

**Status Report
to PIRSA Fisheries**

**Northern Zone
Rock Lobster (*Jasus edwardsii*)
Fishery Status Report 2007/08**

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1 EXECUTIVE SUMMARY

- In 2007 (i.e. the 2007/08 season), the TACC in the NZRLF was 520 tonnes. The total reported commercial catch from logbook data was 459.2 tonnes, a decrease of 6.6% from 2006 (491.5 tonnes). Effort in 2007 was 615,732 potlifts, an increase of 8% from 2006 (569,896 potlifts). In 2007, the highest catch was taken in January (95.0 tonnes) with the lowest catch in May (21.3 tonnes).
- In 2007, catch decreased in all of the major regions (refer to Figure 21) in the NZRLF. This represents the eighth successive season in which catch has decreased in Region D (Kangaroo Island) where approximately 36% of the total catch is taken annually. Notably, in 2007, 8% of the total catch was taken in Region A, compared to only 4% in 2006.
- Over the period 1999 to 2004, the zonal CPUE (November-April inclusive) in the NZRLF decreased, reaching 0.82 kg/potlift. It increased marginally to 0.88 kg/potlift in 2006, likely reflecting recruitment from a spike in puerulus settlement in 2002. However, in 2007, zonal CPUE once again decreased to 0.76 kg/potlift, the lowest in the history of the fishery. CPUE also decreased in all regions within the NZRLF in 2007.
- Pre-recruit index (PRI) 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. However, over the last two seasons, PRI has decreased to 0.29 undersized/potlift, which is likely to reflect the low puerulus settlement in 2003 and 2004. In 2007, PRI also decreased in all major regions of the NZRLF with the exception of Region C (Yorke Peninsula).
- Outputs from the qR fishery model indicate the current biomass in the NZRLF is the lowest in the history of the fishery. In 2007, it was estimated to be 1,865 tonnes. Current egg production is 15.1% of virgin and the exploitation rate is estimated at 24%.
- In summary, the 2007 NZRLF zonal catch of 459.2 tonnes is the second lowest in the history of the fishery representing the fifth consecutive season in which the TACC has not been caught. The 2007 zonal catch rate of 0.76 kg/potlift (Nov-Apr inclusive) is the lowest CPUE on record. The decrease in CPUE was consistent across all months (with the exception of May) and all regions of the 2007 season. The PRI decreased for the second consecutive season in 2007 and is likely to reflect the low puerulus settlement of 2004.
- As per the NZRLF Management Plan, both CPUE and PRI must trigger before a TACC adjustment is made. In 2007, CPUE was below the limit reference point both zonally and regionally and has triggered. PRI has not triggered. However, it is now only above the LRP in one Region (D). It is on the LRP in Region B and below it in Region C.
- Based on the above data, it is clear that the Management Plan objective of biomass rebuilding is not being achieved. The current TACC of 520 tonnes is not constraining catch within the NZRLF. It should also be highlighted that recruitment in 2008 is also expected to be low due to poor settlement in 2003 and 2004.

2 FISHERY STATISTICS

2.1 Catch, effort and CPUE

2.1.1 Zonal catch and effort

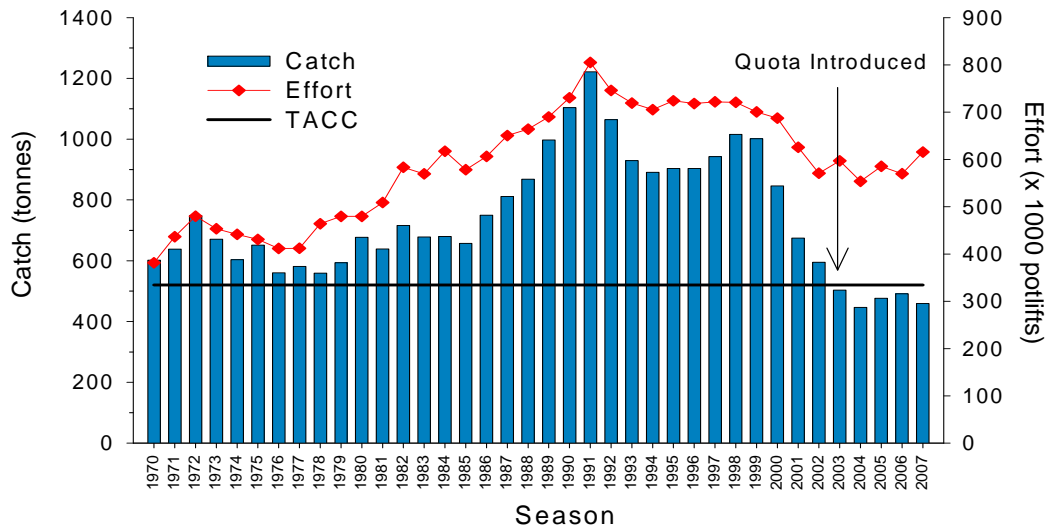


Figure 1 Inter-annual trends in catch and effort in the NZRLF from 1970 to 2007.

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). Over the next two seasons, catch marginally increased reaching 491.5 tonnes in 2006. In 2007, catch once again decreased to 459.2 tonnes representing the fifth consecutive season that the TACC has not been taken. Effort in 2007 was 615,732 potlifts, an increase of 8% from 2006 (569,896 potlifts).

2.1.2 Within season trends

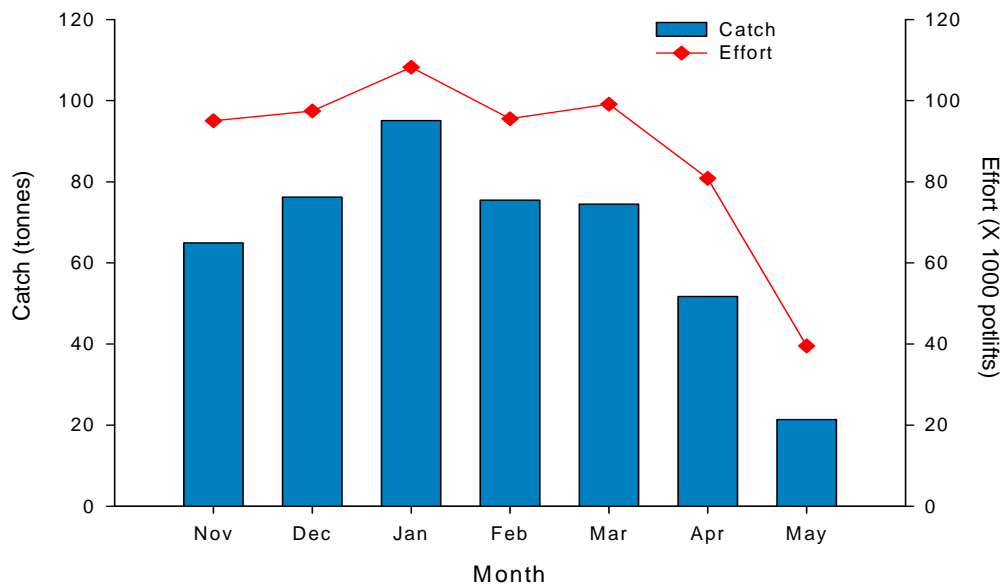


Figure 2 Within season trends in catch and effort in the NZRLF for the 2007 season.

In 2007, the highest catch was taken in January (95.0 tonnes) with the lowest catch in May (21.3 tonnes) (Figure 2). The trends in effort reflected catch levels by month.

2.1.3 Regional catch and effort

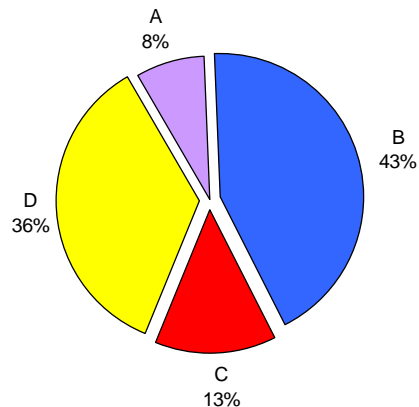


Figure 3 Percentage of total catch from Regions A-D in the NZRLF in 2007 (see Figure 21).

In 2007, 43% of the 459.2 tonne total catch came from Region B with 36% and 13% coming from Regions D and C respectively (Figure 3). These proportions are similar to those from the 2006 season. However, the 8% of total catch from Region A in 2007 represents a noticeable increase from 2006 when only 4% was taken from this region.

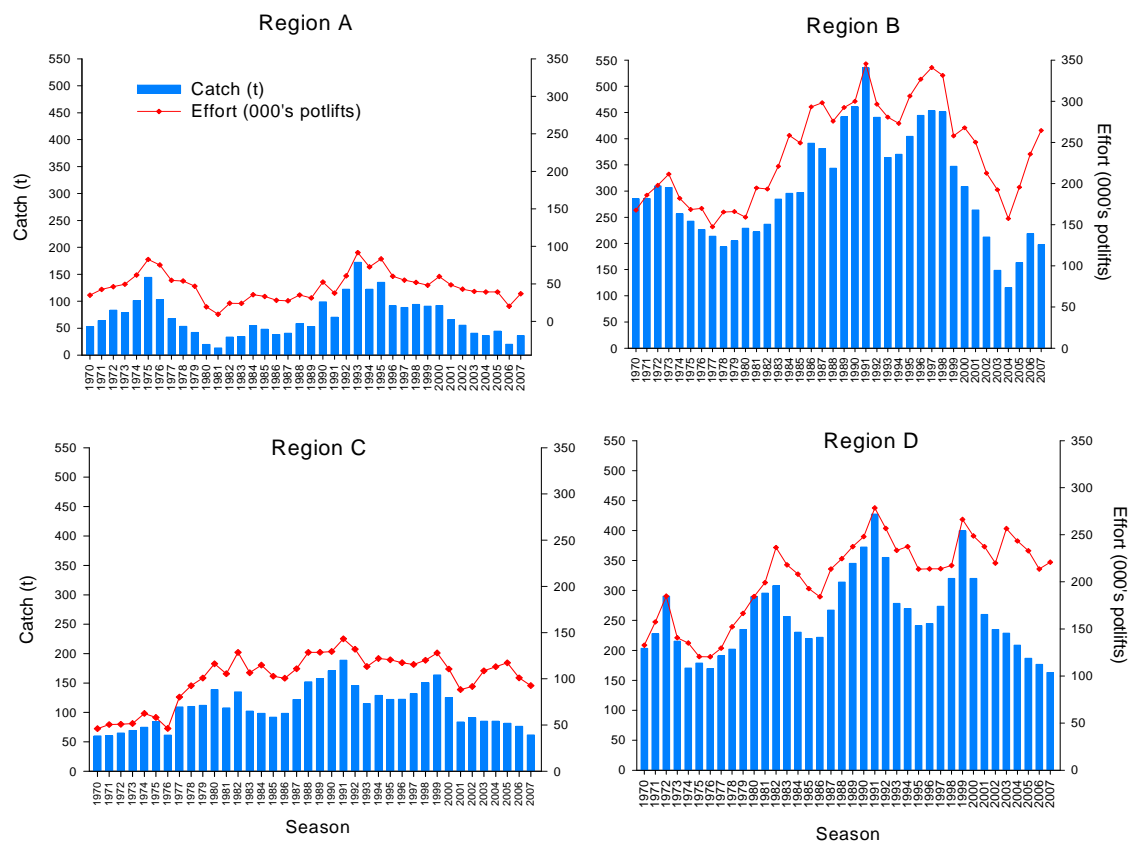


Figure 4. Inter-annual trends in catch and effort in the four Regions of the NZRLF for the fishing seasons between 1970 and 2007 (refer to Figure 21).

Catch generally decreased in all regions from 1998 to 2007 with the exception of Region B where it increased from 115.6 tonnes in 2004 to 218.7 tonnes in 2006 in line with increasing effort (Figure 4). In 2007, however, catch in Region B decreased to 197.6 tonnes despite a continuing increase in effort. Similarly in Region D, catch decreased from 176.6 tonnes in 2006 to 162.9 tonnes in 2007 but with a reported effort increase. In 2007, catch in Regions A and C were 36.0 and 61.8 tonnes respectively.

2.1.4 Zonal CPUE

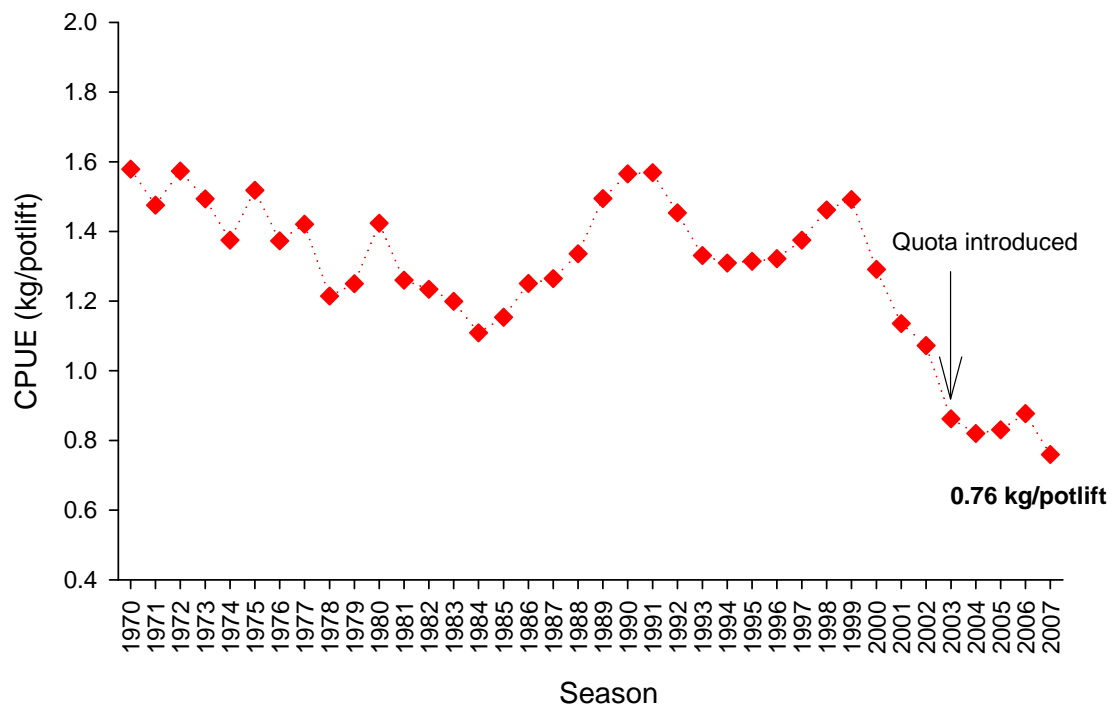


Figure 5 Inter-annual trends in zonal CPUE in the NZRLF between 1970 and 2007.

Over the period 1999 to 2004, the zonal CPUE (November-April inclusive) in the NZRLF has decreased, reaching 0.82 kg/potlift in 2004 (Figure 5). Over the next two seasons CPUE marginally increased to 0.88 kg/potlift in 2006. However, in 2007 CPUE once again decreased to 0.76 kg/potlift, the lowest estimate on record

2.1.5 Within season trends in CPUE

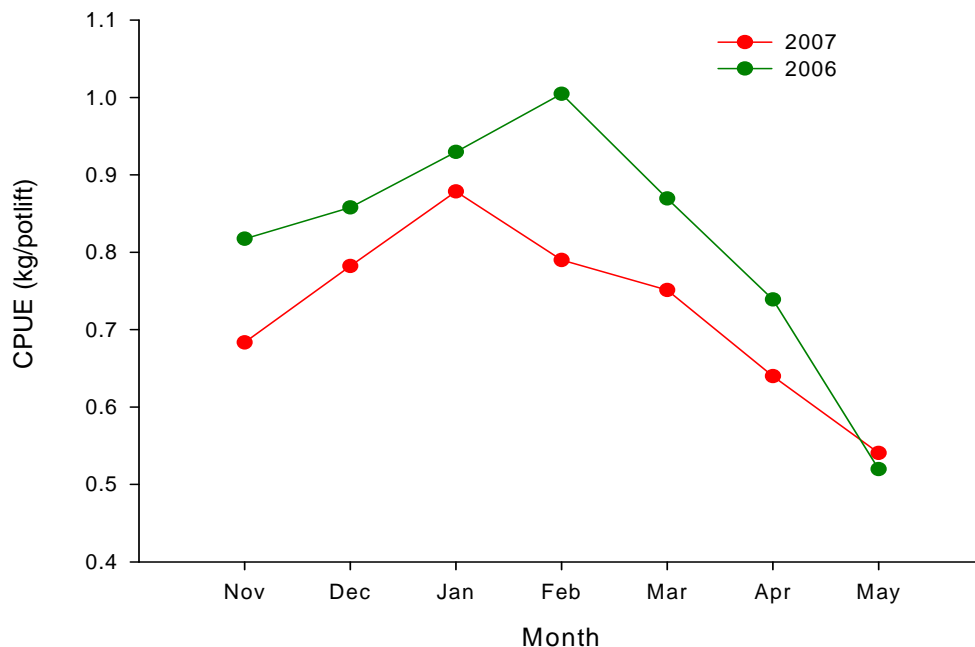


Figure 6 Within season trends in CPUE in the NZRLF in 2006 and 2007.

With the exception of May, CPUE was lower across all months of the 2007 season compared to 2006 (Figure 6). The largest difference was observed in February where 1.00 kg/potlift was observed in 2006 compared to 0.78 kg/potlift in 2007.

2.1.6 Regional CPUE

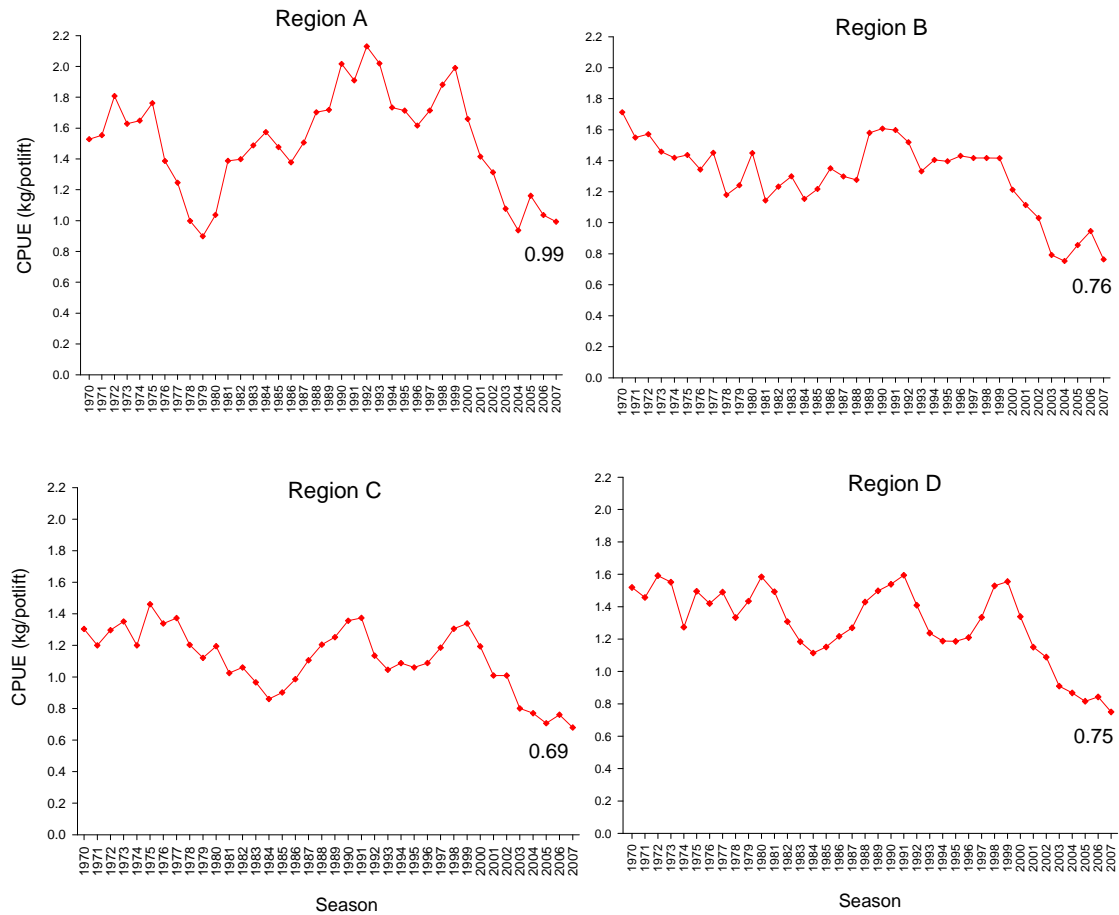


Figure 7 Inter-annual trends in regional CPUE in the NZRLF between 1970 and 2007.

Regional trends in CPUE (November-April inclusive) (Figure 7 and refer to Figure 21) broadly reflect those of zonal catch rate (Figure 5). CPUE generally decreased in all major regions over the period 1999 to 2005 before marginally increasing in 2006. However, in 2007 CPUE once again decreased in all regions within the fishery with estimates of 0.99, 0.76, 0.69 and 0.75 kg/potlift in Regions A, B, C and D respectively.

2.1.7 Annual mean weight

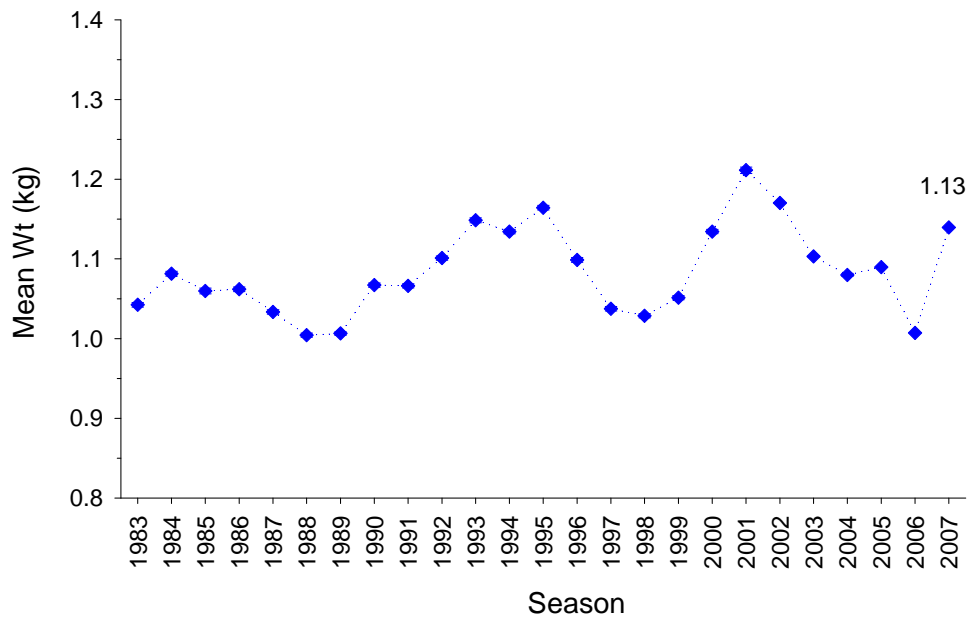


Figure 8 Inter-annual trends in mean lobster weight in the NZRLF from 1983 to 2007.

With the exception of 2005, mean weight in the NZRLF decreased over the period 2001 to 2006 (Figure 8). However, in 2007, mean weight increased to 1.13 kg, the highest on record since 2002.

2.1.8 Average number of days fished

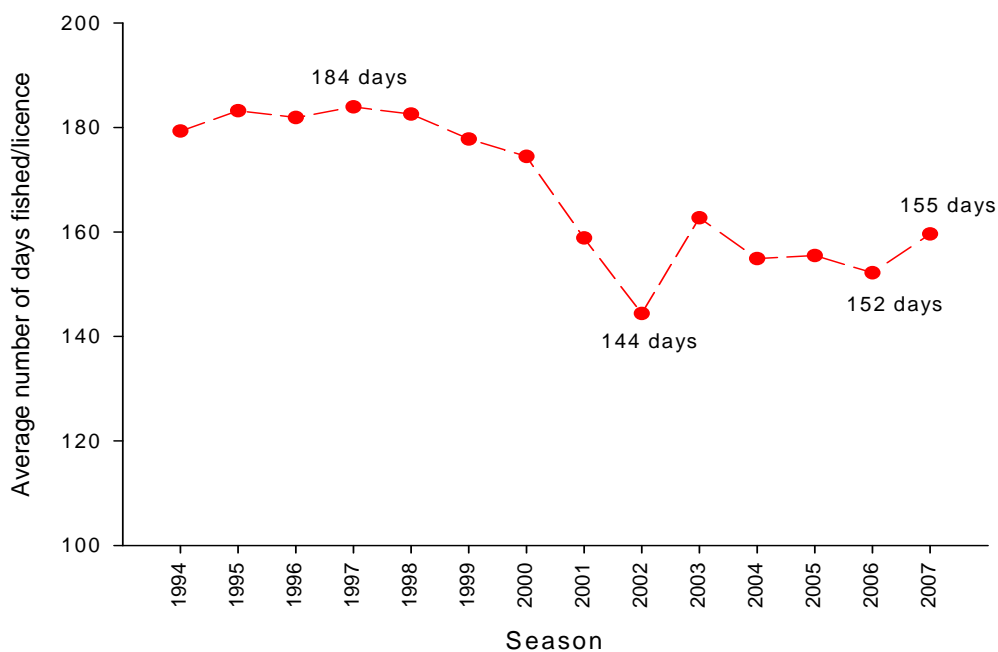


Figure 9 Average numbers of days fished per licence from 1994 to 2007 in the NZRLF.

The average numbers of days fished per licence holder decreased from 184 days in 1997 to 144 days in 2002. This decrease reflects direct limitations on the number of fishable days prior to the introduction of quota. Since the introduction of quota in 2003, the number of days fished has not been limited and has generally increased. In 2007, it was 155 days/licence holder.

2.2 Puerulus settlement index

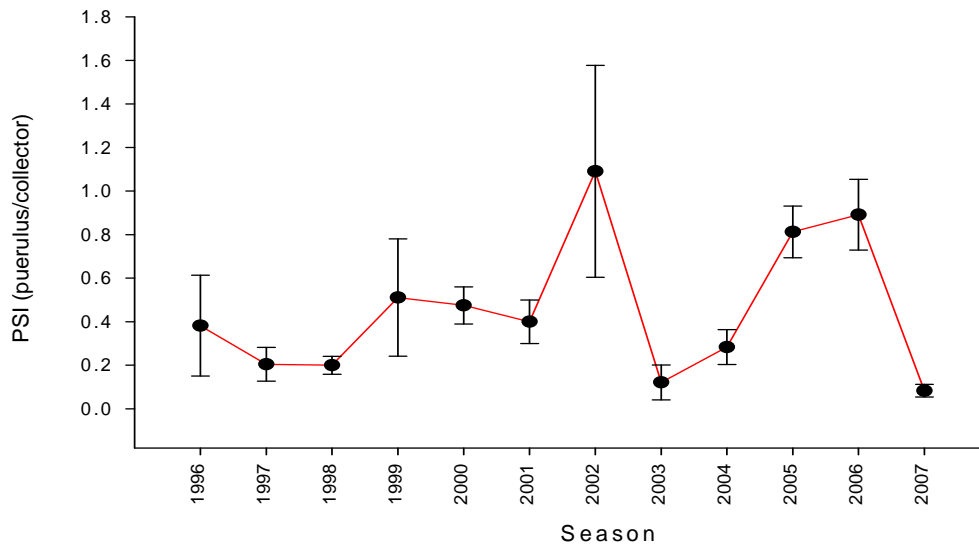


Figure 10 Puerulus settlement Index (PSI) (+/-SE) in the NZRLF from 1996 to 2007.

The highest PSI on record was observed in 2002 (Figure 10). Thereafter, settlement in 2003 and 2004 was poor before higher than average estimates were again recorded in 2005 and 2006. In 2007, the PSI was 0.08 puerulus/collector, the lowest on record since monitoring began. In the NZRLF, the estimated period between settlement and recruitment is 4 years. As a result, recruitment into the fishable biomass in 2008 is expected to be poor, due to low settlement in 2004.

2.3 Pre-recruit index

2.3.1 Zonal pre-recruit index

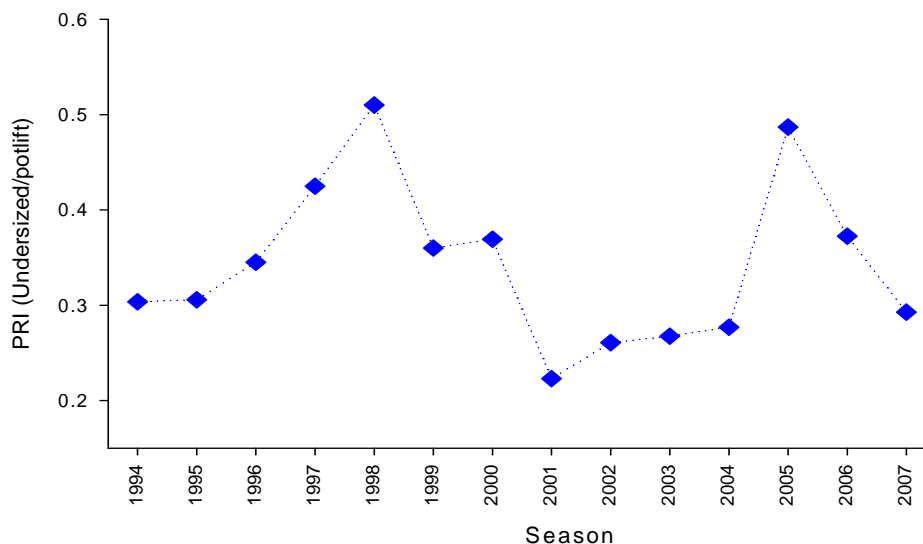


Figure 11 Inter-annual trends in pre-recruit index (PRI) in the NZRLF from 1994 to 2007 based on voluntary catch sampling data.

Based on estimates from voluntary catch sampling (November-March inclusive), PRI increased from 2001 to 2005 (Figure 11) with the estimate for 2005 (0.49 undersized/potlift) being one of the highest on record. However, over the next two seasons, PRI has decreased and in 2007 was estimated to be 0.29 undersized/potlift.

2.3.2 Regional pre-recruit index

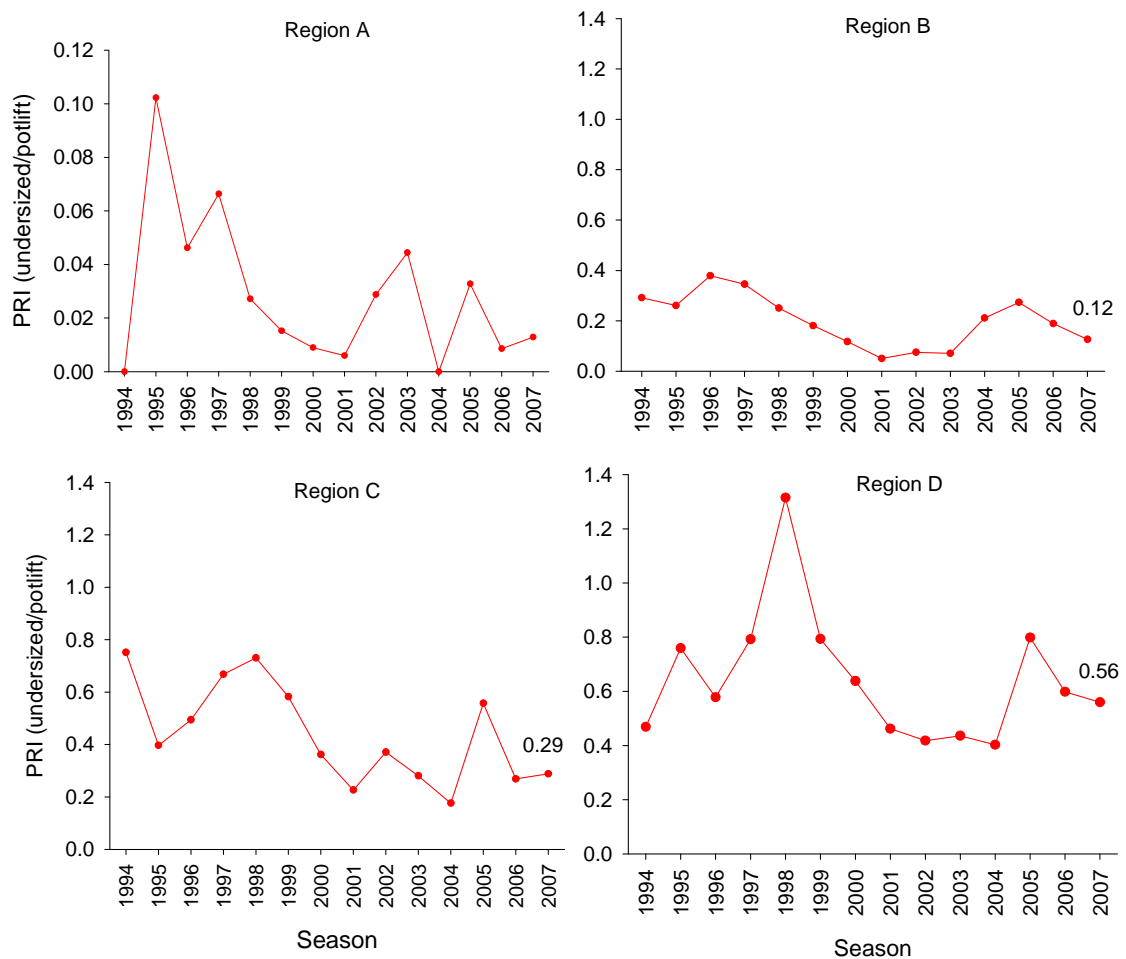


Figure 12 Interannual trends in regional PRI in the NZRLF from 1994 to 2007.

In 2007, regional trends in PRI (November-March inclusive) (Figure 12 and refer to Figure 21) broadly reflected those of zonal PRI (Figure 11). While there was a marginal increase in PRI in Region C, 2007 represented the second consecutive season that PRI decreased in regions B and D. Estimates for 2007 were 0.01, 0.12, 0.29 and 0.56 undersized/potlift in Regions A, B, C and D respectively. Note that scale of y-axis in Region A differs from other regions. The decrease in PRI correlates with the relatively low puerulus settlement observed in 2004.

3 MODEL OUTPUTS

3.1 Biomass

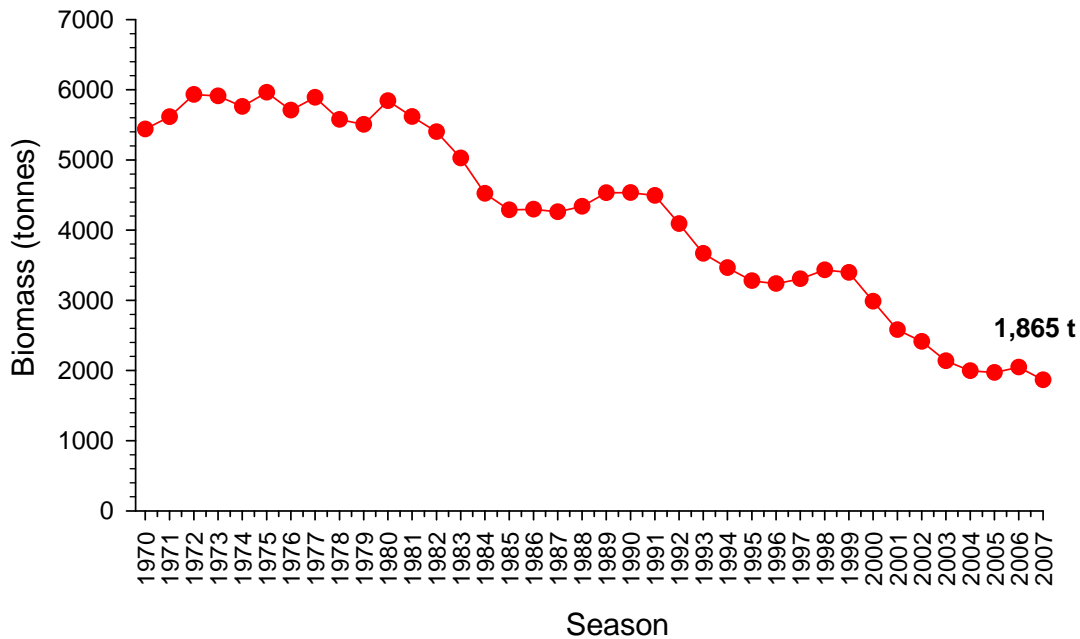


Figure 13 Estimates of biomass for the NZRLF as obtained from the qR fishery model.

Biomass in the NZRLF has been decreasing since 1998 (Figure 13). In 2006, it marginally increased for the first time in recent seasons, likely reflecting the spike in puerulus settlement observed in 2002. However, in 2007, biomass once again decreased and is currently estimated to be 1,865 tonnes.

3.2 Egg Production

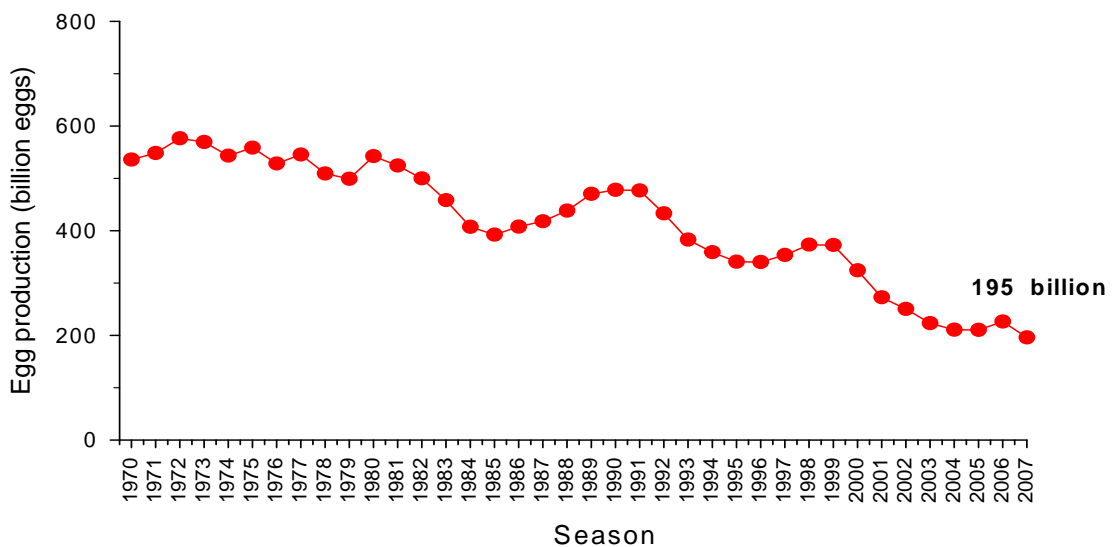


Figure 14 Estimates of egg production for the NZRLF as obtained from the qR fishery model.

Egg production in the NZRLF has been decreasing since 1999 (Figure 14). In line with biomass, it marginally increased in 2006 but once again decreased to an estimated 195 billion eggs in 2007.

3.3 Percent of virgin egg production

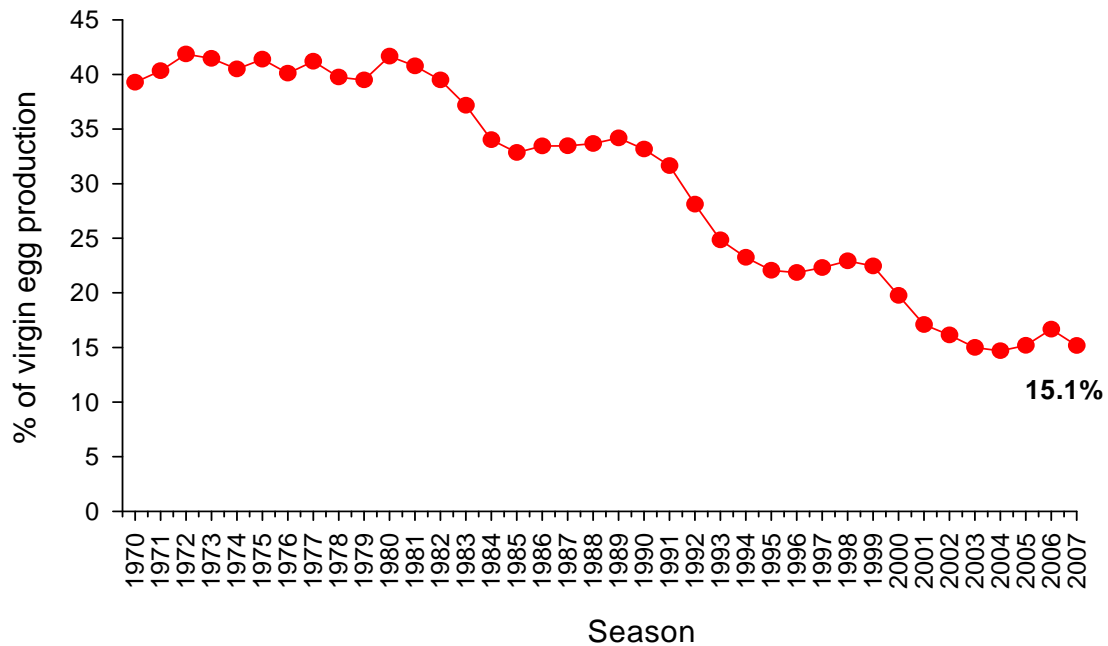


Figure 15 Estimates of % of virgin egg production for the NZRLF as obtained from the qR fishery model.

Model outputs for the 2007 season predict that current egg production in the NZRLF equates to 15.1 % of virgin egg production (Figure 15).

3.4 Exploitation Rate

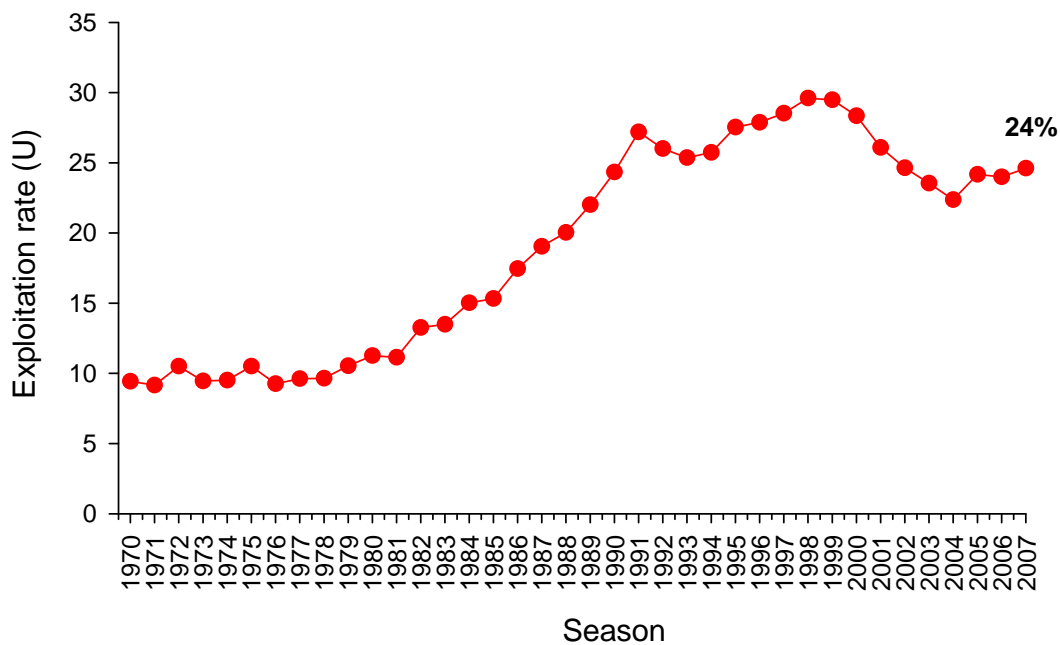


Figure 16 Estimates of exploitation rate in the NZRLF as obtained from the qR fishery model.

Exploitation rate in the NZRLF has been declining since 1998 (Figure 16). Over the last two seasons it has marginally increased and in 2007 was estimated to be 24%.

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).

Region	Catch rate (kg/potlift)		Pre-recruit index (Pot sampling data)
	Target	Limit	Limit
Northern Zone	1.25	1.0	0.33
A	1.4	1.1	0.03
B	1.2	0.9	0.19
C	1.1	0.85	0.42
D	1.25	1.0	0.61

4.2 Zonal catch rate

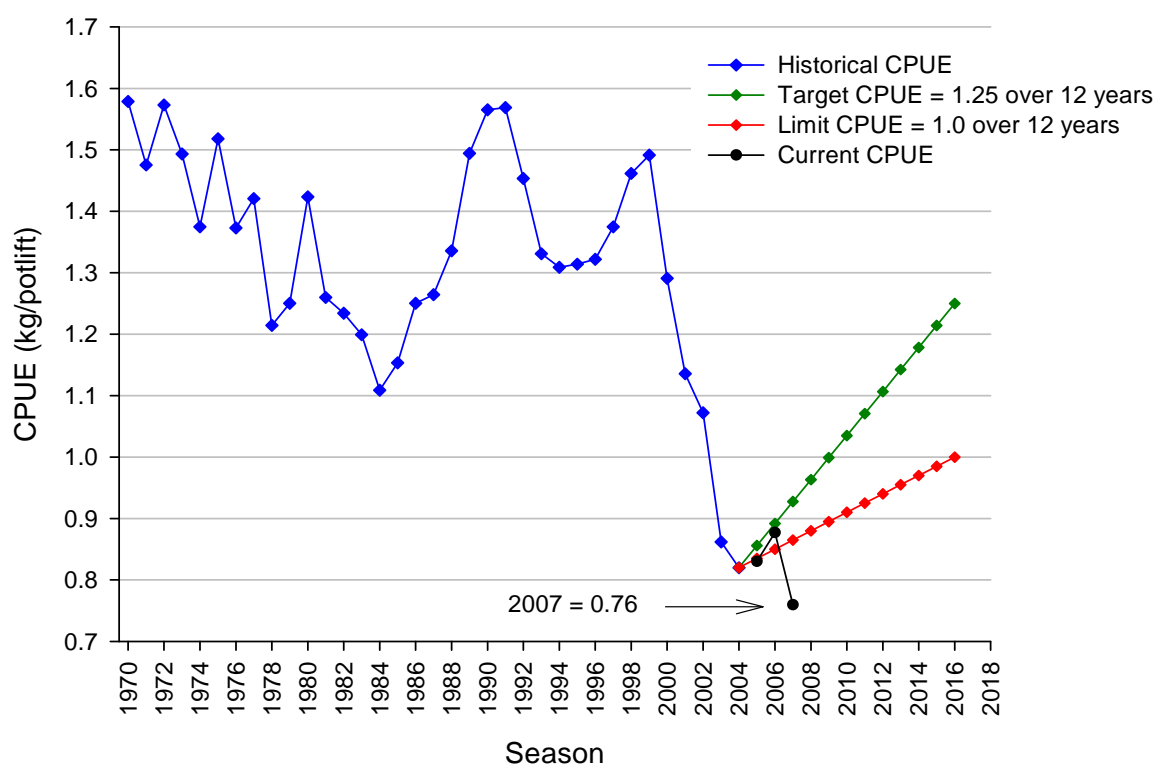


Figure 17 Zonal limit and target reference points for CPUE in the NZRLF including current estimates from the 2007 season.

In 2007, the zonal estimate of 0.76 kg/potlift was below the limit reference trajectory of 1.00 kg/potlift over 12 years (Figure 17) as per the Management Plan for the resource (Sloan and Crosthwaite 2007).

4.3 Regional catch rate

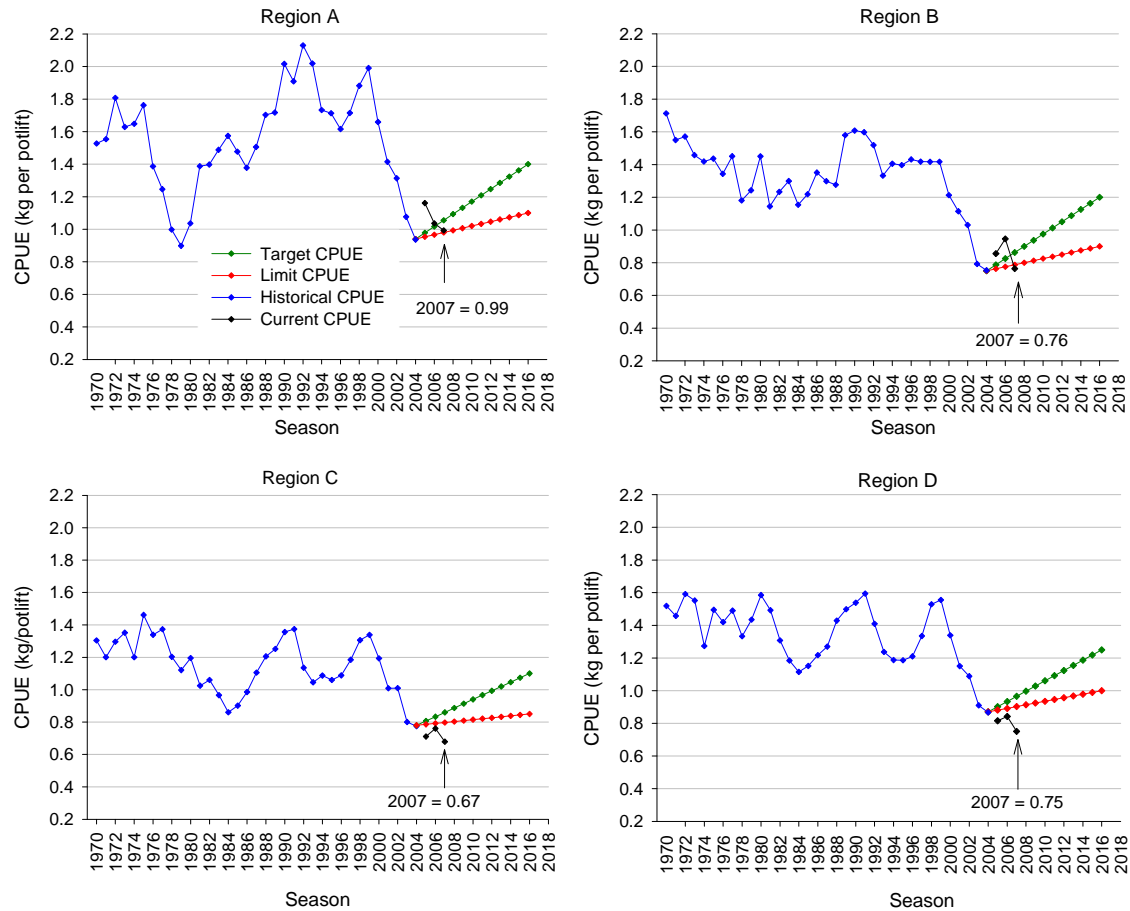


Figure 18 Regional limit and target reference points for CPUE in the NZRLF including current estimates from the 2007 season.

In 2007, regional CPUE estimates were below the limit reference trajectories in all of the major regions of the NZRLF (Figure 18). The CPUE estimate was above the target limit trajectory in Region A. However, it should be noted that Region A is not used in the current TACC decision making process as <10% of the total catch is currently taken in this area.

4.4 Zonal pre-recruit indices

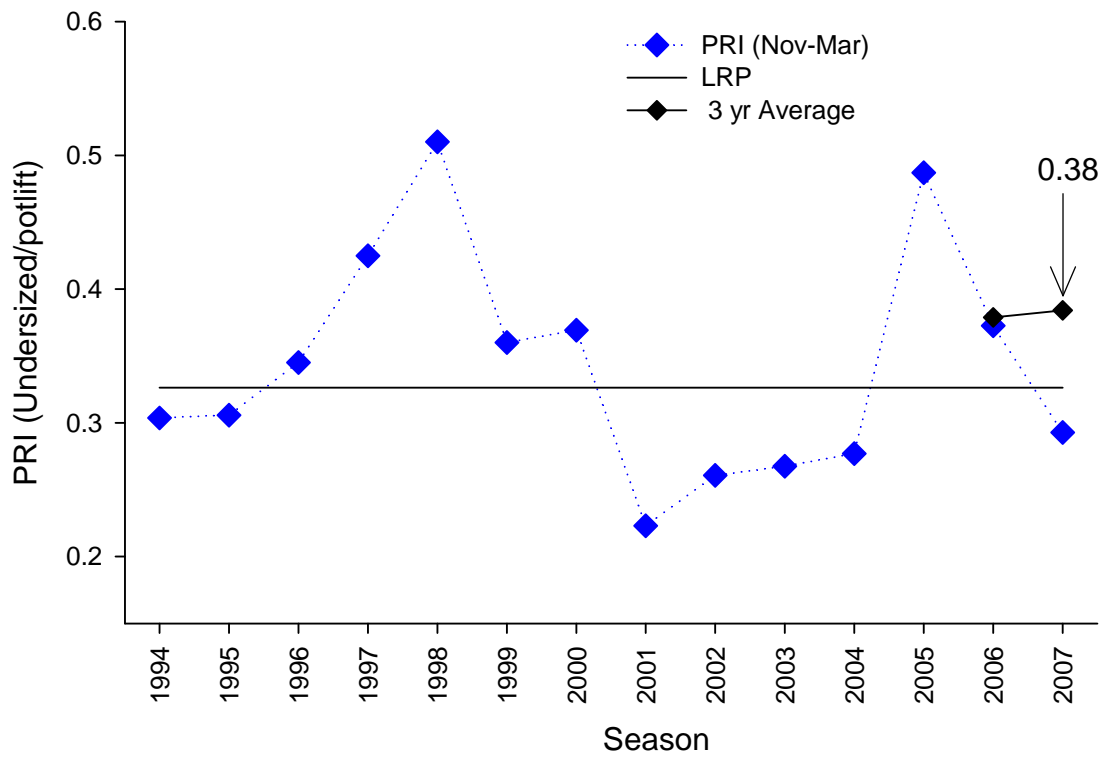


Figure 19 Zonal pre-recruit indices (PRI) (1994-2007) with Limit Reference Point (LRP) and current 3-year average.

In 2007, the zonal 3-year average PRI (2005-2007) was 0.38, which is above the long-term LRP for the NZRLF (Figure 19).

4.5 Regional pre-recruit Index

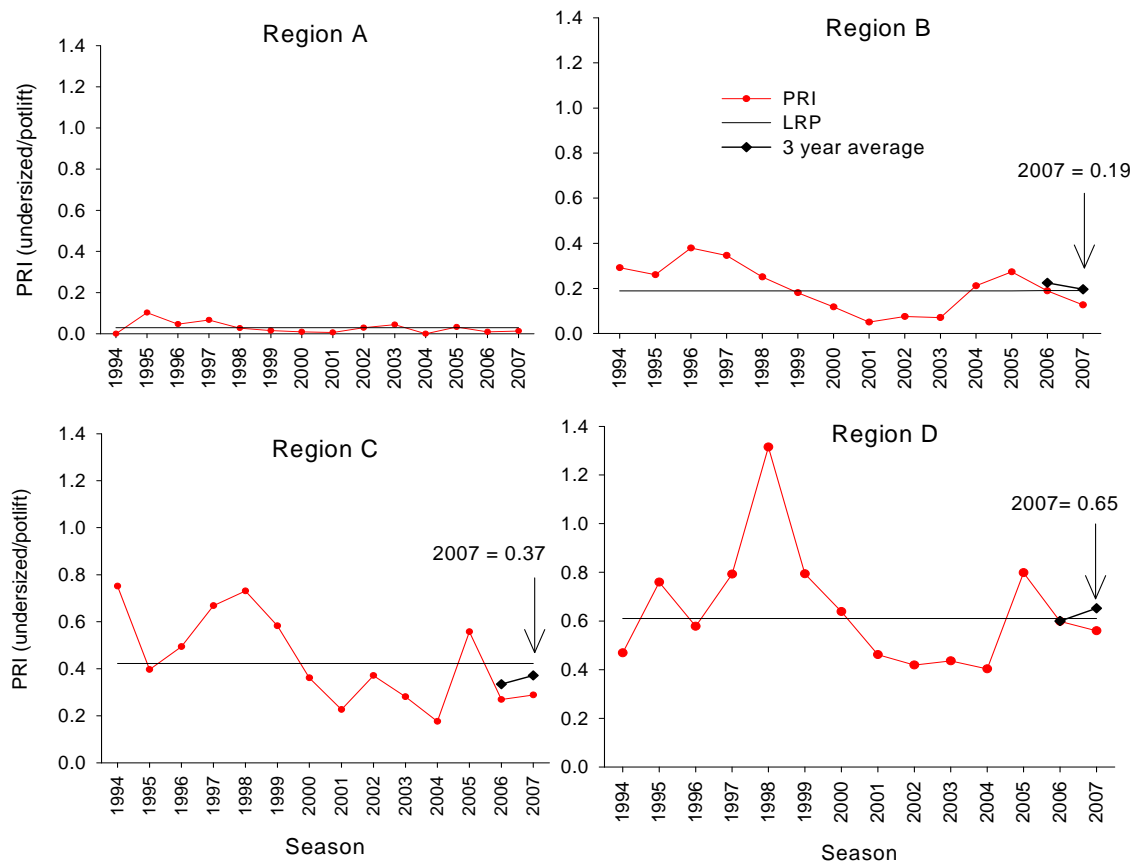


Figure 20 Regional pre-recruit indices (PRI) (1994-2007) with Limit Reference Points (LRPs) and current 3-year average.

In 2007, the regional 3-year average PRI (2005-2007) was on the long-term LRP in Region B, below it in Regions C and marginally above it in Region D (Figure 20).

5 SUMMARY

The 2007 NZRLF zonal catch of 459.2 tonnes is the second lowest in the history of the fishery representing the fifth consecutive season in which the TACC was not caught. The 2007 zonal catch rate of 0.76 kg/potlift (Nov-Apr inclusive) is the lowest CPUE on record. The decrease in CPUE was consistent across all months and all regions of the 2007 season. The PRI decreased for the second consecutive season in 2007 and is likely to reflect the low puerulus settlement of 2004. As per the NZRLF Management Plan, both CPUE and PRI must trigger before a TACC adjustment is made. In 2007, CPUE was below the limit reference point both zonally and regionally and has triggered. PRI has not triggered. However, is it now only above the LRP in one Region (D). It is on the LRP in Region B and below it in Region C. Based on the above data, it is clear that the Management Plan objective of biomass rebuilding is not being achieved. The current TACC of 520 tonnes is not constraining catch within the NZRLF. It should also be highlighted that recruitment in 2008 is also expected to be low due to poor settlement in 2003 and 2004.

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Sloan, S. & Crosthwaite, K., 2007. Management Plan for the South Australian Northern Zone Rock Lobster Fishery. South Australian Fisheries Management Series Paper No.51. Primary Industries and Resources South Australia. Adelaide, 82pp.

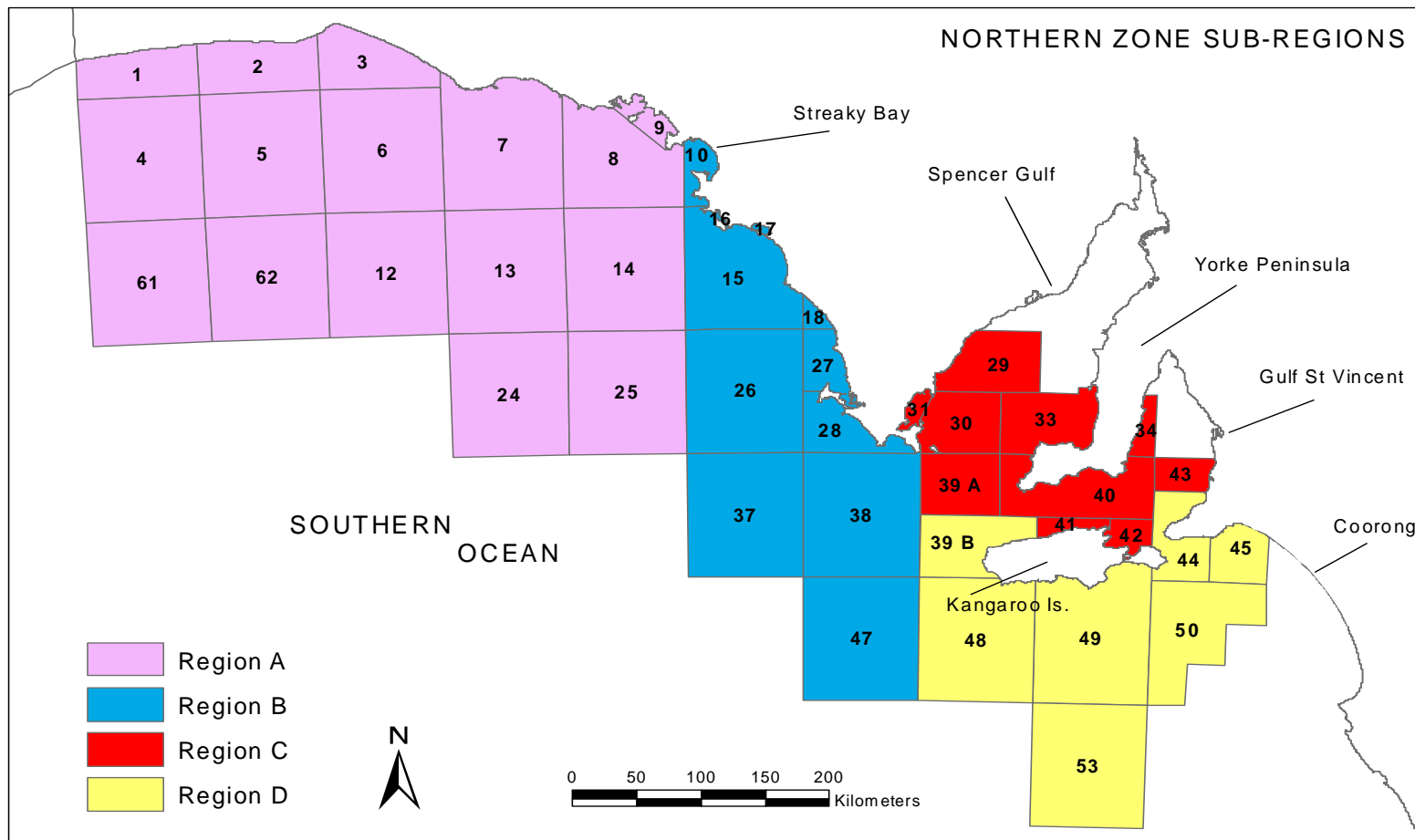


Figure 21 Northern Zone sub-regions and Marine Fishing Areas in the South Australian Rock Lobster Fishery.