Status Report
to PIRSA Fisheries

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

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5 SUMMARY .......................................... 15
In 2006 (i.e. the 2006/07 season), the TACC in the NZRLF was 520 tonnes. The total reported commercial catch from logbook data was 491.5 tonnes, an increase of 3.2% from 2005 (476.4 tonnes). Effort in 2006 was 569,896 potlifts a decrease of 2.6% from 2005 (585,389 potlifts). In 2006, catch was highest in January (95.6 tonnes) and lowest in May (11.9 tonnes). The trends in effort reflected catch levels by month.

In 2006, approximately 80% (395 tonnes) of the catch was taken in Regions B and D of the fishery. Over the last three seasons, catch in Region B has increased from 115.6 tonnes in 2004 to 218.7 tonnes in 2006. Catch in all other Regions has remained relatively stable or marginally decreased.

Over the period 1999 to 2004, the standardised zonal CPUE (November-April inclusive) in the NZRLF decreased, reaching 0.82 kg/potlift in 2004, the lowest on record. However, over the last two seasons, CPUE has increased and in 2006 was 0.88 kg/potlift. Regional trends in CPUE generally reflect those at a zonal level and in 2006 estimates were 1.03, 0.95, 0.76 and 0.84 kg/potlift in Regions A, B, C and D respectively.

Standardised pre-recruit index (PRI) (November-March inclusive) as calculated from voluntary catch sampling increased between 2001 and 2005 with the estimate for 2005 (0.49 undersized/potlift) being one of the highest on record. In 2006, PRI decreased to 0.37 undersized/potlift, which is likely to reflect the low puerulus settlement, observed in 2003 and 2004 in the NZRLF. Regional trends in PRI generally reflect those at a zonal level and in 2006 estimates were 0.008, 0.19, 0.27 and 0.60 undersized/potlift in Regions A, B, C and D respectively.

Biomass, as determined by the qR model, has been decreasing since 1999. In 2006, it increased marginally and was estimated to be 2,086 tonnes.

Egg production in the NZRLF has been decreasing since 1999. In line with biomass, it increased in 2006 and was estimated to be 241 billion eggs. Current egg production in the NZRLF equates to 17.53% of virgin.

Exploitation rate in the NZRLF has been declining since 1998. Over the last two seasons it has marginally increased and in 2006 was estimated to be 23%.

While the status of the NZRLF is currently at a historically low level, this report identifies some positives signs for the resource. Namely, catch and catch rate increased for the second consecutive season in 2006, which is likely to reflect the high puerulus settlement observed in 2002. However, as settlement in 2003 and 2004 was poor, recruitment into the fishable biomass in 2007 and 2008 may be reduced. Future assessments will determine if the current TACC can maintain the fishery through periods of low recruitment, particularly during the rebuilding of the fishery.
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 NZRLF from 1970 to 2006.

Catch in the NZRLF decreased from 1,015.8 tonnes in 1998 (i.e. the 1998/99 season) to 446.1 tonnes in 2004 (Figure 1). In 2005, the catch increased for the first time since 1998 to 476.4 tonnes. In 2006, catch increased further to 491.5 tonnes (a 3.2% increase from 2005). Effort in 2006 was 569,896 potlifts, a decrease of 2.6% from 2005 (585,389 potlifts).

2.1.2 Within season trends

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

In 2006, the highest catch was taken in February (95.6 tonnes) with the lowest catch in May (11.9 tonnes) (Figure 2). The trend in effort reflected catch levels by month.
2.1.3 Regional catch and effort

Long term regional trends in catch and effort indicate that the majority of the catch in the NZRLF is taken from Regions B and D (Figure 3 and Figure 4; refer to Figure 22). Catch generally decreased in all regions from 1998 to 2006 with the exception of Region B where catch has increased from 115.6 tonnes in 2004 to 218.7 tonnes in 2006. In 2006, catch in Regions A, C, and D was 20.1, 76.2 and 176.3 tonnes respectively. Trends in effort generally reflected those in catch.

**Figure 3** Regional catch and effort in the NZRLF from 1970 to 2006 (refer to Figure 22).

**Figure 4** Percentage of total catch from each sub-region in the NZRLF in 2006 (refer to Figure 22).
2.1.4 Standardised zonal CPUE

![Graph showing inter-annual trends in zonal CPUE in the NZRLF between 1970 and 2006.]

**Figure 5** Inter-annual trends in zonal CPUE in the NZRLF between 1970 and 2006.

Over the period 1999 to 2004, the standardised zonal CPUE (November-April inclusive) in the NZRLF has decreased, reaching 0.82 kg/potlift in 2004, the lowest on record. Since then, the CPUE has marginally increased and in 2006 was 0.88 kg/potlift (Figure 5).

2.1.5 Within season trends

![Graph showing within season trends in CPUE in the NZRLF in 2006.]

**Figure 6** Within season trends in CPUE in the NZRLF in 2006.

In 2006, CPUE in the NZRLF increased from November (0.82 kg/potlift) to February (1 kg/potlift) before decreasing to a season low of 0.52 kg/potlift in May.
2.1.6 Standardised regional CPUE

Figure 7 Inter-annual trends in regional CPUE in the NZRLF between 1970 and 2006.

Regional trends in standardised CPUE (November-April inclusive) (Figure 7 and refer to Figure 22) broadly reflect those of zonal catch rate (Figure 5). CPUE has generally decreased in all major regions over the period 1999 to 2005 before marginally increasing in 2006. Estimates of CPUE in 2006 were 1.03, 0.95, 0.76 and 0.84 kg/potlift in Regions A, B, C and D respectively.
2.1.7 Annual mean weight

![Graph of mean lobster weight](image)

**Figure 8** Inter-annual trends in mean lobster weight in the NZRLF from 1983 to 2006.

With the exception of 2005, mean weight in the NZRLF has decreased over the last 5 seasons (Figure 8). In 2006, it was 1.00 kg, which is one of the lowest estimates on record.

2.2 Puerulus Settlement Index

![Graph of puerulus settlement index](image)

**Figure 9** Puerulus settlement Index (PSI) in the NZRLF from 1996 to 2006.

The highest PSI on record since monitoring began was observed in 2002 (Figure 9). Thereafter, settlement in 2003 and 2004 was poor before higher than average estimates were again recorded in 2004 and 2005. In the NZRLF, the estimated period between puerulus settlement and recruitment into the fishable biomass is 4 years.
2.3 Pre-recruit index

2.3.1 Zonal pre-recruit index

![Graph showing inter-annual trends in pre-recruit index (PRI) in the NZRLF from 1994 to 2006 based on voluntary catch sampling data.](image)

**Figure 10** Inter-annual trends in pre-recruit index (PRI) in the NZRLF from 1994 to 2006 based on voluntary catch sampling data.

Standardised PRI (November-March inclusive) as calculated from voluntary catch sampling indicates that PRI increased from 2001 to 2005 (Figure 10) with the estimate for 2005 (0.49 undersized/potlift) being one of the highest on record. In 2006, PRI decreased to 0.37 undersized/potlift.

2.3.2 Within season trends

![Graph showing within season trends in monthly PRI in the NZRLF in 2006](image)

**Figure 11** Within season trends in monthly PRI in the NZRLF in 2006

In 2006, PRI was highest in November at 0.65 undersized/potlift and lowest in May at 0.14 undersized/potlift (Figure 11).
2.3.3 Regional pre-recruit index

Figure 12 Interannual trends in regional PRI in the NZRLF from 1994 to 2006.

Regional trends in standardised PRI (November-March inclusive) (Figure 12 and refer to Figure 22) broadly reflect those of zonal PRI (Figure 10). PRI decreased in all major regions in 2006. Estimates of PRI in 2006 were 0.008, 0.19, 0.27 and 0.60 undersized/potlift in Regions A, B, C and D respectively. Note that scale of y-axis in Region A differs from other regions.
3 MODEL OUTPUTS

3.1 qR Biomass

Figure 13 Estimates of biomass for the NZRLF as provided by the 2006 qR model.

Biomass in the NZRLF has been decreasing since 1998 (Figure 13). In 2006, it marginally increased for the first time in recent seasons and was estimated to be 2,086 tonnes.

3.2 qR Egg Production

Figure 14 Estimates of egg production for the NZRLF as provided by the 2006 qR model.

Egg production in the NZRLF has been decreasing since 1999 (Figure 14). In line with biomass, it increased in 2006 and was estimated to be 241 billion eggs.
3.3 Percent of virgin egg production

Figure 15 Estimates of % of virgin egg production for the NZRLF as provided by the 2006 qR model

Model outputs for the 2006 season predict that current egg production in the NZRLF equates to 17.53 % of virgin egg production (Figure 15).

3.4 Exploitation Rate

Figure 16 Estimates of exploitation rate for the NZRLF as provided by the 2006 qR model.

Exploitation rate in the NZRLF has been declining since 1998 (Figure 16). Over the last two seasons it has marginally increased and in 2006 was estimated to be 23%.
Recruitment, as calculated from the qR model, has been generally declining since 1998. However, in 2006 recruitment increased and was estimated to ~1 million individuals. 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).

Figure 17 Estimates of recruitment and pre-recruit index (PRI) for the NZRLF as provided by the 2006 qR model.
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 NZRLF (refer to Sloan and Crosthwaite, 2007).

<table>
<thead>
<tr>
<th>Region</th>
<th>Catch rate (kg/potlift)</th>
<th>Pre-recruit index (Pot sampling data)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Target</td>
<td>Limit</td>
</tr>
<tr>
<td>Northern Zone</td>
<td>1.25</td>
<td>1.0</td>
</tr>
<tr>
<td>A</td>
<td>1.4</td>
<td>1.1</td>
</tr>
<tr>
<td>B</td>
<td>1.2</td>
<td>0.9</td>
</tr>
<tr>
<td>C</td>
<td>1.1</td>
<td>0.85</td>
</tr>
<tr>
<td>D</td>
<td>1.25</td>
<td>1.0</td>
</tr>
</tbody>
</table>

4.2 Zonal catch rate

![Figure 18](image)

Figure 18 Zonal limit and target reference points for CPUE in the NZRLF including current estimates from the 2006 season.

In 2006, the zonal estimate of 0.88 kg/potlift was above the limit reference trajectory of 1 kg/potlift over 12 years (Figure 18) as per the new Management Plan for the resource (Sloan and Crosthwaite 2007).
4.3 Regional catch rate

In 2006, regional CPUE estimates were above the target limit trajectories in Regions A and B (Figure 19). However, it should be noted that Region A is not used in the current TACC decision making process as <10% of the total is currently taken in this area. Regional CPUE estimates were below the limit reference trajectories in Regions C and D.

Figure 19 Regional limit and target reference points for CPUE in the NZRLF including current estimates from the 2006 season.
4.4 Zonal pre-recruit indices

In 2006, the 3-year average PRI (2004-2006) was 0.38, which is above the long-term LRP for the NZRLF (Figure 20).

Figure 20 Zonal pre-recruit indices (PRI) (1994-2006) with Limit Reference Point (LRP) and current 3-year average.
4.5 Regional pre-recruit Index

![Regional pre-recruit indices (PRI) (1994-2006) with Limit Reference Points (LRPs) and current 3-year average.](image)

In 2006, the 3-year average PRI (2004-2006) was above the long-term LRP in Region B and below it in Regions C and D (Figure 21).

5 SUMMARY

While the status of the NZRLF is currently at a historically low level, this report identifies some positives signs for the resource. Namely, catch and catch rate increased for the second consecutive season in 2006, which is likely to reflect the high puerulus settlement observed in 2002. However, as settlement in 2003 and 2004 was poor, recruitment into the fishable biomass in 2007 and 2008 may be low. Future assessments will determine if the current TACC can maintain the fishery through these periods of low recruitment. A more detailed analysis of the status of the NZRLF will be presented in the NZRLF 2006/07 Stock Assessment Report due for completion in May 2008.

References
Figure 22 Northern Zone sub-regions and Marine Fishing Areas in the South Australian Rock Lobster Fishery.