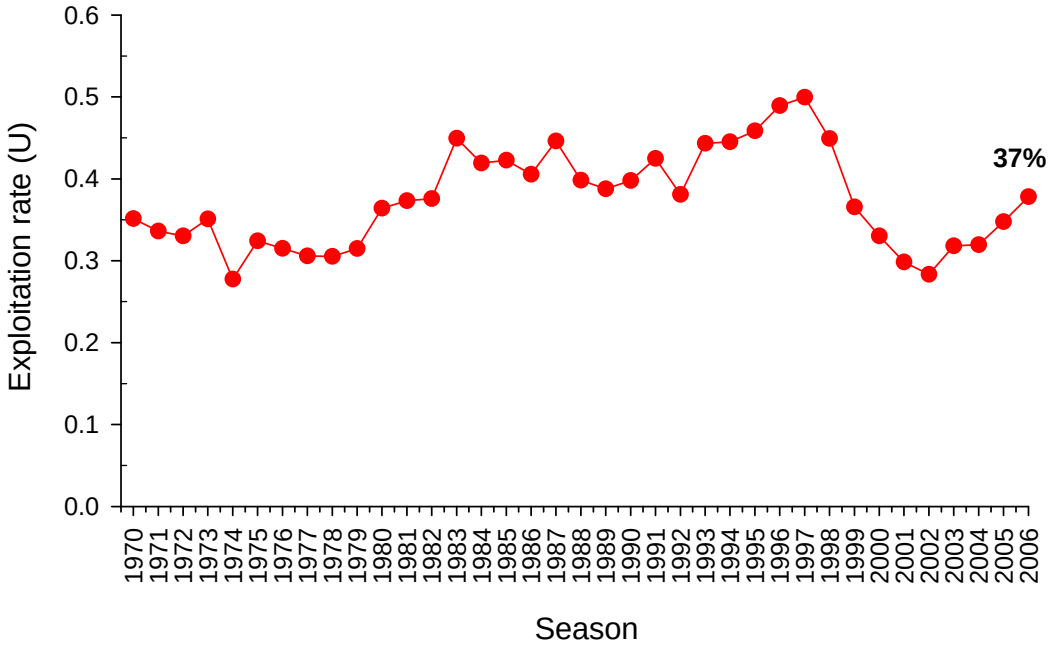

Figure 15 Estimates of exploitation for the SZRLF as obtained from the 2006 qR model.

Exploitation rate in the SZRLF decreased between 1997 and 2002. Over the last four seasons however it has increased and in 2006 was estimated to be 37% (Figure 15).

4 BIOLOGICAL PERFORMANCE INDICATORS

4.1 Reference points

Table 1 Target and limit reference points for both catch rate and pre-recruit index in the SZRLF (refer to Sloan and Crosthwaite 2007).

Region	Catch rate (kg/potlift)	Catch rate (kg/potlift)	Pre-recruit index (Pot sampling data)
	Limit	Target	Limit
Southern Zone	1.47	2.07	1.03
MFA 55	1.60	2.38	0.46
MFA 56	1.54	2.25	1.77
MFA 58	1.23	1.58	2.31

4.2 Zonal catch rate

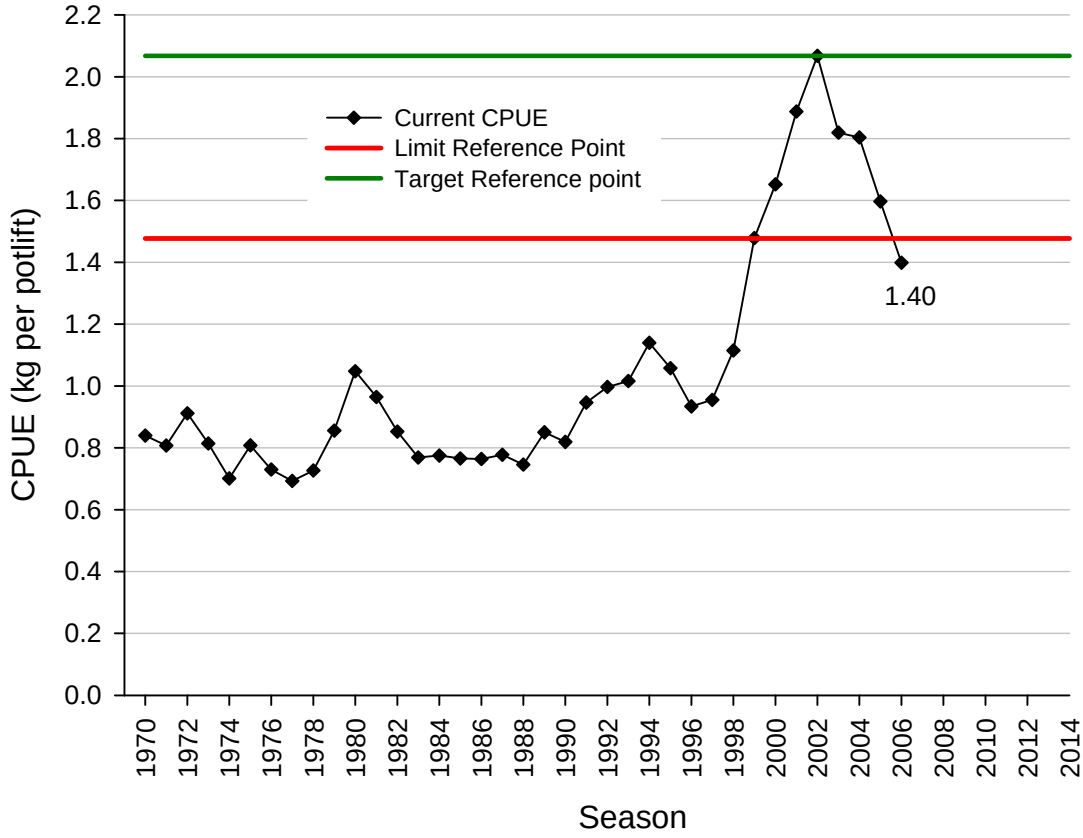

Figure 16 Zonal limit and target reference points for CPUE in the SZRLF including current estimates from the 2006 season.

In 2006, the zonal estimate of 1.40 kg/potlift was below the limit reference point (LRP) of 1.47 kg/potlift (Figure 16) as per the new Management Plan for the resource (Sloan and Crosthwaite 2007).

4.3 Regional catch rate

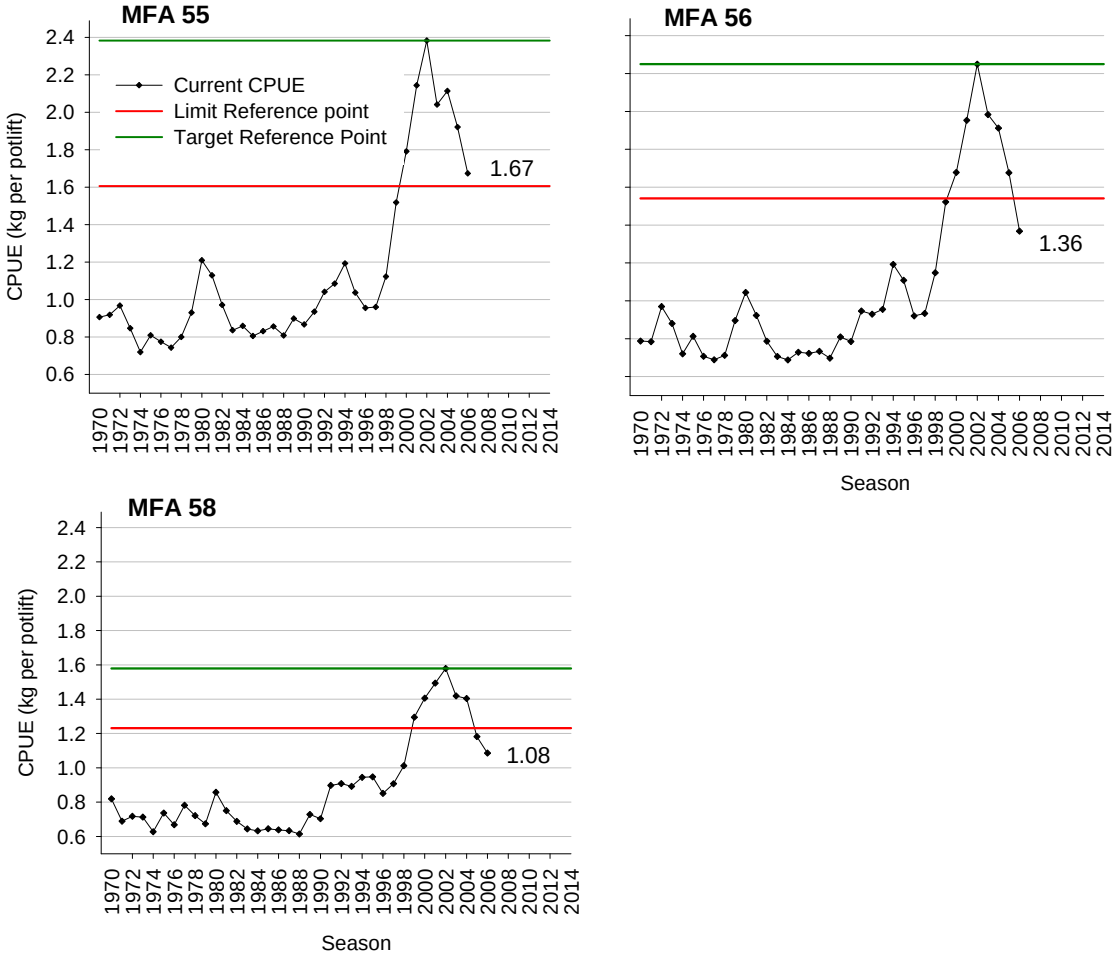

Figure 17 Regional limit and target reference points for CPUE in the SZRLF including current estimates from the 2006 season.

In 2006, current regional CPUE was above the limit reference point (LRP) in MFA 55 and below it MFA 56 and 58 (Figure 17).

4.4 Zonal pre-recruit index

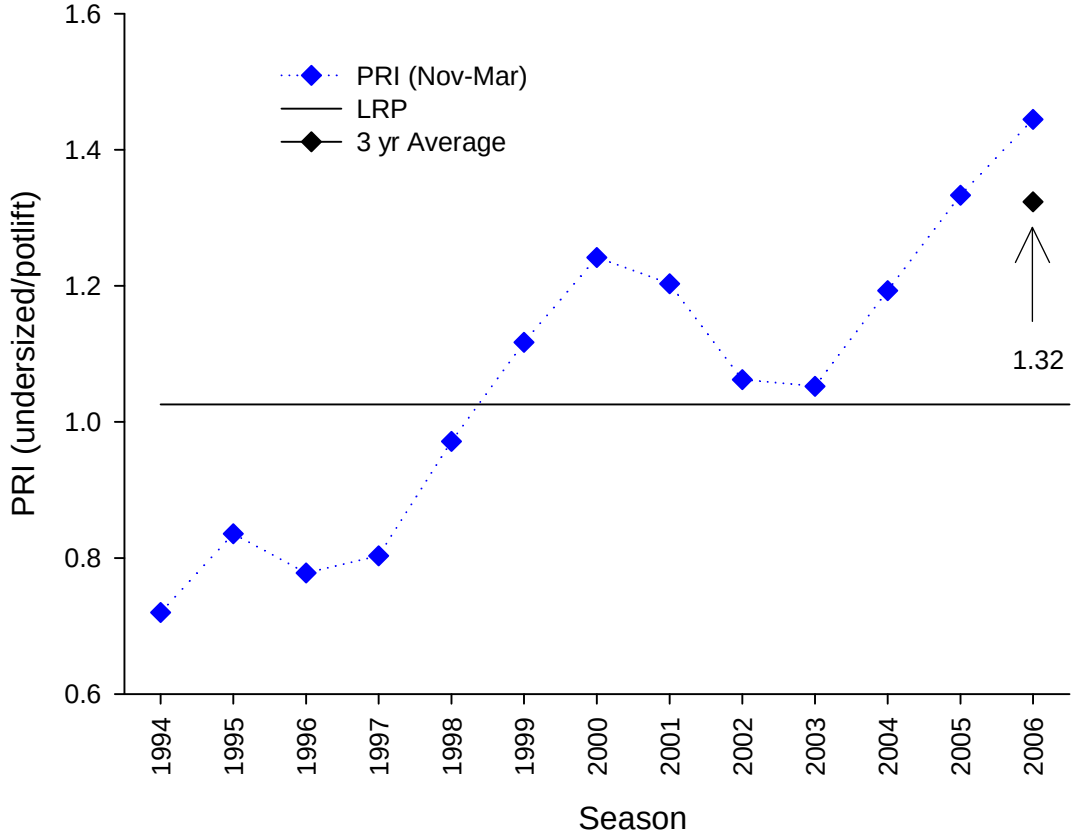

Figure 18 Zonal pre-recruit indices (PRI) (1994-2006) with Limit Reference Point (LRP) and current 3-year average.

In 2006, the 3-year average PRI (2004-2006) was 1.32 undersized/potlift, which is above the long-term LRP for the SZRLF (Figure 18).

4.5 Regional pre-recruit index

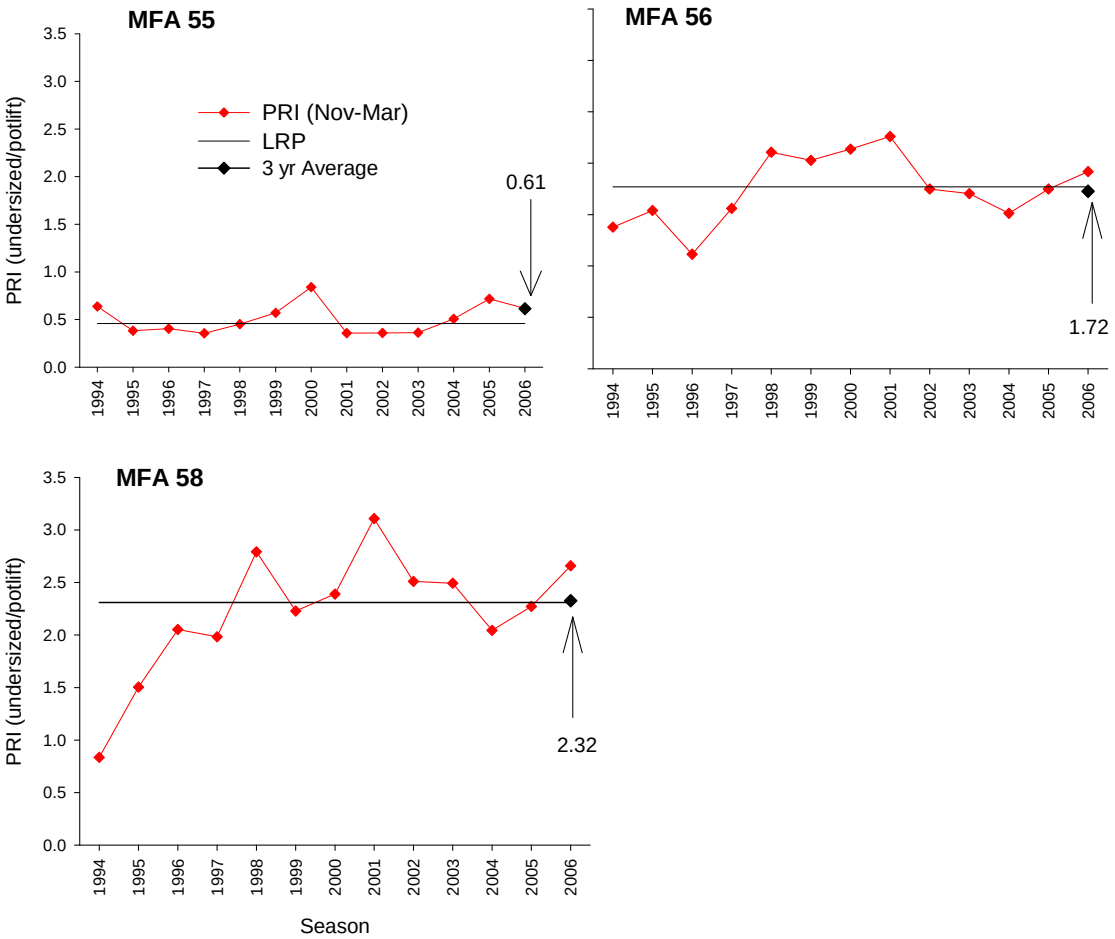

Figure 19 Regional pre-recruit indices (PRI) with Limit Reference Points (LRPs) and current 3-year average.

In 2006, the 3-year average PRI (2004-2006) was above the long-term LRP in MFA 55 and 58 and below it in MFA 56 (Figure 19).

5 SUMMARY

In 2006, catch rate in the SZRLF decreased for the fourth consecutive season. Likely causes of catch rate decline are the continued exploitation of inshore grounds combined with poor recruitment from low settlement in 2000 and 2001. Despite decreasing catch rates, the pre-recruit index has been increasing over the last three seasons, which is likely to reflect the high puerulus settlement observed in 2002. This cohort is expected to enter the legal sized biomass in 2007. Close monitoring in 2007 will determine the strength and magnitude of this recruitment. A more detailed spatial analysis of fishery statistics from the SZRLF will be presented in the 2006/07 Stock Assessment Report due for completion in March 2008.

References

Sloan, S. & Crosthwaite, K., 2007. Management Plan for the South Australian Southern Zone Rock Lobster Fishery. South Australian Fisheries Management Series Paper No.52. Primary Industries and Resources South Australia. Adelaide, 73pp.

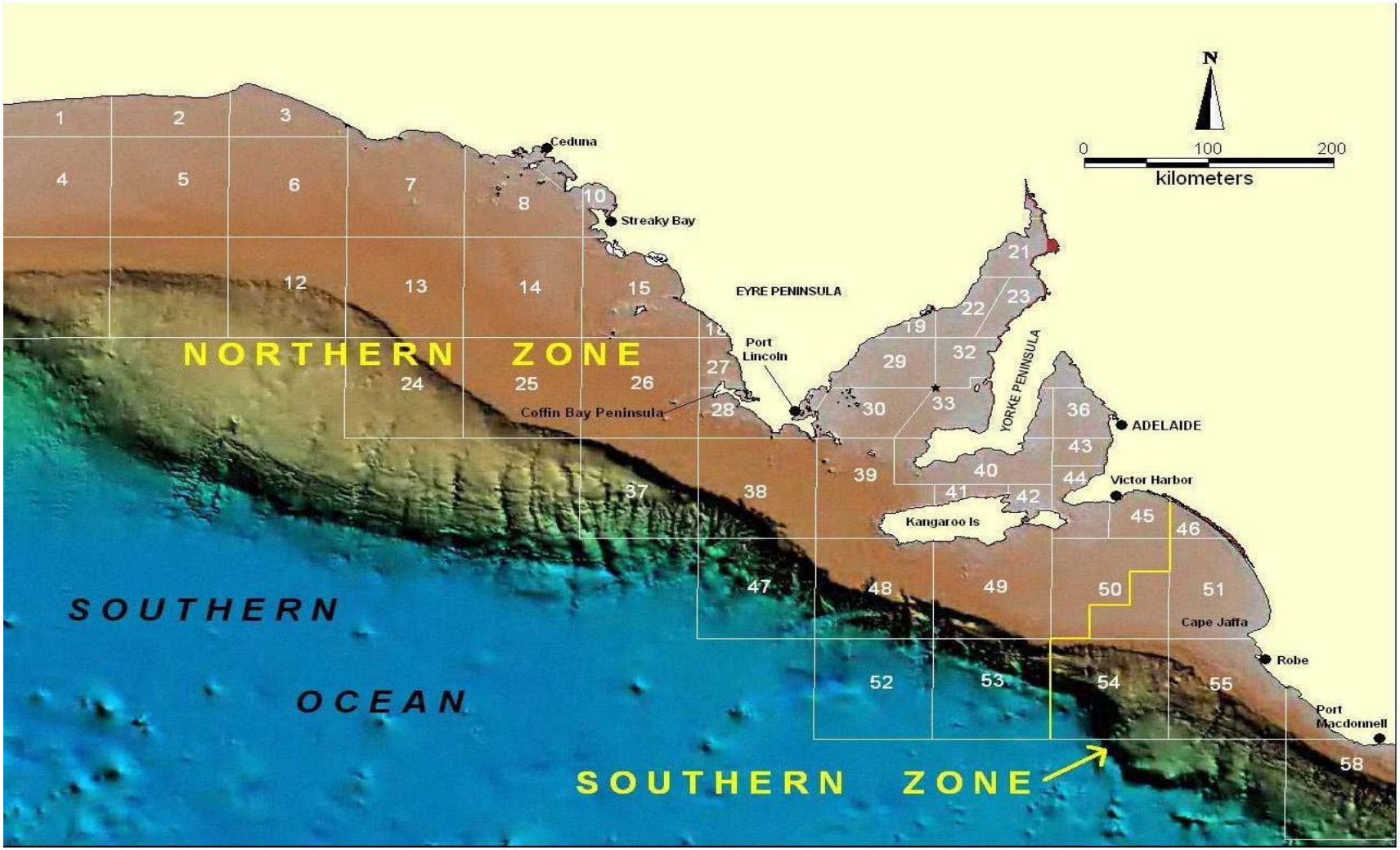

Figure 20 Northern and Southern Zones and Marine Fishing Areas in the South Australian Rock Lobster Fishery.