Rock lobster catch and effort data: summaries and standardisations, 1979–80 to 2005–06

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EXECUTIVE SUMMARY

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Commercial catch and effort data are an important source of information for stock assessments of rock lobster. Summaries of these data are provided for fishing years 1979–80 through to 2005–06 as well as standardisations of catch per unit effort (CPUE) for each of the nine rock lobster quota management areas (QMAs) for the same period. Summaries of the half-year (seasonal) standardisation procedures performed in support of the 2006 CRA 7 and CRA 8 stock assessments are also provided.

In some QMAs there have been substantial changes in the spatial distribution of catch. For example, in CRA 1 the proportion of catch taken in Area 901 rose from 17% in 1979–80 to 52% in 2000–01. In CRA 5, the proportion of catch taken in Area 917 has fallen from 65% in 1986–87 to 32% in 2003–04; meanwhile the proportion of the catch taken in Area 916 has increased substantially. In other QMAs, such as CRA 2 and CRA 7, there has been less change in the spatial distribution of catch.

There has been an increase in the proportion of catch taken during autumn and winter in most QMAs, including recent shifts in CRA 7, CRA 8 and CRA 9. The shift from a spring/summer to an autumn/winter fishery occurred quite rapidly in the 1990s in most of the east coast QMAs, first in the North Island and then followed by CRA 5 in the South Island. For example, in CRA 2, the proportion of catch taken in July rose from 8% to 35% in the six years from 1990–91 to 1996–97. In CRA 5, the proportion of catch taken during spring and summer (October to March) decreased from a peak of 83% in 1990–91 to 10% in 2001–02. An even more rapid shift occurred in CRA 3 associated with the change in the management regime in 1992–93. This shift is now reversing in CRA 2, CRA 3, CRA 4 and is possibly beginning to reverse in CRA 5. There is evidence in the two most recent fishing years that CRA 7 and CRA 8 are beginning to establish predominant July and August fisheries. Only in CRA 6 has the seasonal distribution of catch remained relatively constant.

There is a reasonable level of consistency within most QMAs in the overall trends shown by the CPUE series for the constituent statistical areas. This consistency exists in spite of considerable year-to-year variation in these series. CRA 3 is the QMA with the greatest similarity in the CPUE trends between statistical areas.

The standardisation procedure applied to each QMA did not usually result in much change relative to the arithmetic and unstandardised annual indices of CPUE. However, there was a general tendency for the standardisation procedure to upwardly adjust the relative CPUE at peak CPUEs in the late 1990s, accounting for shifts in effort to winter/early spring because the unstandardised catch rates tend to be lower in winter.

Standardised CPUE for CRA 1 to CRA 5 show a similar pattern: catch rates that peaked in the early to mid-1980s, then declined steadily to the early 1990s, followed by a rapid rise in CPUE. In CRA 2, CRA 3, and CRA 4, CPUEs peaked towards the end of the decade, and the series continued with various degrees of steady decline, with CRA 3 being the most severe. CRA 1 and CRA 5 continued to show an increasing trend in CPUE, although there has been a drop in the CRA 5 CPUE in 2004–05 and 2005–06. The timing of these events differ slightly. For example, CRA 2 reached its lowest CPUE in 1987–88 but all the other areas reached it in 1992–93. The year when the peak CPUE was achieved and the relative magnitude of the peak CPUE also differ between these QMAs.

Standardised analyses by the half-year periods used in the rock lobster assessment model have been documented in this report for CRA 4, CRA 7 and CRA 8. These analyses were used to support the annual 2006 stock assessment and other analyses performed in support of management decisions.

1. INTRODUCTION

Commercial catch and effort data are an important source of information for stock assessments of rock lobster. They are used to provide an annual index of vulnerable biomass for each stock and to estimate the distribution of catch between seasons and among month/Area strata. There have been continuing refinements to the way in which rock lobster catch and effort data are checked and corrected (Booth et al. 1994, Vignaux & Kendrick 1998, Sullivan et al. 2004) and the way in which standardised indices of vulnerable biomass are calculated from them (Maunder & Starr 1995).

While the primary use of catch and effort data in stock assessments is to estimate annual indices that are assumed to be proportional to vulnerable biomass, the same data can also be used to examine the spatial and temporal distribution of catch and effort. Such analyses can be important for interpreting changes in overall catch rates for a Quota Management Area. They can also provide information for use in monitoring the fishery. For example, the proportion of catch by month and statistical area is used as a guideline for the allocation of rock lobster catch sampling effort. Earlier versions of this report have been published by Starr & Bentley (2005) and Starr (2006).

In this report, summaries of the spatial and temporal distribution of the catch and standardised indices of vulnerable biomass are presented. The following information for each QMA is presented:

(a) the number of vessels targeting rock lobster using pots by statistical area and fishing year;

(b) the percentage of catch by statistical area and fishing year,

(c) the percentage of catch by month and fishing year,

(d) the percentage of catch by month and statistical area for the 2005–06 fishing year,

(e) the cumulative monthly catch by fishing year,

(f) the arithmetic catch per unit effort by statistical area and fishing year,

(g) arithmetic, unstandardised, and standardised indices of catch per unit effort for each fishing year.

This report also documents the standardisation procedure and results for the CPUE analyses performed in support of the 2006 CRA 7 and CRA 8 assessments (Breen et al. 2006). This information is not presented elsewhere and requires documentation because these analyses represent key model inputs into the two stock assessments. A similar analysis for CRA 4 is also presented because it provided input into stakeholder decisions to voluntarily reduce the quota in that QMA in April 2007.

The standardised indices of CPUE are assumed, in the stock assessment, to reflect changes in vulnerable biomass; that is, the total weight of the lobsters that is vulnerable to the fishery and can be legally retained. The annual vulnerable biomass will be affected by changes in management of the fishery (e.g., changes in the size limit or changes to the escape gap regulations), in addition to other factors. The standardisation procedure takes into account changes in the spatial and temporal distribution of fishing effort (at the scale of statistical area), but it cannot adjust for changes in vulnerable biomass caused by management or regulatory changes. Therefore, the CPUE indices within each series will not be directly comparable over the entire range of years if regulations have changed in the mean time. However, this comparison is made implicitly in the stock assessment which is able to adjust its estimates of the vulnerable biomass to account for the regulation changes.

The inability of the standardisation procedure to account for changes in the definition of vulnerable biomass due to management actions needs to be considered when interpreting the CPUE indices presented in this report. For example, there were significant management changes to the CRA 3 fishery in 1992–93, including a change in the size limit for males in the winter. The CPUE indices will reflect the changes in the definitions of the vulnerable biomass before and after this management initiative. It is not possible to directly draw conclusions about the state of the stock based solely on the

CPUE series presented in this report because this requires consideration of additional data, such as catch sampling and tagging data, and this is best done in the context of a stock assessment model.

2. METHODS

2.1 Data

The catch and effort data from 1 April 1979 to 30 June 1989 were obtained from the Fisheries Statistics Unit (FSU), and the equivalent data from 1 July 1989 to 31 March 2006 were obtained from the Ministry of Fisheries Catch Effort Landing Returns (CELR ; MFish replog 6417). These data sources were documented by Bentley et al. (2005) and the data are stored and maintained in the CRACE database (Bentley et al. 2005).

2.2 Error checking

All records with error ratings equal to or greater than 2, for the fields FSU statistical area, CELR pots lifted and CELR statistical area, were excluded from this analysis. The documentation of these error designations, including how they are defined and generated, is described in Bentley et al. (2005).

All records for vessel 4548 (a coded value), which exclusively fishes in CRA 2, have been dropped from this analysis because of an extreme number of outliers from this vessel. All other data have been retained in the analyses.

2.3 Catch correction

A corrected catch weight was calculated by adjusting the estimated catch weight in the effort part of the CELR form by the corresponding landed weight from the landing part of the form. This was done using method B4, described in Bentley et al. (2005). This algorithm summarises the data for every vessel by month and statistical area and corrects the total estimated catch based on the total landed catch for the month. Data for a vessel in a month where the landed catch is zero but the effort is not zero are excluded, and the data from the following month for that vessel are also excluded. The presumption is that some of the catch landed in the second month was held over from the first month, thus breaking the link between the catch and effort data.

2.4 Calculation of number of vessels fishing rock lobster

The number of vessels that fished within each statistical area are counted for each fishing year using the same data set as used for the catch summaries and the CPUE standardisation. This data set is based on vessels that target rock lobster and for which the primary method is rock lobster potting.

There are often a relatively large number of vessels that report small quantities of rock lobster in an Area during a fishing year. For example, on the landings part of CELR forms, 67 vessels reported landing rock lobsters in CRA 5 during 2001–02. However, 30 of these vessels had a total catch for the year of less than 1 t (5 had less than 10 kg). These vessels may have caught lobster accidentally as bycatch or mistakenly recorded CRA on returns. A "rock lobster" vessel is arbitrarily defined to be a vessel which caught at least 1 t of CRA in the total QMA for a fishing year.

For some Quota Management areas, there is a significant jump in the estimated number of vessels in the 1989–90 fishing year. This fishing year had two different data sources (FSU and CELR), switching between systems on 1 July 1989. It is possible that, in some instances, each data source may have used different vessel identifiers for the same vessel, causing some duplicate counting. This problem is restricted to the 1989–90 fishing year, and estimates of vessel numbers for that fishing year should be considered less accurate than for other years.

2.5 Annual indices of CPUE

'Arithmetic', 'unstandardised', and standardised indices of annual CPUE were calculated for each QMA. Arithmetic CPUE (A_y) for the year y is calculated as the total catch for the year divided by the total number of pot lifts in the year:

$$A_y = \frac{\sum_{i \in y} C_i}{\sum_{i \in y} P_i} \qquad \text{Eq. 1}$$

where C_i and P_i are the catch and pot lifts for the vessel-month-Area combination i in year y.

Unstandardised CPUE (G_y) for the year y is the geometric mean of the ratio of catch to potlifts for each vessel, month, statistical area combination:

$$G_y = \exp\left[\frac{\sum_{i \in y} \ln\left(C_i / P_i\right)}{n_y}\right] \qquad \text{Eq. 2}$$

where, n_y is the number of vessel-month-Area combinations in the year y. It has the same distributional assumptions as the standardised CPUE, but does not take into account changes in the seasonal and spatial distribution of fishing effort. This index is the same as the "year index" calculated by the standardisation procedure without the modification of the additional explanatory variables. Presenting the arithmetic and unstandardised CPUE indices in this report provides a measure of how much the standardisation procedure has modified the series from these two sets of indices.

Standardised CPUE is calculated from a generalised linear model (GLM; Maunder & Starr 1995) using fishing year, month, and statistical area as explanatory variables. Maunder & Starr (1995) examined alternative methods for standardising rock lobster catch and effort data to obtain indices of abundance. They found that vessel effects were small and suggested that a standardisation based on year, month and Area was superior to a model including vessel effects because it allowed more data to be used. Canonical coefficients and standard errors were calculated for each factor (Francis 1999).

The unstandardised and standardised coefficients (the geometric mean of these series equal 1.0) were multiplied by the geometric mean of the arithmetic CPUE indices (Eq. 1) so that all three sets of indices were scaled to the same mean in terms of kg/potlift for comparability.

2.6 Indices by assessment (seasonal) period for CRA 4, CRA 7 and CRA 8

The assessment model (Breen et al. 2006) requires standardised indices of vulnerable biomass by assessment period. A period is defined as one of two six month seasons, either autumn–winter (1 April to 30 September) or spring–summer (1 October to 31 March). Thus, the fishing year explanatory variable is replaced in the standardisation model by a period explanatory variable. The model becomes

$$\ln(CPUE) = \text{Intercept} + Period + Month + Area + \varepsilon \qquad \text{Eq. 3}$$

The interpretation of the month explanatory variable in this model differs from the more usual model based on a complete fishing year. In the case of the month categorical variable for an annual model, 11 of 12 months are estimated, with the remaining month set to 1 because of confounding. When the fishing year is split into two seasons, further confounding occurs with the month effects, resulting in dropping one of the month coefficients in each period. The indices are slightly sensitive to the choice of the month dropped, with the estimated coefficients changing by small amounts when different months are successively dropped. A convention has been adopted which sets the month with the most records in each six-month period equal to 1.0 because this month should have the lowest error in most

instances. The month coefficients in this model do not show as much variation as the month effects in an annual model because part of the seasonal variation would be explained by differences between periods. Therefore, the month effect will take into account only the within-period variation, rather than the full seasonal variation within a fishing year.

A further refinement was added to the seasonal standardisation procedure in 2006 by forcing each season (autumn/winter and spring/summer) to have separate geometric means. That is, the geometric mean for each seasonal series was made to equal 1.0, with the final output scaled to the absolute value of the geometric mean of the arithmetic series by season. This was done so that each series would be scaled to the correct relative level within the stock assessment model. Previously this function was handled by a parameter in the stock assessment model which tended to be poorly estimated.

3. RESULTS

3.1 Landed catch and TACC

Total landed New Zealand commercial rock lobster catch in 2005–06 was almost identical to the landings in 2003–04 and 2004–05, with the first two years being about 200 t below the total New Zealand TACC for rock lobster while landings in 2005–06 were only 100 t below the TACC because the CRA 3 TACC had been reduced in this fishing year (Table 1). There has been a close correspondence between rock lobster landings and the TACC which has existed since 1998–99. The QMA that shows the greatest shortfall between the TACC and landings is CRA 4 (Table 1), which previously had been capturing its entire TACC. Landings in CRA 2 and CRA 6, which previously had shown shortfalls relative to the TACC, have recovered to about 10 t below the TACC. Landings for CRA 3 were about 20 t below the new TACC (Table 1).

There is a reasonably close correspondence in all rock lobster QMAs between the catch reported to the QMR and the sum of the landings from the bottom section of the CELR form (Table 2). A large shortfall in some QMAs (such as CRA 8 and CRA 6) is likely due to the common practice in these QMAs of holding fish after capture but prior to landing and the consequent exclusion of these landings from this analysis using the procedure described in Section 2.3. However, there appears to be some year-to-year variation in this ratio: for instance, CRA 8 shows a higher retention rate in 2005–06 compared to 2004–05 and CRA 3 has reversed a low value observed for this ratio in 2004–05. CRA 5 is showing some stability in this ratio in the past 2-3 years after recording low values for this ratio in the early part of the 2000s.

3.2 CRA 1

Only 15 vessels reported catch from CRA 1 in 2005–06, which is less than half of the vessels reporting in the 1979–80 fishing year and the same number as recorded in 2004–05 (Table 3). There was a large increase in the proportion of the CRA 1 catch taken from Area 901 during the late 1990s, and a corresponding drop in the proportion of catch taken in areas 902 and 903 (Table 4). This pattern reversed in 2003–04 when over 45% of the catch was taken in Area 902, but has now increased again, with 40% of the catch taken from Area 901 in 2005–06 and a corresponding drop in the catch taken from Area 902 (Table 3, Table 4). The proportion of catch taken from Area 939 has varied around 20% over the last six years.

Trends in cumulative monthly catch by fishing year show a relatively stable catch distribution in the early 1980s, with most catch taken in the spring and summer months (Table 5, Figure 2). There was a shift towards a winter and spring fishery in the early 1990s. The shift away from the winter fishery that was first observed in 2003–04 has continued in 2005–06, with the major portion of the catch taken in areas 901, 902 and 939 between July and October (extending to November and December in 901; Table 6).

Arithmetic CPUE trajectories from 1979–80 to 2001–02 show variable trends between areas, although Area 901 has shown the most increase and has the highest overall CPUE (Table 7, Figure 3). CPUE from all areas combined shows a shallow peak in 1982–83 followed by a long steady decline to 1992–93 (Table 8, Figure 4). Catch rates then increased rapidly to over 1 kg/potlift in 1995–96 and have remained stable above this level since then. Catch rates appear to have declined in Area 939 while remaining very high in areas 901 and 902 (Table 7). The standardised series shows an increase for 2005–06 even though there was a small decrease in the arithmetic series, reflecting the strong increase observed for the unstandardised (or geometric mean) series (Eq. 2 and Figure 4).

3.3 CRA 2

A total of 36 vessels reported catch from CRA 2, representing an increase for 2005–06, but less than half the number reporting in 1979–80 (Table 9). The small increase observed in 2005–06 relative to 2004–05 probably reflected a slightly better fishery in this most recent fishing year. The relative importance of the four rock lobster statistical areas which make up this QMA has remained relatively constant over the last decade, with Area 906 (western Bay of Plenty) continuing to be the most important statistical area, recording nearly 40% of the annual catch (Table 10). The percentage of catch coming from the eastern Bay of Plenty (areas 907 and 908) has remained relatively constant between 40 and 50% since the early 1990s, but the relative contribution between these two statistical areas has varied annually.

The trends in cumulative monthly catch by fishing year show a reasonably stable catch distribution in the early 1980s with most of the catch taken in the spring and summer, apart from a high level of catch in July 1989 (Table 11, Figure 5). There was a gradual shift towards a winter fishery in the early 1990s, with about 60% of the 1994–95 catch taken from April to September. This shift peaked between 1996–97 and 1998–99 with over 85% of the catch in each of those three fishing years taken between April and September. The shift has now reversed, with over 40% of the catch remaining at the end of October in the most recent four fishing years, while in the latter half of the 1990s less than 10% of the catch was taken after October (Table 11). In 2005–06, most of the catch was taken between July and February, spread between the four statistical areas with Area 906 predominating (Table 12).

Arithmetic CPUE trajectories from 1979–80 show increasing trends in all areas from the early 1990s, with Area 907 showing the strongest increase (Table 13, Figure 6). The overall trend in CPUE for the entire QMA shows a steady increase from the early 1990s to a peak in 1997–98 and 1998–99 followed by a decline to a current level (Table 14, Figure 7). The arithmetic and standardised CPUE trends are very similar, except that the standardised analysis estimated a higher peak for the period 1997–98 and 1998–99. This was probably caused by the shift in effort towards winter months which caused a reduction in the arithmetic and unstandardised CPUE. The standardised index for 2005–06 is the same that observed in 2004–05 and both years show a slight upturn compared to the 2003–04 index, but have not returned to the high levels observed in the late 1990s and early 2000s (Figure 7).

3.4 CRA 3

As with other QMAs, there has been a decrease since the 1979–80 fishing year in the number of vessels that report catch from CRA 3 (Table 15). The number of vessels declined from about 80 vessels in the early 1980s to about 30 in the mid 1990s. Vessel number increased to nearly 40 in 2002–03 and 2003–04 but dropped to 33 in 2004–05 and to 29 in 2005–06 (Table 15). Relatively high numbers of vessels (over 50) continued to report catch until the 1993–94 fishing year, the year after the TACC was cut by 50% and the fishery shifted to primarily the winter months.

The relative importance of the three rock lobster statistical areas which make up this QMA remained relatively constant to 2000–01, with Area 910 (Gisborne) being the most important (Table 16). Area 911 (Mahia Peninsula) then became the statistical area with the highest catch from the 2001–02 to 2003–04 fishing years, possibly because of the higher catch rates occurring in that Area. However, the

proportion of the catch recorded in Area 911 dropped in 2004–05 to about 40% and stayed at that level in 2005–06. About 5% of the catch also shifted away from Area 909 (East Cape) to Area 910 in 2005–06 (Table 16).

This fishery was primarily a summer fishery until regulations were changed in 1992–93 to encourage a winter fishery aimed at males by lowering the minimum size limit to 52 mm tail width from 54 mm tail width only for June through August. The cumulative monthly catch proportions by fishing year show this shift clearly, with over 60% of the catch taken by the end of August in 1993–94 rising to over 90% in 1996–97 and 1997–98 (Table 17, Figure 8). This shift is now reversing, with the winter catch dropping to below 80% taken by the end of August in 2000–01 and to about 50% in the four most recent fishing year (Table 17). There were significant catches in November and December since 2002–03, once these months were reopened to commercial fishing. In 2005–06, June and July remained important months for catch, especially in Area 910 (Table 18).

Arithmetic CPUE trajectories from 1979–80 show strong increasing trends in all areas beginning in the early 1990s, with all three areas increasing to similar levels (Table 19, Figure 9). All statistical areas peaked in CPUE in 1997–98 and have since declined. Area 909 appears to have dropped less (to about 0.8 kg/potlift) while Areas 910 and 911 dropped to about 0.5–0.6 kg/potlift, except for 2004–05 when Area 911 dropped to less than 0.4 kg/potlift. Areas 909 and 911 appeared to drop less quickly than Area 910 in the late 1990s and early 2000s,, possibly accounting for the shift in the relative amount of catch coming from Areas 910 and 911 (see Table 18). The overall trend in CPUE for the entire QMA shows a steady increase from the early 1990s to a peak in 1997–98, followed by a decline to a level somewhat higher than the early 1990s (Table 20, Figure 10). The arithmetic, unstandardised and standardised CPUE trends are all very similar, except that the standardised analysis estimated a relatively higher peak for 1997–98 (Table 20, Figure 10). This was probably caused by the shift in effort towards winter months causing a reduction in average CPUE in the arithmetic series. There is a small increase in all three series from 2004–05 to 2005–06 which is consistent with a similar small increase observed a year sooner in CRA 2 (Table 20, Figure 10).

3.5 CRA 4

Although there has been a decrease since the 1979–80 fishing year in the number of vessels that report catch from CRA 4, the decline is less than in CRA 1, CRA 2, and CRA 3 (Table 21). However, there was a drop of 7 vessels between 2004–05 and 2005–06, possibly reflecting the decrease in fishing success in this fishery. The number of vessels fell from about 85 to 90 during the 1980s to 61 to 72 vessels in the late 1990s and early 2000s. The single count of 131 vessels in 1989 is likely an artefact of the changeover from the FSU to CELR systems where vessels were likely double-counted because the vessel codes were not properly transferred between the systems. The relative importance of the five rock lobster statistical areas that make up this QMA has remained relatively constant for the 27 years presented, with Area 914 (South Wairarapa) being consistently the most important and accounting for over 50% of the landings in 2005–06 (Table 22). Area 913 (North Wairarapa) contributes most of the remainder of the catch. In 2005–06, Area 915 reversed a trend of declining importance compared to 2003–04 and 2004–05.

Before 1992–93, most fishing took place in the spring and summer months, although a significant proportion of the catch was also taken in winter (Table 23, Figure 11). Winter fishing predominated by the 1994–95 fishing year and this pattern was maintained up to the 2002–03 fishing year, with still over 60% of the catch taken from April to August in that year (Table 23, Figure 11). However, this trend is now reversing, with just over 40% of the catch taken by the end of August in 2004–05 and less than 40% for the same period in 2005–06. The November–March months accounted for over 40% and over 50% of the respective 2004–05 and 2005–06 landings. Only 25% of the catch was taken between June and September in Areas 912, 913, 914, and 915 in 2005–06 (Table 24).

Arithmetic CPUE trajectories from 1979–80 show an increase in all areas (the data for Area 934 are too sparse to draw a conclusion for that statistical area) beginning in 1992–93 (Table 25, Figure 12). The increase in Area 914 ended by the 1996–97 fishing year, well below the peak catch rates observed

in the two more northerly areas, and then remained relatively constant while Areas 912 and 913 increased to much higher levels (Table 25, Figure 12). The four main statistical areas declined to approximately the same mean catch per potlift in 2002–03 and 2003–04, (although Area 914 was higher in 2003–04; Table 25). All areas have now dropped to below 1.0 kg/potlift by 2005–06, even though Area 915 showed a modest increase from 0.7 to 0.8 kg/potlift between 2004–05 and 2005–06. The pattern of increase and the peak year for mean catch rate in Areas 912 and 913 resembles similar patterns observed in the more northerly statistical areas in CRA 2 and CRA 3 (compare Figure 6 and Figure 9 with Figure 12). Note that the year of peak catch rates in CRA 3 is one or two years earlier than for the peaks observed in Areas 912 and 913. The overall trend in CPUE for the entire QMA is similar to that for CRA 3, with a steady increase from the early 1990s to a peak in 1998–99, which is one year later than in CRA 3 (Table 26, Figure 13). The relative decline since the peak fishing year continues to be less for CRA 4 than for CRA 3, with CRA 3 registering a drop of 70 to 80% compared to the peak year while the equivalent reduction for CRA 4 is only 20 to 45% (compare Table 20 with Table 26). However, CRA 4 is much closer to the minimum CPUE recorded for the series, with 2005–06 CPUE only 70% greater than the minimum while the equivalent value for CRA 3 is 137%. The arithmetic, unstandardised and standardised CPUE trends for CRA 4 are all very similar, except that the standardised analysis estimates a relatively higher peak for 1998–99 (Table 26, Figure 13). This was probably caused by the shift in effort towards winter months, causing a reduction in average CPUE in the arithmetic and unstandardised series.

3.6 CRA 5

There has been a decline in the number of vessels fishing in CRA 5 since the 1979–80 fishing year, with fewer than 40 vessels reporting in this QMA since 1999–00, compared to the 80 to 90 which fished there during the 1980s (Table 27). There has been a further gradual attrition in the number of vessels since 2000–01, with the number of vessels reporting more than 1 t of landings dropping to only 30 in 2005–06. Six rock lobster statistical areas make up this QMA, but most of the catch is reported from Area 916 (Cape Campbell) and Area 917 (Kaikoura-Motunau) and a lesser amount from Area 933 (Marlborough Sounds; Table 28). The relative catch proportions between these areas have changed somewhat, with Area 916 rising in importance in the last five years to over 40% of the catch along with a corresponding decrease in the relative importance of Area 932. Area 917 appears to have increased slightly in the relative proportion of reported landings in 2004–05 and 2005–06, along with a corresponding drop in the landings from Marlborough Sounds (Area 933; Table 28).

This fishery remained predominantly a summer fishery for longer than any of the North Island QMAs and did not shift to a winter fishery until 1996–97 (Table 29, Figure 14). Unlike the northern QMAs, the relative proportion of the catch taken in the winter months has continued to stay high up to 2003–04, with about 80% of the catch taken by the end of September in 2003–04. However, the April-September percentage dropped to below 70% in both 2004–05 and 2005–06, indicating that this trend may now be reversing. In 2005–06, nearly 60% of the catch was taken between April and August in Areas 916 and 917, with the peak catch month being May in both Areas 916 and 917 (Table 30). Note that historically May has been a strong catch month in this QMA, with this month accounting for 14–28% of the annual catch since 1996–97 (Table 29).

Arithmetic CPUE trajectories from 1979–80 show similar trends in each of the statistical areas up to 1997–98. At that time there was an increase in CPUE in all areas, but at a much greater rate in Area 916 (Table 31, Figure 15). Area 916 increased to catch rates that were much higher than those in the other statistical areas, peaking in 2000–01. However, the arithmetic catch rate for Area 916 dropped in 2005–06 to below 2 kg/potlift after being stable at 2.2 to 2.4 kg/potlift for the previous three fishing years. The overall trend in CPUE for this QMA shows a continuous increase that peaked in 2003–04, with successive drops observed in 2004–05 and 2005–06 (Table 32, Figure 16). The unstandardised and standardised CPUE trends are nearly identical, while the arithmetic CPUE trend lags behind both series based on log(CPUE) (Table 32, Figure 16). This difference reflects the different methodologies used to compute the mean catch rate within a year by each index (i.e., the arithmetic mean in Eq. 1 compared to the geometric mean in Eq. 2).

3.7 CRA 6

The number of vessels fishing in CRA 6 fluctuated between 39 and 59 during the 1980s and most of the 1990s. In 1999–2000 the number of vessels dropped to 34 and has since remained at about that level (Table 33).

Four rock lobster statistical areas make up the Chatham Islands QMA, with Area 942 (Southeast Chatham Islands) generally having about half of the landings (Table 34). The relative proportions between these areas have remained reasonably constant, with the two northern statistical areas (940 and 941) accounting for about 40% of the annual catch.

This fishery has been predominantly a spring-summer (October to February) fishery for its entire history, with little tendency to shift to a winter fishery as on the New Zealand mainland (Table 35, Figure 17). In 2005–06, 69% of the catch was taken between September and February in Areas 940, 941, and 942 (Table 36).

Arithmetic CPUE trajectories from 1979–80 show a decline in mean annual catch rates in the early 1980s for all areas except Area 941 (Table 37, Figure 18). Area 942 consistently has had the highest mean catch rates since the mid 1980s, which probably explains why this statistical area has the highest catch (see Table 36). Mean catch rates in all four statistical areas, although variable, have tended to stabilise since the mid 1990s. All four areas may be now increasing, with Area 942 showing an increasing trend since 2002–03 and the other three areas showing an increase from 2004–05 to 2005–06. The overall trend in CPUE for the QMA shows a drop in the early 1980s, followed by a period of relative stability near 1 kg/potlift through the 1990s (Table 38, Figure 19). CPUE has since increased to nearly 1.5 kg/potlift, with the standardised and unstandardised indices being slightly higher than the arithmetic index in recent years. All three series show a gradual increasing trend since the late 1990s or the early 2000s.

3.8 CRA 7

The number of vessels reporting rock lobster in CRA 7 has dropped more precipitously since the early 1980s compared to the other rock lobster QMAs, with over 70 vessels participating in the early 1980s compared to a low of 7 in 1997–98 (Table 39). The number of vessels recovered to 25 by the 2000–01 but has since dropped again to 14 in 2004–05 and 2005–06. There are only two statistical areas in this QMA, with Area 920 accounting for about two-thirds of the catch in most years up to 2003–04, but with a shift towards Area 921 in the most recent two fishing years (Table 40). The distribution between the two statistical areas varies, with the percentage in Area 920 dropping to near 50% in some years, including 2005–06.

The seasonal distribution for this fishery has tended to be relatively consistent over the entire period because this fishery is restricted by regulation to 21 June to 19 November (for the take of "concession" sized lobsters; Table 41, Figure 20). However, Figure 20 shows that catches accumulated much more quickly in 2004–05 and then even more quickly in 2005–06, with nearly 50% of the annual catch taken by the end of July 2005–06 compared to a more usual expectation of 20 to 36% taken to the end of that month. In 2005–06, 78% of the catch was taken in July and August in combined Areas 920 and 921 (Table 42).

Arithmetic CPUE trajectories from 1979–80 show a decline in mean annual catch rates into the early 1980s, followed by a period of variable catch rates declining to a low point in 1999–00 (Table 43, Figure 21). Area 921 has consistently had the higher mean catch rates, but they tend also to be more variable. Both areas had a broadly declining trend in mean CPUE to the end of the 1990s, although this pattern is highly variable and has been reversed, particularly in Area 921 (Figure 21). The overall trend in CPUE for this QMA also reflects this broad downward trend but there are notable increases in mean CPUE in 1986–87, 1991–92, and 1993–94 (Table 44, Figure 22). Mean CPUE has been rising consistently since 1997–98 when the lowest value in the series was recorded to the current 2005–06

value, which is the highest in the series (Figure 22). The arithmetic and standardised CPUE trends are very similar (Table 44, Figure 22).

3.9 CRA 8

This QMA historically had the greatest number of vessels (Table 45). Over 250 vessels reported lobster in the early 1980s, but this total has gradually dropped to 60 at the present time, with a decline of four vessels in 2004–05 and a further two vessels in 2005–06 compared to the number in 2003–04 (Table 45). Seven rock lobster statistical areas make up this QMA, with about 80% of catch reported from Areas 926 to 928 since the mid-1990s (Fiordland; Table 46). Area 926 (Puysegur) appears to have increased in relative importance within the three Fiordland statistical areas, accounting for about 50% of the total CRA 8 landings in the four most recent fishing years. Area 924 (Stewart Island) is also an important fishery that has contributed between 12 and 23% of the annual landings, with recent levels near 12–16% (Table 46).

The seasonal distribution of catch for this fishery has been relatively consistent over the entire period, with about 80% of catch taken from August to November (Table 47, Figure 23). In some years, up to 14% of the annual catch is taken in December and up to 11% in January, probably reflecting poor catches earlier in the fishing year (Table 47). However, this seasonal distribution appears to be shifting in 2003–04 and 2004–05, with a trend towards an earlier fishery (much as has been observed in the east coast QMAs). Catches to the end of July accounted for over 40% of the annual catch in these two fishing years, compared to a more usual cumulative total of less than 30% of the annual catch (Figure 23). By the end of September, over 80% of the annual catch had been taken in 2004–05 and 2005–06 compared to less than 60% in 2002–03 and less than 40% in the mid-1990s. About 35% of the total annual catch was taken in Area 926 over the months of July, August and September in 2005–06 (Table 48).

Arithmetic CPUE trajectories by statistical area from 1979–80 show a gradual decline in mean annual catch rates during the 1980s and early 1990s (Table 49, Figure 24). Catch rates were relatively stable up to the early 2000s, with Areas 924 and 926 having the highest mean catch rates amongst the high total catch statistical areas (Table 49). Catch rates are now improving at a great rate, with rises in all statistical areas except Area 927 to 2005–06 (Table 49). The overall trend in CPUE for this QMA shows a drop from the early 1980s to the early 1990s followed by a period of relative stability. There has been a rising trend since 1999–00, with a very strong rise in 2003–04 and a further rise in 2005–06, characterised by a large relative error (Table 50, Figure 25). The lowest mean annual CPUE values in this time series were recorded in 1992–93 and 1997–98 (Table 50). The arithmetic, unstandardised and standardised CPUE trends are all very similar, with the standardised index rising the most steeply of the three (Table 50, Figure 25).

3.10 CRA 9

The number of vessels reporting lobster catch in this QMA has more than halved from about 20 in the early 1980s to less than 10 in the three most recent fishing years (Table 51). Some of the statistical areas in this QMA do not have any vessels reporting catch in the more recent fishing years. There are seven rock lobster statistical areas in CRA 9, with Areas 931 and 935 being the most important in terms of size of landings, and with lower proportions of landings in Areas 930, 936 and 937 (Table 52). The relative contribution of these areas to the total CRA 9 catch has fluctuated widely but Area 935 has consistently had the highest proportion of landings, probably reflecting the distribution of effort rather than any underlying changes in the relative abundance between statistical areas (Table 52).

The temporal distribution of catch in this fishery has shifted away from being a predominantly summer to late winter fishery in the early 1990s (Table 53, Figure 26). This shift was particularly strong in 2001–02 and again in 2005–06, with over 90% of the catch taken by the end of October (Table 53). Between 61 and 83% of the total annual catch has been taken by the end of September in

the six most recent fishing years. In 2005–06, about 47% of the catch was taken in July and August in Areas 931 and 935 (Table 54).

The arithmetic CPUE trajectories by statistical area from 1979–80 to 2005–06 are difficult to interpret because many of the year/statistical area combinations cannot be reported because of confidentiality restrictions (Table 55, Figure 27). However, Areas 931 and 935 have shown the highest mean annual catch rates in most years (Table 55). CPUE for this QMA increased strongly from 2002–03 to 2004–05 after a long period of relative stability. This has been followed by a non-significant drop in 2005–06, although the precision for these increased annual indices is relatively low (Table 56, Figure 28). The arithmetic, unstandardised and standardised CPUE trends are very similar throughout the series (Table 56, Figure 28).

3.11 CRA 4 standardised CPUE indices by period

Standardised indices by season (autumn-winter: April–September; spring-summer: October–March) have been calculated for CRA 4 (Table 57, Figure 29), beginning from the 1979–80 autumn-winter season and ending with the 2006–07 autumn-winter season. The final data point (Autumn-Winter 2006–07) was based on an analysis of partial data (up to the end of August 2006) because stakeholders required an early indication of the status of the most recent period with data. This series was used to provide advice to CRA 4 stakeholders on recent CPUE trends so as to make an informed decision on the voluntary shelving of quota in response to declining catch rates. The amount of quota put aside was based on a set of operational decision rules derived from an earlier CRA 4 stock assessment (Breen & Kim 2006).

The total deviance explained by the model is good (29%, Table 58), with most of the explanatory power lying with model period. The residual patterns show some deviation from the lognormal assumption at the extreme tails of the residual distribution, but appear to be reasonable in the centre of the distribution. There is some contrast in the month explanatory variable, with higher monthly coefficients in May/June (autumn-winter season) and November/December (spring-summer season), with a tailing off of the coefficients at the end of each season (Figure 30). Catch rates are slightly higher in the more northerly statistical areas of CRA 4 compared to the statistical areas near and in Cook Strait (Areas 912 to 914 are slightly greater than one while Areas 915 and 934 are below one; Figure 30).

Although not reported in detail in this report, the analysis was repeated using only vessels which took the top 50% of the catch. This second analysis was based on approximately one-quarter of the fleet (in terms of number of active vessels), with the remaining 50% of the annual catch being taken by the remaining three-quarters of the fleet. Some stakeholders felt that the recent decline in the CPUE index (Figure 32) was due, at least in part, to the recent recruitment of less experienced fishermen to the fishy and their inability to adjust to recent changing conditions. This hypothesis was investigated by confining the analysis only to the fishermen who appeared from the data to be the most successful. These vessels tended to have a higher absolute CPUE than the total fleet, with an increase of about 25% over the mean total fleet CPUE for the entire period ([right panel] Figure 31). However, when the two series were standardised to the same mean value, there was no difference in the overall trend ([left panel] Figure 31).

3.12 CRA 7 standardised CPUE indices by period

Standardised indices by season (autumn-winter: April–September; spring-summer: October–March) have been calculated for CRA 7 (Table 59, Figure 32), beginning from the 1979–80 autumn-winter season and ending with the 2005–06 spring-summer season. This series was used as input into the 2006 stock assessment for CRA 7 (Breen et al 2006) and in presentations to stakeholders.

The total deviance explained by the model is good (about 30%, Table 60), with most of the explanatory power lying with model period. The residual patterns show some deviation from the

lognormal assumption at the extreme tails of the residual distribution, but appear acceptable in the centre of the distribution. There is little contrast in the month explanatory variable, with high monthly coefficients estimated from June to January and with some tailing off of the coefficients at each end of the year (Figure 33). Area 921 has a much higher catch rate than Area 920 (Figure 33). The CPUE series by model period is very similar to the annual series, and there is little difference between the three series (arithmetic, geometric and standardised) except for the smoothing out of a major peak observed in the arithmetic series for Period 98 (spring-summer 1993–94; Figure 32). The values for 2005–06 in both the autumn/winter and spring/summer series are the highest since 1979–80 (Figure 32). The relative error associated with these recent indices is larger than the error in earlier parts of the series, particularly for the spring/summer series, reflecting the lack of data in this season in recent years.

3.13 CRA 8 standardised CPUE indices by period

Standardised indices by season (autumn-winter: April–September; spring-summer: October–March) have been calculated for CRA 8 (Table 61, Figure 34), beginning from the 1979–80 autumn-winter season and ending with the 2005–06 spring-summer season. This series was used as input into the 2006 stock assessment for CRA 8 (Breen et al. 2006) and in presentations to stakeholders.

The total deviance explained by the model is not as high as in the CRA 7 model (about 19%, Table 62), again with most of the explanatory power lying with model period. As with the CRA 7 model, the residual patterns show some deviation from the lognormal assumption at both tails of the residual distribution, but are acceptable in the centre of the distribution. The peak catching months extend from September to February, with considerably lower relative catch rates in the winter months (Figure 35). Area 925 (Snares) has the highest relative catch rate, although very little catch is taken from this statistical area (Table 46). The relative catch rates for the other four important statistical areas (Area 924: Stewart Island; Areas 926 to 928: Fiordland) show little contrast amongst the four areas, all being near 1.0 (Figure 35). The CPUE series by model period shows a long period trending downward from the beginning of the series to the mid-1990s, ending in the lowest observed value for the autumn/winter series in Period 107 (autumn/winter 1998–99; Figure 34) and for the spring/summer series in Period 96 (spring/summer 1992–93; Figure 34). CPUE has since risen to 1.9 kg/potlift in Period 121 (autumn/winter 2005–06; Figure 34), a value near the maximum values observed at the beginning of the autumn/winter series. The equivalent value observed in Period 122 for the spring/summer series is 3.0 kg/potlift (spring/summer 2005–06; Figure 34), which is the highest value in the entire spring/summer series since beginning in Period 69 (spring/summer 1979–80).

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Table 1: Reported commercial catch (t), commercial TACC (t) and total allowable catch (TAC) of *Jasus edwardsii* to the Quota Management System by rock lobster QMA for each fishing year since the species was included in the QMS on 1 April 1990.

	CRA 1			CRA 2			CRA 3		
Fishing Year	Catch	TACC	TAC	Catch	TACC	TAC	Catch	TACC	TAC
1990–91	131.1	160.1	–	237.6	249.5	–	324.1	437.1	–
1991–92	128.3	146.8	–	229.7	229.4	–	268.8	397.7	–
1992–93	110.5	137.4	–	190.3	214.6	–	191.5	327.5	–
1993–94	127.4	130.5	–	214.9	214.6	–	179.5	163.7	–
1994–95	130.0	130.5	–	212.8	214.6	–	160.7	163.7	–
1995–96	126.7	130.5	–	212.5	214.6	–	156.9	163.7	–
1996–97	129.4	130.5	–	213.2	214.6	–	203.5	204.7	–
1997–98	129.3	130.5	–	234.4	236.1	452.6	223.4	224.9	379.4
1998–99	128.7	131.1	–	232.3	236.1	452.6	325.7	327.0	453.0
1999–00	125.7	131.1	–	235.1	236.1	452.6	326.1	327.0	453.0
2000–01	130.9	131.1	–	235.4	236.1	452.6	328.1	327.0	453.0
2001–02	130.6	131.1	–	225.0	236.1	452.6	289.9	327.0	453.0
2002–03	130.8	131.1	–	205.7	236.1	452.6	291.3	327.0	453.0
2003–04	128.7	131.1	–	196.0	236.1	452.6	215.9	327.0	453.0
2004–05	130.8	131.1	–	197.3	236.1	452.6	162.0	327.0	453.0
2005–06	130.5	131.1	–	225.2	236.1	452.6	170.0	190.0	319.0
2006–07	–	131.1	–	–	236.1	452.6	–	190.0	319.0

	CRA 4			CRA 5			CRA 6		
Fishing Year	Catch	TACC	TAC	Catch	TACC	TAC	Catch	TACC	TAC
1990–91	523.2	576.3	–	308.6	465.2	–	369.7	518.2	–
1991–92	530.5	529.8	–	287.4	426.8	–	388.3	503.0	–
1992–93	495.7	495.7	–	258.8	336.9	–	329.4	503.0	–
1993–94	492.0	495.7	–	311.0	303.2	–	341.8	530.6	–
1994–95	490.4	495.7	–	293.9	303.2	–	312.5	530.6	–
1995–96	487.2	495.7	–	297.6	303.2	–	315.3	530.6	–
1996–97	493.6	495.7	–	300.3	303.2	–	378.3	530.6	–
1997–98	490.4	495.7	–	299.6	303.2	–	338.7	400.0	480.0
1998–99	493.3	495.7	–	298.2	303.2	–	334.2	360.0	370.0
1999–00	576.5	577.0	771.0	349.5	350.0	467.0	322.4	360.0	370.0
2000–01	573.8	577.0	771.0	347.4	350.0	467.0	342.7	360.0	370.0
2001–02	574.1	577.0	771.0	349.1	350.0	467.0	328.7	360.0	370.0
2002–03	575.7	577.0	771.0	348.7	350.0	467.0	336.3	360.0	370.0
2003–04	575.7	577.0	771.0	349.9	350.0	467.0	290.4	360.0	370.0
2004–05	569.9	577.0	771.0	345.1	350.0	467.0	323.0	360.0	370.0
2005–06	504.1	577.0	771.0	345.6	350.0	467.0	351.2	360.0	370.0
2006–07	–	577.0	771.0	–	350.0	467.0	–	360.0	370.0

	CRA 7			CRA 8		
Fishing Year	Catch	TACC	TAC	Catch	TACC	TAC
1990–91	133.4	179.4	–	834.5	1152.4	–
1991–92	177.7	164.7	–	962.7	1054.6	–
1992–93	131.6	153.1	–	876.5	986.8	–
1993–94	138.1	138.7	–	896.1	888.1	–
1994–95	120.3	138.7	–	855.6	888.1	–
1995–96	81.3	138.7	–	825.6	888.1	–
1996–97	62.9	138.7	–	862.4	888.1	–
1997–98	36.0	138.7	–	785.6	888.1	–
1998–99	58.6	138.7	–	808.1	888.1	–
1999–00	56.5	111.0	131.0	709.8	711.0	798.0
2000–01	87.2	111.0	131.0	703.4	711.0	798.0
2001–02	76.9	89.0	109.0	572.1	568.0	655.0
2002–03	88.6	89.0	109.0	567.1	568.0	655.0
2003–04	81.4	89.0	109.0	567.6	568.0	655.0
2004–05	94.2	94.9	114.9	603.0	603.4	690.4
2005–06	95.0	94.9	114.9	603.2	603.4	690.4
2006–07	–	120.2	140.2	–	755.2	842.2

	CRA 9			Total		
Fishing Year	Catch	TACC	TAC	Catch[1]	TACC[1]	TAC
1990–91	45.3	54.7	–	2907.4	3793.0	–
1991–92	47.5	50.2	–	3020.9	3502.9	–
1992–93	45.7	47.0	–	2629.9	3201.9	–
1993–94	45.5	47.0	–	2746.2	2912.1	–
1994–95	45.2	47.0	–	2621.5	2912.1	–
1995–96	45.4	47.0	–	2548.6	2912.1	–
1996–97	46.9	47.0	–	2690.5	2953.1	–
1997–98	46.7	47.0	–	2584.2	2864.1	1312.0
1998–99	46.9	47.0	–	2726.0	2926.8	1275.6
1999–00	47.0	47.0	–	2748.5	2850.2	3442.6
2000–01	47.0	47.0	–	2795.9	2850.2	3442.6
2001–02	46.8	47.0	–	2593.0	2685.2	3277.6
2002–03	47.0	47.0	–	2591.1	2685.2	3277.6
2003–04	45.9	47.0	–	2451.5	2685.2	3277.6
2004–05	47.0	47.0	–	2472.3	2726.4	3318.8
2005–06	46.6	47.0	–	2471.2	2589.4	3184.8
2006–07	–	47.0	–	–	2766.6	3362.0

[1] TACC totals exclude CRA 10 (TACC=0.1 t); catch totals exclude CRA 10 and ET catches (outside EEZ).

Table 2: **Ratio of the sum of landed catch from the bottom portion of the CELR forms relative to the reported QMR/MHR catch for each QMA and fishing year. Landed catches from CELRs include only records where error ratings are less than or equal to 1 and have been adjusted using the B4 algorithm (Bentley et al. 2005). The landed catch data From CELRs are the data used to calculate all tables and graphs in this report.**

Fishing Year	CRA 1	CRA 2	CRA 3	CRA 4	CRA 5	CRA 6	CRA 7	CRA 8	CRA 9
1990–91	0.96	0.86	1.00	0.99	0.94	0.81	0.89	0.86	1.03
1991–92	1.12	0.91	0.99	0.99	1.00	0.84	0.94	0.93	1.02
1992–93	1.08	0.96	0.99	1.00	0.98	0.83	0.97	0.92	1.04
1993–94	1.06	0.99	1.03	1.00	0.96	0.85	0.98	0.89	1.17
1994–95	0.99	0.93	1.00	1.01	0.96	0.92	0.98	0.90	1.35
1995–96	0.93	0.93	1.02	0.98	0.95	0.94	0.96	0.88	1.24
1996–97	1.01	0.89	0.93	0.94	0.94	0.88	0.92	0.86	1.84
1997–98	0.87	0.87	0.91	0.95	0.94	0.87	0.92	0.85	1.55
1998–99	0.87	0.90	0.87	0.94	0.92	0.83	0.86	0.85	1.45
1999–00	0.98	0.86	0.97	0.94	0.90	0.75	0.58	0.84	1.74
2000–01	0.91	0.93	0.96	0.96	0.87	0.82	0.95	0.87	1.02
2001–02	0.95	0.93	0.94	0.96	0.87	0.85	0.97	0.85	0.93
2002–03	0.96	0.93	0.91	0.98	0.86	0.82	0.95	0.79	0.94
2003–04	0.96	0.94	0.91	0.92	0.94	0.83	1.00	0.83	0.92
2004–05	0.96	0.92	0.88	0.92	1.00	0.86	0.91	0.82	0.89
2005–06	0.92	0.94	0.95	0.87	0.98	0.85	0.94	0.90	1.01

Table 3: **Number of vessels reporting rock lobster by statistical area from CRA 1, 1979–80 through to 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.**

Fishing year	901	902	903	904	939	All
1979–80	5	9	8	7	10	34
1980–81	3	9	10	11	9	34
1981–82	3	8	10	9	8	33
1982–83	3	10	8	9	9	33
1983–84	5	14	6	8	7	31
1984–85	5	14	4	8	7	30
1985–86	5	10	8	10	8	34
1986–87	5	11	12	9	9	35
1987–88	4	10	13	8	9	30
1988–89	5	6	8	6	8	26
1989–90	7	7	5	8	9	27
1990–91	12	10	7	7	8	27
1991–92	8	16	13	12	8	33
1992–93	3	11	7	10	8	31
1993–94	6	8	6	9	6	27
1994–95	4	6	5	9	4	22
1995–96	4	6	5	9	5	23
1996–97	3	3	8	11	5	26
1997–98	2	3	4	7	6	21
1998–99	2	3	3	6	6	19
1999–00	5	3	3	6	6	20
2000–01	4	3	3	6	5	18
2001–02	4	4	3	5	5	18
2002–03	6	6	3	3	6	17
2003–04	2	6	3	3	6	16
2004–05	3	5	4	2	5	15
2005–06	3	5	3	2	5	15

Table 4: Percentage of annual catch by statistical area from CRA 1, 1979–80 through 2005--06.

Fishing year	901	902	903	904	939
1979–80	16.9	23.6	19.8	15.3	24.4
1980–81	12.5	31.0	13.4	17.8	25.2
1981–82	11.1	35.4	20.6	12.1	20.8
1982–83	18.3	32.4	12.1	14.1	23.1
1983–84	21.3	31.7	7.9	14.3	24.7
1984–85	16.4	39.6	7.4	14.7	21.9
1985–86	17.4	31.1	8.6	19.2	23.7
1986–87	11.0	25.0	19.5	22.2	22.2
1987–88	18.3	23.9	15.7	18.3	23.8
1988–89	20.1	25.2	12.0	19.6	23.1
1989–90	28.3	20.4	11.3	19.7	20.4
1990–91	27.2	27.9	10.0	14.0	20.9
1991–92	7.9	30.7	16.7	18.4	26.3
1992–93	15.5	28.6	14.0	20.1	21.8
1993–94	27.0	27.9	11.7	16.8	16.6
1994–95	25.2	20.7	13.6	24.4	16.2
1995–96	15.3	16.6	17.0	31.9	19.2
1996–97	16.3	16.1	19.1	30.6	18.0
1997–98	13.8	19.4	16.0	22.9	27.9
1998–99	23.2	18.5	12.0	15.7	30.6
1999–00	45.1	8.3	5.3	10.3	30.9
2000–01	51.5	10.9	8.0	10.2	19.4
2001–02	49.2	9.5	8.5	8.6	24.1
2002–03	36.8	21.1	7.0	6.9	28.3
2003–04	15.2	47.0	6.1	10.2	21.5
2004–05	28.2	30.7	7.8	9.3	24.0
2005–06	40.3	19.1	8.8	10.6	21.2

Table 5: Percentage of annual catch by month from CRA 1, 1979–80 through 2005–06.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.9	0.1	0.1	4.4	9.4	7.3	10.1	16.5	15.8	14.9	16.4	4.2
1980–81	2.1	0.3	0.7	3.7	6.8	4.4	11.9	10.0	19.1	23.9	11.1	5.9
1981–82	1.2	0.1	0.3	2.6	6.4	7.1	11.1	13.4	22.1	22.3	8.9	4.6
1982–83	0.2	0.4	0.4	2.8	6.3	9.6	9.7	16.1	19.6	15.1	12.5	7.2
1983–84	2.0	0.0	0.3	5.5	9.0	7.8	15.8	14.8	14.2	15.1	10.6	4.9
1984–85	1.8	0.7	0.6	4.0	5.1	11.1	13.5	15.4	16.0	14.5	10.1	7.2
1985–86	1.4	0.8	1.1	6.3	8.2	6.6	10.4	13.9	15.0	17.6	12.8	5.7
1986–87	1.7	0.6	1.0	6.1	10.1	10.3	14.5	14.3	13.1	11.4	11.9	5.1
1987–88	1.1	0.4	0.6	3.7	9.1	6.6	14.7	14.2	13.9	17.3	12.0	6.4
1988–89	2.4	1.4	1.0	1.8	7.2	2.4	12.8	18.3	20.7	15.4	9.0	7.6
1989–90	1.1	0.4	0.5	4.0	5.3	8.9	5.9	18.6	20.9	16.9	12.2	5.2
1990–91	0.1	0.2	0.7	4.3	14.9	12.0	14.3	14.8	15.9	11.3	7.1	4.5
1991–92	0.2	0.4	1.1	8.0	9.5	10.3	10.3	9.8	19.7	16.8	9.9	3.9
1992–93	0.1	1.1	1.9	6.3	9.5	8.3	14.0	13.9	14.2	14.9	11.0	4.9
1993–94	0.1	0.3	1.8	7.2	9.2	7.2	18.4	14.7	17.7	12.9	7.9	2.6
1994–95	0.1	0.5	2.4	9.5	15.0	7.6	10.8	17.1	17.2	8.9	7.7	3.1
1995–96	1.2	2.1	2.8	11.9	19.0	18.9	16.8	10.6	6.8	2.4	3.4	4.1
1996–97	1.2	5.0	3.9	18.5	13.9	18.9	15.7	12.2	5.9	2.3	1.7	1.0
1997–98	5.3	6.7	5.4	20.8	20.0	18.4	12.2	4.0	2.4	0.4	0.3	4.0
1998–99	4.8	6.3	7.7	21.1	17.3	20.7	10.9	4.3	3.3	2.9	0.3	0.4
1999–00	3.1	4.4	5.0	19.5	25.7	20.1	13.1	4.7	2.6	0.7	0.2	0.9
2000–01	2.3	2.2	4.9	13.4	23.6	23.3	22.6	4.8	0.9	1.0	0.6	0.5
2001–02	3.3	4.1	5.6	14.8	20.5	26.8	11.4	7.5	3.9	1.3	0.3	0.4
2002–03	4.1	5.0	2.5	15.5	19.0	16.9	21.0	8.4	4.0	3.0	0.2	0.4
2003–04	3.1	0.7	0.5	19.5	15.7	10.3	24.1	8.5	9.9	4.2	2.3	1.0
2004–05	1.9	2.8	3.8	17.9	14.4	13.0	21.5	8.9	2.7	4.5	7.2	1.4
2005–06	2.5	1	1.6	9.8	17.7	19	21.1	13.5	8.5	3.9	0.9	0.6

Table 6: Percentage of catch from CRA 1 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in that month/statistical area combination.

Month	901	902	903	904	939
Apr	.	.	.	.	2.5
May	0.4	.	.	.	0.6
Jun	0.5	0.3	0.4	0.3	.
Jul	3.7	1.3	2.3	1.9	0.6
Aug	5.7	4.5	1.8	2.6	3.0
Sep	4.8	6.4	1.7	1.9	4.3
Oct	8.4	4.4	0.9	1.9	5.5
Nov	8.3	1.9	0.6	0.8	1.9
Dec	5.7	0.1	0.4	0.7	1.6
Jan	2.1	0.2	0.5	0.4	0.7
Feb	0.5	.	0.1	0.0	0.3
Mar	0.3	0.1	0.1	.	0.1

Table 7: Arithmetic CPUE (total kg/total potlifts) for CRA 1 by fishing year and statistical area, 1979–80 through 2005–06. A '.'indicates that the value was not available because there were fewer than 3 vessels or there was no fishing in that year/statistical area combination.

Fishing year	901	902	903	904	939
1979–80	1.91	1.42	0.70	0.52	0.47
1980–81	2.05	1.80	0.71	0.76	0.77
1981–82	2.01	1.78	0.90	0.72	0.78
1982–83	2.87	2.06	0.58	0.72	0.86
1983–84	1.89	1.47	0.60	0.66	1.12
1984–85	1.68	1.37	0.64	0.58	0.77
1985–86	1.16	1.30	0.67	0.62	0.80
1986–87	1.34	0.97	0.74	0.53	0.71
1987–88	1.58	0.94	0.64	0.51	0.64
1988–89	1.62	0.98	0.47	0.68	0.73
1989–90	1.49	1.14	0.50	0.49	0.60
1990–91	1.10	0.68	0.57	0.48	0.60
1991–92	1.45	0.81	0.44	0.41	0.65
1992–93	1.73	0.65	0.47	0.32	0.49
1993–94	1.88	1.03	0.41	0.33	0.50
1994–95	1.76	1.19	0.61	0.47	0.66
1995–96	1.83	1.30	0.90	0.67	1.02
1996–97	2.42	1.03	0.83	0.66	1.25
1997–98	2.12	1.24	0.74	0.52	1.12
1998–99	.	1.18	0.80	0.54	1.08
1999–00	2.85	1.13	0.48	0.34	1.16
2000–01	2.82	1.22	0.72	0.40	0.89
2001–02	2.92	2.77	0.77	0.50	0.86
2002–03	2.05	3.04	0.72	0.36	0.96
2003–04	.	3.29	0.79	0.36	0.81
2004–05	3.48	2.01	1.09	0.58	0.69
2005–06	3.19	2.19	0.81	.	0.57

Table 8: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 1 (kg/potlift) for 1979–80 through 2005–06. (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.74	0.78	0.81	0.040
1980–81	1.01	0.91	0.97	0.042
1981–82	1.09	0.91	0.92	0.045
1982–83	1.12	0.96	0.99	0.043
1983–84	1.11	1.00	0.94	0.042
1984–85	0.96	0.94	0.87	0.042
1985–86	0.89	0.84	0.81	0.041
1986–87	0.75	0.80	0.80	0.040
1987–88	0.74	0.75	0.75	0.041
1988–89	0.80	0.69	0.66	0.048
1989–90	0.75	0.73	0.65	0.046
1990–91	0.68	0.64	0.55	0.045
1991–92	0.60	0.65	0.64	0.040
1992–93	0.53	0.54	0.54	0.042
1993–94	0.65	0.62	0.62	0.043
1994–95	0.77	0.79	0.80	0.047
1995–96	0.94	1.07	1.20	0.053
1996–97	0.94	0.99	1.16	0.052
1997–98	0.89	0.97	1.16	0.057
1998–99	1.04	1.17	1.34	0.060
1999–00	1.09	1.06	1.11	0.062
2000–01	1.17	1.10	1.12	0.062
2001–02	1.30	1.26	1.28	0.062
2002–03	1.20	1.24	1.13	0.060
2003–04	1.22	1.15	1.13	0.066
2004–05	1.23	1.42	1.28	0.066
2005–06	1.14	1.50	1.32	0.070

Table 9: Number of vessels reporting rock lobster by statistical area from CRA 2, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.

Fishing year	905	906	907	908	All
1979–80	12	31	14	27	80
1980–81	12	41	17	25	89
1981–82	16	38	15	26	88
1982–83	16	34	13	24	82
1983–84	14	29	15	20	75
1984–85	10	29	14	24	73
1985–86	14	30	15	23	78
1986–87	12	29	13	18	70
1987–88	6	25	15	18	59
1988–89	8	27	16	11	55
1989–90	14	3	1	1	17
1990–91	13	29	16	20	57
1991–92	12	27	15	17	51
1992–93	9	20	7	18	47
1993–94	8	24	11	15	46
1994–95	9	22	9	14	47
1995–96	9	23	8	15	44
1996–97	8	17	7	13	40
1997–98	12	16	8	10	42
1998–99	10	12	5	10	35
1999–00	8	14	7	9	34
2000–01	11	16	7	12	39
2001–02	11	14	7	10	36
2002–03	9	15	10	9	37
2003–04	8	13	7	9	34
2004–05	5	13	8	11	31
2005–06	12	13	9	9	36

Table 10: Percentage of annual catch by statistical area from CRA 2, 1979–80 through 2005–06.

Fishing year	905	906	907	908
1979–80	10.6	31.4	25.0	32.9
1980–81	9.8	38.6	24.0	27.6
1981–82	12.0	40.0	18.6	29.4
1982–83	14.0	42.9	18.9	24.3
1983–84	13.8	41.5	18.7	26.0
1984–85	11.0	38.8	18.2	31.9
1985–86	11.2	38.4	25.1	25.3
1986–87	9.8	44.1	19.6	26.5
1987–88	8.2	50.2	17.3	24.3
1988–89	10.5	49.8	18.3	21.4
1989–90	68.1	15.2	5.8	10.9
1990–91	14.9	41.8	17.3	26.1
1991–92	11.1	44.8	19.3	24.9
1992–93	14.6	44.0	11.7	29.8
1993–94	15.2	45.1	14.4	25.3
1994–95	14.8	46.4	17.9	20.9
1995–96	13.8	47.6	14.7	23.9
1996–97	15.7	48.9	14.8	20.6
1997–98	15.0	45.9	21.4	17.7
1998–99	19.3	39.8	21.6	19.3
1999–00	15.7	41.7	25.2	17.4
2000–01	16.3	42.3	23.0	18.4
2001–02	15.9	41.7	21.2	21.2
2002–03	14.6	34.7	21.8	29.0
2003–04	17.2	35.6	24.5	22.7
2004–05	11.2	38.3	23.4	27.1
2005–06	16.5	37.7	24.1	21.6

Table 11: Percentage of annual catch by month from CRA 2, 1979–80 through 2005–06. A '.' indicates that no fishing took place in that fishing year/month combination.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.6	0.2	0.3	5.8	11.1	11.6	14.0	15.9	14.4	13.0	8.3	4.9
1980–81	1.1	0.8	2.3	9.8	13.6	10.4	17.0	10.1	13.1	12.1	6.6	3.1
1981–82	1.5	0.7	1.3	7.4	10.1	9.7	16.1	15.4	14.9	11.5	6.4	4.8
1982–83	1.7	0.2	1.2	7.8	11.5	11.1	15.2	15.1	14.9	10.3	6.9	4.1
1983–84	1.4	0.2	1.6	9.7	8.7	9.1	16.8	15.9	12.3	12.4	8.2	3.8
1984–85	1.5	0.3	1.0	7.7	8.9	14.6	18.0	13.1	13.9	11.7	6.0	3.2
1985–86	0.6	0.2	0.5	6.4	9.4	9.2	18.1	15.8	14.0	13.4	8.5	4.0
1986–87	1.0	0.2	0.5	6.4	10.2	11.6	17.5	15.5	15.9	11.3	6.1	3.6
1987–88	0.6	0.1	0.6	9.5	10.8	10.3	16.7	16.9	14.3	11.5	6.1	2.6
1988–89	1.2	0.1	0.9	8.2	13.9	13.1	16.5	11.4	13.3	10.1	6.9	4.2
1989–90	2.2	0.7	2.6	24.3	9.3	10.4	8.9	17.7	10.1	11.1	2.3	0.4
1990–91	0.0	0.1	0.5	7.9	16.7	14.7	16.4	14.6	12.4	8.3	5.8	2.6
1991–92	0.5	0.8	1.4	11.5	12.9	12.9	19.0	15.0	10.3	7.7	5.4	2.5
1992–93	0.4	0.5	2.6	9.8	10.3	11.2	16.6	13.3	13.7	9.3	7.2	5.1
1993–94	0.3	0.1	2.7	13.4	15.6	15.4	18.3	10.9	9.4	8.2	3.7	2.0
1994–95	0.3	0.3	5.2	18.6	18.6	16.0	20.5	10.6	5.0	2.6	1.7	0.8
1995–96	0.4	0.9	7.2	22.4	24.6	19.7	16.7	3.4	1.8	0.6	0.9	1.3
1996–97	3.2	5.8	7.0	35.1	19.6	16.0	6.8	1.8	1.1	1.4	1.1	0.9
1997–98	5.3	3.8	9.3	32.0	18.9	19.8	9.1	0.4	1.0	.	0.1	0.3
1998–99	1.7	4.3	8.0	21.8	21.8	29.7	5.6	2.5	0.6	0.1	2.2	1.6
1999–00	2.1	4.4	3.7	21.2	20.3	23.0	19.0	2.0	0.6	1.2	1.0	1.3
2000–01	4.7	1.8	1.2	10.6	18.8	19.1	24.2	7.7	2.9	1.4	3.2	4.6
2001–02	3.8	2.5	1.6	13.9	14.3	16.9	23.6	9.1	3.9	2.6	3.8	4.1
2002–03	2.8	1.2	1.2	10.4	10.5	9.0	23.5	13.4	9.7	6.1	6.8	5.5
2003–04	2.0	0.6	1.1	7.8	10.7	12.6	19.9	12.6	9.3	12.1	6.5	4.9
2004–05	2.0	1.5	2.2	12.6	9.7	10.4	16.6	14.3	7.4	9.5	7.6	6.2
2005–06	1.8	0.9	0.5	7.5	11.1	14.1	16.3	12.5	11.1	10.1	9.4	4.8

Table 12: Percentage of catch from CRA 2 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in that month/statistical area combination.

Month	905	906	907	908
Apr	0.0	1.3	0.2	0.2
May	0.0	0.5	0.1	0.2
Jun	0.1	0.0	0.2	0.2
Jul	1.5	2.3	2.3	1.3
Aug	2.3	3.9	2.3	2.6
Sep	2.8	4.3	4.3	2.7
Oct	2.5	6.3	4.2	3.3
Nov	2.4	4.3	3.5	2.3
Dec	2.1	4.0	2.6	2.4
Jan	1.0	3.5	2.7	2.8
Feb	1.2	4.7	1.4	2.2
Mar	0.6	2.5	0.3	1.4

Table 13: Arithmetic CPUE (total kg/total potlifts) for CRA 2 by fishing year and statistical area, 1979–80 through 2005–06.

Fishing year	905	906	907	908
1979–80	0.68	0.40	0.69	0.54
1980–81	0.74	0.55	0.79	0.55
1981–82	0.57	0.53	0.67	0.53
1982–83	0.53	0.43	0.52	0.39
1983–84	0.48	0.35	0.44	0.37
1984–85	0.43	0.33	0.42	0.40
1985–86	0.46	0.39	0.52	0.41
1986–87	0.44	0.36	0.41	0.36
1987–88	0.40	0.35	0.35	0.31
1988–89	0.37	0.37	0.33	0.37
1989–90	0.45	0.26	0.22	0.36
1990–91	0.50	0.46	0.49	0.53
1991–92	0.49	0.43	0.45	0.39
1992–93	0.49	0.39	0.36	0.38
1993–94	0.48	0.45	0.56	0.37
1994–95	0.47	0.55	0.89	0.43
1995–96	0.74	0.70	1.28	0.52
1996–97	0.90	0.77	1.91	0.65
1997–98	0.88	0.80	2.16	0.54
1998–99	0.96	0.83	2.19	0.61
1999–00	0.75	0.67	1.18	0.47
2000–01	0.72	0.65	0.89	0.70
2001–02	0.59	0.47	0.65	0.67
2002–03	0.43	0.36	0.49	0.53
2003–04	0.53	0.36	0.46	0.46
2004–05	0.56	0.39	0.47	0.44
2005–06	0.51	0.47	0.47	0.43

Table 14: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 2 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.52	0.53	0.52	0.024
1980–81	0.61	0.62	0.62	0.023
1981–82	0.55	0.52	0.52	0.022
1982–83	0.45	0.43	0.43	0.023
1983–84	0.39	0.36	0.35	0.023
1984–85	0.37	0.34	0.34	0.023
1985–86	0.43	0.40	0.39	0.024
1986–87	0.37	0.37	0.36	0.025
1987–88	0.34	0.32	0.31	0.025
1988–89	0.36	0.35	0.34	0.028
1989–90	0.38	0.35	0.35	0.040
1990–91	0.49	0.49	0.47	0.029
1991–92	0.43	0.44	0.43	0.029
1992–93	0.40	0.42	0.41	0.032
1993–94	0.44	0.44	0.44	0.032
1994–95	0.54	0.52	0.53	0.036
1995–96	0.69	0.72	0.76	0.040
1996–97	0.83	0.81	0.89	0.043
1997–98	0.85	0.93	1.01	0.045
1998–99	0.91	1.02	1.10	0.044
1999–00	0.71	0.79	0.83	0.043
2000–01	0.71	0.74	0.74	0.040
2001–02	0.56	0.53	0.53	0.037
2002–03	0.44	0.43	0.42	0.036
2003–04	0.43	0.43	0.42	0.037
2004–05	0.43	0.47	0.47	0.036
2005–06	0.47	0.49	0.48	0.036

Table 15: Number of vessels reporting rock lobster by statistical area from CRA 3, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.

Fishing year	909	910	911	All
1979–80	8	45	30	70
1980–81	11	46	36	85
1981–82	15	39	28	77
1982–83	16	44	29	85
1983–84	14	47	32	84
1984–85	14	49	33	86
1985–86	14	43	33	83
1986–87	12	38	29	76
1987–88	11	42	25	72
1988–89	11	30	22	58
1989–90	10	46	24	77
1990–91	9	30	23	58
1991–92	8	32	35	65
1992–93	6	24	32	54
1993–94	7	24	20	48
1994–95	7	21	16	41
1995–96	4	18	12	34
1996–97	4	18	11	32
1997–98	6	17	9	30
1998–99	7	16	9	30
1999–00	6	17	10	32
2000–01	5	17	12	33
2001–02	5	16	13	33
2002–03	5	20	14	38
2003–04	5	19	16	39
2004–05	4	15	16	33
2005–06	4	15	11	29

Table 16: Percentage of annual catch by statistical area from CRA 3, 1979–80 through 2005–06.

Fishing year	909	910	911
1979–80	12.3	53.0	34.7
1980–81	16.1	44.8	39.1
1981–82	19.2	48.3	32.5
1982–83	16.8	51.9	31.3
1983–84	11.7	52.9	35.4
1984–85	16.7	41.7	41.7
1985–86	15.4	41.8	42.8
1986–87	13.2	51.1	35.7
1987–88	19.8	47.6	32.6
1988–89	14.9	42.0	43.1
1989–90	11.8	52.8	35.4
1990–91	11.0	49.8	39.3
1991–92	11.8	41.1	47.1
1992–93	12.1	40.1	47.9
1993–94	17.9	46.1	36.0
1994–95	16.8	47.7	35.5
1995–96	13.4	54.4	32.2
1996–97	14.9	55.6	29.4
1997–98	17.2	54.9	27.9
1998–99	17.3	59.3	23.4
1999–00	17.2	54.6	28.1
2000–01	15.0	45.4	39.6
2001–02	15.5	35.5	49.1
2002–03	12.0	36.3	51.8
2003–04	13.9	36.1	50.0
2004–05	18.6	41.0	40.5
2005–06	13.5	45.6	40.9

Table 17: Percentage of annual catch by month from CRA 3, 1979–80 through 2005–06. A '.' Indicates that no fishing took place in the indicated fishing year/month cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	1.4	0.3	5.3	7.2	3.1	4.8	14.8	26.6	16.7	12.1	4.8	2.9
1980–81	2.4	0.5	3.3	8.1	6.5	4.8	11.6	18.5	18.0	14.7	6.4	5.2
1981–82	2.6	0.3	4.7	9.5	4.4	5.3	8.4	12.3	23.4	16.1	5.7	7.3
1982–83	1.6	0.5	4.7	7.6	7.0	3.8	8.7	24.4	17.7	11.4	6.2	6.4
1983–84	2.4	1.2	9.1	7.4	7.0	5.2	11.2	19.6	13.9	12.2	5.3	5.5
1984–85	1.5	0.4	11.2	6.8	3.7	3.7	17.1	21.5	15.7	11.0	5.7	1.5
1985–86	1.8	0.2	6.1	8.1	4.0	3.4	12.8	20.2	17.5	13.1	8.9	3.8
1986–87	1.4	0.1	4.9	5.3	2.7	3.8	18.1	26.0	20.1	11.5	4.5	1.5
1987–88	1.2	0.9	7.7	4.7	5.2	4.4	22.5	15.6	19.4	10.8	4.7	2.8
1988–89	1.1	0.4	4.4	4.1	2.3	8.3	22.3	17.4	16.9	9.1	5.0	8.7
1989–90	1.9	1.1	3.6	4.1	1.7	6.4	10.1	21.8	23.1	14.8	5.9	5.4
1990–91	2.0	1.1	4.0	7.3	3.8	6.5	19.0	22.3	16.7	8.3	6.2	2.8
1991–92	3.7	0.5	2.4	7.9	5.2	4.2	14.4	21.2	20.6	11.2	5.0	3.7
1992–93	1.6	0.8	6.5	6.3	4.8	1.9	7.1	19.0	22.5	17.8	5.9	5.9
1993–94	3.1	2.8	27.1	23.6	8.4	0.2	0.3	0.4	0.3	0.3	29.5	4.1
1994–95	7.5	.	42.9	24.0	14.9	0.3	0.4	0.2	0.6	0.1	7.7	1.6
1995–96	6.1	0.0	38.2	37.7	13.4	0.2	0.4	0.2	0.1	.	3.3	0.6
1996–97	9.2	.	37.5	35.5	15.2	0.5	0.7	0.1	.	.	0.6	0.7
1997–98	7.2	.	32.3	42.9	16.2	0.8	.	.	.	.	0.1	0.6
1998–99	14.4	.	27.9	24.5	21.8	1.5	0.0	.	0.4	.	8.5	0.9
1999–00	4.6	0.1	32.1	31.5	18.3	1.5	0.1	.	.	.	8.8	3.0
2000–01	8.4	.	24.2	20.0	13.4	10.8	0.0	.	.	0.0	15.5	7.8
2001–02	9.1	0.0	25.7	16.9	11.7	0.1	0.5	.	.	0.0	17.3	18.6
2002–03	2.2	.	24.8	16.9	8.4	5.8	8.0	6.6	3.7	5.9	11.1	6.7
2003–04	1.1	.	28.6	15.7	5.2	5.1	8.0	14.4	7.2	4.5	4.9	5.3
2004–05	1.7	.	30.8	13.1	8.2	1.2	4.4	11.3	5.8	9.0	8.5	6.0
2005–06	0.3	.	21.2	21.2	7.9	3.1	9.2	14.3	8.1	4.5	7.1	3.1

Table 18: Percentage of catch from CRA 3 by statistical area and month for 2005–06. A '.' Indicates that no fishing took place in the indicated statistical area/month cell.

Month	909	910	911
Apr	.	0.0	0.3
May	.	.	.
Jun	3.6	14.8	2.8
Jul	4.7	13.6	2.9
Aug	1.3	3.6	3.0
Sep	0.3	0.1	2.7
Oct	0.4	1.5	7.4
Nov	0.6	5.4	8.4
Dec	0.4	3.5	4.1
Jan	1.1	0.8	2.6
Feb	1.0	1.3	4.8
Mar	0.2	1.0	2.0

Table 19: Arithmetic CPUE (total kg/total potlifts) for CRA 3 by fishing year and statistical area, 1979–80 through 2005–06.

Fishing year	909	910	911
1979–80	1.01	0.95	0.84
1980–81	1.20	0.84	0.95
1981–82	1.32	0.89	0.84
1982–83	0.96	0.93	1.01
1983–84	0.80	0.82	0.97
1984–85	0.77	0.64	0.92
1985–86	0.66	0.64	0.89
1986–87	0.69	0.65	0.71
1987–88	0.49	0.39	0.50
1988–89	0.47	0.35	0.60
1989–90	0.56	0.43	0.68
1990–91	0.46	0.42	0.50
1991–92	0.32	0.28	0.38
1992–93	0.34	0.27	0.27
1993–94	0.59	0.46	0.46
1994–95	1.04	0.84	0.85
1995–96	1.22	1.57	1.03
1996–97	2.02	1.87	1.50
1997–98	2.62	2.10	2.12
1998–99	1.94	1.57	1.61
1999–00	1.69	1.50	1.61
2000–01	1.45	0.93	1.61
2001–02	1.00	0.71	1.22
2002–03	0.81	0.55	0.93
2003–04	0.88	0.60	0.60
2004–05	0.82	0.55	0.42
2005–06	0.82	0.59	0.61

Table 20: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 3 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.91	0.85	0.80	0.022
1980–81	0.93	0.93	0.89	0.021
1981–82	0.93	0.91	0.88	0.021
1982–83	0.96	0.98	0.95	0.021
1983–84	0.86	0.88	0.86	0.020
1984–85	0.75	0.73	0.70	0.020
1985–86	0.73	0.70	0.67	0.020
1986–87	0.67	0.61	0.58	0.022
1987–88	0.44	0.43	0.41	0.022
1988–89	0.45	0.45	0.42	0.025
1989–90	0.51	0.47	0.46	0.022
1990–91	0.45	0.43	0.43	0.023
1991–92	0.33	0.31	0.30	0.022
1992–93	0.28	0.26	0.25	0.022
1993–94	0.48	0.45	0.50	0.033
1994–95	0.87	0.89	0.93	0.043
1995–96	1.30	1.38	1.43	0.048
1996–97	1.76	1.80	1.92	0.048
1997–98	2.18	2.50	2.70	0.051
1998–99	1.63	1.87	2.05	0.046
1999–00	1.56	1.76	1.92	0.045
2000–01	1.19	1.27	1.41	0.040
2001–02	0.95	1.00	1.08	0.039
2002–03	0.73	0.73	0.73	0.032
2003–04	0.62	0.60	0.57	0.032
2004–05	0.52	0.52	0.49	0.035
2005–06	0.62	0.62	0.59	0.035

Table 21: Number of vessels reporting rock lobster by statistical area from CRA 4, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded. A '0' indicates that fishing took place but none of the qualified vessels fished.

Fishing year	912	913	914	915	934	All
1979–80	25	32	31	17	0	86
1980–81	26	20	30	19	0	86
1981–82	30	25	27	17	0	88
1982–83	28	22	29	18	0	89
1983–84	26	23	32	17	1	89
1984–85	25	24	32	19	1	90
1985–86	27	21	39	17	1	88
1986–87	25	23	35	17	2	88
1987–88	24	19	35	17	0	85
1988–89	22	24	42	16	0	87
1989–90	33	40	57	19	0	131
1990–91	26	25	32	18	0	85
1991–92	25	33	35	13	1	88
1992–93	31	29	33	11	1	94
1993–94	32	33	38	13	2	100
1994–95	23	29	40	14	4	89
1995–96	19	21	36	14	2	80
1996–97	19	15	35	16	1	74
1997–98	18	15	35	9	.	72
1998–99	22	15	32	11	.	65
1999–00	18	15	33	12	1	70
2000–01	21	13	25	11	1	61
2001–02	22	18	25	13	2	62
2002–03	16	16	25	13	1	65
2003–04	15	16	27	13	.	65
2004–05	16	16	27	10	2	61
2005–06	12	12	25	12	2	54

Table 22: Percentage of annual catch by statistical area from CRA 4, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the indicated statistical area/fishing year cell.

Fishing year	912	913	914	915	934
1979–80	21.4	30.2	38.2	10.1	0.1
1980–81	32.4	21.7	33.5	12.2	0.2
1981–82	35.6	22.6	29.3	12.4	0.0
1982–83	25.7	21.8	37.6	14.8	0.1
1983–84	19.8	27.8	40.0	12.2	0.1
1984–85	25.1	25.7	37.1	11.6	0.5
1985–86	27.0	21.2	36.7	14.7	0.4
1986–87	21.9	29.3	37.4	11.2	0.3
1987–88	19.3	25.0	44.3	11.4	0.0
1988–89	17.6	27.0	45.5	9.9	0.0
1989–90	23.0	35.3	33.8	7.9	0.0
1990–91	28.3	29.5	31.7	10.5	0.1
1991–92	31.6	29.3	30.0	8.8	0.3
1992–93	30.1	26.3	32.6	10.6	0.4
1993–94	23.8	28.8	36.7	9.9	0.9
1994–95	21.9	24.5	41.7	9.7	2.1
1995–96	22.9	23.1	46.8	6.3	0.9
1996–97	24.6	19.6	46.0	9.2	0.6
1997–98	25.5	22.0	45.0	7.5	.
1998–99	31.3	21.9	38.2	8.5	.
1999–00	26.5	22.4	39.7	10.6	0.8
2000–01	26.9	23.5	37.8	10.9	0.9
2001–02	22.2	21.6	42.3	12.8	1.3
2002–03	23.4	27.0	36.5	12.5	0.6
2003–04	19.3	31.9	40.8	8.0	.
2004–05	15.6	28.4	48.8	6.3	1.0
2005–06	9.7	21.1	55	12.9	1.3

Table 23: Percentage of annual catch by month from CRA 4, 1979–80 through 2005–06.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.3	0.5	9.4	9.8	4.6	7.1	13.5	23.4	13.1	10.8	5.3	2.1
1980–81	0.8	3.3	8.6	8.3	7.1	8.8	14.3	13.4	12.8	13.5	6.8	2.4
1981–82	1.4	3.2	7.4	9.6	5.8	10.0	11.8	10.0	13.5	14.9	9.0	3.6
1982–83	0.4	5.4	6.6	8.5	8.2	6.9	11.7	13.8	15.3	12.9	8.2	2.3
1983–84	0.4	3.3	13.1	8.4	8.7	5.8	12.5	16.4	11.5	11.8	5.7	2.6
1984–85	0.2	6.3	13.8	7.1	4.3	7.8	15.4	16.1	13.4	9.9	4.6	1.1
1985–86	0.4	1.4	11.4	8.3	5.3	5.3	12.9	14.8	17.5	14.6	6.5	1.6
1986–87	0.3	3.4	10.7	4.9	2.8	6.6	17.8	17.3	17.0	14.0	4.3	1.1
1987–88	0.5	4.4	10.2	3.7	6.4	4.8	22.7	18.2	14.4	9.3	4.0	1.5
1988–89	0.5	5.1	8.9	4.4	3.4	9.3	16.9	21.5	14.4	8.5	4.3	2.6
1989–90	1.4	3.3	8.0	6.7	2.2	9.0	11.5	19.6	15.1	14.5	6.0	2.6
1990–91	0.3	2.7	8.1	6.4	2.7	11.4	19.2	18.3	13.6	8.6	7.0	1.6
1991–92	1.6	4.3	5.7	11.7	4.7	4.7	17.0	17.9	15.2	11.6	3.8	1.7
1992–93	0.9	2.6	17.2	8.7	3.7	4.0	11.5	17.2	16.2	10.7	4.7	2.5
1993–94	1.1	14.2	17.1	9.5	3.7	1.9	15.3	15.3	14.5	4.6	2.1	0.6
1994–95	3.2	17.5	13.3	10.3	6.6	4.3	13.1	17.2	8.2	4.3	0.8	1.2
1995–96	3.9	25.1	12.1	11.9	6.1	11.8	13.2	7.3	3.1	1.6	1.8	2.1
1996–97	9.3	30.3	18.9	11.1	11.2	10.7	4.4	2.1	0.7	0.5	0.0	1.1
1997–98	7.3	30.6	19.3	18.3	10.0	8.4	3.2	0.2	0.5	1.5	0.3	0.5
1998–99	4.3	21.5	13.2	19.3	18.2	14.0	4.6	1.4	0.5	0.8	1.7	0.5
1999–00	2.4	19.7	20.4	19.9	11.5	19.4	2.1	0.6	2.9	0.5	0.3	0.4
2000–01	5.5	24.3	24.4	16.6	6.2	10.8	6.4	2.9	0.7	0.4	0.8	1.1
2001–02	5.9	14.2	25.2	11.9	9.2	16.9	5.3	4.6	2.0	2.4	1.1	1.3
2002–03	5.6	11.9	22.9	13.6	9.1	13.8	2.7	5.5	2.9	6.2	4.2	1.5
2003–04	4.6	9.1	17.8	15.4	6.2	10.9	11.6	7.3	2.9	6.6	2.4	5.1
2004–05	3.5	9.9	18.1	7.8	3.2	3.3	13.3	7.7	6.2	17.5	7.7	1.9
2005–06	1.4	11.0	10.0	8.5	4.9	3.7	10.2	8.0	17.8	12.2	8.4	3.8

Table 24: Percentage of catch from CRA 4 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in the indicated statistical area/month cell.

Month	912	913	914	915	934
Apr	0.1	0.2	0.4	0.7	0.0
May	0.1	3.0	6.9	1.0	0.0
Jun	0.5	2.6	5.2	1.6	0.2
Jul	1.2	2.5	3.7	1.0	0.1
Aug	0.5	0.7	3.0	0.7	.
Sep	0.7	0.3	2.0	0.6	0.1
Oct	2.0	2.7	5.0	0.3	0.1
Nov	1.7	2.2	3.6	0.3	0.2
Dec	1.4	3.6	11.0	1.7	0.2
Jan	0.7	2.0	7.3	1.9	0.3
Feb	0.5	0.8	4.9	2.1	0.1
Mar	0.3	0.5	2.0	0.9	.

Table 25: Arithmetic CPUE (total kg/total potlifts) for CRA 4 by fishing year and statistical area, 1979–80 through 2005–06. A '.' indicates that fewer than 3 vessels took part or that no fishing took place in the indicated statistical area/fishing year cell.

Fishing year	912	913	914	915	934
1979–80	0.93	0.98	0.90	0.56	.
1980–81	1.05	0.77	0.83	0.58	0.93
1981–82	1.09	0.83	0.74	0.59	.
1982–83	0.90	0.94	1.08	0.66	.
1983–84	0.77	1.02	1.05	0.64	.
1984–85	0.86	0.84	0.78	0.55	.
1985–86	0.79	0.77	0.72	0.60	0.75
1986–87	0.85	0.92	0.88	0.61	.
1987–88	0.65	0.78	0.79	0.59	.
1988–89	0.51	0.63	0.69	0.53	.
1989–90	0.64	0.74	0.51	0.41	.
1990–91	0.75	0.53	0.39	0.39	.
1991–92	0.74	0.54	0.38	0.38	.
1992–93	0.63	0.51	0.47	0.46	0.46
1993–94	0.55	0.65	0.62	0.41	.
1994–95	0.78	0.69	0.76	0.46	0.41
1995–96	0.95	0.82	0.92	0.59	0.37
1996–97	1.21	1.03	1.03	0.74	.
1997–98	1.71	1.49	1.07	0.84	.
1998–99	1.72	2.51	1.02	0.72	.
1999–00	1.38	1.80	1.05	1.23	0.84
2000–01	1.16	1.91	1.14	1.12	0.95
2001–02	0.93	1.17	1.08	1.11	0.81
2002–03	1.08	1.18	1.02	1.21	.
2003–04	1.10	1.36	1.08	0.90	.
2004–05	0.77	1.20	1.06	0.69	.
2005–06	0.60	0.94	0.94	0.81	.

Table 26: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 4 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.87	0.86	0.82	0.021
1980–81	0.83	0.83	0.80	0.020
1981–82	0.83	0.87	0.85	0.021
1982–83	0.92	0.94	0.92	0.020
1983–84	0.90	0.86	0.84	0.019
1984–85	0.77	0.78	0.76	0.020
1985–86	0.73	0.74	0.73	0.020
1986–87	0.84	0.80	0.77	0.020
1987–88	0.73	0.70	0.67	0.020
1988–89	0.62	0.58	0.56	0.021
1989–90	0.59	0.57	0.54	0.020
1990–91	0.50	0.52	0.50	0.021
1991–92	0.50	0.52	0.50	0.020
1992–93	0.52	0.51	0.48	0.020
1993–94	0.58	0.56	0.54	0.021
1994–95	0.69	0.68	0.68	0.022
1995–96	0.86	0.84	0.86	0.024
1996–97	1.03	1.09	1.18	0.027
1997–98	1.24	1.30	1.40	0.030
1998–99	1.31	1.43	1.55	0.029
1999–00	1.27	1.35	1.47	0.029
2000–01	1.26	1.18	1.26	0.029
2001–02	1.06	1.04	1.10	0.027
2002–03	1.09	1.14	1.19	0.027
2003–04	1.14	1.20	1.22	0.027
2004–05	1.00	0.96	0.96	0.025
2005–06	0.88	0.84	0.83	0.026

Table 27: Number of vessels reporting rock lobster by statistical area from CRA 5, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded. A '.' indicates that no fishing took place in the statistical area/fishing year cell. A '0' indicates that fishing took place but none of the qualified vessels fished.

Fishing year	916	917	918	919	932	933	All
1979–80	21	51	13	3	1	9	88
1980–81	19	50	12	1	1	11	86
1981–82	15	51	12	0	2	11	85
1982–83	19	60	13	3	1	13	93
1983–84	16	59	11	1	.	13	93
1984–85	16	60	10	2	0	14	95
1985–86	13	56	11	2	2	15	92
1986–87	11	55	11	4	5	11	91
1987–88	11	51	10	3	2	12	84
1988–89	7	44	9	3	1	9	71
1989–90	15	44	10	0	0	7	66
1990–91	11	40	10	1	3	11	62
1991–92	11	37	21	1	1	11	68
1992–93	12	31	13	0	.	11	59
1993–94	9	35	12	.	0	13	59
1994–95	9	27	8	.	0	11	51
1995–96	12	25	6	1	2	12	49
1996–97	10	22	9	2	1	12	47
1997–98	8	21	7	1	1	12	45
1998–99	6	18	5	.	1	13	41
1999–00	7	20	7	1	1	12	39
2000–01	8	18	6	.	.	10	36
2001–02	10	17	2	.	0	8	34
2002–03	10	16	2	.	.	9	34
2003–04	12	14	2	.	.	11	34
2004–05	12	13	1	.	2	9	32
2005–06	11	13	2	.	0	8	30

Table 28: Percentage of annual catch by statistical area from CRA 5, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the statistical area/fishing year cell.

Fishing year	916	917	918	919	932	933
1979–80	26.7	47.9	12.8	1.1	1.0	10.4
1980–81	29.3	50.2	6.3	0.4	0.3	13.5
1981–82	23.0	52.0	7.3	0.1	1.5	16.1
1982–83	19.9	57.3	4.0	0.7	0.1	18.0
1983–84	19.2	57.5	5.6	0.3	.	17.4
1984–85	19.5	61.4	4.7	0.7	0.1	13.6
1985–86	19.4	62.1	6.7	0.7	0.3	10.8
1986–87	15.9	65.3	7.3	1.9	1.6	8.0
1987–88	22.4	58.0	6.3	3.2	0.7	9.4
1988–89	19.3	58.6	8.2	3.2	0.7	10.0
1989–90	28.7	56.1	9.5	0.1	0.0	5.6
1990–91	28.4	57.6	4.9	0.0	0.6	8.4
1991–92	29.9	46.2	10.9	0.0	0.1	13.0
1992–93	24.9	58.4	7.0	0.2	.	9.6
1993–94	23.5	54.3	8.1	.	0.1	14.1
1994–95	28.0	50.5	4.3	.	0.0	17.2
1995–96	26.9	43.2	3.2	0.0	1.3	25.3
1996–97	24.4	45.0	4.8	0.0	2.1	23.7
1997–98	23.9	42.4	4.4	0.0	2.4	26.9
1998–99	23.3	41.7	5.8	.	3.4	25.7
1999–00	29.6	41.7	4.0	0.0	0.0	24.7
2000–01	31.0	40.1	2.8	.	.	26.1
2001–02	42.8	39.2	1.5	.	0.1	16.4
2002–03	45.8	35.6	1.0	.	.	17.6
2003–04	47.8	32.4	0.9	.	.	18.9
2004–05	43.4	39.7	0.9	.	0.1	16.0
2005–06	44.4	40.8	1.4	.	0	13.4

Table 29: Percentage of annual catch by month from CRA 5, 1979–80 through 2005–06.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.7	7.0	6.4	6.2	4.6	7.5	11.6	17.9	13.5	15.6	7.6	1.5
1980–81	1.2	9.0	2.6	3.2	4.5	6.6	13.2	20.4	14.6	16.1	7.6	1.1
1981–82	0.9	6.2	2.6	3.4	2.4	4.8	12.1	18.7	21.2	16.4	8.2	3.1
1982–83	1.3	6.7	3.1	2.9	4.3	5.0	10.5	20.1	20.3	16.0	7.7	2.1
1983–84	1.2	4.8	5.0	4.3	5.5	5.4	8.5	8.8	17.1	23.6	11.8	4.0
1984–85	1.9	8.2	6.0	4.3	2.7	3.8	8.5	19.9	20.0	16.5	6.1	2.0
1985–86	2.7	4.7	2.1	2.8	3.6	4.4	12.4	14.8	21.0	20.8	8.0	2.7
1986–87	3.1	7.7	3.6	2.4	2.0	4.6	9.8	22.3	21.4	16.9	5.2	0.9
1987–88	2.3	4.4	5.1	2.8	4.7	4.2	13.6	18.6	22.2	15.7	4.9	1.3
1988–89	1.5	4.9	3.5	2.7	3.6	6.4	7.9	20.6	20.6	21.6	4.6	2.1
1989–90	2.2	5.1	2.4	2.4	2.0	4.0	6.9	15.8	20.8	25.4	10.4	2.5
1990–91	2.7	3.8	1.6	2.8	2.1	3.9	13.4	24.8	22.8	14.7	6.2	1.3
1991–92	0.4	3.4	1.9	3.8	3.6	4.0	10.8	19.9	19.1	22.1	8.9	2.1
1992–93	0.9	2.5	5.7	3.5	3.7	2.3	7.9	12.0	21.1	25.0	12.2	3.1
1993–94	0.7	6.7	7.3	7.6	5.6	3.8	10.0	13.0	19.9	15.3	7.7	2.2
1994–95	1.8	9.9	4.6	5.2	5.7	5.1	7.0	19.0	17.0	13.3	7.9	3.6
1995–96	1.8	10.9	5.1	5.5	5.0	5.9	10.9	14.3	15.3	10.6	8.2	6.5
1996–97	8.3	20.9	7.4	5.9	7.7	9.0	10.7	8.8	10.2	6.1	3.2	1.6
1997–98	15.2	24.1	10.9	7.6	7.3	7.4	7.7	5.6	5.1	4.5	3.2	1.3
1998–99	7.7	18.0	14.1	11.5	12.9	12.3	9.3	4.0	3.7	2.0	2.2	2.2
1999–00	11.1	19.0	11.7	13.3	12.1	11.6	8.2	2.8	3.1	2.8	2.1	2.1
2000–01	7.6	24.1	16.7	13.9	10.6	10.7	9.1	2.2	1.5	2.5	0.2	1.1
2001–02	9.0	21.3	13.1	17.2	17.2	12.4	4.6	2.3	0.5	0.6	0.9	0.9
2002–03	9.1	21.7	15.9	13.4	15.8	10.1	3.3	2.3	1.0	2.8	2.3	2.3
2003–04	1.4	14.3	19.7	18.7	12.7	13.9	7.8	2.0	2.1	3.9	1.8	1.7
2004–05	3.7	22.6	13.2	13.9	7.1	6.7	7.0	7.9	4.1	10.1	1.9	1.7
2005–06	3.1	28.4	12.9	10.4	8.3	5.6	8.8	7.3	6.2	6.6	1.4	1.0

Table 30: Percentage of catch from CRA 5 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in the statistical area/month cell.

Month	916	917	918	919	932	933
Apr	1.8	1.3	.	.	.	.
May	16.7	11.4	.	.	.	0.3
Jun	7.3	4.6	.	.	0.0	1.1
Jul	5.0	3.9	0.2	.	.	1.3
Aug	3.4	3.8	0.6	.	.	0.5
Sep	1.5	2.1	0.2	.	.	1.9
Oct	1.8	2.4	0.1	.	.	4.5
Nov	0.8	4.6	0.1	.	.	1.8
Dec	1.2	3.8	0.2	.	.	1.0
Jan	4.2	1.8	0.0	.	.	0.6
Feb	0.2	0.8	0.1	.	.	0.3
Mar	0.6	0.2	.	.	.	0.2

Table 31: Arithmetic CPUE (total kg/total potlifts) for CRA 5 by fishing year and statistical area, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the statistical area/fishing year cell or that fewer than 3 vessels fished.

Fishing year	916	917	918	919	932	933
1979–80	0.83	0.68	1.10	0.95	.	0.73
1980–81	1.00	0.87	0.85	1.22	.	0.90
1981–82	0.64	0.86	0.82	.	.	0.81
1982–83	0.67	0.94	0.61	0.67	.	0.90
1983–84	0.64	0.80	0.73	0.40	.	0.74
1984–85	0.75	0.81	0.70	0.43	.	0.65
1985–86	0.77	0.70	0.75	0.44	0.45	0.49
1986–87	0.61	0.67	0.80	0.59	0.84	0.36
1987–88	0.59	0.45	0.71	0.57	.	0.34
1988–89	0.48	0.37	0.71	0.32	.	0.30
1989–90	0.56	0.38	0.58	.	.	0.29
1990–91	0.44	0.42	0.48	.	0.55	0.41
1991–92	0.44	0.31	0.55	.	0.24	0.37
1992–93	0.37	0.34	0.45	.	.	0.31
1993–94	0.43	0.36	0.49	.	.	0.39
1994–95	0.56	0.35	0.37	.	.	0.51
1995–96	0.64	0.39	0.41	.	.	0.63
1996–97	0.69	0.46	0.65	.	.	0.66
1997–98	1.05	0.65	0.61	.	.	0.95
1998–99	1.12	0.75	0.88	.	.	1.04
1999–00	2.13	0.77	0.87	.	.	0.91
2000–01	3.48	0.83	1.40	.	.	0.97
2001–02	2.84	0.83	1.64	.	.	1.06
2002–03	2.25	0.93	1.31	.	.	0.88
2003–04	2.36	1.11	1.38	.	.	0.86
2004–05	2.21	0.98	1.37	.	.	0.87
2005–06	1.90	0.97	1.72	.	.	0.70

Table 32: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 5 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.76	0.68	0.65	0.024
1980–81	0.90	0.81	0.79	0.026
1981–82	0.79	0.73	0.70	0.027
1982–83	0.84	0.78	0.77	0.025
1983–84	0.75	0.70	0.69	0.025
1984–85	0.76	0.71	0.70	0.025
1985–86	0.68	0.58	0.57	0.025
1986–87	0.63	0.51	0.51	0.026
1987–88	0.47	0.43	0.43	0.026
1988–89	0.39	0.38	0.37	0.029
1989–90	0.42	0.42	0.40	0.030
1990–91	0.43	0.41	0.38	0.029
1991–92	0.37	0.33	0.32	0.026
1992–93	0.35	0.32	0.31	0.028
1993–94	0.39	0.38	0.37	0.030
1994–95	0.42	0.40	0.39	0.031
1995–96	0.49	0.47	0.46	0.033
1996–97	0.56	0.61	0.63	0.035
1997–98	0.78	0.85	0.88	0.038
1998–99	0.89	1.07	1.14	0.040
1999–00	1.00	1.11	1.15	0.040
2000–01	1.16	1.26	1.36	0.046
2001–02	1.27	1.37	1.50	0.050
2002–03	1.26	1.49	1.58	0.049
2003–04	1.39	1.65	1.72	0.048
2004–05	1.26	1.53	1.55	0.047
2005–06	1.18	1.41	1.41	0.047

Table 33: Number of vessels reporting rock lobster by statistical area from CRA 6, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.

Fishing year	940	941	942	943	All
1979–80	11	13	17	8	39
1980–81	13	12	15	11	42
1981–82	11	16	21	19	45
1982–83	18	17	27	15	54
1983–84	12	16	24	9	50
1984–85	18	18	26	9	53
1985–86	14	19	26	17	57
1986–87	20	14	22	12	48
1987–88	15	17	24	12	47
1988–89	12	13	18	8	42
1989–90	18	18	20	9	55
1990–91	15	14	20	5	40
1991–92	15	19	28	5	45
1992–93	14	20	25	6	50
1993–94	16	19	28	9	53
1994–95	19	15	31	15	59
1995–96	17	15	24	12	51
1996–97	21	14	23	10	50
1997–98	20	11	23	8	50
1998–99	16	11	17	8	42
1999–00	12	9	16	4	34
2000–01	14	8	17	5	33
2001–02	11	10	14	6	32
2002–03	11	8	15	5	32
2003–04	12	12	15	6	35
2004–05	11	10	15	3	34
2005–06	13	10	18	6	35

Table 34: Percentage of annual catch by statistical area from CRA 6, 1979–80 through 2005–06.

Fishing year	940	941	942	943
1979–80	21.5	24.6	38.4	15.5
1980–81	28.5	21.3	31.2	19.0
1981–82	19.6	29.0	34.8	16.6
1982–83	24.6	19.1	40.1	16.1
1983–84	21.8	24.2	38.9	15.1
1984–85	25.6	25.1	36.7	12.6
1985–86	28.4	22.1	33.1	16.5
1986–87	29.0	15.6	37.1	18.3
1987–88	24.0	19.2	41.1	15.7
1988–89	20.4	13.9	50.0	15.6
1989–90	30.0	21.9	38.7	9.4
1990–91	23.4	19.2	50.5	6.9
1991–92	21.2	22.0	52.3	4.5
1992–93	23.1	21.2	47.5	8.2
1993–94	24.9	20.2	45.4	9.5
1994–95	22.5	19.5	49.4	8.7
1995–96	27.9	14.1	46.8	11.2
1996–97	27.0	18.2	43.0	11.8
1997–98	29.2	19.9	43.4	7.4
1998–99	29.0	19.4	43.5	8.2
1999–00	24.0	21.6	47.2	7.1
2000–01	24.1	17.4	51.8	6.6
2001–02	24.2	18.5	48.2	9.1
2002–03	19.5	24.2	43.1	13.2
2003–04	23.4	21.4	45.7	9.5
2004–05	20.3	23.7	50.5	5.5
2005–06	22.2	20.5	47.8	9.5

Table 35: Percentage of annual catch by month from CRA 6, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the month/fishing year cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	.	7.2	8.1	6.1	3.5	3.5	12.1	14.5	15.1	18.5	11.3	.
1980–81	.	2.2	8.5	9.2	2.1	1.7	8.2	14.1	16.8	25.6	11.7	.
1981–82	.	4.8	6.6	4.8	2.9	3.5	18.4	14.6	14.2	15.2	14.8	.
1982–83	.	2.5	10.3	9.1	3.9	3.1	7.6	10.9	11.8	23.1	17.8	.
1983–84	.	1.4	7.0	7.9	6.5	2.6	7.0	17.6	15.9	18.7	15.4	.
1984–85	.	4.1	6.0	5.0	3.2	2.0	12.3	13.7	19.1	20.8	13.8	0.1
1985–86	.	4.1	5.9	3.4	1.8	6.3	12.2	13.0	19.1	14.8	19.2	.
1986–87	.	2.1	4.0	3.3	3.1	2.9	10.7	16.9	20.4	19.9	16.8	.
1987–88	.	1.1	4.6	4.4	4.8	1.3	9.7	15.6	21.3	18.1	15.7	3.3
1988–89	.	3.1	7.2	4.7	2.8	1.4	8.7	14.4	16.9	22.3	18.5	.
1989–90	.	3.6	5.4	5.7	3.3	1.6	9.9	10.4	19.2	21.4	19.5	0.0
1990–91	.	1.9	5.5	3.4	1.6	1.5	16.0	15.0	16.7	17.0	21.3	0.0
1991–92	.	1.4	5.9	4.0	1.8	2.1	10.7	9.6	17.4	30.9	13.5	2.8
1992–93	.	1.3	8.2	7.3	6.0	3.3	2.4	10.1	16.0	20.9	17.7	6.7
1993–94	.	1.6	8.7	8.2	4.8	3.2	8.8	15.7	13.1	14.0	21.9	.
1994–95	0.0	4.4	6.2	5.1	4.4	2.6	8.6	16.1	14.8	20.9	17.0	.
1995–96	.	4.2	6.8	3.8	5.9	6.7	23.7	11.9	10.0	12.2	14.6	0.3
1996–97	.	5.3	8.3	5.7	5.1	8.7	20.3	11.1	13.0	12.5	10.1	0.0
1997–98	0.0	8.0	9.4	8.2	5.4	6.7	11.3	12.1	14.8	11.7	12.4	0.0
1998–99	.	6.5	7.1	5.6	5.2	6.5	16.6	18.7	11.9	9.4	12.6	.
1999–00	.	6.6	7.3	6.2	5.6	8.3	17.6	12.9	11.2	12.1	12.0	0.1
2000–01	.	5.2	6.8	6.7	4.8	9.7	17.8	16.0	10.2	10.7	11.9	0.2
2001–02	.	2.9	7.9	6.3	4.1	4.3	15.1	14.3	13.2	17.0	14.8	0.1
2002–03	.	2.2	6.2	9.5	5.9	5.7	8.0	15.9	11.1	18.4	17.0	0.1
2003–04	.	1.7	5.3	6.6	8.6	6.3	15.9	12.8	12.4	19.0	11.2	0.1
2004–05	.	3.9	7.1	10.1	3.9	4.8	10.3	15.1	12.4	17.0	14.9	0.6
2005–06	.	3.8	6.4	7.3	5.5	5.5	10.3	14.0	18.2	16.8	12.2	.

Table 36: Percentage of catch from CRA 6 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in the month/statistical area cell.

Month	940	941	942	943
Apr	.	.	.	.
May	0.7	1	2	0.2
Jun	1.2	1.7	3.1	0.4
Jul	1.2	2.1	3.5	0.5
Aug	0.4	1.2	3.6	0.3
Sep	0.1	1.3	3.6	0.5
Oct	2	2.4	4.9	1
Nov	4.2	2.1	6.2	1.5
Dec	4.2	2.6	9.4	1.9
Jan	4.7	3.8	6.7	1.6
Feb	3.4	2.3	4.9	1.5
Mar	.	.	.	.

Table 37: Arithmetic CPUE (total kg/total potlifts) for CRA 6 by fishing year and statistical area, 1979–80 through 2005–06.

Fishing year	940	941	942	943
1979–80	2.04	1.43	3.67	3.22
1980–81	2.59	1.38	2.44	2.82
1981–82	2.71	1.40	3.10	2.52
1982–83	2.17	0.97	2.23	2.28
1983–84	2.34	1.28	1.80	1.88
1984–85	1.54	1.07	1.42	1.51
1985–86	1.71	1.14	1.42	1.42
1986–87	1.52	1.32	2.00	1.68
1987–88	1.52	1.09	1.78	1.45
1988–89	1.22	1.09	1.62	1.41
1989–90	1.47	1.09	1.50	1.15
1990–91	1.36	0.92	1.87	0.94
1991–92	1.24	0.86	1.78	0.84
1992–93	0.94	0.79	1.72	0.91
1993–94	0.97	0.88	1.38	0.80
1994–95	1.09	0.74	1.46	0.70
1995–96	1.00	0.77	1.44	0.82
1996–97	0.88	0.84	1.29	0.95
1997–98	0.73	0.77	1.08	0.94
1998–99	0.91	1.04	1.53	1.24
1999–00	0.97	0.94	1.71	0.83
2000–01	0.92	0.91	1.54	0.83
2001–02	0.98	0.86	1.47	1.15
2002–03	1.12	0.99	1.31	1.18
2003–04	1.15	0.76	1.40	0.99
2004–05	1.14	0.89	1.53	1.04
2005–06	1.30	0.91	1.68	1.51

Table 38: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 6 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	2.33	2.12	2.19	0.036
1980–81	2.18	2.05	2.02	0.037
1981–82	2.19	2.30	2.30	0.035
1982–83	1.78	1.63	1.66	0.031
1983–84	1.73	1.64	1.63	0.031
1984–85	1.35	1.31	1.30	0.031
1985–86	1.41	1.38	1.37	0.031
1986–87	1.66	1.53	1.51	0.033
1987–88	1.48	1.36	1.32	0.033
1988–89	1.40	1.29	1.27	0.036
1989–90	1.34	1.20	1.14	0.036
1990–91	1.38	1.21	1.18	0.036
1991–92	1.29	1.25	1.22	0.032
1992–93	1.14	1.22	1.18	0.031
1993–94	1.07	1.05	1.05	0.029
1994–95	1.07	1.05	1.04	0.029
1995–96	1.08	1.04	1.06	0.029
1996–97	1.02	1.10	1.12	0.030
1997–98	0.88	1.04	1.06	0.031
1998–99	1.17	1.26	1.30	0.035
1999–00	1.19	1.30	1.34	0.038
2000–01	1.15	1.18	1.20	0.037
2001–02	1.15	1.17	1.19	0.039
2002–03	1.16	1.27	1.29	0.038
2003–04	1.10	1.21	1.23	0.039
2004–05	1.21	1.37	1.35	0.037
2005–06	1.35	1.45	1.45	0.036

Table 39: Number of vessels reporting rock lobster by statistical area from CRA 7, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.

Fishing year	920	921	All
1979–80	64	35	90
1980–81	58	35	86
1981–82	50	35	79
1982–83	24	22	42
1983–84	23	22	40
1984–85	39	24	59
1985–86	47	26	66
1986–87	40	25	58
1987–88	41	16	51
1988–89	28	15	38
1989–90	12	7	17
1990–91	28	12	37
1991–92	34	15	46
1992–93	29	11	35
1993–94	32	10	37
1994–95	26	8	32
1995–96	22	16	27
1996–97	16	8	22
1997–98	7	4	7
1998–99	13	9	18
1999–00	13	6	17
2000–01	18	12	25
2001–02	17	9	22
2002–03	18	6	20
2003–04	16	3	17
2004–05	12	4	14
2005–06	10	5	14

Table 40: Percentage of annual catch by statistical area from CRA 7, 1979–80 through 2005–06.

Fishing year	920	921
1979–80	61.3	38.7
1980–81	62.0	38.0
1981–82	60.5	39.5
1982–83	53.6	46.4
1983–84	52.3	47.7
1984–85	63.5	36.5
1985–86	74.5	25.5
1986–87	72.6	27.4
1987–88	78.5	21.5
1988–89	70.1	29.9
1989–90	63.9	36.1
1990–91	66.5	33.5
1991–92	71.9	28.1
1992–93	69.9	30.1
1993–94	67.4	32.6
1994–95	64.9	35.1
1995–96	57.2	42.8
1996–97	62.9	37.1
1997–98	51.6	48.4
1998–99	48.3	51.7
1999–00	74.0	26.0
2000–01	50.7	49.3
2001–02	72.7	27.3
2002–03	76.5	23.5
2003–04	70.5	29.5
2004–05	58.4	41.6
2005–06	52.0	48.0

Table 41: Percentage of annual catch by month from CRA 7, 1979–80 through 2005–06. A '.' indicates that fishing did not take place in that fishing year/month cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	1.7	0.0	5.7	18.1	26.8	22.6	13.4	6.5	3.4	1.1	0.6	0.3
1980–81	0.0	0.2	8.6	19.9	33.4	15.4	12.3	5.4	2.1	1.2	0.9	0.6
1981–82	0.1	0.0	8.5	27.5	25.0	19.9	9.3	5.5	1.9	1.6	0.7	0.0
1982–83	0.1	0.0	5.7	25.8	24.3	15.3	11.6	10.0	5.0	1.8	0.3	0.0
1983–84	.	.	5.8	19.0	24.9	19.9	15.4	6.6	5.3	2.0	0.8	0.2
1984–85	0.0	0.0	15.8	30.5	16.6	12.6	11.7	7.6	3.1	1.5	0.5	0.1
1985–86	0.0	0.0	10.9	28.1	25.5	12.9	10.6	5.4	3.8	1.5	1.1	0.1
1986–87	.	0.0	5.6	17.5	19.9	24.9	14.3	8.9	5.7	2.2	0.9	0.1
1987–88	0.0	0.0	7.1	24.7	27.4	16.0	12.0	7.0	2.8	1.6	0.9	0.5
1988–89	0.0	.	4.3	18.6	28.1	14.8	18.3	11.5	1.8	1.5	1.0	0.0
1989–90	.	0.1	2.6	6.0	18.0	27.2	16.5	11.7	8.6	6.5	2.7	0.2
1990–91	0.0	.	7.0	25.0	20.0	19.6	9.1	5.9	6.8	4.2	1.9	0.2
1991–92	0.0	0.0	21.9	34.6	32.7	9.6	0.9	0.2	0.1	.	0.0	.
1992–93	.	.	5.9	18.7	19.9	24.1	17.9	7.8	5.0	0.4	0.3	0.1
1993–94	0.0	.	15.7	40.1	24.4	11.6	8.0	0.1	0.0	0.0	.	.
1994–95	.	0.0	9.4	28.7	33.5	19.6	7.4	1.2	.	.	0.2	.
1995–96	.	0.0	5.9	39.0	26.1	19.9	8.1	1.0	.	.	.	.
1996–97	.	.	4.8	19.4	32.1	19.1	19.2	5.4	.	.	.	.
1997–98	.	.	2.4	17.9	22.9	21.3	13.5	22.0	.	.	.	.
1998–99	.	.	6.0	30.1	21.0	9.1	12.5	20.2	1.0	.	.	.
1999–00	.	.	7.3	20.4	27.5	17.4	14.0	13.5	.	.	.	.
2000–01	.	.	6.6	22.2	28.6	15.6	17.7	9.2	.	0.1	.	.
2001–02	.	.	9.0	27.1	25.7	18.6	12.6	6.9	.	.	0.0	.
2002–03	.	0.0	10.2	21.2	30.5	20.6	15.8	1.8	.	.	.	.
2003–04	.	0.0	7.1	29.1	25.5	15.2	18.4	4.8	.	.	.	.
2004–05	0.0	.	11.5	36.2	30.8	12.8	5.9	2.9	.	.	.	.
2005–06	.	.	9	45.7	32.1	10.9	2	0.2	.	.	.	.

Table 42: Percentage of catch from CRA 7 by statistical area and month for 2005–06. A '.' indicates that fishing did not take place in that statistical area/month cell.

Month	920	921
Apr	.	.
May	.	.
Jun	7.7	1.3
Jul	28	17.7
Aug	10.6	21.5
Sep	3.6	7.3
Oct	1.8	0.2
Nov	0.2	.
Dec	.	.
Jan	.	.
Feb	.	.
Mar	.	.

Table 43: Arithmetic CPUE (total kg/total potlifts) for CRA 7 by fishing year and statistical area, 1979–80 through 2005–06.

Fishing year	920	921
1979–80	0.91	1.39
1980–81	0.75	1.27
1981–82	0.66	1.10
1982–83	0.40	0.72
1983–84	0.33	0.53
1984–85	0.52	0.76
1985–86	0.72	0.85
1986–87	0.74	1.08
1987–88	0.70	0.84
1988–89	0.40	0.61
1989–90	0.28	0.68
1990–91	0.34	0.74
1991–92	0.77	1.02
1992–93	0.33	0.76
1993–94	0.51	1.17
1994–95	0.37	1.06
1995–96	0.24	0.49
1996–97	0.20	0.44
1997–98	0.18	0.36
1998–99	0.25	0.38
1999–00	0.20	0.31
2000–01	0.27	0.49
2001–02	0.45	0.50
2002–03	0.45	1.07
2003–04	0.45	1.88
2004–05	0.55	1.61
2005–06	0.83	1.81

Table 44: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 7 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.05	1.00	0.99	0.031
1980–81	0.89	0.87	0.87	0.033
1981–82	0.79	0.75	0.74	0.034
1982–83	0.50	0.49	0.48	0.037
1983–84	0.40	0.42	0.41	0.038
1984–85	0.59	0.56	0.56	0.038
1985–86	0.75	0.74	0.74	0.037
1986–87	0.81	0.84	0.85	0.038
1987–88	0.73	0.70	0.71	0.041
1988–89	0.45	0.42	0.42	0.046
1989–90	0.36	0.33	0.35	0.044
1990–91	0.41	0.42	0.44	0.041
1991–92	0.83	0.97	0.96	0.053
1992–93	0.40	0.40	0.42	0.045
1993–94	0.63	0.62	0.61	0.056
1994–95	0.48	0.46	0.47	0.052
1995–96	0.31	0.28	0.28	0.052
1996–97	0.25	0.24	0.24	0.056
1997–98	0.24	0.18	0.17	0.061
1998–99	0.30	0.28	0.27	0.061
1999–00	0.22	0.27	0.28	0.064
2000–01	0.35	0.37	0.35	0.058
2001–02	0.46	0.47	0.45	0.063
2002–03	0.52	0.62	0.63	0.068
2003–04	0.58	0.58	0.62	0.076
2004–05	0.75	0.85	0.85	0.090
2005–06	1.12	1.28	1.26	0.102

Table 45: Number of vessels reporting rock lobster by statistical area from CRA 8, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded.

Fishing year	922	923	924	925	926	927	928	All
1979–80	6	48	76	5	67	69	67	271
1980–81	6	50	85	4	63	59	50	253
1981–82	8	39	76	5	68	40	34	221
1982–83	6	32	67	6	71	46	33	214
1983–84	6	41	56	7	73	47	34	208
1984–85	8	33	59	7	70	57	36	212
1985–86	3	38	54	5	63	58	40	208
1986–87	3	28	51	5	56	42	36	187
1987–88	5	24	53	1	57	38	28	173
1988–89	4	29	38	5	43	23	22	135
1989–90	7	36	40	11	78	42	27	178
1990–91	3	15	35	14	65	38	25	134
1991–92	5	19	34	4	71	43	34	143
1992–93	4	16	32	7	52	33	37	144
1993–94	3	19	33	8	51	34	34	143
1994–95	2	10	32	16	42	29	34	122
1995–96	3	10	18	10	36	27	30	112
1996–97	3	11	21	9	36	25	31	111
1997–98	2	12	18	8	36	23	35	107
1998–99	1	11	17	9	34	20	37	104
1999–00	2	13	16	7	29	21	21	91
2000–01	1	8	14	4	32	24	18	87
2001–02	2	6	13	3	34	15	18	74
2002–03	1	2	12	2	33	12	15	69
2003–04	1	5	11	4	29	11	14	66
2004–05	2	6	10	4	29	9	13	62
2005–06	1	6	8	1	28	10	14	60

Table 46: Percentage of estimated annual catch by statistical area from CRA 8, 1979–80 through 2005–06.

Fishing year	922	923	924	925	926	927	928
1979–80	1.9	12.7	25.6	0.4	22.4	19.5	17.6
1980–81	1.2	11.3	30.5	1.3	24.1	17.1	14.5
1981–82	1.5	11.9	27.5	1.9	32.4	13.8	11.0
1982–83	1.4	9.9	24.9	1.0	33.2	18.8	10.8
1983–84	1.1	10.2	22.3	1.5	35.8	17.2	11.9
1984–85	1.3	9.4	22.0	0.8	30.5	24.9	11.2
1985–86	0.7	10.5	21.3	1.0	29.5	24.2	12.9
1986–87	1.1	9.9	27.8	0.4	30.2	16.2	14.3
1987–88	1.3	12.5	27.8	0.1	32.0	15.5	10.8
1988–89	1.7	16.2	23.8	1.0	32.8	11.5	12.9
1989–90	1.1	8.9	23.0	0.5	36.5	19.3	10.7
1990–91	0.9	6.7	23.0	1.4	37.9	18.9	11.2
1991–92	1.0	6.0	19.6	1.3	32.3	23.1	16.6
1992–93	0.8	5.6	19.6	1.4	33.0	18.4	21.2
1993–94	1.5	6.4	22.9	1.7	30.2	17.4	19.8
1994–95	1.0	3.9	24.2	4.0	27.8	18.7	20.3
1995–96	0.8	5.1	17.0	3.6	30.4	21.1	21.9
1996–97	0.8	5.5	16.1	2.7	33.3	21.7	20.0
1997–98	0.3	4.4	16.6	1.2	32.6	19.2	25.6
1998–99	0.4	6.0	11.6	1.3	35.0	20.0	25.7
1999–00	0.5	6.5	13.6	3.1	36.4	22.8	17.1
2000–01	0.5	3.6	15.5	2.1	40.8	25.3	12.1
2001–02	0.8	3.3	14.9	0.3	42.8	22.9	15.0
2002–03	0.9	1.8	15.6	1.1	48.4	18.3	13.9
2003–04	0.6	3.9	12.8	0.3	51.5	16.8	14.2
2004–05	0.8	3.8	12.1	1.2	50.0	16.7	15.6
2005–06	0.5	2.9	12.4	0.6	45.9	19.8	18.0

Table 47: Percentage of estimated annual catch by month from CRA 8, 1979–80 through 2005–06.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.2	0.3	2.2	4.0	8.4	16.5	25.0	18.9	9.3	8.9	5.0	1.2
1980–81	0.2	0.3	2.4	5.4	7.0	14.4	25.3	21.2	12.6	7.4	3.1	0.8
1981–82	0.1	0.3	1.9	2.7	10.7	22.2	26.0	18.6	9.1	5.2	2.1	1.1
1982–83	0.3	0.2	3.4	3.3	7.2	20.3	29.2	10.5	10.5	8.3	5.5	1.2
1983–84	0.4	0.2	2.1	3.3	5.3	13.2	18.8	22.4	15.5	11.7	5.8	1.4
1984–85	0.2	0.3	1.3	2.4	9.6	24.8	24.8	14.8	10.6	5.6	3.5	2.0
1985–86	0.3	0.7	3.1	3.6	18.5	21.2	21.1	14.3	8.7	4.2	2.9	1.5
1986–87	0.6	0.6	1.4	2.1	9.5	19.1	20.1	20.1	11.7	7.8	4.5	2.6
1987–88	0.4	0.2	0.7	2.2	8.9	19.7	20.2	19.0	12.7	8.0	6.0	1.9
1988–89	0.7	0.7	2.9	3.2	5.7	12.1	17.0	17.9	14.0	16.0	7.3	2.6
1989–90	0.6	0.3	0.8	1.6	11.1	22.9	13.9	19.2	12.4	9.0	6.2	2.0
1990–91	0.3	0.1	0.9	2.5	8.3	17.6	17.1	19.7	10.5	11.9	7.0	4.2
1991–92	0.3	0.4	2.9	3.5	7.1	14.7	18.2	16.0	14.7	12.9	7.2	2.1
1992–93	0.5	0.2	2.2	4.0	8.3	17.4	15.5	15.8	15.1	8.6	8.5	3.9
1993–94	0.1	0.2	1.0	4.5	19.2	27.6	19.7	11.9	7.0	3.4	2.9	2.4
1994–95	0.1	0.4	3.5	5.2	11.2	25.6	18.5	11.4	10.4	9.0	3.3	1.3
1995–96	0.2	0.2	2.9	4.2	11.9	20.4	19.9	18.9	8.3	7.1	4.3	1.9
1996–97	0.2	0.3	2.2	4.0	10.0	19.1	22.4	19.1	11.1	8.2	2.4	0.9
1997–98	0.2	0.3	3.0	4.7	8.1	21.0	21.6	15.9	11.1	9.6	3.6	0.9
1998–99	0.1	0.3	1.4	2.4	7.6	17.4	16.6	22.4	13.2	10.4	6.3	1.8
1999–00	0.0	0.1	0.6	2.1	15.9	24.8	22.5	14.0	8.8	7.9	2.1	1.1
2000–01	0.1	0.0	0.4	2.6	14.9	37.7	15.3	13.0	6.5	4.9	3.7	1.0
2001–02	0.2	0.6	1.2	5.8	14.3	33.2	21.5	14.5	3.6	3.8	1.1	0.2
2002–03	0.8	0.8	0.7	5.3	20.7	31.6	19.2	8.8	3.4	4.9	1.0	2.7
2003–04	0.5	0.8	1.5	10.5	29.6	38.8	10.6	2.1	0.3	3.6	1.1	0.7
2004–05	0.7	2.0	2.8	14.0	22.2	40.6	6.6	2.4	0.7	3.7	2.8	1.4
2005–06	2.6	3.0	7.6	13.5	23.7	37.1	5.7	0.7	0.5	4.2	0.6	0.9

Table 48: Percentage of estimated catch from CRA 8 by statistical area and month for 2005–06. A'.' indicates that fishing did not take place in that statistical area/month cell.

Month	922	923	924	925	926	927	928
Apr	.	.	.	.	0.6	1.4	0.6
May	.	.	0.0	0.4	0.6	1.3	0.7
Jun	.	.	0.0	0.2	1.8	2.7	2.9
Jul	.	0.0	0.4	.	5.2	3.4	4.5
Aug	0.3	0.9	3.9	.	11.7	3.2	3.7
Sep	0.2	1.5	6.3	.	18.6	7.2	3.3
Oct	.	0.2	0.4	.	4.0	0.5	0.6
Nov	.	0.1	0.0	.	0.5	.	0.1
Dec	.	0.0	0.1	.	0.1	.	0.3
Jan	.	0.3	1.2	.	2.1	.	0.5
Feb	.	.	.	.	0.3	.	0.3
Mar	.	.	.	.	0.5	0.1	0.3

Table 49: Arithmetic CPUE (total kg/total potlifts) for CRA 8 by fishing year and statistical area, 1979–80 through 2005–06. A'.' indicates that fishing did not take place in that statistical area/month cell or that fewer than 3 vessels fished.

Fishing year	922	923	924	925	926	927	928
1979–80	1.99	2.23	1.89	5.01	1.84	1.52	1.63
1980–81	1.32	1.90	2.00	7.95	1.96	1.33	1.37
1981–82	1.52	1.81	1.90	10.43	2.14	1.45	1.22
1982–83	1.10	1.82	1.73	4.44	1.99	1.22	1.07
1983–84	0.81	1.18	1.23	4.46	1.53	0.99	1.09
1984–85	0.86	1.25	1.33	3.67	1.30	1.19	0.96
1985–86	0.94	1.49	1.66	13.46	1.51	1.14	1.04
1986–87	1.10	1.17	1.69	2.11	1.23	0.79	0.91
1987–88	1.01	1.45	1.72	.	1.35	0.82	0.91
1988–89	0.54	1.07	1.07	1.58	1.04	0.70	0.69
1989–90	0.81	0.87	1.27	0.60	0.90	0.72	0.71
1990–91	0.61	0.93	1.23	1.38	0.94	0.72	0.57
1991–92	0.42	0.86	1.12	2.02	0.84	0.74	0.68
1992–93	0.47	0.79	1.07	0.93	0.71	0.54	0.57
1993–94	1.21	1.33	1.64	1.78	0.94	0.71	0.65
1994–95	0.73	0.89	1.22	1.29	0.90	0.75	0.70
1995–96	0.92	0.76	1.09	1.24	1.08	0.85	0.69
1996–97	0.80	0.75	0.96	1.20	1.01	0.83	0.72
1997–98	0.64	0.66	0.90	0.94	0.78	0.68	0.62
1998–99	.	0.73	0.71	0.88	1.01	0.86	0.62
1999–00	.	0.75	0.88	0.82	1.14	0.89	0.52
2000–01	.	1.20	1.26	1.56	1.28	0.82	0.55
2001–02	.	1.44	1.33	0.61	1.04	0.79	0.64
2002–03	.	.	1.34	.	1.29	0.93	0.74
2003–04	.	2.75	2.32	1.57	1.92	1.56	0.94
2004–05	.	2.46	1.92	1.15	1.74	1.43	1.13
2005–06	.	4.27	3.08	.	1.92	1.21	1.50

Table 50: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 8 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.79	2.07	2.09	0.020
1980–81	1.72	1.83	1.82	0.021
1981–82	1.79	1.82	1.74	0.023
1982–83	1.57	1.52	1.49	0.022
1983–84	1.25	1.16	1.12	0.021
1984–85	1.22	1.12	1.09	0.021
1985–86	1.36	1.29	1.29	0.022
1986–87	1.15	1.14	1.14	0.022
1987–88	1.24	1.22	1.20	0.023
1988–89	0.92	0.93	0.90	0.027
1989–90	0.89	0.88	0.82	0.024
1990–91	0.87	0.88	0.83	0.026
1991–92	0.82	0.81	0.80	0.024
1992–93	0.68	0.71	0.72	0.024
1993–94	0.92	0.94	0.96	0.027
1994–95	0.88	0.87	0.87	0.027
1995–96	0.90	0.90	0.89	0.029
1996–97	0.87	0.84	0.84	0.029
1997–98	0.72	0.70	0.72	0.027
1998–99	0.79	0.74	0.74	0.028
1999–00	0.84	0.77	0.76	0.033
2000–01	0.98	0.91	0.91	0.036
2001–02	0.92	0.95	0.97	0.040
2002–03	1.10	1.18	1.21	0.044
2003–04	1.67	1.76	1.84	0.049
2004–05	1.58	1.70	1.80	0.048
2005–06	1.75	1.91	2.18	0.049

Table 51: Number of vessels reporting rock lobster by statistical area from CRA 9, 1979–80 through 2005–06. Vessels recorded as catching less than 1 t in a year for the entire QMA have been excluded. A '.' indicates that no fishing took place in the statistical area/fishing year cell. A '0' indicates that fishing took place but none of the qualified vessels fished.

Fishing year	929	930	931	935	936	937	938	All
1979–80	4	6	6	3	6	3	.	23
1980–81	2	4	5	4	8	5	1	23
1981–82	1	3	7	3	4	4	.	20
1982–83	2	3	7	2	4	4	.	19
1983–84	1	3	7	3	6	6	.	22
1984–85	0	3	6	3	6	5	.	21
1985–86	0	2	7	7	6	6	.	20
1986–87	0	2	6	5	6	6	.	20
1987–88	0	2	5	5	6	5	.	19
1988–89	.	1	1	4	5	2	0	10
1989–90	1	4	4	7	3	1	.	18
1990–91	0	1	5	5	2	1	1	12
1991–92	.	1	5	6	0	1	0	13
1992–93	.	3	4	5	0	1	0	12
1993–94	0	3	3	6	0	0	.	12
1994–95	1	6	3	5	0	1	.	16
1995–96	1	4	1	6	1	1	.	14
1996–97	1	6	5	6	1	2	.	18
1997–98	1	6	5	7	4	1	.	19
1998–99	1	5	5	5	1	1	1	16
1999–00	1	7	6	4	0	1	.	17
2000–01	0	3	2	3	3	2	0	9
2001–02	0	2	2	4	2	3	0	11
2002–03	0	1	2	4	2	2	.	10
2003–04	.	1	3	3	2	1	.	9
2004–05	.	0	2	4	2	1	.	8
2005–06	0	1	2	4	1	1	.	8

Table 52: Percentage of estimated annual catch by statistical area from CRA 9, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the statistical area/fishing year cell.

Fishing year	929	930	931	935	936	937	938
1979–80	14.7	14.7	28.8	13.1	13.4	15.3	.
1980–81	3.3	10.9	16.9	14.4	29.2	25.0	0.3
1981–82	4.3	8.9	32.5	10.2	20.0	24.1	.
1982–83	7.2	9.0	42.3	16.0	8.5	17.1	.
1983–84	2.0	6.3	50.1	8.2	12.6	20.7	.
1984–85	0.7	12.2	42.1	16.5	12.4	16.1	.
1985–86	0.1	7.0	38.6	18.8	16.3	19.2	.
1986–87	1.0	6.3	34.6	23.2	23.4	11.5	.
1987–88	0.0	2.8	33.5	36.3	16.1	11.2	.
1988–89	.	5.5	19.6	46.9	19.5	8.0	0.4
1989–90	2.1	19.5	24.2	43.4	6.5	4.4	.
1990–91	0.1	3.8	40.4	46.5	5.3	1.8	2.1
1991–92	.	2.6	49.8	40.2	1.3	5.1	0.9
1992–93	.	12.5	41.7	40.2	0.1	3.9	1.6
1993–94	1.4	23.0	26.3	47.5	0.1	1.6	.
1994–95	5.6	31.9	13.2	46.1	0.4	2.8	.
1995–96	5.7	27.9	5.7	43.2	8.8	8.7	.
1996–97	4.8	19.0	22.8	45.5	3.2	4.7	.
1997–98	5.7	16.5	19.7	45.4	9.9	2.9	.
1998–99	4.7	31.1	19.2	35.2	4.5	4.7	0.7
1999–00	2.6	34.8	28.4	28.7	0.6	5.0	.
2000–01	1.2	7.5	33.7	35.3	10.3	11.9	0.0
2001–02	0.1	10.0	24.0	41.6	12.2	11.5	0.6
2002–03	0.3	4.9	27.8	44.4	12.4	10.1	.
2003–04	.	6.3	36.5	30.7	17.6	8.8	.
2004–05	.	2.3	30.3	54.7	8.5	4.2	.
2005–06	0.1	5.8	25.4	56.2	7.4	5.1	.

Table 53: Percentage of estimated annual catch by month from CRA 9, 1979–80 through 2005–06. A '.' indicates that no fishing took place in the month/fishing year cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	3.4	0.1	0.6	3.6	2.9	2.0	15.0	26.0	11.6	17.5	11.0	6.3
1980–81	0.8	0.1	0.2	2.7	2.7	2.4	13.4	5.7	21.1	32.0	15.0	3.8
1981–82	0.6	0.2	1.4	2.4	3.0	1.2	9.0	19.9	20.7	19.7	14.7	7.3
1982–83	4.0	0.7	2.4	4.6	8.1	3.1	8.2	8.0	16.0	14.8	20.8	9.3
1983–84	2.6	0.9	2.8	11.2	5.2	0.9	5.5	11.6	11.6	21.1	18.4	8.2
1984–85	0.8	2.3	2.3	5.1	5.3	8.3	7.9	16.4	13.4	15.6	14.4	8.2
1985–86	4.4	1.6	0.3	2.9	6.5	10.4	10.4	14.6	17.3	12.8	11.6	7.3
1986–87	2.0	0.6	0.6	4.8	4.3	5.1	9.5	16.2	20.8	15.3	10.6	10.2
1987–88	2.7	0.1	1.7	3.0	5.9	4.8	15.9	18.0	13.6	15.2	11.4	7.8
1988–89	4.4	.	0.5	4.9	3.0	8.3	3.7	13.6	18.6	21.3	12.9	8.8
1989–90	1.3	0.0	0.0	3.9	7.6	16.1	7.8	10.6	12.5	15.8	18.3	6.0
1990–91	0.4	.	.	2.2	5.1	11.9	21.4	12.2	6.4	13.1	11.1	16.2
1991–92	1.1	0.0	2.0	17.1	6.1	8.9	9.8	17.4	12.5	10.1	7.4	7.4
1992–93	0.5	0.8	11.7	11.9	3.4	13.6	11.6	11.1	10.4	9.1	11.7	4.3
1993–94	1.0	0.5	1.0	24.3	9.3	12.7	16.3	7.1	11.0	5.7	8.7	2.5
1994–95	0.3	0.0	4.4	12.0	11.6	13.7	22.4	8.9	13.8	9.4	2.0	1.4
1995–96	0.0	0.5	2.4	7.4	16.5	24.1	23.9	13.1	5.1	3.7	0.5	2.7
1996–97	0.4	0.5	4.6	16.2	17.2	22.3	17.0	8.1	7.3	4.6	0.7	1.1
1997–98	0.2	0.2	12.5	21.0	15.0	17.1	12.0	7.3	7.0	3.6	3.9	0.2
1998–99	1.1	1.2	2.6	8.2	12.7	17.9	12.6	18.4	10.8	8.3	3.7	2.6
1999–00	0.8	1.6	6.4	9.4	15.9	27.3	18.2	12.5	5.7	2.2	0.1	0.0
2000–01	3.2	2.3	6.0	20.4	19.5	12.6	13.9	12.5	6.8	2.5	0.0	0.3
2001–02	4.2	2.7	8.8	25.3	13.5	23.3	13.9	3.8	2.8	0.6	0.6	0.3
2002–03	11.3	5.0	1.9	18.0	14.1	14.2	6.3	8.1	8.1	3.2	8.2	1.6
2003–04	8.0	0.7	1.1	16.1	28.8	9.0	8.7	5.8	9.5	10.7	.	1.6
2004–05	0.8	0.2	3.6	34.6	27.6	16.3	13.3	.	1.1	0.8	0.1	1.5
2005–06	1.3	2.5	12.0	20.6	28.8	29.5	2.6	0.4	0.8	0.2	0.9	0.3

Table 54: Percentage of estimated catch from CRA 9 by statistical area and month for 2005–06. A '.' indicates that no fishing took place in the statistical area/month cell.

Month	929	930	931	935	936	937	938
Apr	.	1.2	.	.	.	0.1	.
May	.	1.1	.	1.3	.	0.1	.
Jun	.	0.8	5.9	5.2	.	0.1	.
Jul	0.1	1.2	4.4	14.8	.	.	.
Aug	.	0.5	6.6	21.6	.	0.1	.
Sep	.	0.9	7.3	11.8	7.4	2.1	.
Oct	.	.	1.3	0.9	.	0.4	.
Nov	.	.	.	.	.	0.4	.
Dec	.	.	.	0.3	.	0.5	.
Jan	.	.	.	0.2	.	.	.
Feb	.	.	.	.	.	0.9	.
Mar	.	.	.	.	.	0.3	.

Table 55: Arithmetic CPUE (total kg/total potlifts) for CRA 9 by fishing year and statistical area, 1979–80 through 2005–06. A'.' indicates that fishing did not take place in that statistical area/month cell or that fewer than 3 vessels fished.

Fishing year	929	930	931	935	936	937	938
1979–80	1.21	1.03	2.51	0.63	0.68	1.30	.
1980–81	0.65	1.05	2.28	0.82	0.88	1.80	.
1981–82	0.73	0.83	2.35	0.49	0.63	1.28	.
1982–83	0.82	0.48	1.58	0.69	0.46	0.83	.
1983–84	.	0.70	1.81	0.63	0.44	0.89	.
1984–85	.	0.61	1.78	0.75	0.51	0.77	.
1985–86	.	0.53	1.07	0.67	0.54	0.72	.
1986–87	.	0.64	1.14	0.90	0.79	0.63	.
1987–88	.	.	0.89	1.20	0.61	0.61	.
1988–89	.	0.42	.	1.29	0.52	0.66	.
1989–90	0.46	0.61	1.44	1.03	0.42	0.47	.
1990–91	.	.	1.37	0.86	1.14	.	0.70
1991–92	.	.	1.36	0.81	.	.	.
1992–93	.	0.63	1.43	0.78	.	.	.
1993–94	.	1.20	1.49	1.28	.	.	.
1994–95	.	0.66	1.33	1.23	.	.	.
1995–96	0.50	0.70	.	1.27	.	.	.
1996–97	.	0.70	0.86	1.25	.	.	.
1997–98	0.83	0.55	0.61	1.02	1.06	.	.
1998–99	0.63	0.74	1.22	0.98	.	.	.
1999–00	.	0.74	0.99	1.01	.	.	.
2000–01	0.72	0.70	.	0.74	0.47	.	.
2001–02	.	0.54	1.81	0.66	.	0.92	.
2002–03	.	.	.	1.21	.	.	.
2003–04	.	.	1.79	2.21	.	.	.
2004–05	.	.	.	2.30	.	.	.
2005–06	.	.	.	2.15	.	1.58	.

Table 56: Annual arithmetic, unstandardised and standardised (with standard error) CPUE indices for CRA 9 (kg/potlift). (s.e.=standard error).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.11	1.06	1.17	0.049
1980–81	1.14	1.11	1.26	0.048
1981–82	0.98	0.92	0.97	0.056
1982–83	0.86	0.80	0.81	0.056
1983–84	0.94	0.87	0.84	0.057
1984–85	0.89	0.81	0.80	0.055
1985–86	0.74	0.70	0.71	0.056
1986–87	0.87	0.83	0.82	0.057
1987–88	0.85	0.87	0.84	0.061
1988–89	0.81	0.76	0.82	0.074
1989–90	0.83	0.72	0.74	0.063
1990–91	0.98	0.90	0.82	0.080
1991–92	0.93	0.98	0.85	0.078
1992–93	0.88	1.03	0.95	0.081
1993–94	1.30	1.18	1.11	0.081
1994–95	0.93	0.83	0.88	0.071
1995–96	0.98	0.98	1.07	0.081
1996–97	0.98	0.95	0.96	0.071
1997–98	0.79	0.81	0.83	0.069
1998–99	0.92	1.03	1.09	0.072
1999–00	0.87	0.90	0.90	0.074
2000–01	0.93	1.03	1.05	0.087
2001–02	0.82	1.02	1.02	0.091
2002–03	1.11	1.21	1.19	0.090
2003–04	1.63	1.89	1.72	0.111
2004–05	2.14	2.44	2.25	0.121
2005–06	2.22	2.09	2.05	0.113

Table 57: Standardised indices for each period with associated standard error and the corresponding arithmetic (unstandardised) CPUE (kg/potlift) for CRA 4 from period 69 (AW 1979–80) through period 123 (AW 2006–07). [s.e.=standard error; N/A: not available]

Fishing	Autumn/winter [AW] season				Spring/summer [SS] season			
year	Period	Arithmetic	Standardised	s.e.	Period	Arithmetic	Standardised	s.e.
1979–80	69	0.79	0.82	0.034	70	0.92	0.87	0.028
1980–81	71	0.85	0.85	0.032	72	0.82	0.80	0.028
1981–82	73	0.83	0.88	0.033	74	0.83	0.87	0.029
1982–83	75	0.89	0.95	0.031	76	0.93	0.94	0.027
1983–84	77	0.92	0.89	0.031	78	0.90	0.83	0.027
1984–85	79	0.76	0.78	0.030	80	0.78	0.77	0.029
1985–86	81	0.61	0.64	0.030	82	0.80	0.83	0.028
1986–87	83	0.68	0.69	0.031	84	0.93	0.87	0.028
1987–88	85	0.60	0.58	0.032	86	0.80	0.78	0.029
1988–89	87	0.50	0.50	0.032	88	0.69	0.65	0.030
1989–90	89	0.48	0.46	0.031	90	0.66	0.65	0.028
1990–91	91	0.42	0.43	0.032	92	0.55	0.58	0.029
1991–92	93	0.40	0.43	0.029	94	0.57	0.58	0.029
1992–93	95	0.45	0.41	0.029	96	0.58	0.57	0.029
1993–94	97	0.50	0.45	0.029	98	0.67	0.66	0.033
1994–95	99	0.61	0.59	0.029	100	0.84	0.80	0.038
1995–96	101	0.79	0.73	0.030	102	1.07	1.09	0.046
1996–97	103	0.99	1.05	0.031	104	1.54	1.41	0.069
1997–98	105	1.22	1.24	0.033	106	1.67	1.69	0.082
1998–99	107	1.28	1.35	0.033	108	1.84	2.11	0.074
1999–00	109	1.24	1.31	0.032	110	1.72	1.70	0.076
2000–01	111	1.20	1.05	0.034	112	1.88	1.96	0.067
2001–02	113	1.01	0.95	0.033	114	1.38	1.45	0.058
2002–03	115	0.98	0.97	0.033	116	1.74	1.69	0.050
2003–04	117	1.01	1.01	0.035	118	1.49	1.61	0.046
2004–05	119	0.79	0.74	0.035	120	1.30	1.33	0.040
2005–06	121	0.79	0.73	0.039	122	0.94	0.95	0.038
2006–07	123	0.54	0.66	0.044	124	N/A	N/A	N/A

Table 58: Proportion of the total deviance explained by each variable in the standardised CPUE model used in the CRA 4 management decision making.

	Iteration		
Variable	1	2	3
Period	0.220		
Month	0.047	0.263	
Area	0.021	0.246	0.287
Additional deviance explained	0.000	0.043	0.025

Table 59: Standardised indices for each period with associated standard error and the corresponding arithmetic (unstandardised) CPUE (kg/potlift) for CRA 7 from period 69 (autumn/winter [AW] 1979–80) through period 122 (spring/summer [SS] 2005–06). [s.e.=standard error]

	Autumn/winter season				Spring/summer season			
Fishing year	Period	Arithmetic	Standardised	s.e.	Period	Arithmetic	Standardised	s.e.
1979–80	69	1.13	1.03	0.041	70	0.88	0.96	0.050
1980–81	71	0.97	1.01	0.044	72	0.69	0.72	0.053
1981–82	73	0.85	0.82	0.043	74	0.60	0.63	0.057
1982–83	75	0.46	0.43	0.047	76	0.66	0.60	0.063
1983–84	77	0.38	0.37	0.049	78	0.47	0.50	0.063
1984–85	79	0.61	0.57	0.048	80	0.53	0.54	0.064
1985–86	81	0.83	0.84	0.048	82	0.57	0.63	0.059
1986–87	83	0.83	0.84	0.051	84	0.76	0.86	0.061
1987–88	85	0.79	0.83	0.056	86	0.58	0.62	0.061
1988–89	87	0.41	0.38	0.060	88	0.53	0.50	0.076
1989–90	89	0.27	0.24	0.063	90	0.57	0.53	0.064
1990–91	91	0.42	0.45	0.057	92	0.39	0.44	0.063
1991–92	93	0.82	0.94	0.058	94	1.03	1.10	0.154
1992–93	95	0.41	0.38	0.059	96	0.38	0.48	0.071
1993–94	97	0.60	0.69	0.063	98	1.38	0.33	0.138
1994–95	99	0.51	0.54	0.063	100	0.30	0.34	0.099
1995–96	101	0.32	0.29	0.061	102	0.23	0.24	0.103
1996–97	103	0.24	0.22	0.066	104	0.30	0.32	0.106
1997–98	105	0.18	0.14	0.072	106	0.53	0.31	0.122
1998–99	107	0.25	0.22	0.072	108	0.47	0.44	0.117
1999–00	109	0.20	0.25	0.077	110	0.36	0.37	0.119
2000–01	111	0.32	0.32	0.070	112	0.45	0.46	0.105
2001–02	113	0.46	0.46	0.075	114	0.48	0.45	0.115
2002–03	115	0.48	0.58	0.078	116	0.81	0.88	0.145
2003–04	117	0.54	0.60	0.091	118	0.78	0.71	0.141
2004–05	119	0.79	0.83	0.100	120	0.51	0.97	0.217
2005–06	121	1.12	1.19	0.110	122	1.27	1.91	0.284

Table 60: Proportion of the total deviance explained by each variable in the standardised CPUE model used in the CRA 7 stock assessment.

	Iteration		
Variable	1	2	3
Period	0.262		
Month	0.052	0.307	
Area	0.004	0.267	0.311
Additional deviance explained	0.000	0.045	0.004

Table 61: Standardised indices for each period with associated standard error and the corresponding arithmetic (unstandardised) CPUE (kg/potlift) for CRA 8 from period 69 (autumn-winter 1979–80) through period 122 (spring–summer 2005–06). [s.e.=standard error]

	Autumn/winter season				Spring/summer season			
Fishing year	Period	Arithmetic	Standardised	s.e.	Period	Arithmetic	Standardised	s.e.
1979–80	69	1.54	2.05	0.033	70	1.93	2.16	0.027
1980–81	71	1.65	1.93	0.036	72	1.76	1.79	0.028
1981–82	73	1.82	1.87	0.037	74	1.77	1.70	0.030
1982–83	75	1.39	1.44	0.035	76	1.70	1.54	0.029
1983–84	77	0.98	0.94	0.036	78	1.37	1.27	0.028
1984–85	79	1.22	1.13	0.036	80	1.22	1.08	0.028
1985–86	81	1.52	1.47	0.034	82	1.24	1.18	0.030
1986–87	83	1.05	1.00	0.036	84	1.20	1.26	0.029
1987–88	85	1.20	1.10	0.039	86	1.26	1.29	0.030
1988–89	87	0.74	0.78	0.046	88	1.01	0.99	0.036
1989–90	89	0.80	0.74	0.041	90	0.95	0.88	0.031
1990–91	91	0.73	0.70	0.046	92	0.95	0.93	0.033
1991–92	93	0.63	0.68	0.040	94	0.94	0.89	0.031
1992–93	95	0.59	0.64	0.040	96	0.74	0.78	0.032
1993–94	97	0.87	0.87	0.041	98	0.99	1.04	0.037
1994–95	99	0.81	0.80	0.041	100	0.95	0.93	0.037
1995–96	101	0.80	0.81	0.046	102	0.98	0.97	0.039
1996–97	103	0.70	0.67	0.045	104	1.01	1.00	0.039
1997–98	105	0.58	0.58	0.042	106	0.85	0.85	0.037
1998–99	107	0.63	0.56	0.047	108	0.89	0.89	0.037
1999–00	109	0.76	0.66	0.051	110	0.91	0.85	0.044
2000–01	111	1.02	0.84	0.055	112	0.93	0.97	0.048
2001–02	113	0.79	0.78	0.055	114	1.16	1.22	0.060
2002–03	115	0.97	0.94	0.058	116	1.38	1.65	0.069
2003–04	117	1.61	1.68	0.061	118	1.97	1.99	0.088
2004–05	119	1.48	1.55	0.058	120	2.28	2.26	0.091
2005–06	121	1.66	1.88	0.056	122	2.71	3.02	0.113

Table 62: Proportion of the total deviance explained by each variable in the standardised CPUE model used in the CRA 8 stock assessment.

	Iteration		
Variable	1	2	3
Period	0.155		
Month	0.038	0.192	
Area	0.047	0.186	0.218
Additional deviance explained	0.000	0.037	0.026

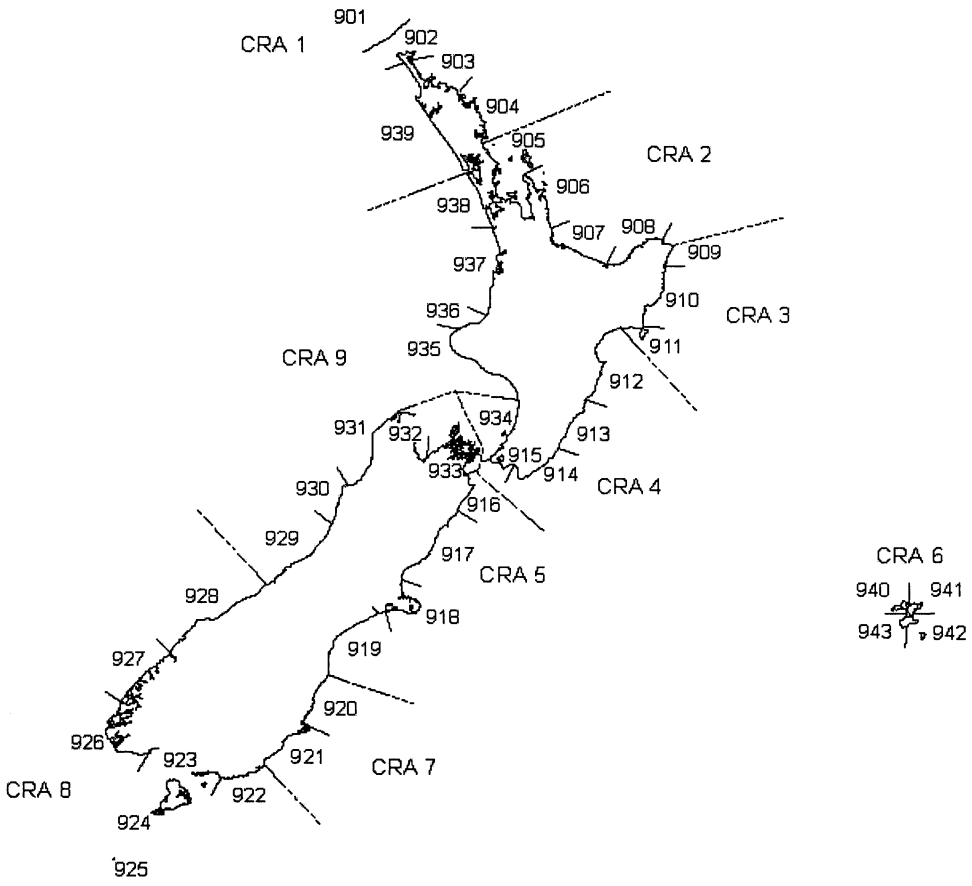

Figure 1: Map of rock lobster statistical areas and quota management areas.

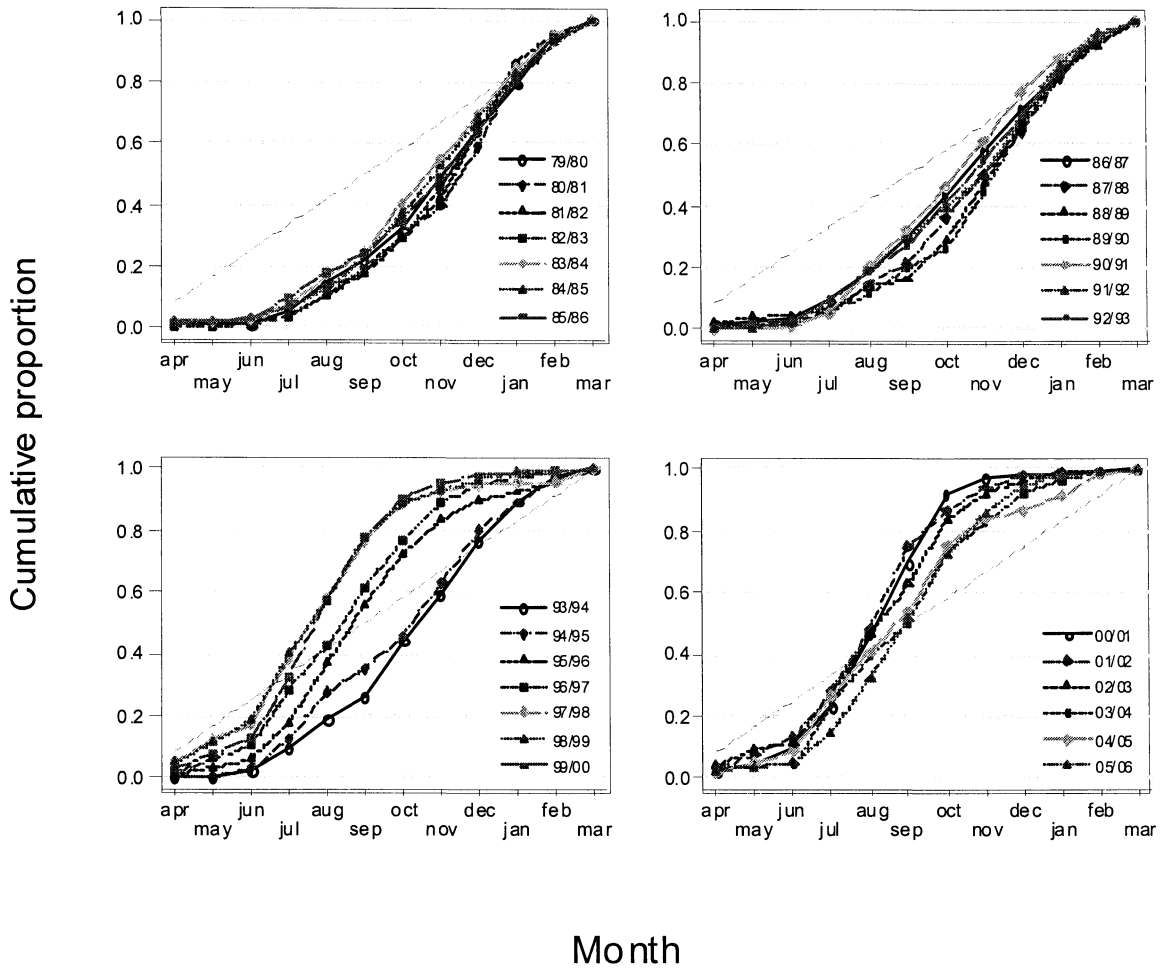

Figure 2: Cumulative catch percentages by fishing month for CRA 1, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

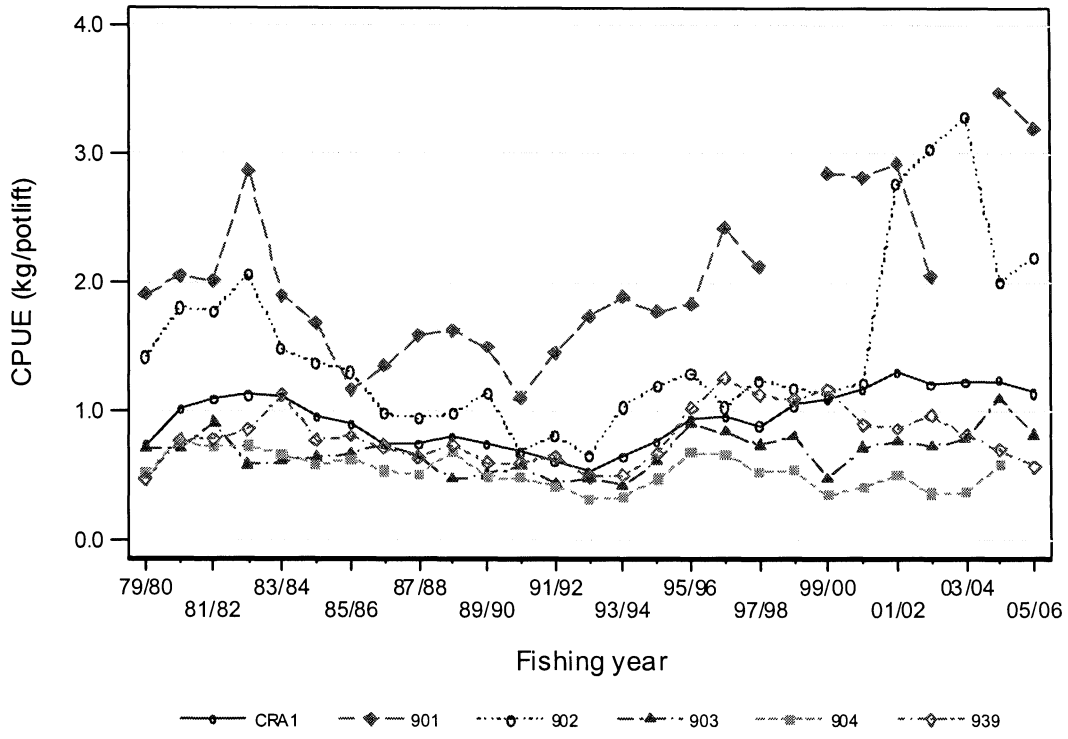

Figure 3: **Arithmetic CPUE (total kg/total potlifts) for CRA 1 by fishing year and statistical area from 1979–80 through 2005–06.**

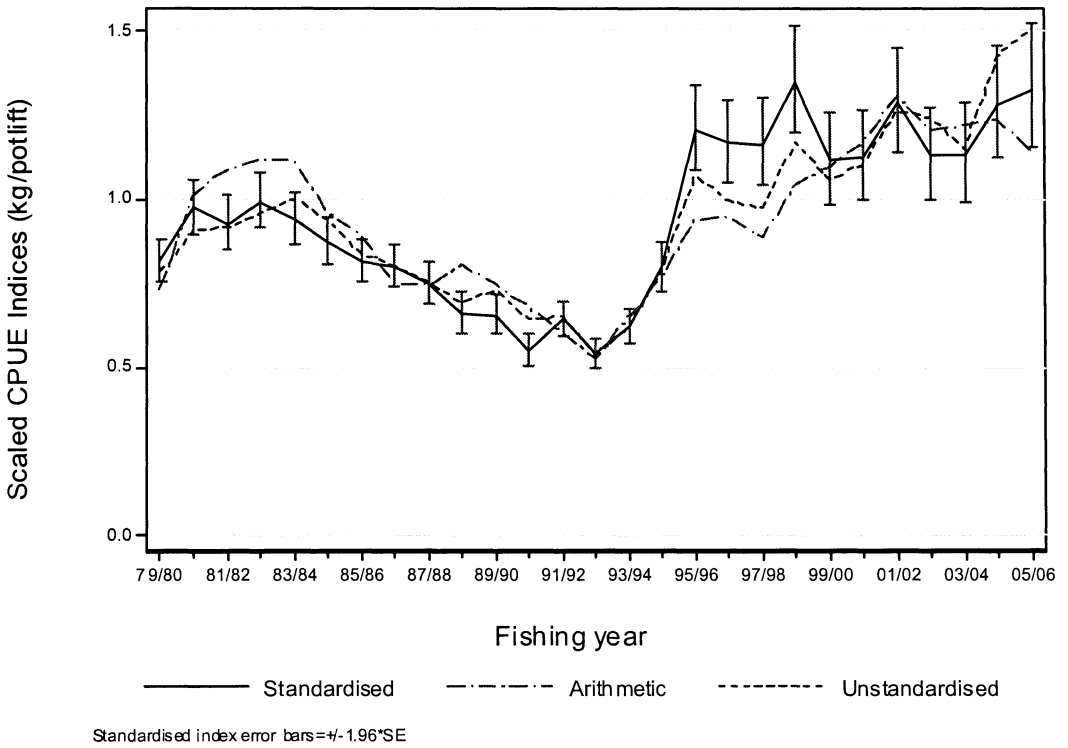

Figure 4: **Annual CPUE indices for CRA 1: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.**

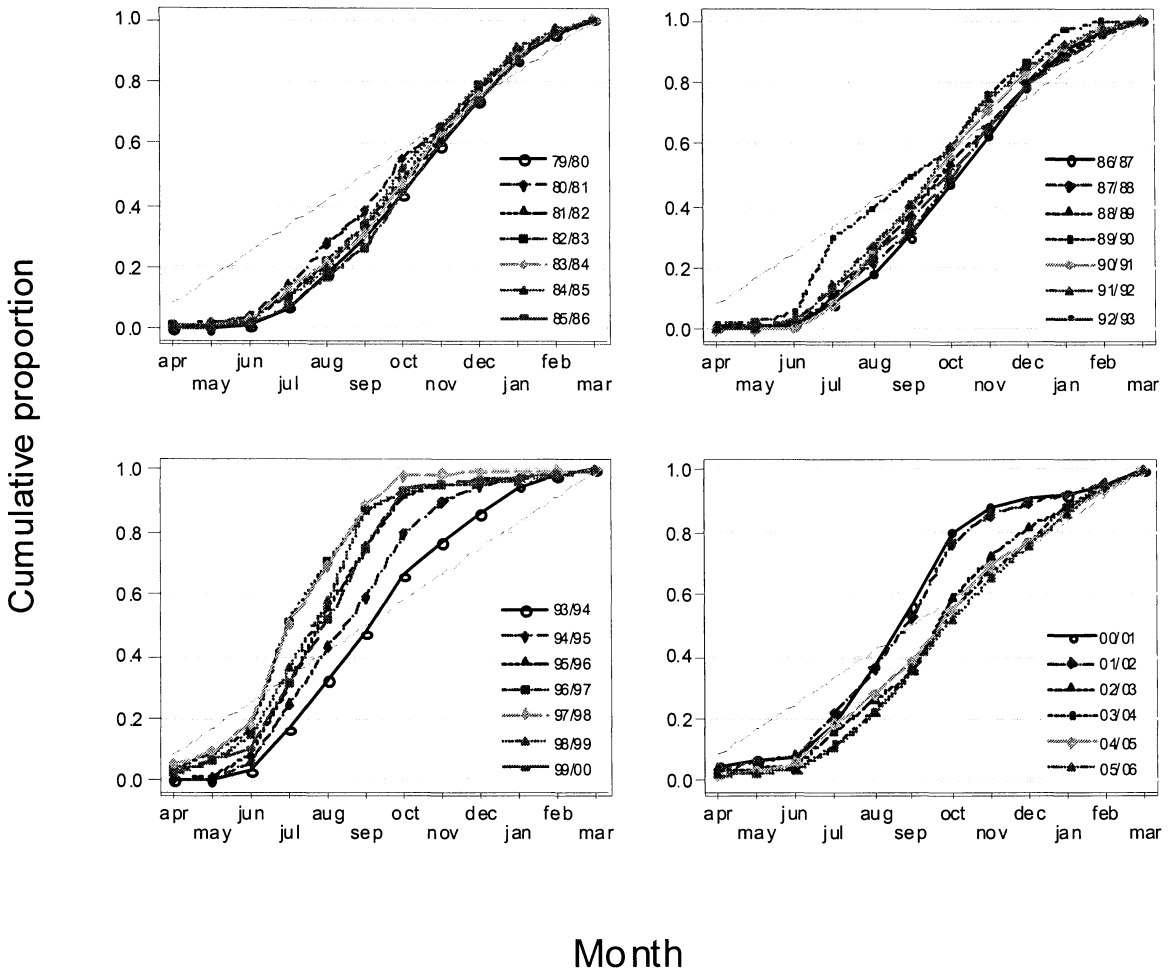

Figure 5: Cumulative catch percentages by fishing month for CRA 2, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

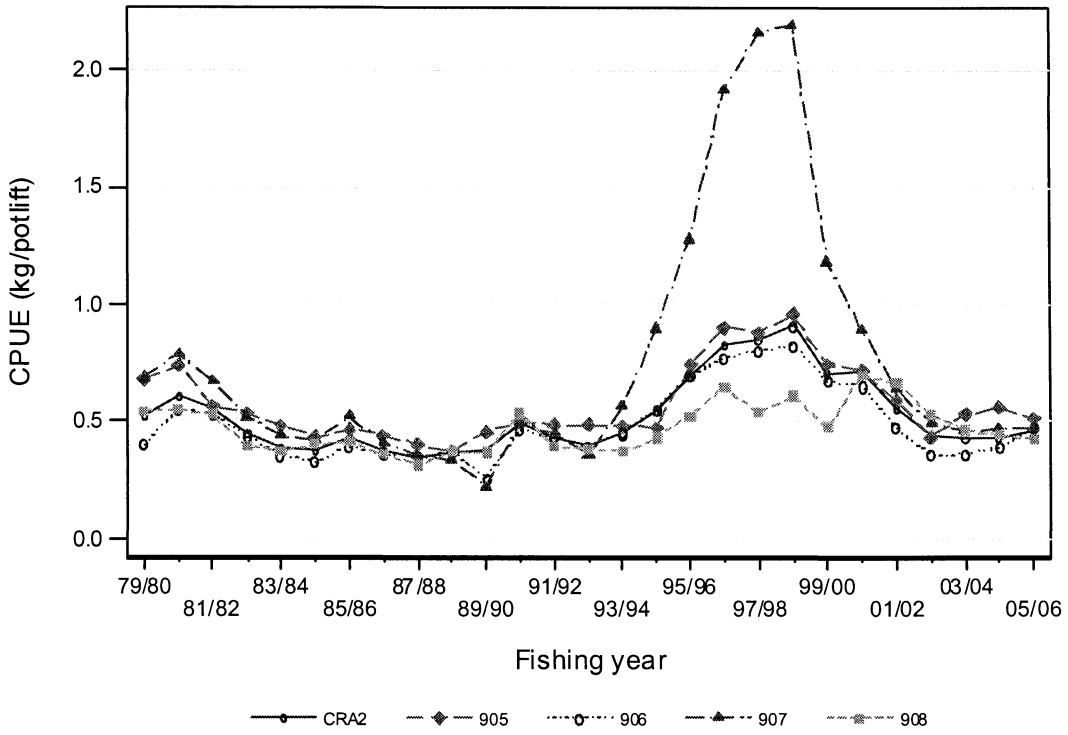

Figure 6: **Arithmetic CPUE (total kg/total potlifts) for CRA 2 by fishing year and statistical area from 1979–80 through 2005–06.**

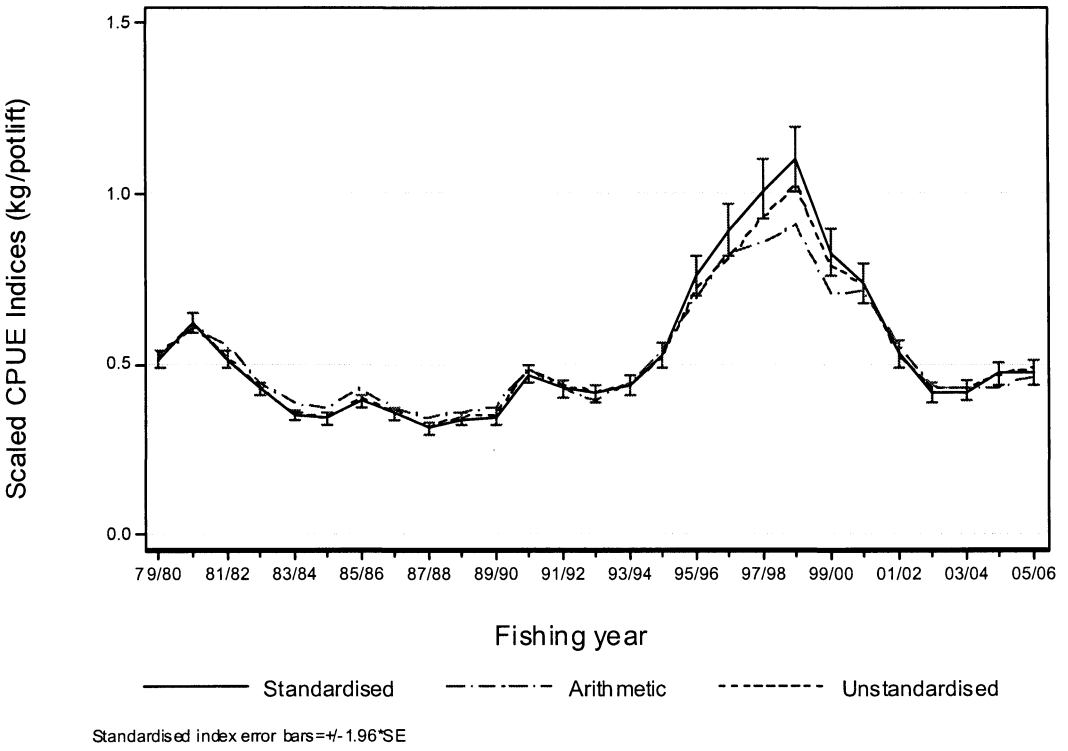

Figure 7: **Annual CPUE indices for CRA 2: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.**

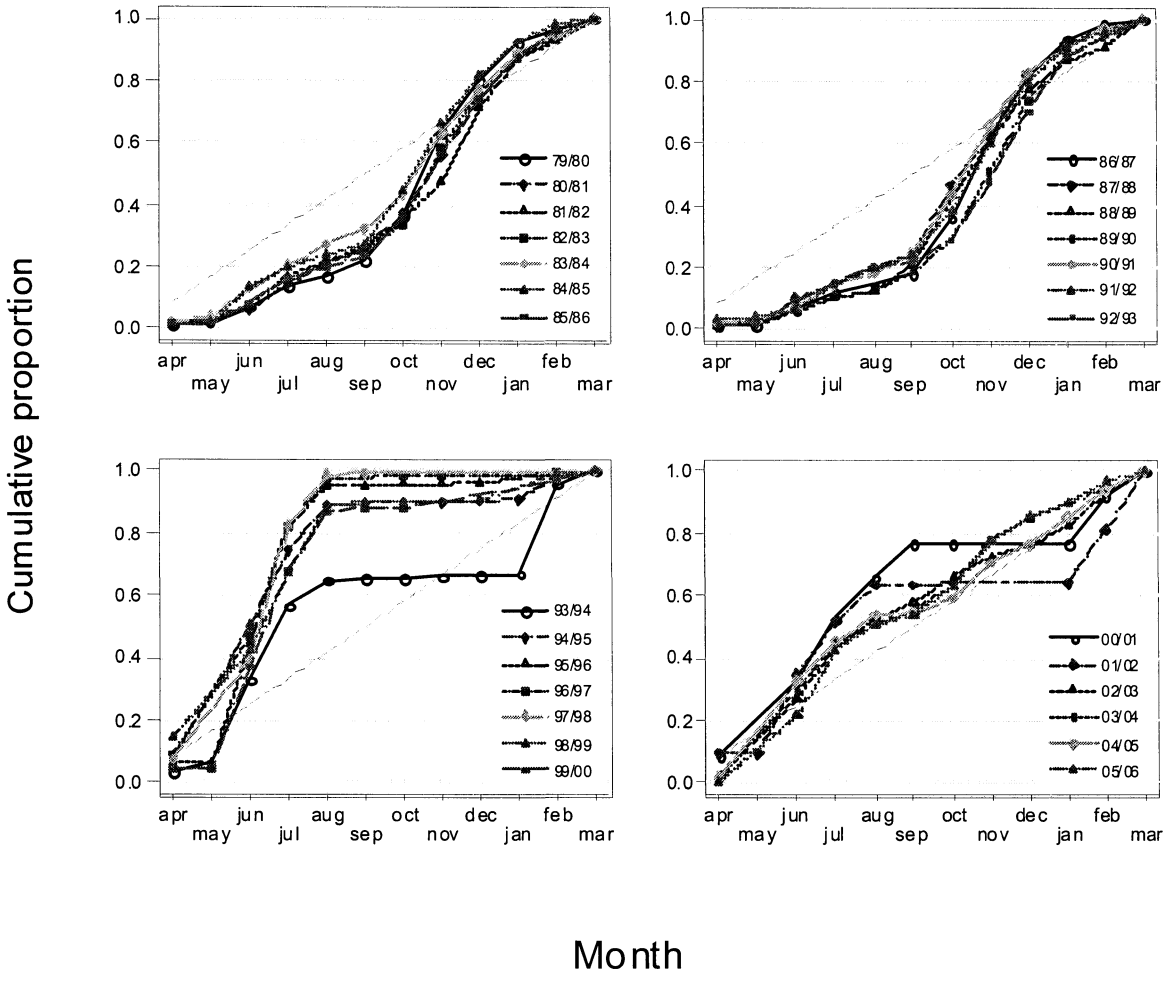

Figure 8: Cumulative catch percentages by fishing month for CRA 3, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

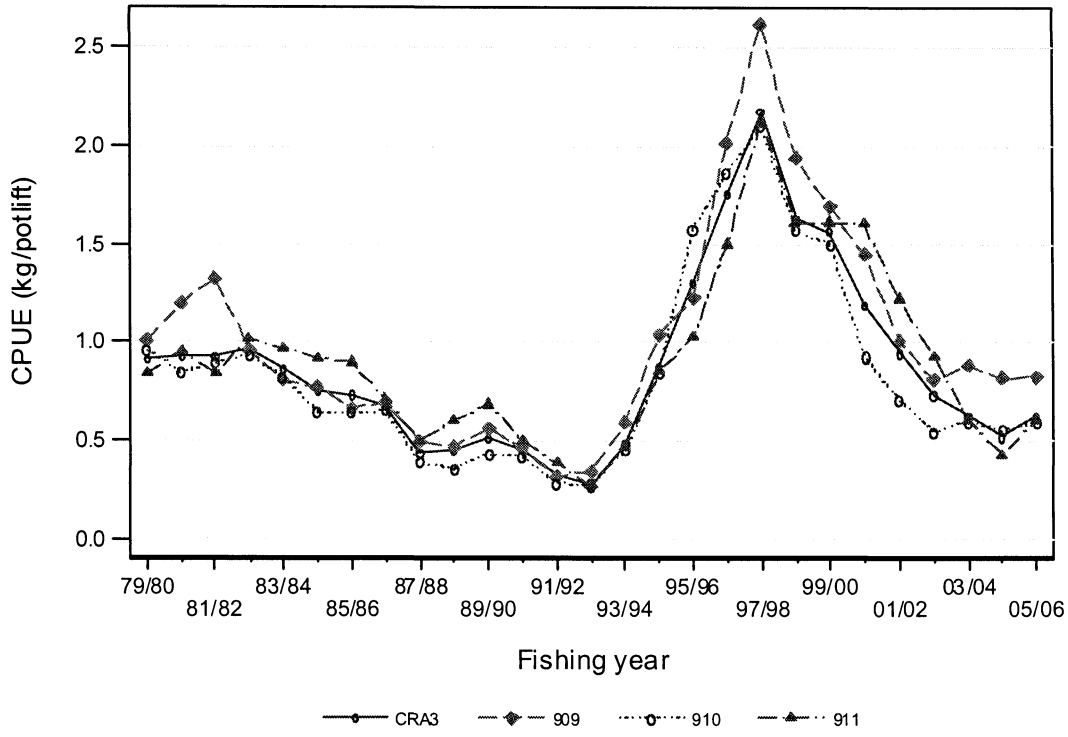

Figure 9: Arithmetic CPUE (total kg/total potlifts) for CRA 3 by fishing year and statistical area from 1979–80 through 2005–06.

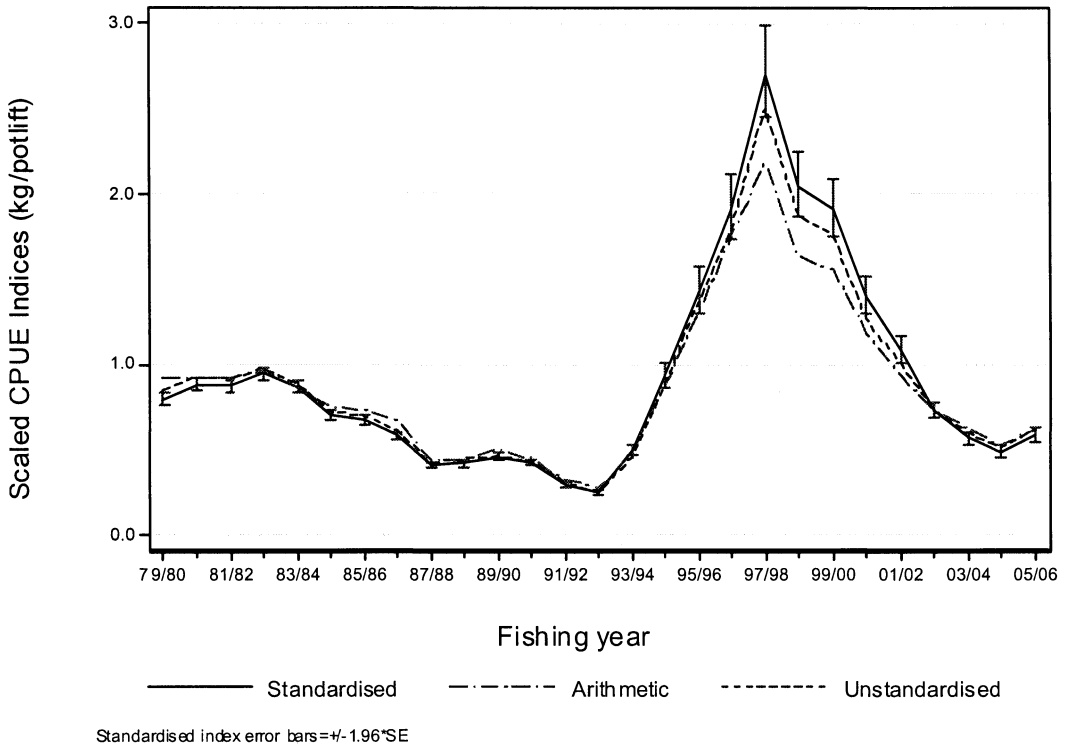

Figure 10: Annual CPUE indices for CRA 3: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

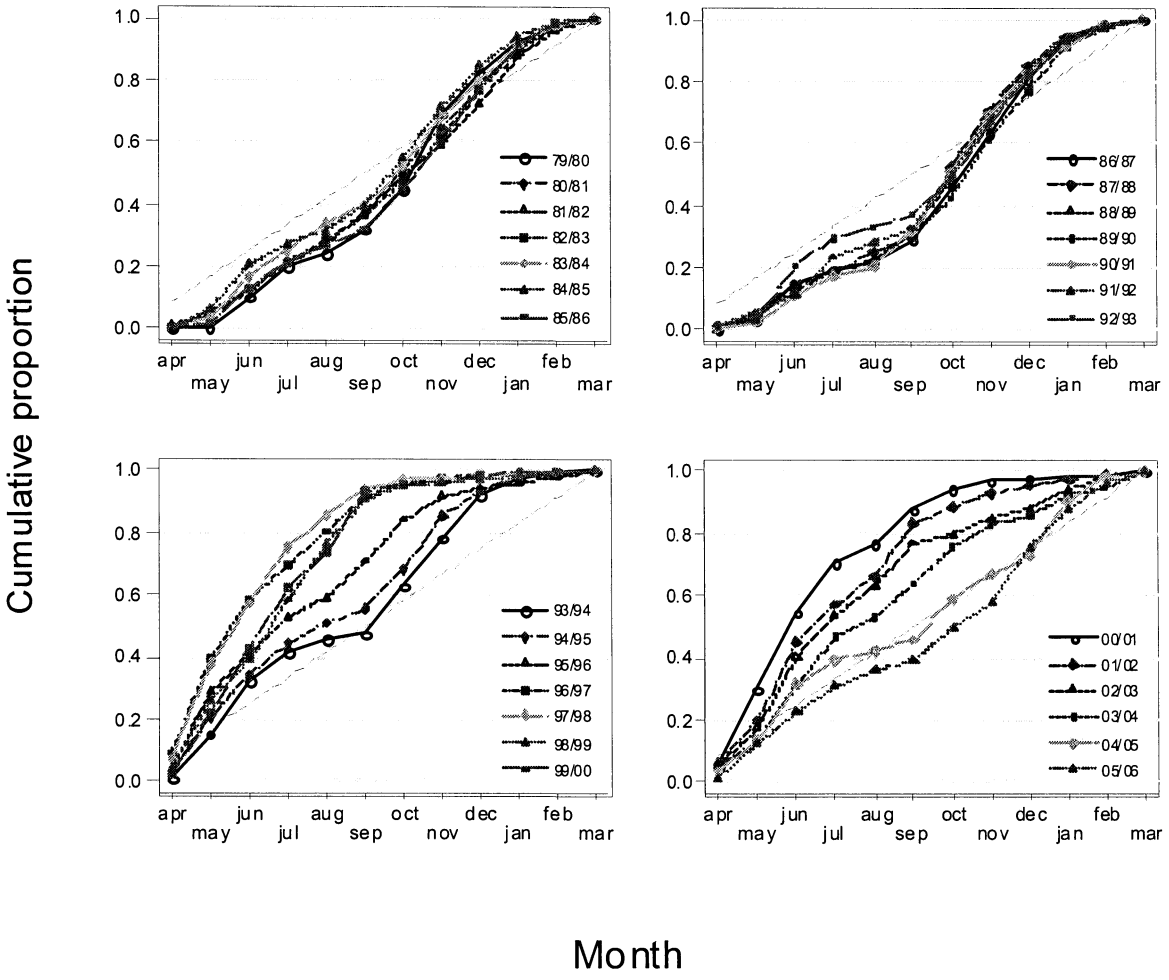

Figure 11: Cumulative catch percentages by fishing month for CRA 4, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

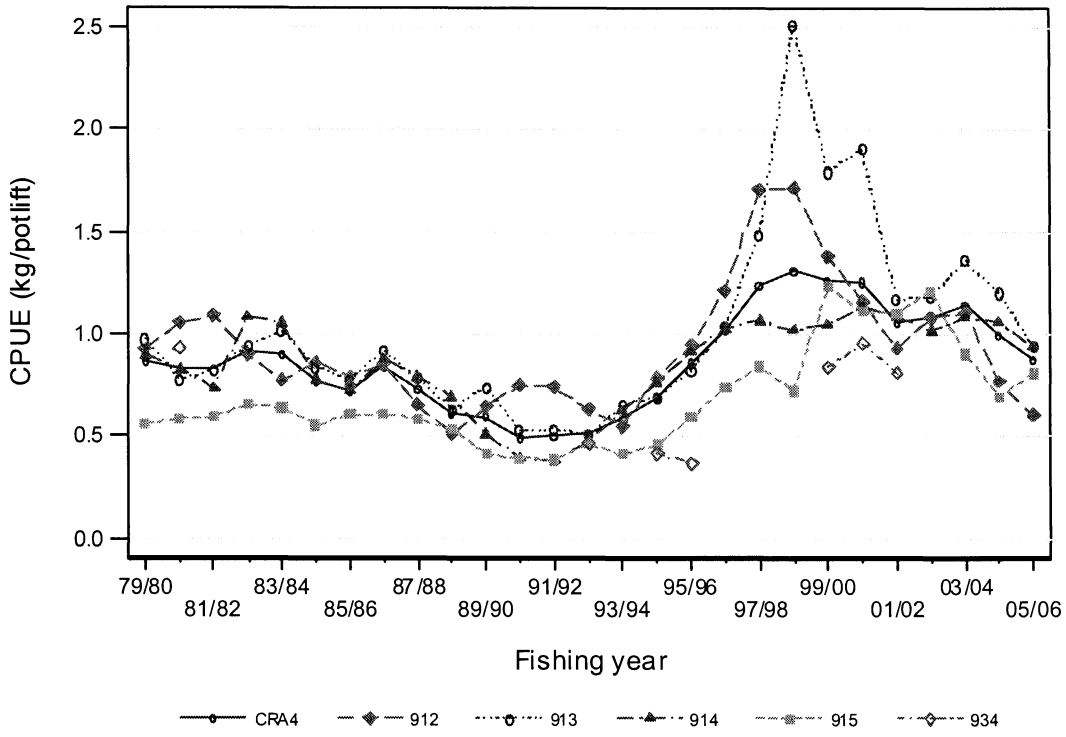

Figure 12: Arithmetic CPUE (total kg/total potlifts) for CRA 4 by fishing year and statistical area from 1979–80 through 2005–06.

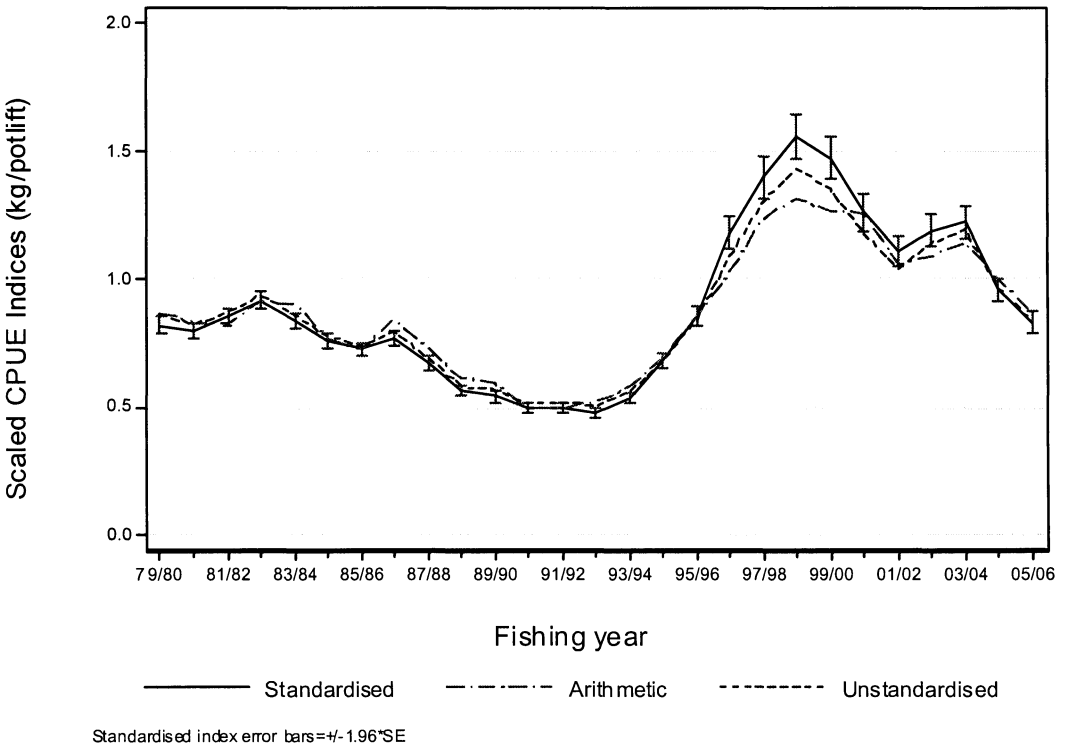

Figure 13: Annual CPUE indices for CRA 4: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

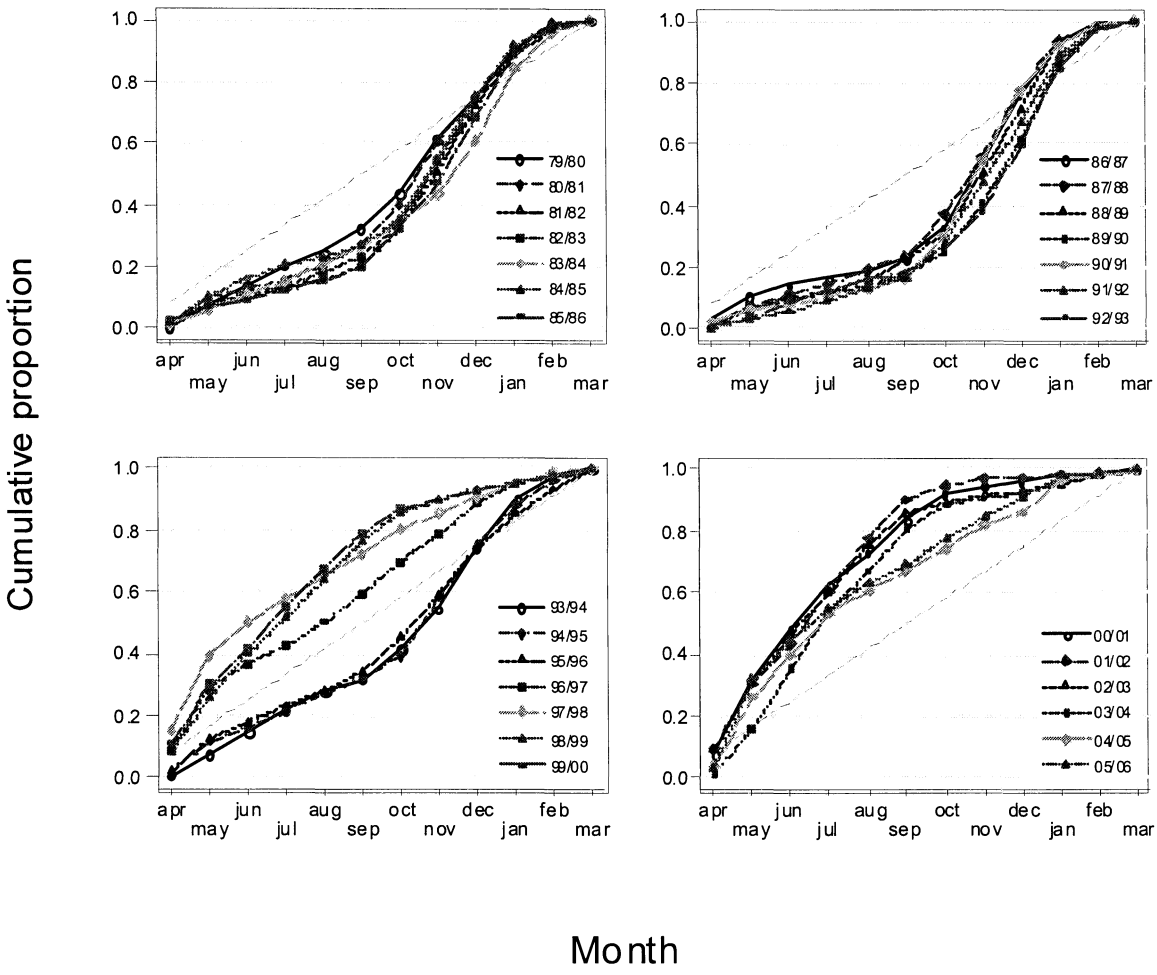

Figure 14: Cumulative catch percentages by fishing month for CRA 5, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

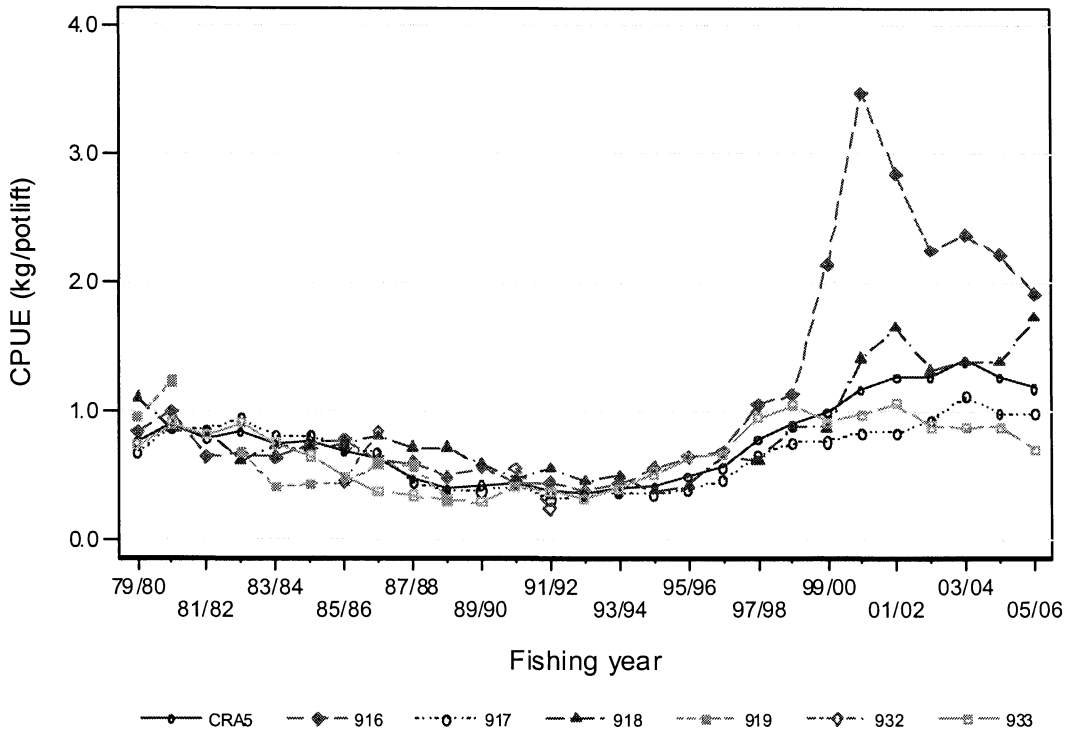

Figure 15: Arithmetic CPUE (total kg/total potlifts) for CRA 5 by fishing year and statistical area from 1979–80 through 2005–06.

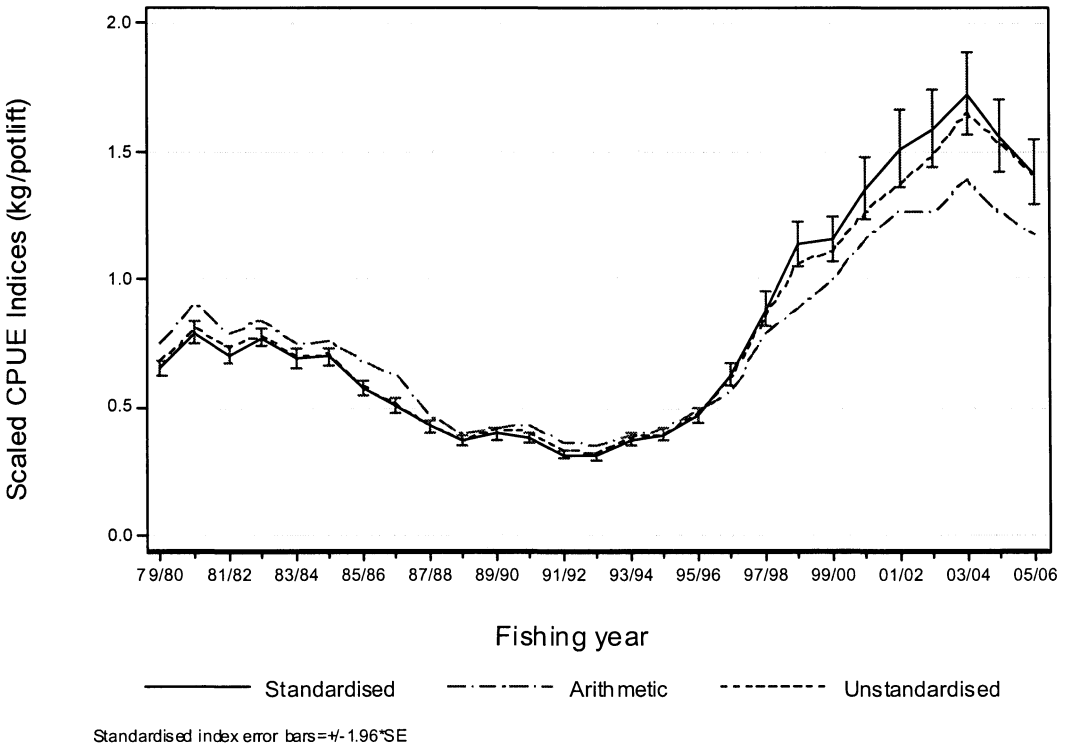

Figure 16: Annual CPUE indices for CRA 5: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

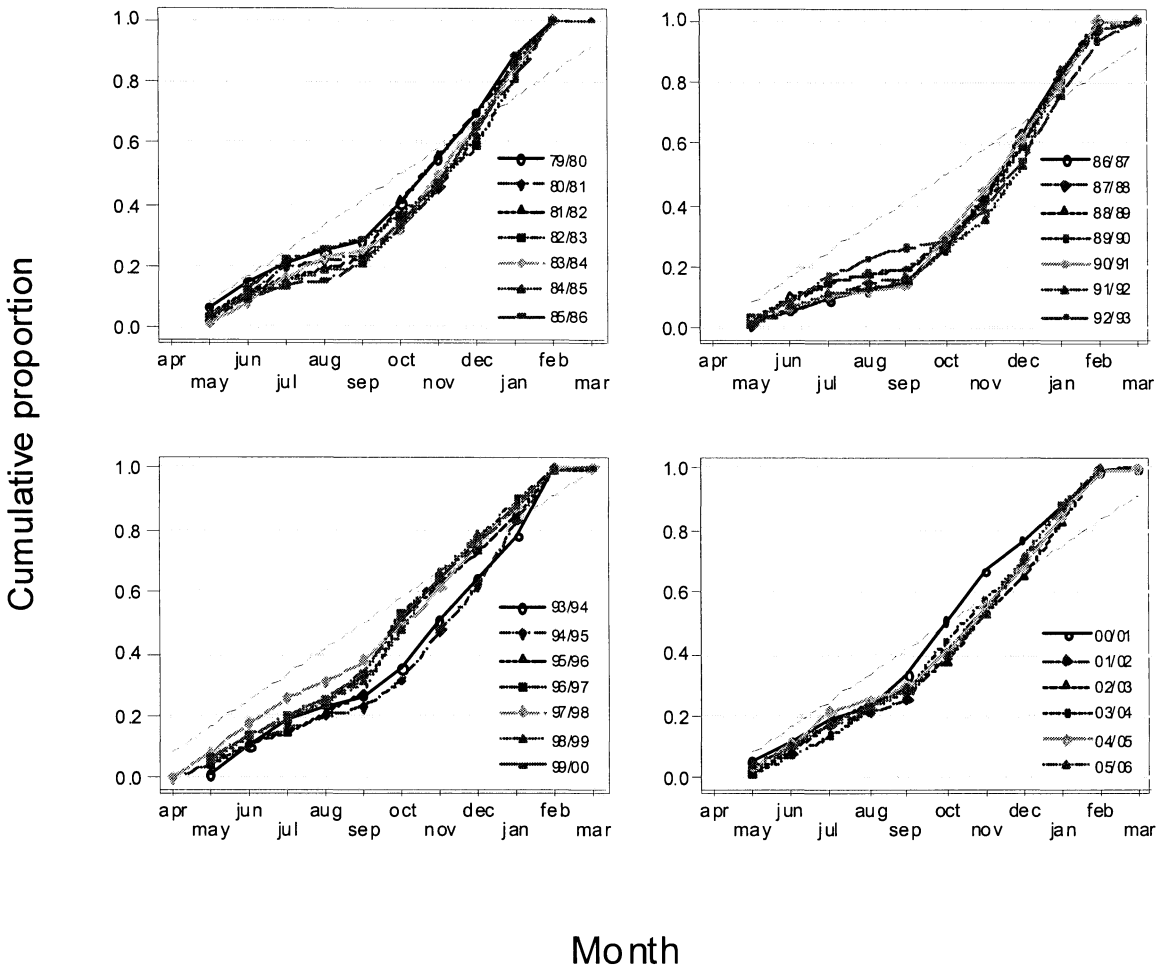

Figure 17: Cumulative catch percentages by fishing month for CRA 6, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

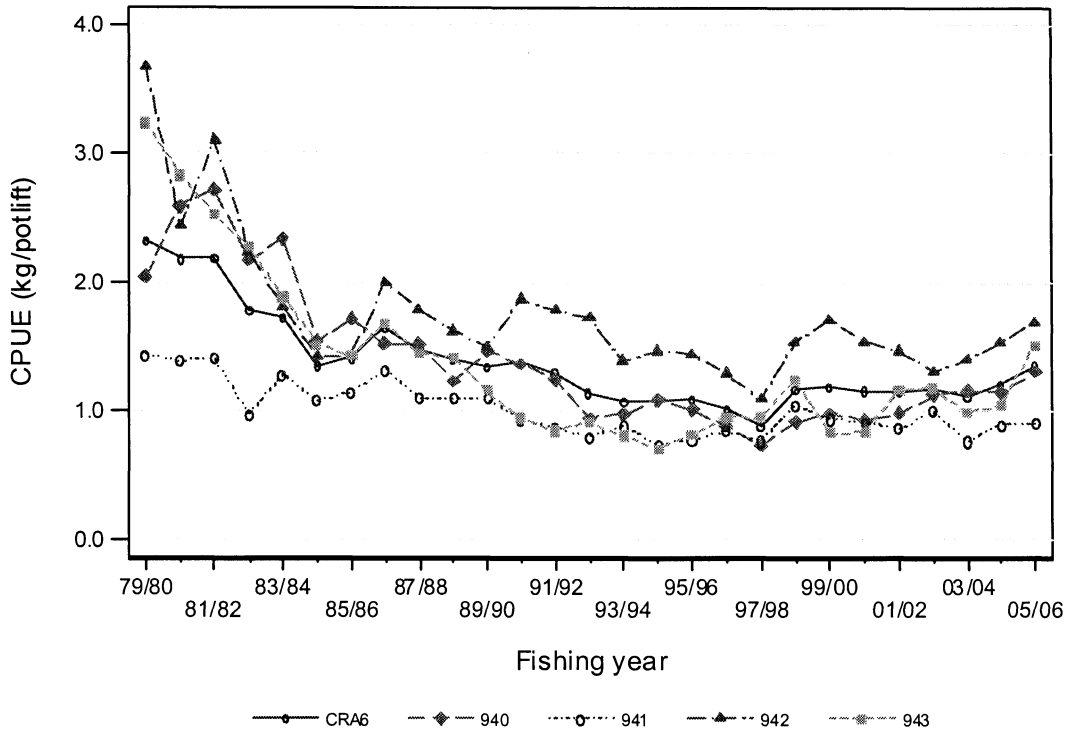

Figure 18: Arithmetic CPUE (total kg/total potlifts) for CRA 6 by fishing year and statistical area from 1979–80 through 2005–06.

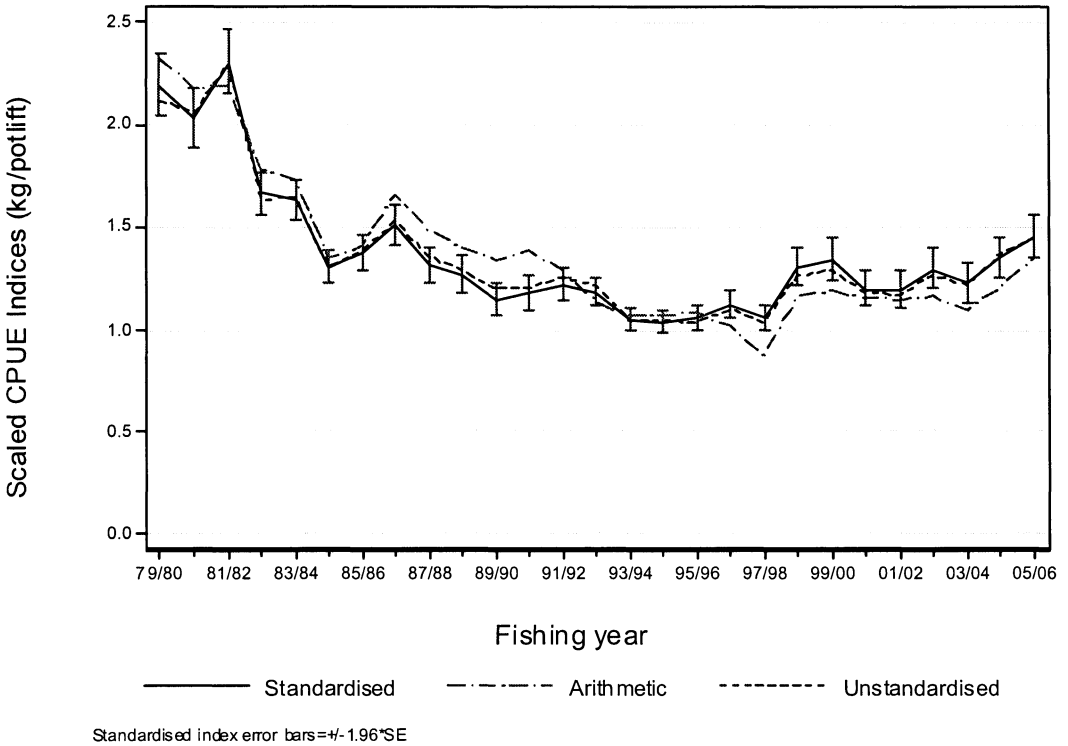

Figure 19: Annual CPUE indices for CRA 6: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

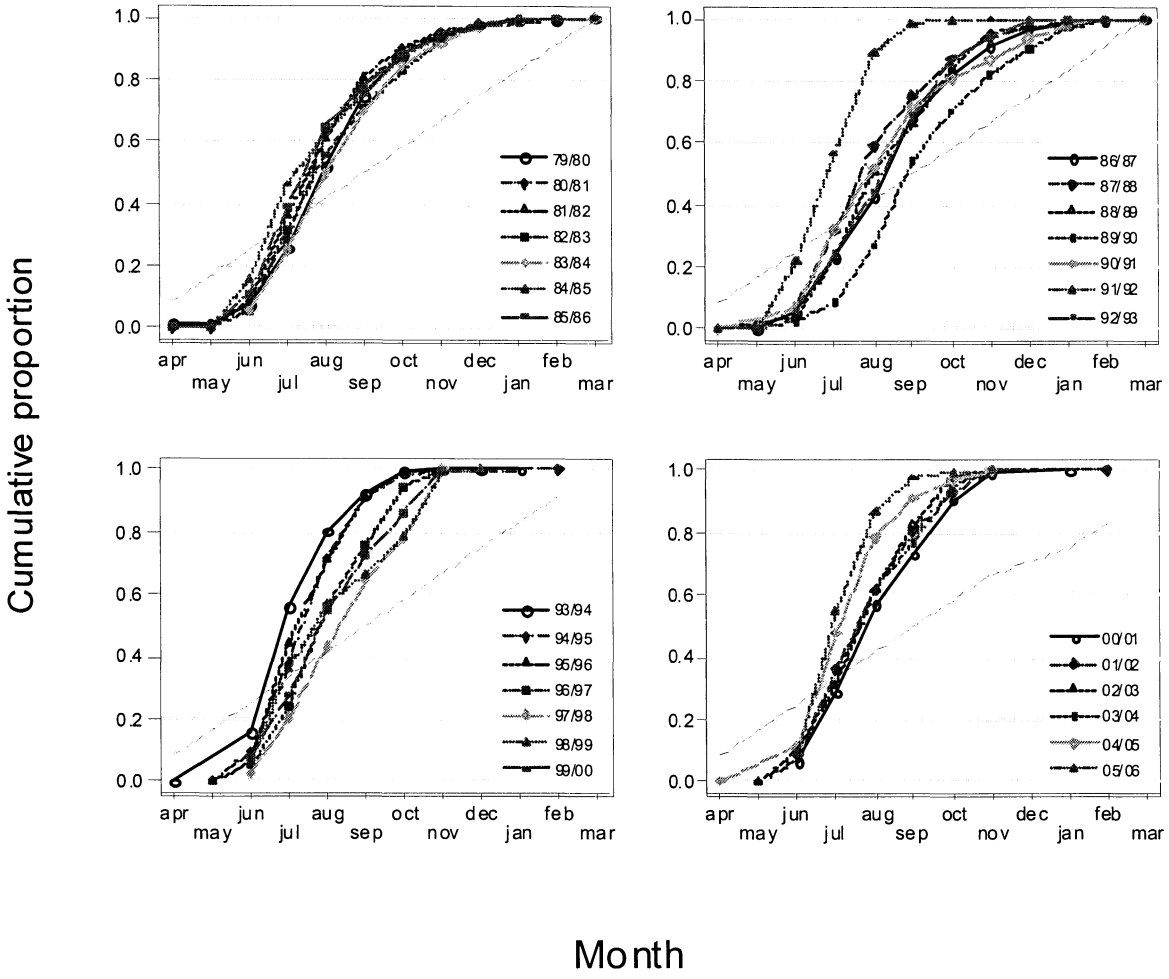

Figure 20: Cumulative catch percentages by fishing month for CRA 7, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

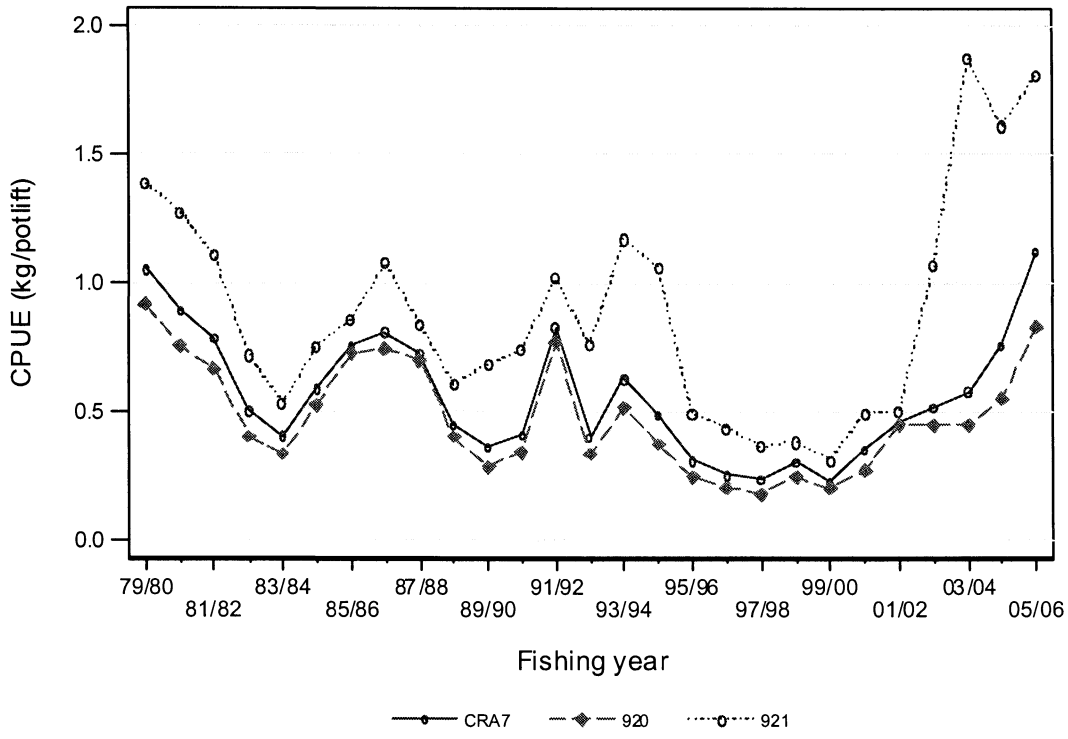

Figure 21: Arithmetic CPUE (total kg/total potlifts) for CRA 7 by fishing year and statistical area from 1979–80 through 2005–06.

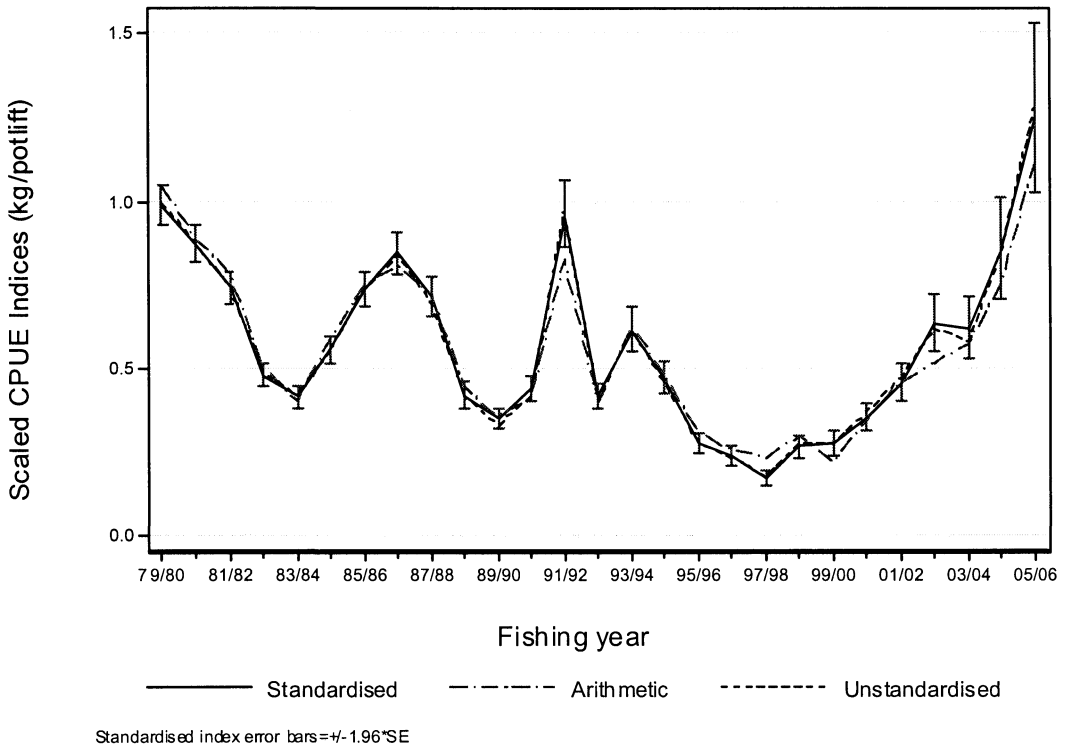

Figure 22: Annual CPUE indices for CRA 7: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

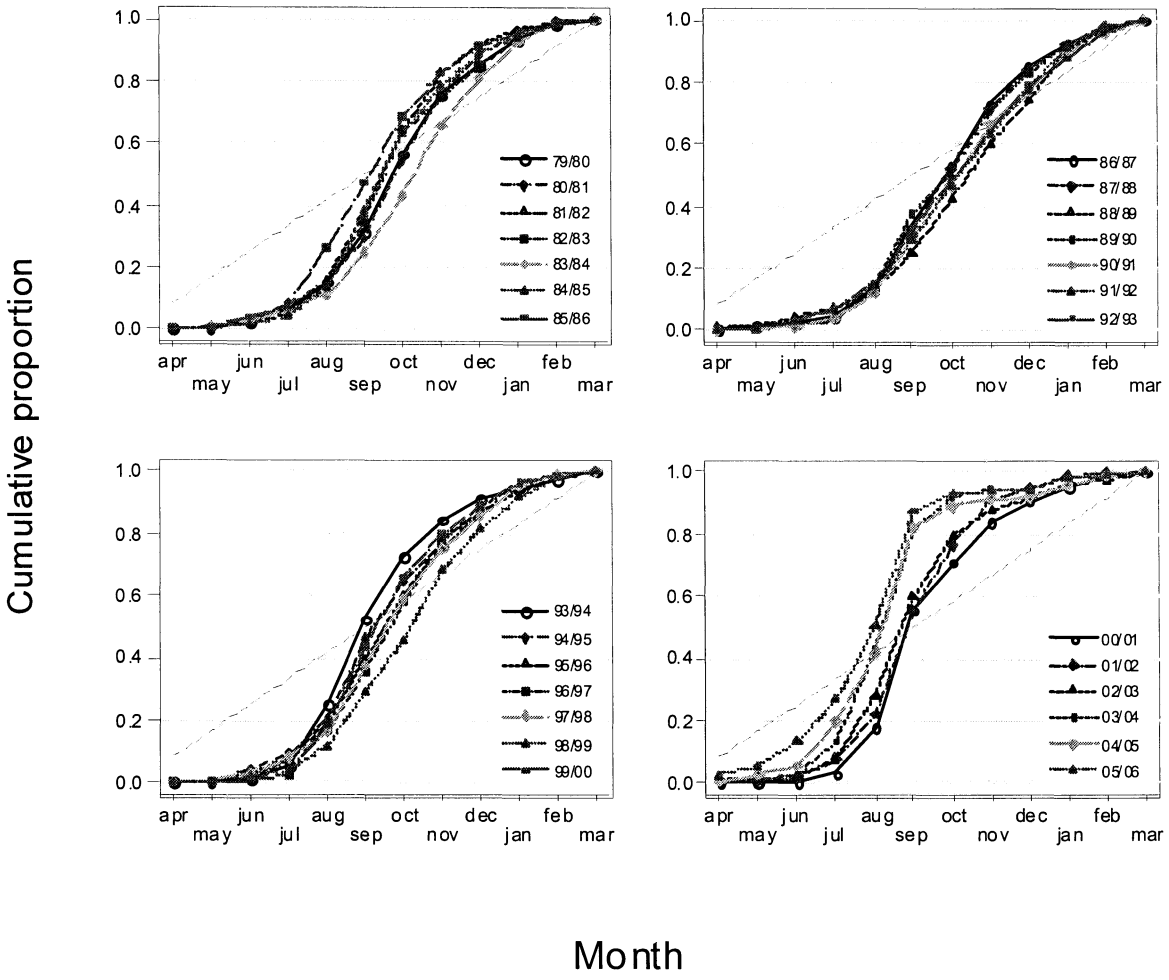

Figure 23: Cumulative catch percentages by fishing month for CRA 8, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

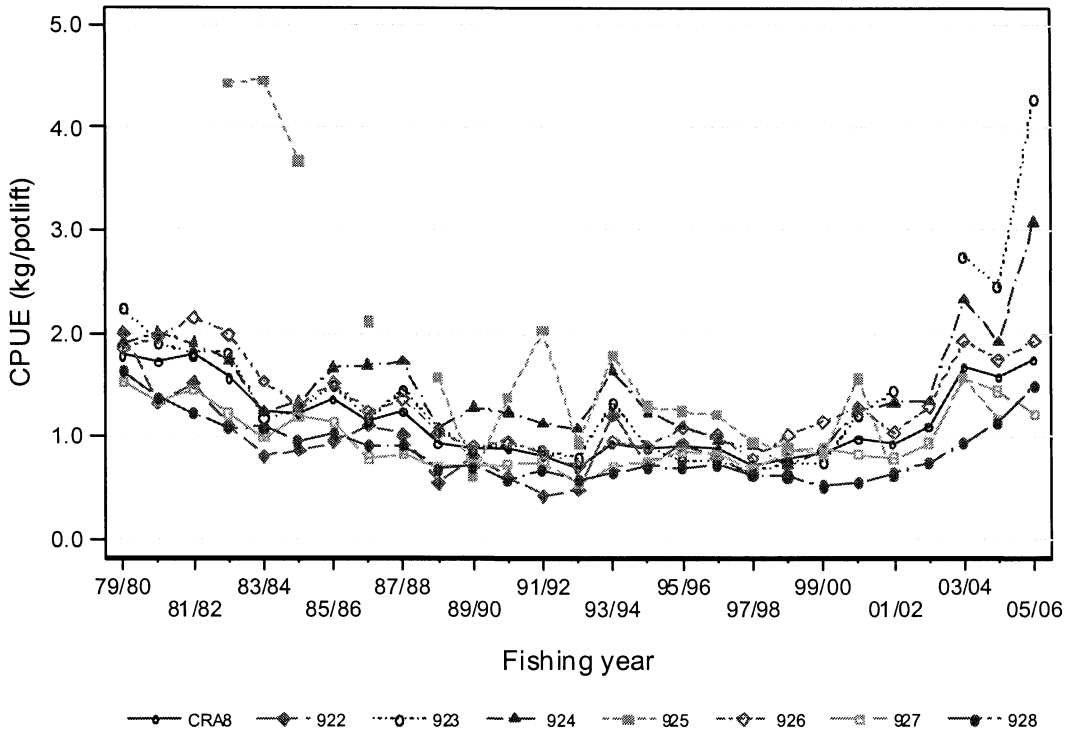

Figure 24: Arithmetic CPUE (total kg/total potlifts) for CRA 8 by fishing year and statistical area from 1979–80 through 2005–06.

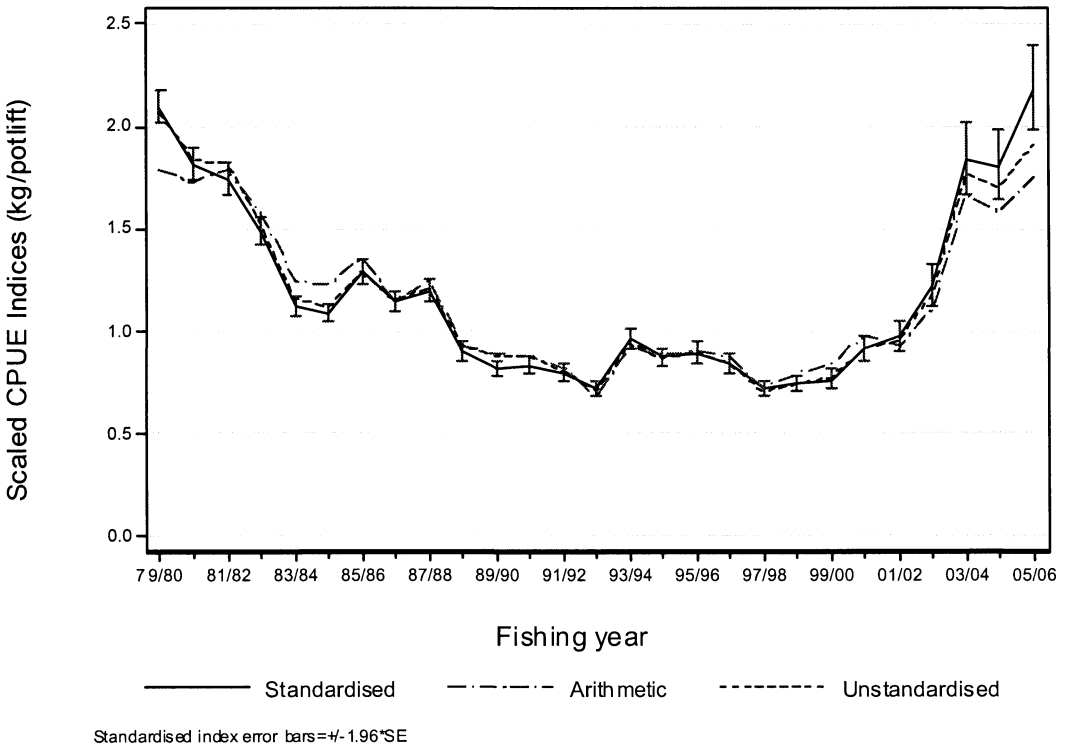

Figure 25: Annual CPUE indices for CRA 8: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. 1979–80 through 2005–06.

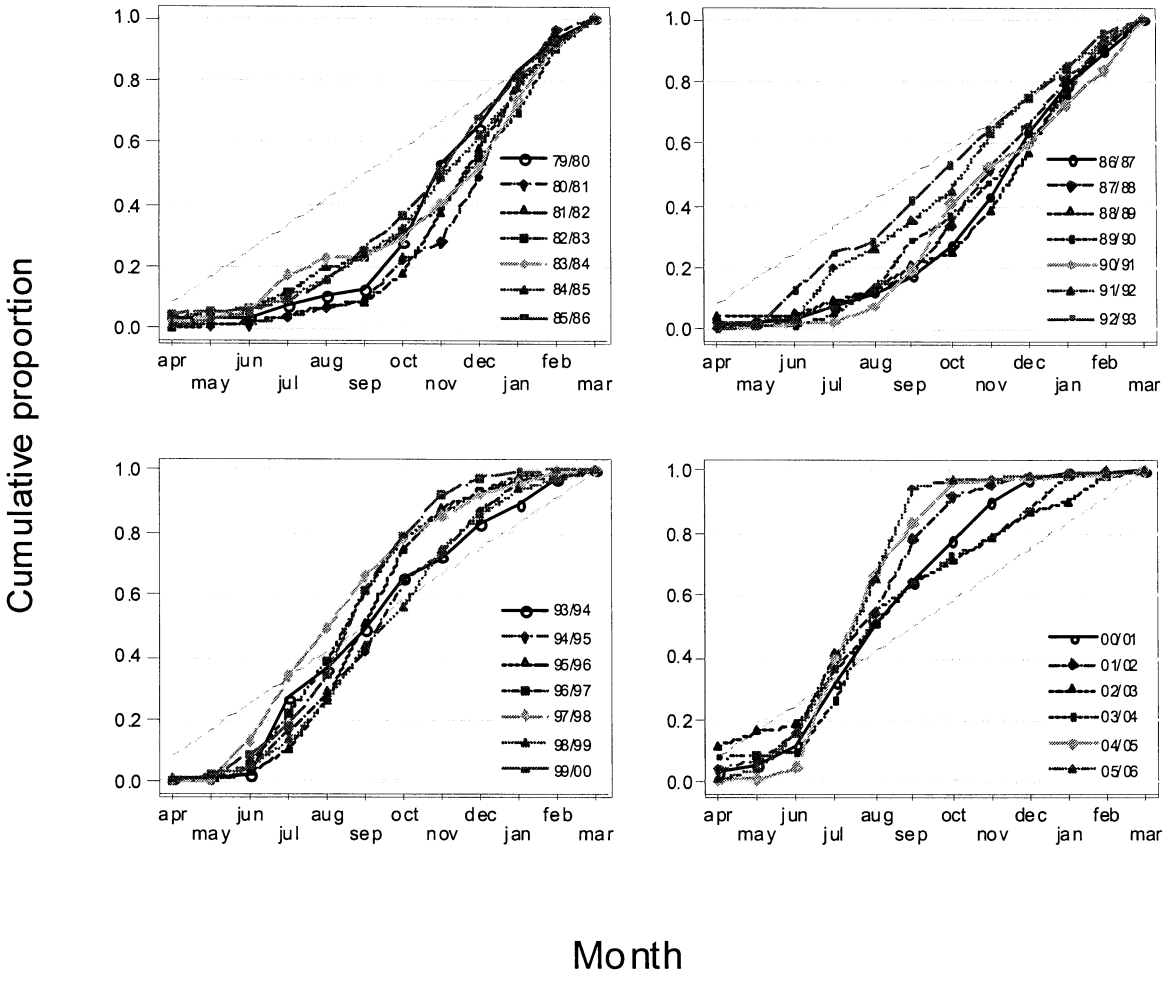

Figure 26: Cumulative catch percentages by fishing month for CRA 9, 1979–80 through 2005–06. Dotted line provides a reference equivalent to an equal distribution of catch across all months.

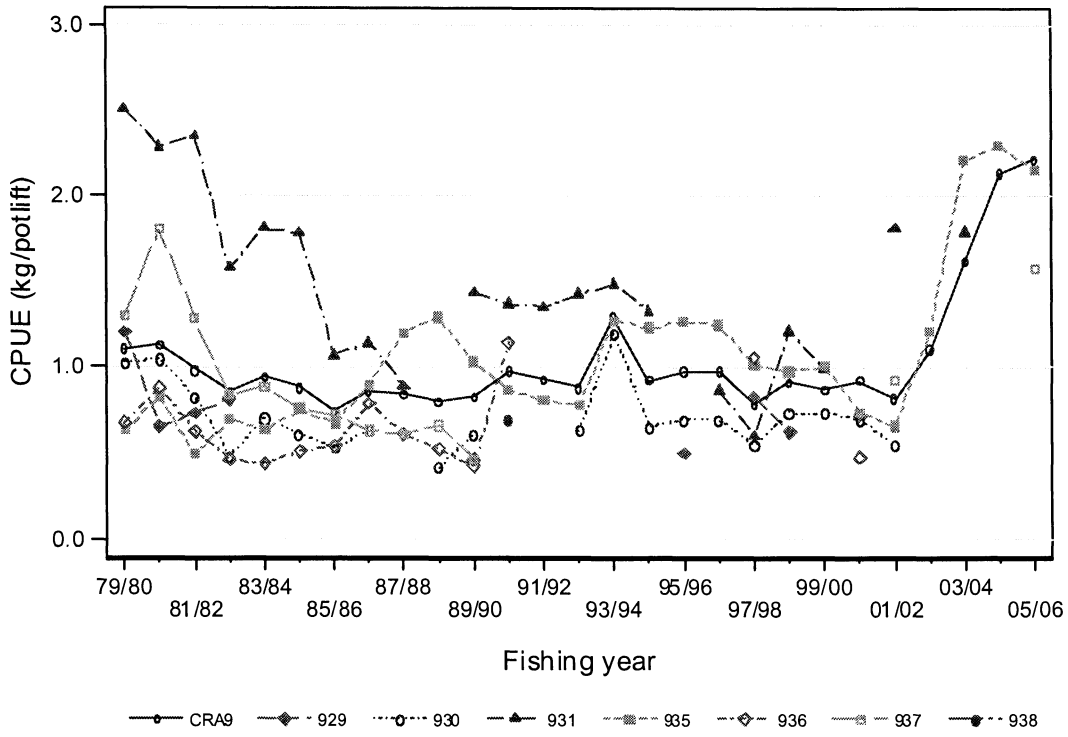

Figure 27: Arithmetic CPUE (total kg/total potlifts) for CRA 9 by fishing year and statistical area from 1979–80 through 2005–06.

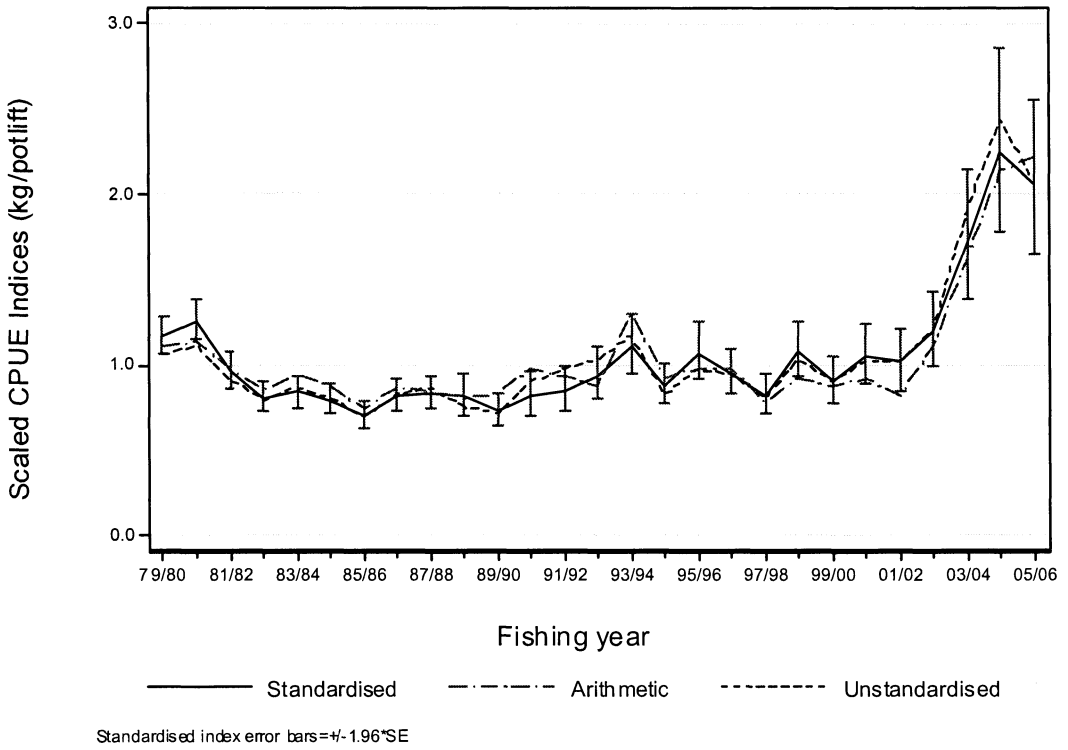

Figure 28: Annual CPUE indices for CRA 9: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 through 2005–06.

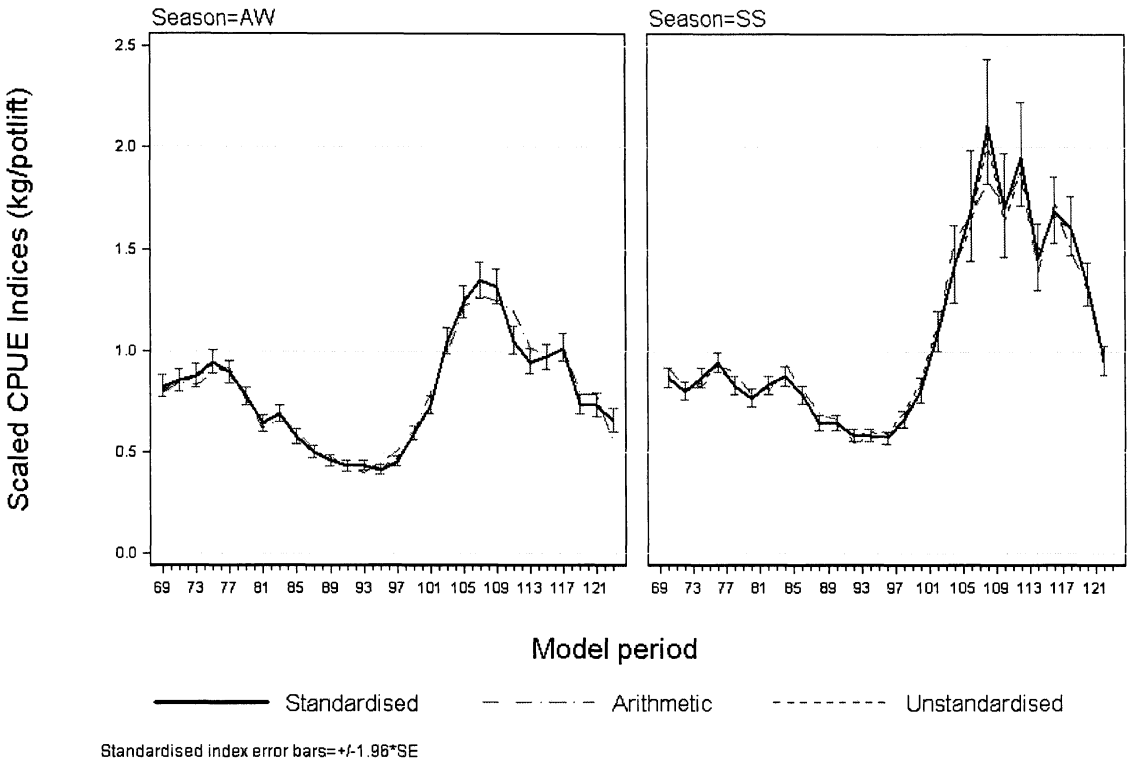

Figure 29: Standardised, unstandardised, and arithmetic CPUE indices (kg/potlift) by period for CRA 4 from Period 69 (autumn/winter [AW] 1979–80) to Period 123 (AW 2006–07). Vertical bars are 95% confidence intervals. The geometric mean for the autumn/winter series [left panel] = 0.75 kg/potlift and for the spring/summer [SS] series [right panel] = 0.99 kg/potlift.

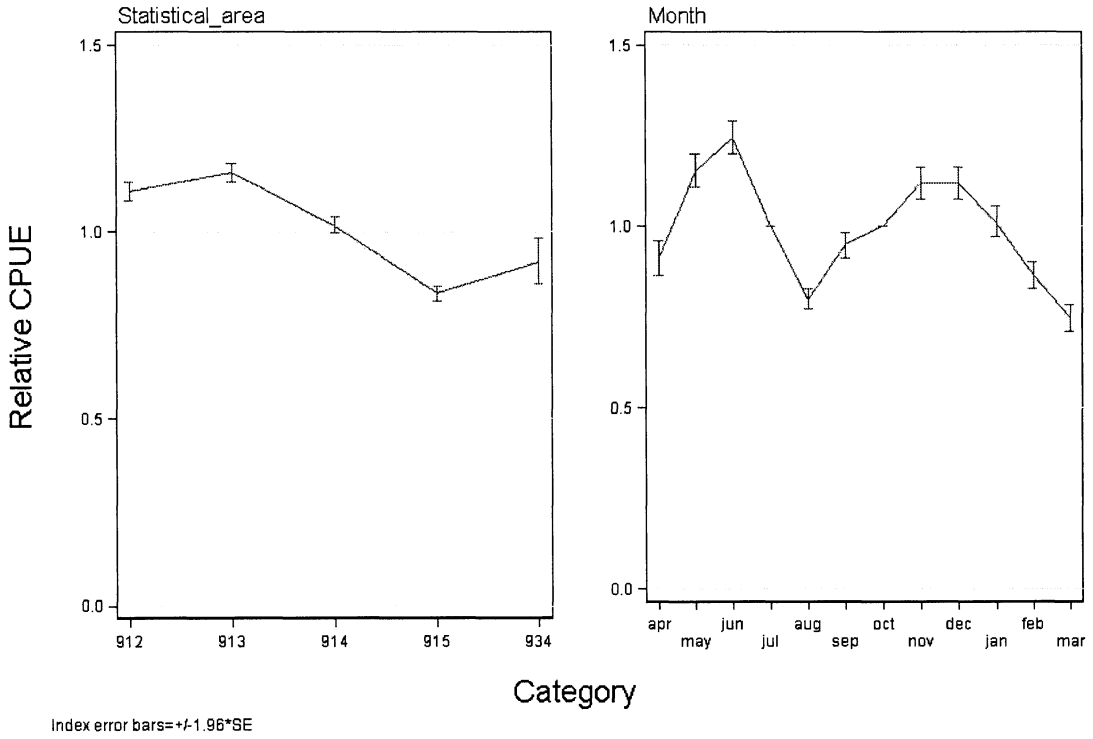

Figure 30: Coefficients for month and statistical area from the CRA 4 CPUE standardisation. The statistical area coefficients are in canonical form (Francis 1999). The reference month (July and October) coefficients equal 1.0 with s.e. of zero.

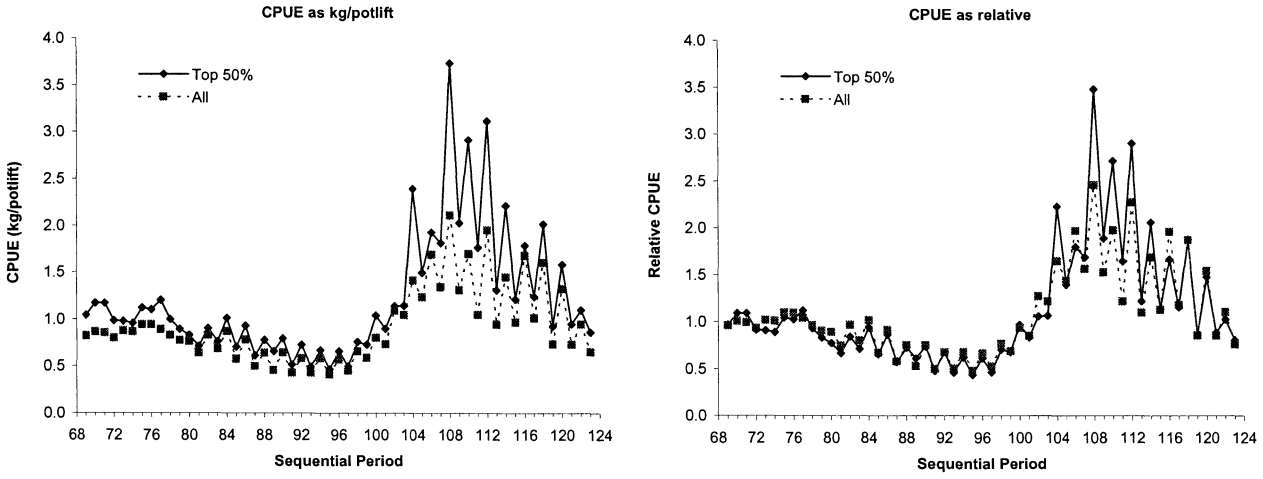

Figure 31. Comparison of CPUE trajectories for CRA 4: all participants compared to the participants who captured the top 50% of the total catch in each fishing [left panel]: CPUE presented as kg/potlift; [right panel]: CPUE presented as relative to the mean of each series.

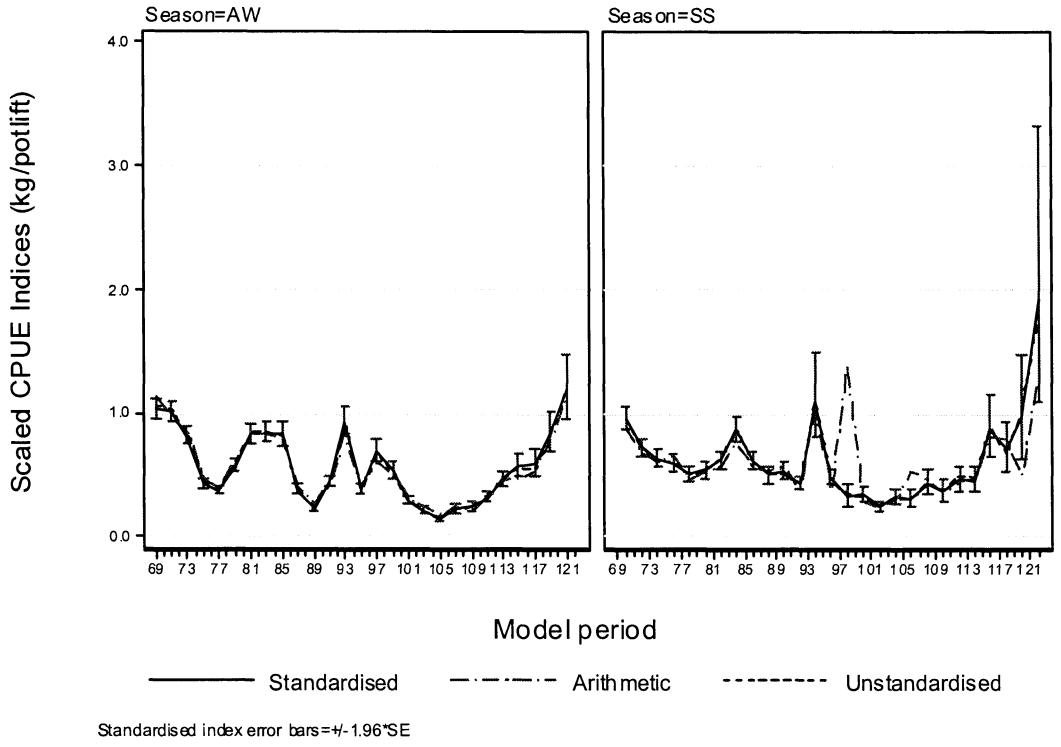

Figure 32: Standardised, unstandardised, and arithmetic CPUE indices (kg/potlift) by period for CRA 7 from Period 69 (autumn/winter [AW] 1979–80) to Period 122 (spring/summer [SS] 2005–06). Vertical bars are 95% confidence intervals. The geometric mean for the autumn/winter series [left panel] = 0.50 kg/potlift and for the spring/summer series [right panel] = 0.56 kg/potlift.

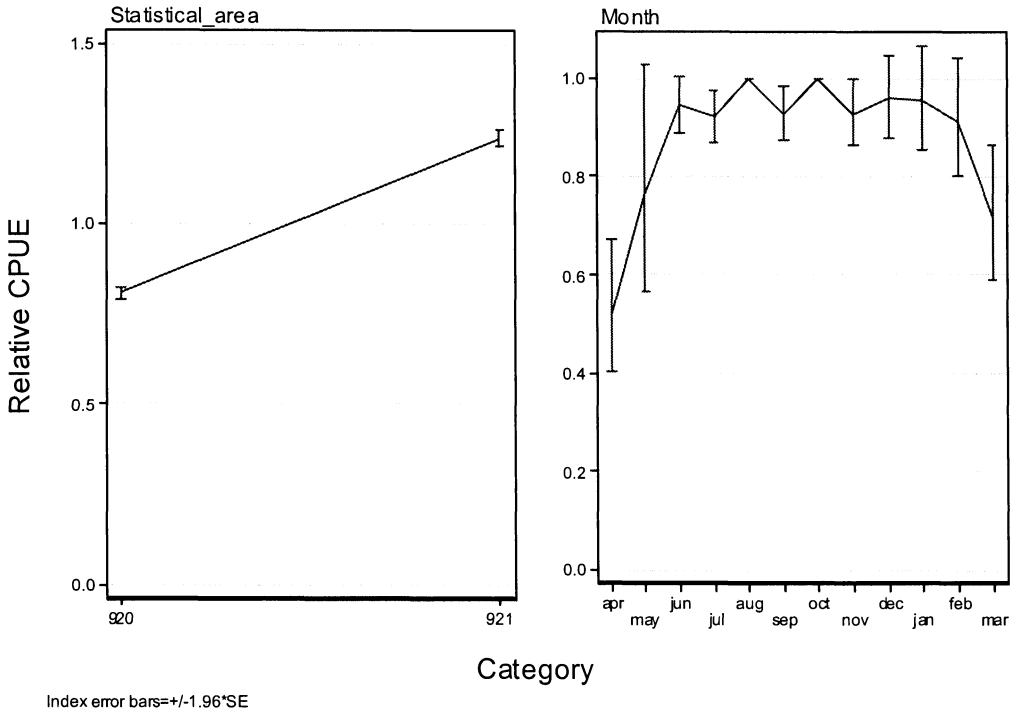

Figure 33: Coefficients for month and statistical area from the CRA 7 CPUE standardisation. The statistical area coefficients are in canonical form (Francis 1999). The reference month (August and October) coefficients equal 1.0 with s.e. of zero.

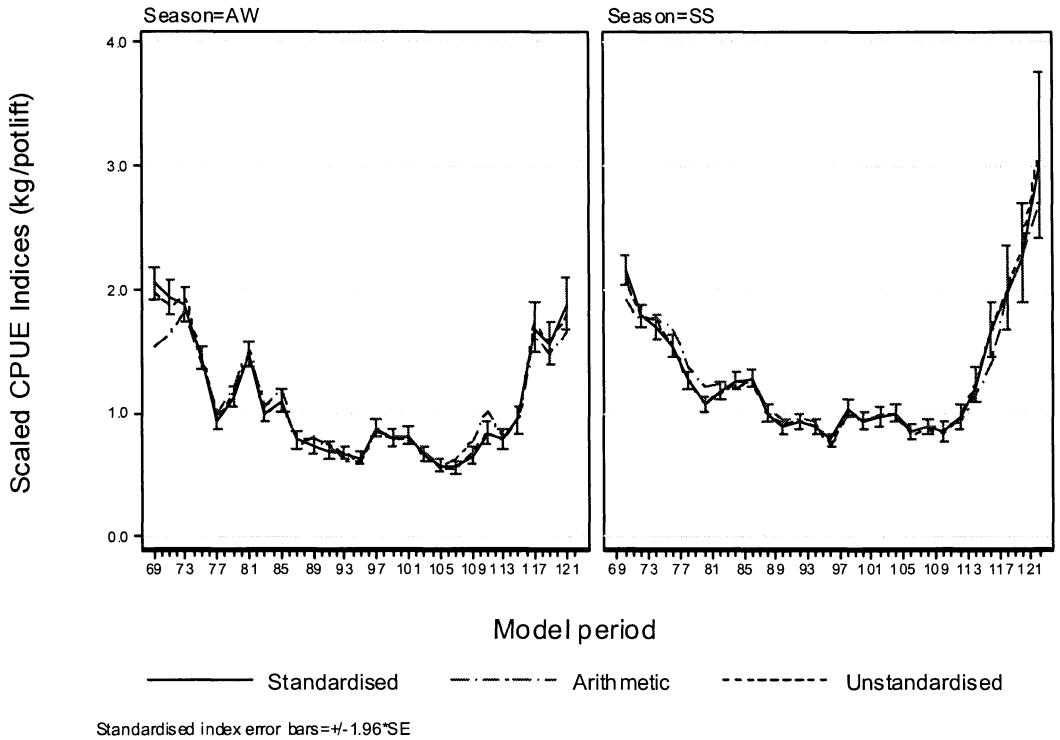

Figure 34: Standardised, unstandardised, and arithmetic CPUE indices (kg/potlift) by period for CRA 8 from Period 69 (autumn/winter [AW] 1979–80) to Period 122 (spring/summer [SS] 2005–06). Vertical bars are 95% confidence intervals. The geometric mean for the autumn/winter series [left panel] = 0.99 kg/potlift and for the spring/summer series [right panel] = 1.22 kg/potlift.

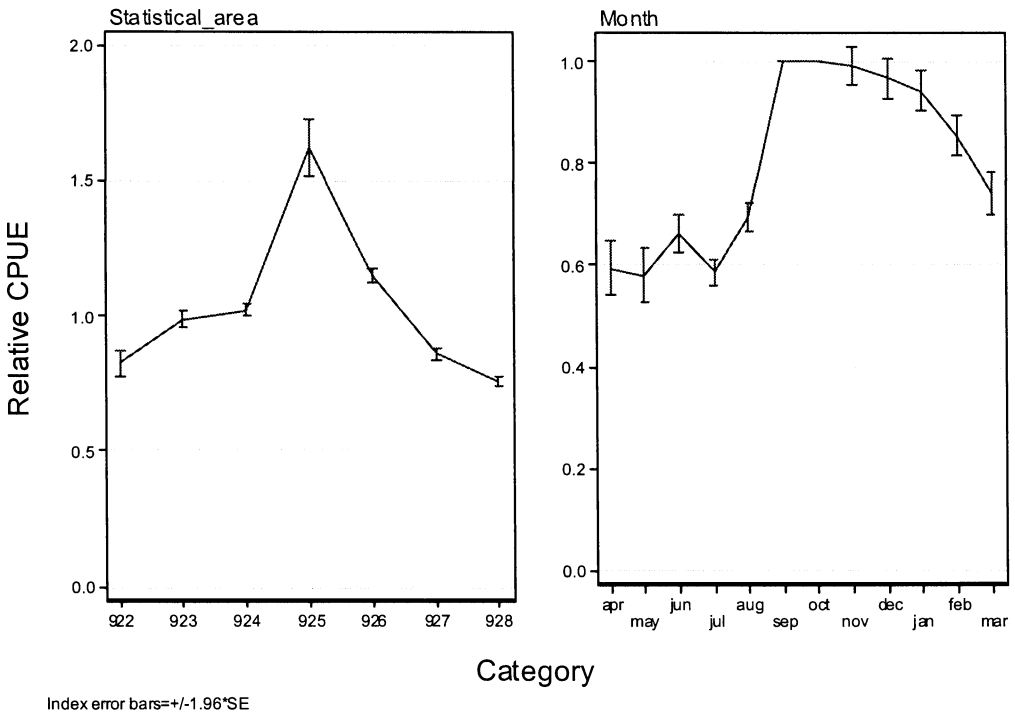

Figure 35: Coefficients for month and statistical area from the CRA 8 CPUE standardisation. The statistical area coefficients are in canonical form (Francis 1999). The reference month (September and October) coefficients equal 1.0 with s.e. of zero.