Status Report
to PIRSA Fisheries

Northern Zone
Rock Lobster (*Jasus edwardsii*)
Fishery Status Report 2005/06

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1 EXECUTIVE SUMMARY

- In 2005 (i.e. the 2005/06 season), the TACC in the NZRLF was 520 tonnes. The total reported commercial catch from logbook data was 476.4 tonnes, an increase of 6.8% from 2004 (446.1 tonnes). Effort in 2005 was 580,255 potlifts, an increase of 4.8% from 2004 (553,701). In 2005, catch was highest in January (97.1 tonnes) and lowest in May (21 tonnes). The trend in effort reflected catch levels by month.

- In 2005, catch decreased in Marine Fishing Areas (MFAs) 39, 40, 49, and 50 and increased in MFAs 7, 8, 15, 27, 28 and 48 compared to the 2004 season. Trends in effort generally reflected trends in catch. Of particular note was MFA 28, where catch increased by 39.4% from 62.7 tonnes in 2004 to 87.4 tonnes in 2005.

- The CPUE in the NZRLF has been decreasing since 1999. In 2005, the CPUE was 0.81 kg/potlift, a marginal increase from the 2004 estimate of 0.80 kg/potlift. Despite this, the 2005 CPUE estimate remains one of the lowest on record.

- Mean lobster weight in the NZRLF has fluctuated between 0.95 and 1.16 kg since 1983 but has been decreasing over the last three seasons. In 2005, the mean weight was 1.09 kg, a marginal increase from the 2004 estimate (1.08 kg). Mean weight in 2005 was lowest in November at 0.92 kg and highest in May at 1.29 kg.

- The introduction of escape gaps in the fishery has affected pre-recruit estimates in recent seasons and as a result, estimates of PRI are now reliant on catch sampling data (where escape gaps are closed). PRI as calculated from catch sampling data indicates that the PRI has increased over the last three seasons. In 2005, it increased further to 0.49 undersized/potlift, which is the second highest estimate on record. Notably, PRI as calculated using logbook data also increased in 2005 to 0.17 undersized/potlift.

- Biomass, as determined by the qR model, has been decreasing since 1999. In 2005, it was 1,975 tonnes, the lowest in the history of the fishery.

- Egg production in the NZRLF has been decreasing since 1999. In 2005, it was 428 billion eggs, the lowest in the history of the fishery. Current egg production in the NZRLF equates to 15.40% of virgin.

- Exploitation rate, as determined by the qR model, has been declining since 1998. In 2005, the exploitation rate increased to 24%.

- In the 2005 season, three of the six performance indicators for the fishery i.e. biomass, egg production and catch rate in the NZRLF were negatively outside the reference range as defined in the Fishery Management Plan (based on Zacharin 1997). As a result, the status of the NZRLF remains at the lowest level in the history of the fishery. Despite this, the report identifies some positives signs for the fishery, specifically the observed increase in pre-recruit index in 2005. Future assessments will determine if this translates to strong recruitment to the fishery during the 2006/07 and 2007/08 seasons.

2 FISHERY STATISTICS

2.1 Catch, effort and CPUE

2.1.1 Interannual patterns

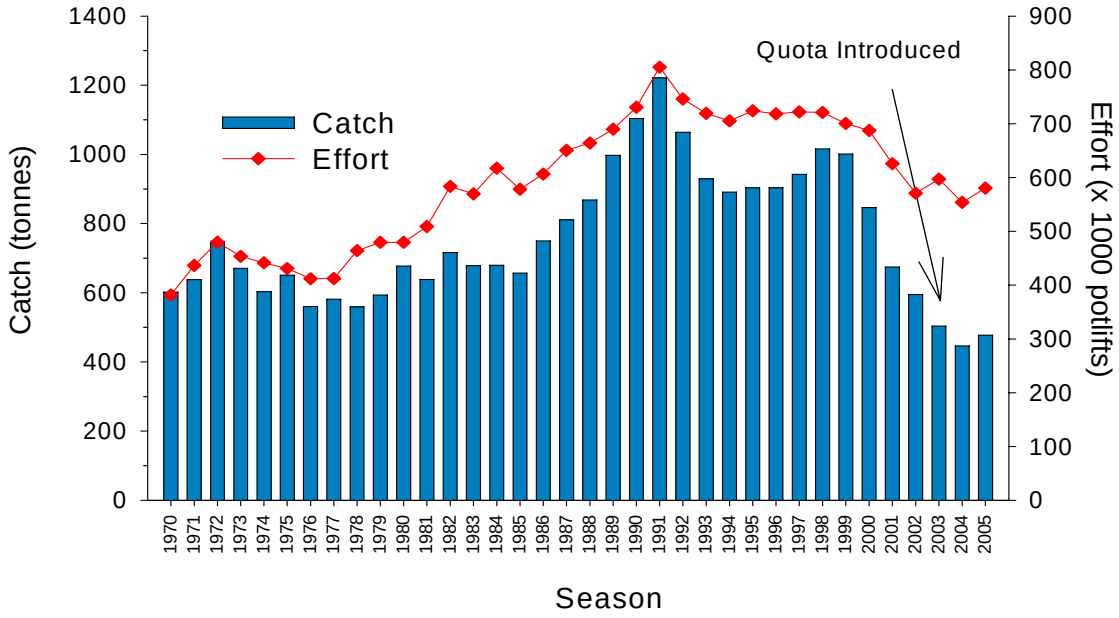

Figure 1 Inter-annual trends in catch and effort in the NZRLF from 1970 to 2005.

Catch in the NZRLF has been declining since 1998 (Figure 1). In 2005 (i.e. the 2005/06 season), the catch was 476.4 tonnes, an increase of 6.8% from 2004 (446.1 tonnes). Effort in 2005 was 580,255 potlifts, an increase of 4.8% from 2004 (553,701 potlifts).

2.1.2 Within season trends

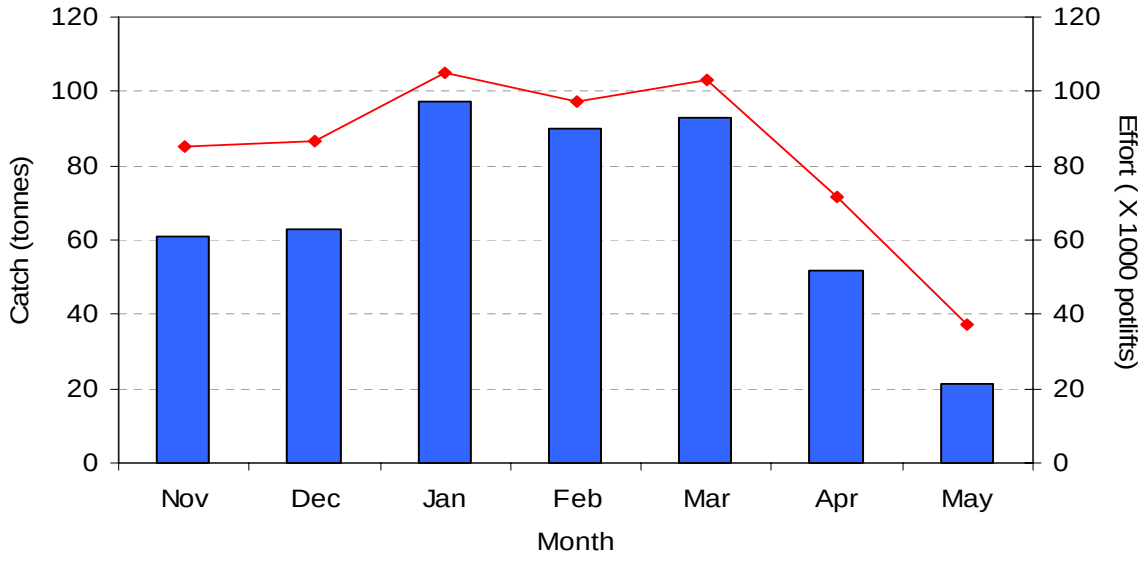

Figure 2 Within season trends in catch and effort in the NZRLF for the 2005 season.

In 2005, the highest catch was taken in January (97.1 tonnes) with the lowest catch in May (21 tonnes). The trend in effort reflected catch levels by month (Figure 2).

2.1.3 Patterns across Marine Fishing Areas (MFAs)

Table 1 Total catch and effort from the 10 major MFAs (in terms of tonnage landed) in the NZRLF in 2005.

MFA	Catch (t)	Effort (X 1000 potlifts)
7	5.98	5.57
8	29.10	26.70
15	37.04	44.07
27	23.25	25.84
28	87.45	107.32
39	93.88	117.44
40	47.40	71.97
48	61.26	73.93
49	43.00	57.06
50	12.70	14.68

In 2005, over 90% of the catch was taken from 10 MFAs in the NZRLF (Table 1 and Figure 3). This ranged from 5.98 tonnes in MFA 7 to 93.88 tonnes in MFA 39. (Refer to Figure 18 for location of MFAs).

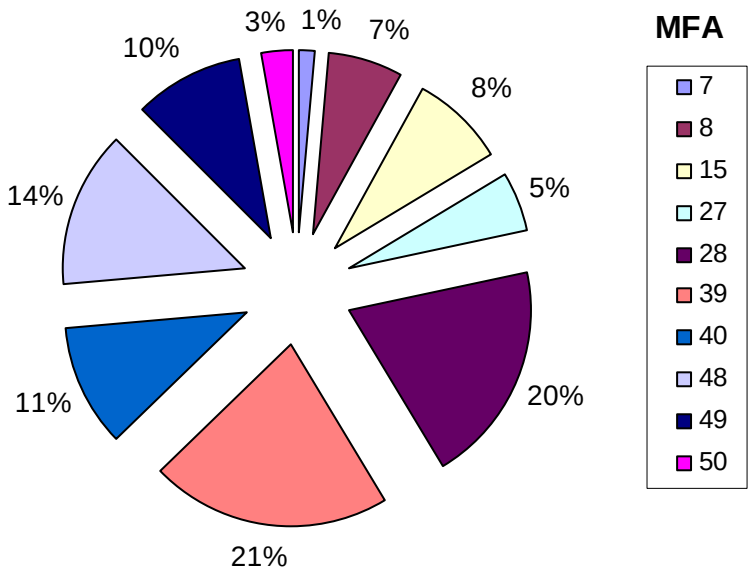

Figure 3 Proportion of the total catch taken from each of the 10 major MFAs of the NZRLF in 2005.

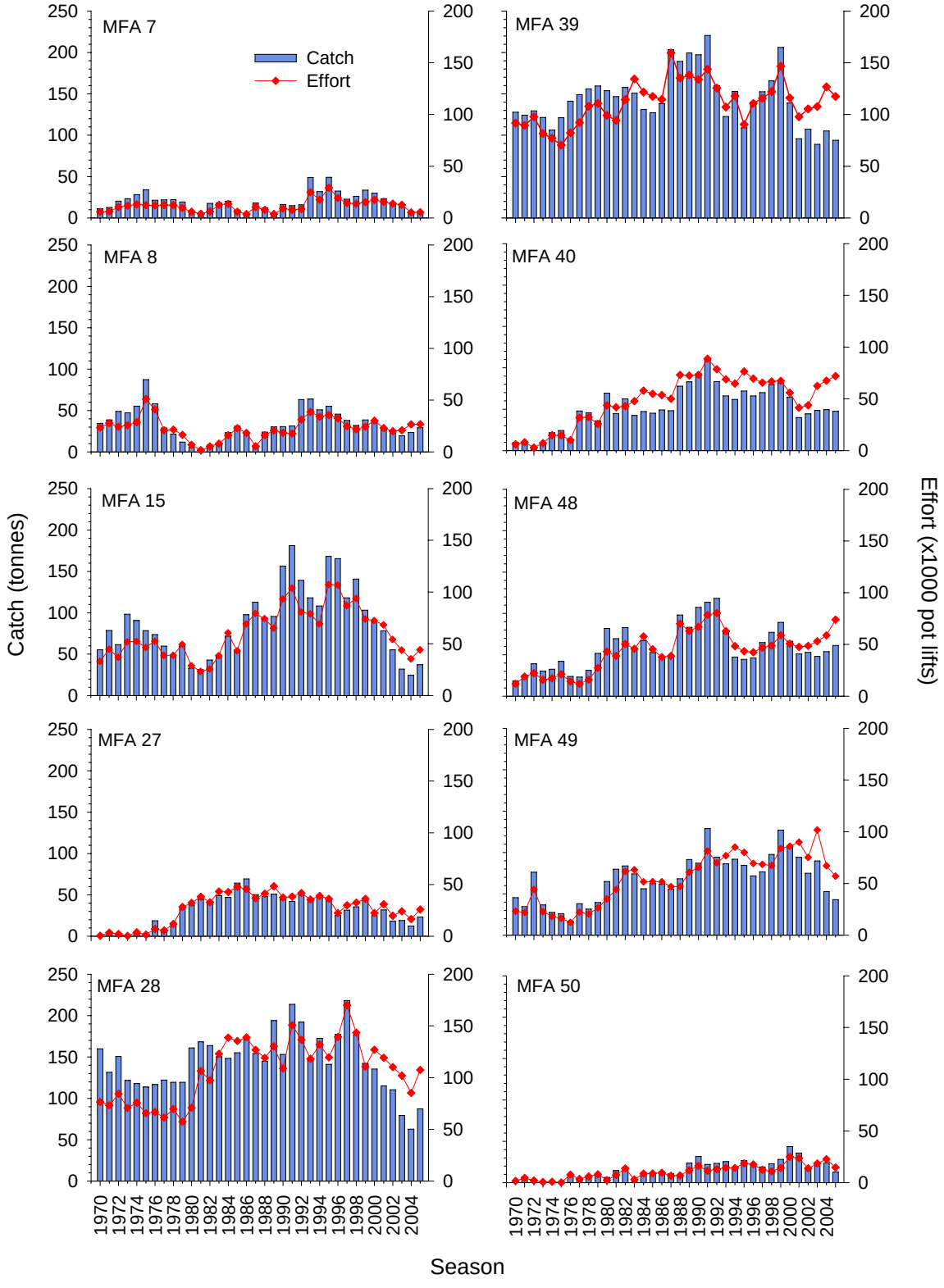

Figure 4 Inter-annual trends in catch and effort in the 10 major MFAs of the NZRLF for the fishing seasons between 1970 and 2005 (note: alternate seasonal ticks on x-axis).

In 2005, catch decreased in MFAs 39, 40, 49 and 50 and increased in MFAs 7, 8, 15, 27, 28 and 48 (Figure 4). Trends in effort generally reflected trends in catch. Of particular note was MFA 28 where catch increased by 39.4% from 62.7 tonnes in 2004 to 87.4 tonnes in 2005 (Refer to Figure 18 for location of MFAs).

2.1.4 Catch by depth

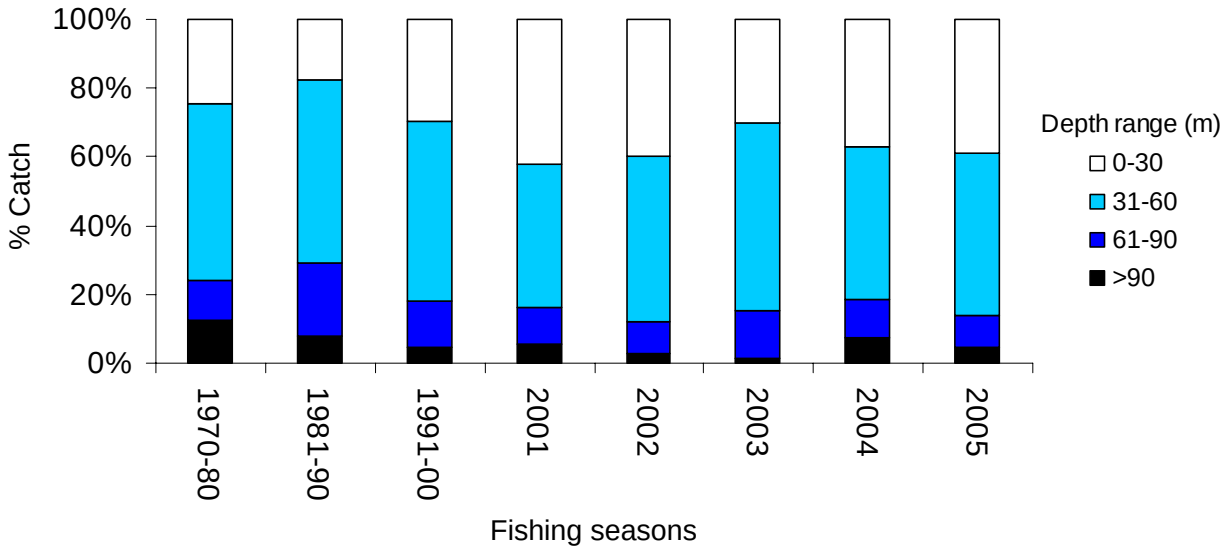

Figure 5 Percentage of catch taken from four depth ranges in the NZRLF during the 1970s, 1980s, 1990s and the last five fishing seasons.

In 2005, 86% of the catch was taken in depths of <60 m. The proportion of catch taken in depths >90 m decreased from 7.6% in 2004 to 4.4 % in 2005 (Figure 5).

2.1.5 Annual CPUE

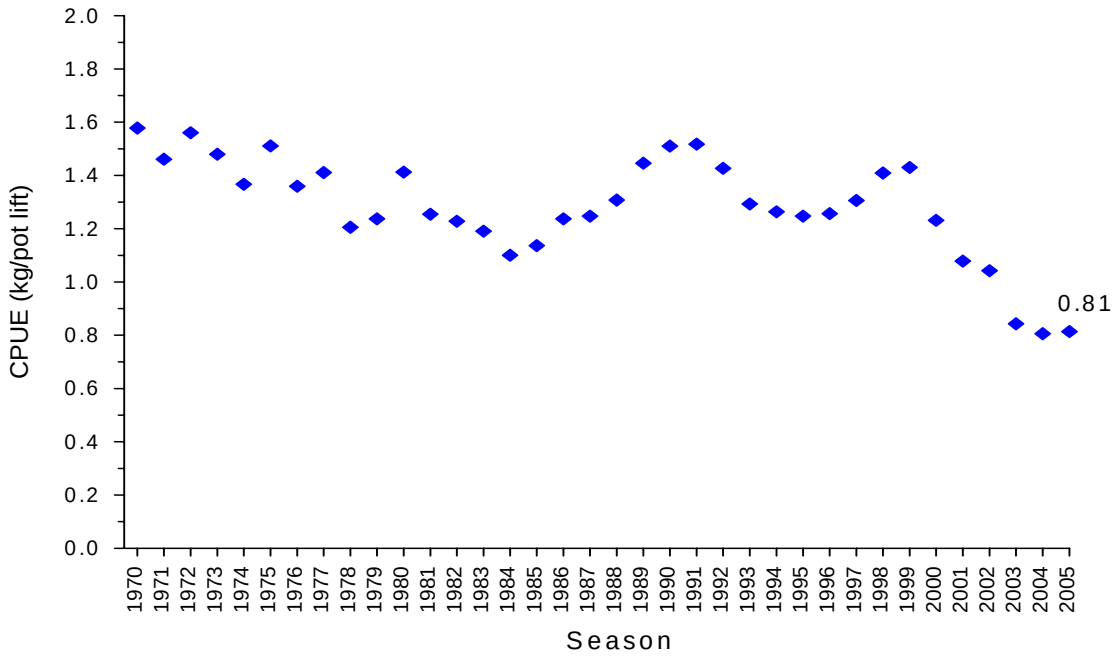

Figure 6 Inter-annual trends in CPUE in the NZRLF between 1970 and 2005.

Since 1999, the CPUE in the NZRLF has declined, reaching 0.80 kg/potlift in 2004, the lowest on record. In 2005, the CPUE increased marginally to 0.81 kg/potlift, (Figure 6).

2.2 Annual Mean Weight

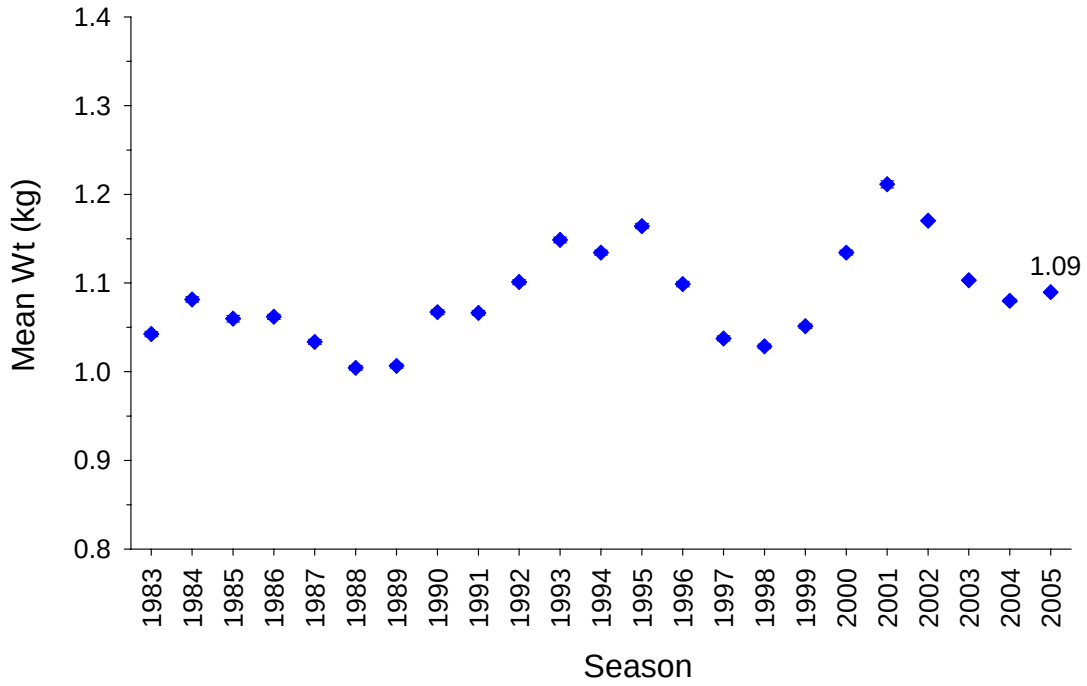

Figure 7 Inter-annual trends in mean lobster weight in the NZRLF from 1983 to 2005.

Mean lobster weight in the NZRLF has fluctuated between 1.0 and 1.21 kg from 1983-2001 (Figure 7). Mean weight has decreased over the last three seasons. In 2005, it increased marginally to 1.09 kg.

2.2.1 Monthly Mean Weight

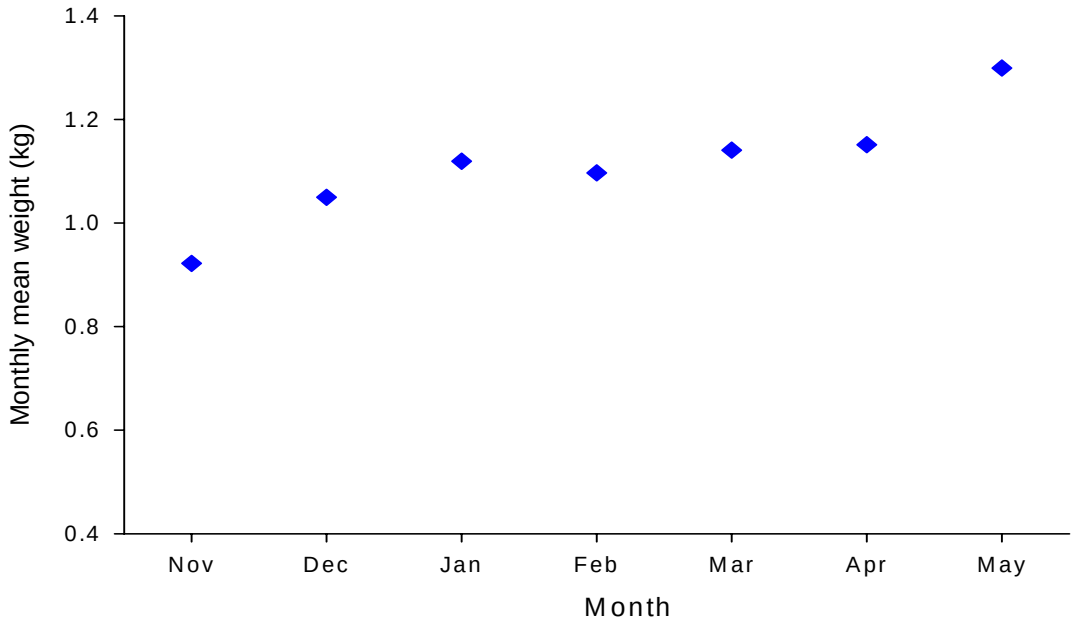

Figure 8 Within season trends in monthly mean lobster weight in the NZRLF in 2005.

Mean weight in 2005 was lowest in November at 0.92 kg and highest in May at 1.29 kg (Figure 8).

2.3 Annual Pre-recruit Index

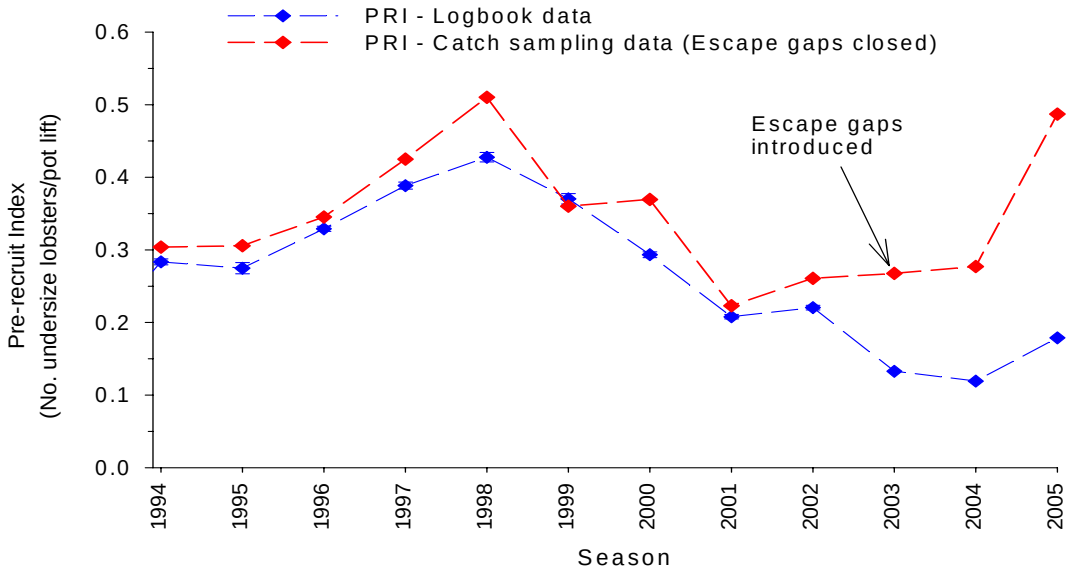

Figure 9 Inter-annual trends in pre-recruit index (PRI) in the NZRLF from 1994 to 2005 based on both logbook and catch sampling data.

The introduction of escape gaps in the fishery has affected pre-recruit estimates in recent seasons and as a result, estimates of PRI are now reliant on catch sampling data (where escape gaps are closed; Figure 9). PRI as calculated from catch sampling data suggests that the PRI has increased over the last three seasons. In 2005, it increased further to 0.49 undersized/potlift, which is the second highest estimate on record. Notably, PRI as calculated using logbook data also increased in 2005 to 0.17 undersized/potlift.

2.4 Levels of catch sampling participation

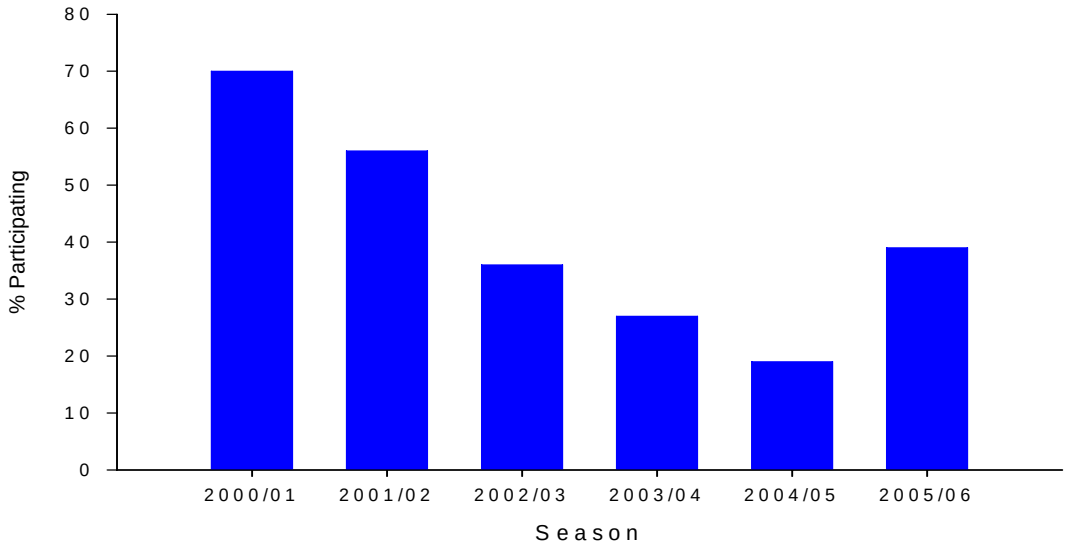

Figure 10 Percentage of licence holders participating in the voluntary catch sampling program over the last 6 seasons.

The percentage of licence holders participating in the voluntary catch sampling program more than doubled in 2005 and currently stands at 40% (Figure 10).

2.5 Sex Ratio

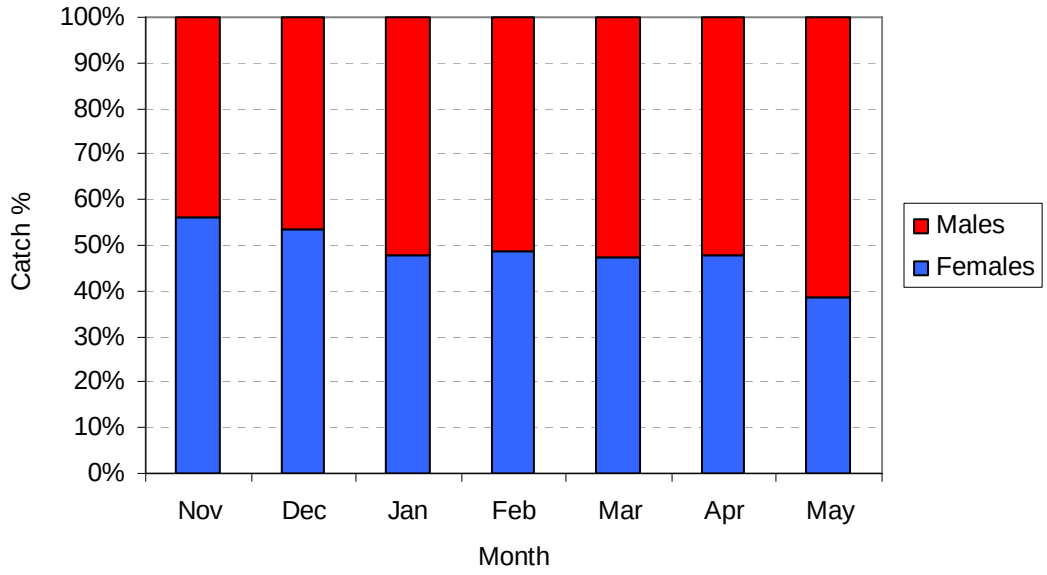

Figure 11 Within season trends in sex ratio during the NZRLF 2005 season.

The proportion of females in the catch during 2005 was lowest in May (39%) and highest in November (56%) (Figure 11).

2.5.1 Reproductive condition of females

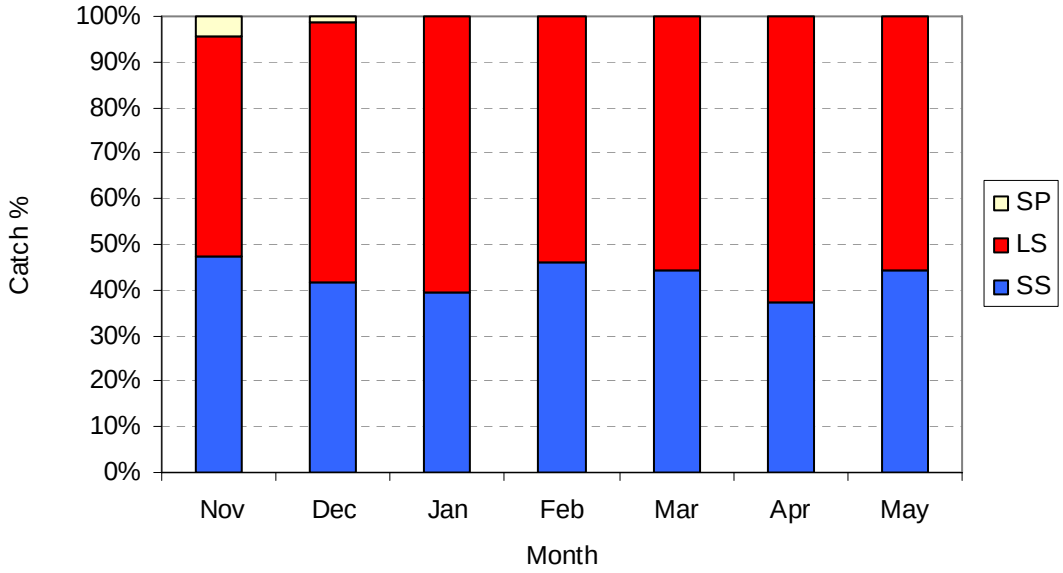

Figure 12 Within season trends in reproductive condition of females during the NZRLF 2005 season. SP = Spawning (ovigerous); LS = Long Setae (sexually mature); SS = Short Setae (sexually immature).

In November, 4.3% of the female catch was represented by spawning (ovigerous) females (Figure 12). This declined to 1.2% in December. No spawning females were observed from January to May during which sexually mature non-ovigerous females represented between 54-63% of the catch.

3.1 qR Biomass

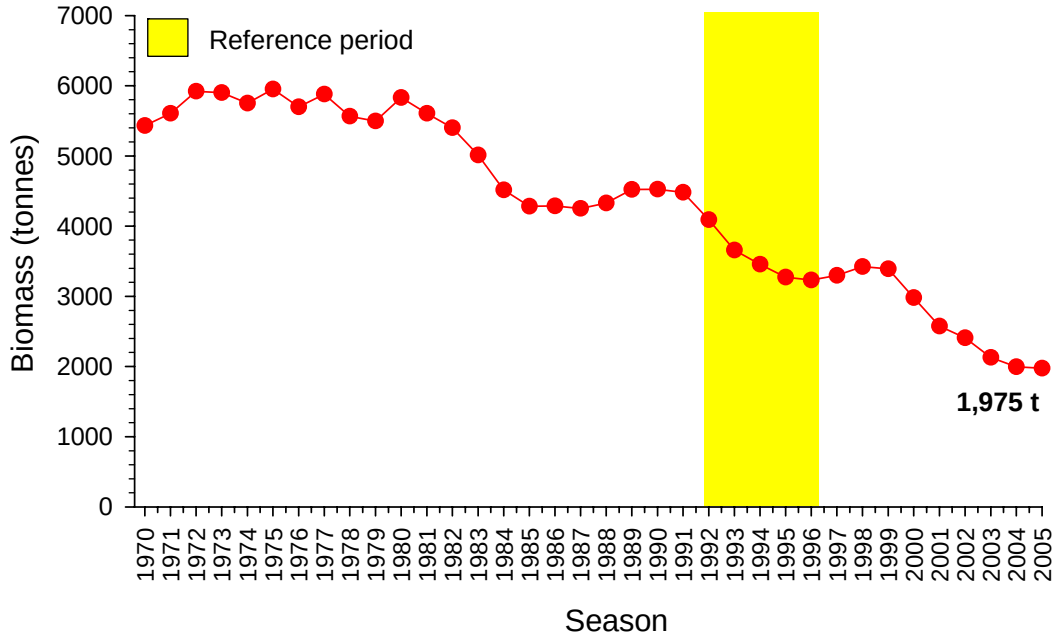

Figure 13 Estimates of biomass for the NZRLF as provided by the 2005 qR model.

Biomass in the NZRLF has been decreasing since 1998 (Figure 13). In 2005, it was 1,975 tonnes, the lowest in the history of the fishery.

3.2 qR Egg Production

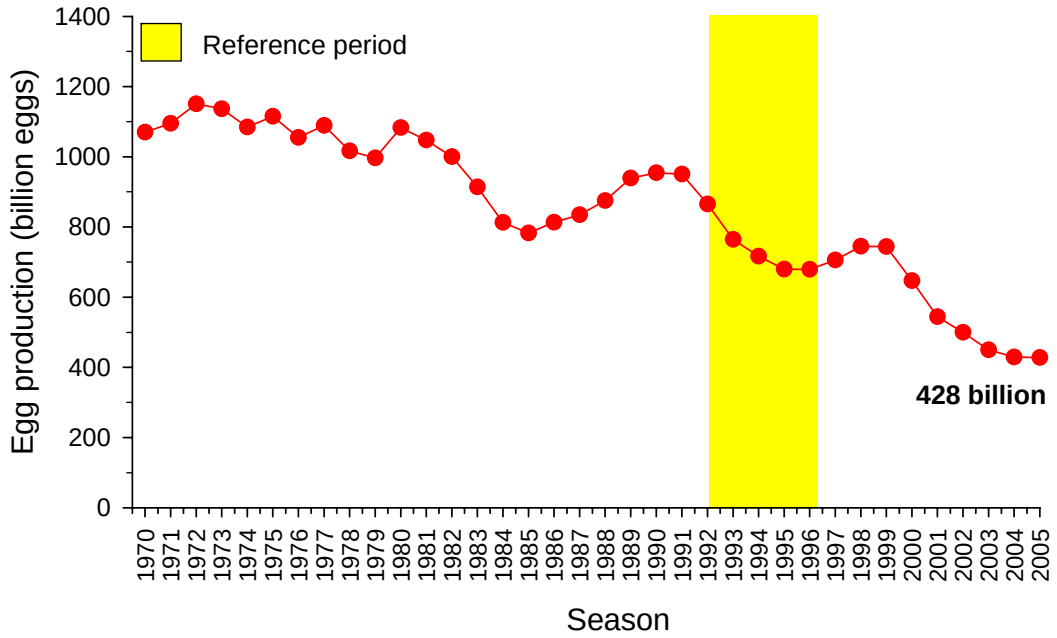

Figure 14 Estimates of egg production for the NZRLF as provided by the 2005 qR model.

Egg production in the NZRLF has been decreasing since 1999. In 2005, it was 428 billion eggs, the lowest in the history of the fishery (Figure 14).

3.3 Percent of virgin egg production

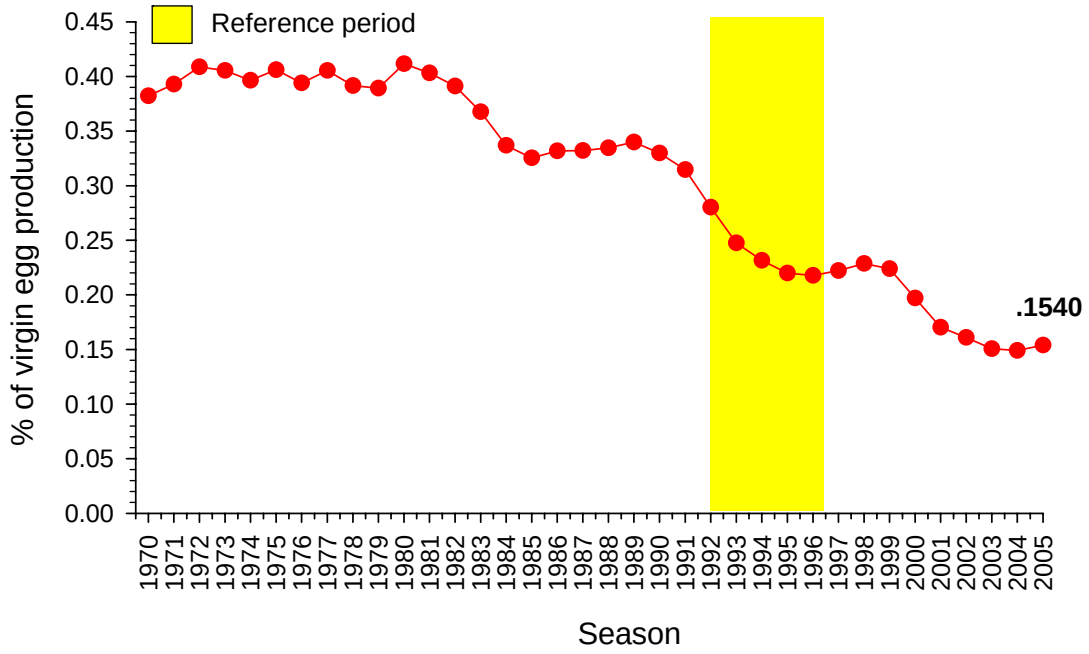

Figure 15 Estimates of % of virgin egg production for the NZRLF as provided by the 2005 qR model

Model outputs for the 2005 season predict that current egg production in the NZRLF equates to 15.40% of virgin egg production (Figure 15).

3.4 Exploitation Rate

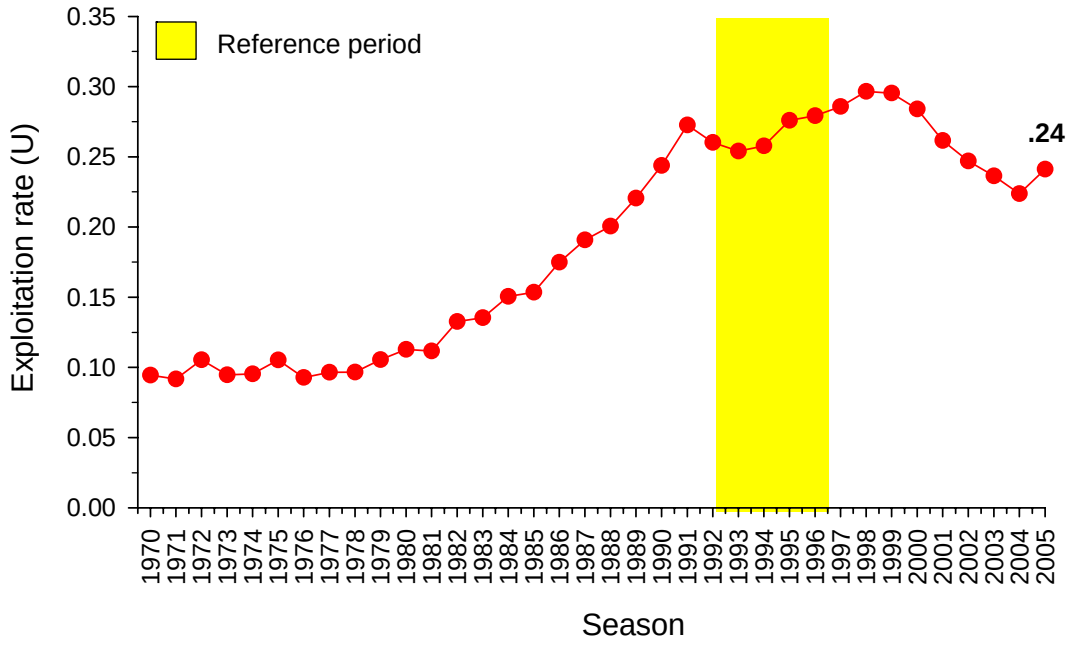

Figure 16 Estimates of exploitation rate for the NZRLF as provided by the 2005 qR model.

Exploitation rate in the NZRLF has been declining since 1998 (Figure 16). However, in 2005, the exploitation rate increased to 24%.

3.5 Recruitment

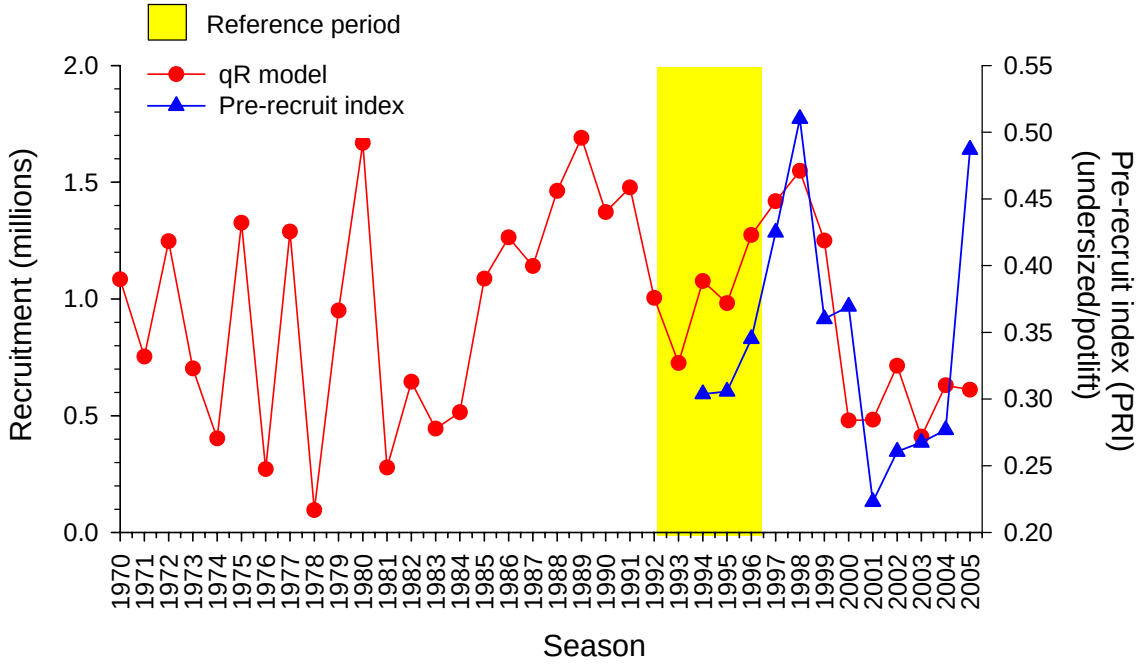

Figure 17 Estimates of recruitment for the NZRLF as provided by the 2005 qR model.

Recruitment, as calculated from the qR model, has been generally declining since 1998. Model recruitment outputs are generally in line with estimates of pre-recruit index, except for 2005, where the increase in PRI was not reflected in a comparable increase in qR recruitment (Figure 17).

4 BIOLOGICAL PERFORMANCE INDICATORS

Table 2 Biological performance indicators for the NZRLF and current status levels for the 2005 season. Figures in red indicate performance indicators that have been negatively triggered.

INDICATOR	2005/06	Lower	Upper
Exploitation Rate	0.2412	0.2178	0.2803
Egg Production (billions)	428.2	679.1	865.4
Pre-recruit index (Catch Sampling)	0.49	0.30	0.34
Catch rate (kg/potlift)	0.81	1.25	1.43
Biomass	1,975	3,232	4,089
Mean size (kg)	1.09	1.06	1.13

The historical data from 1992 through 1996 have been used to define the range of the biological performance indicators (Zacharin 1997). In the 2005 season, three of the six performance indicators for the NZRLF i.e. biomass, egg production and catch rate were negatively outside the reference range as defined in the Fishery Management Plan (Table 2).

5 SUMMARY

Based on the biological performance indicators, the status of the NZRLF remains at the lowest level in the history of the fishery. Despite this, the report identifies some positives signs for the fishery, specifically the observed increase in pre-recruit index in 2005. Future assessments will determine if this translates to strong recruitment to the fishery during the 2006/07 and 2007/08 seasons. A more detailed analysis of the status of the NZRLF will be presented in the NZRLF 2005/06 Stock Assessment Report due for completion in May 2007.

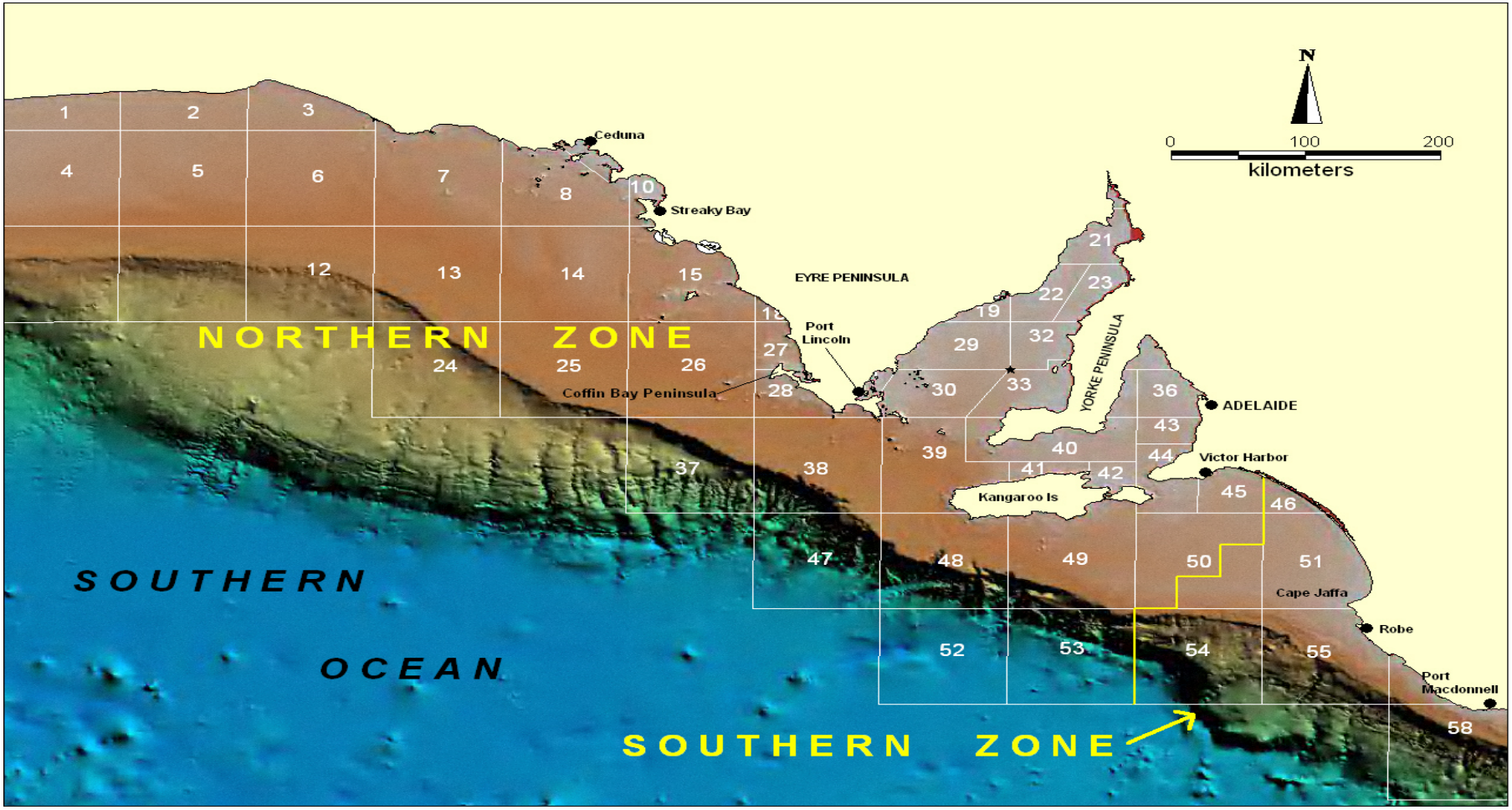

Figure 18 Northern and Southern Zones and Marine Fishing Areas in the South Australian Rock Lobster Fishery.