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Rock lobster catch and effort data: summaries and CPUE standardisations, 1979–80 to 2010–11

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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 (1 April to 31 March) 1979–80 to 2010–11 as are standardisations of catch per unit effort (CPUE) for each of the nine rock lobster Quota Management Areas (QMAs) over the same period. Annual CPUE standardisations based on a 1 October–30 September year ("offset year") are provided for CRA 3, CRA 4, CRA 5, CRA 7, and CRA 8 because these analyses are used as input to management procedure decision rules that form the basis for TAC changes in these QMAs. This report also includes a summary of the half-year (seasonal) standardisation procedure performed in CRA 4 which was used as model input to the 2011 CRA 4 stock assessment.

The spatial distribution of catch by statistical area has varied in most QMAs over the 32 years of available data. For example, in CRA 3, Area 911 (Mahia) rose to more than 50% of the landed catch in the early 2000s after being less than 30% of the catch in the mid 1990s. In CRA 5, catch taken in Area 916 increased substantially from 2000–01 with a corresponding drop in the proportion of catch taken in Area 917. These changes have since reversed, showing that the relative importance of statistical areas within a QMA is dynamic. In some other QMAs, notably CRA 2 and CRA 6, the distribution between statistical areas has remained relatively consistent over time. 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 (October to March) to an autumn-winter fishery occurred quite rapidly in the 1990s in most of the east coast QMAs, first in the North Island, followed by CRA 5 in the South Island east coast. 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. This shift has now reversed in CRA 2, CRA 3, and CRA 4 (and may be slowing in CRA 5) but there is evidence that CRA 3 may be changing back to a winter fishery, coinciding with an increase in overall CPUE. CRA 8 is becoming a July and August fishery while CRA 7 seasonal catch is spreading out as the CPUE drops. A recent development in CRA 8 is the landing of more than 10% of the annual catch in April in the five most recent fishing years.

There is consistency in the trends shown by the unstandardised CPUE series among the component statistical areas within most QMAs. This consistency exists in spite of considerable year-to-year variation in these series. CRA 3 has the greatest similarity in the CPUE trends among 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 adjust the relative peak CPUE upwards in the late 1990s in most QMAs. This occurred because unstandardised catch rates tended to be lower in winter and these fisheries shifted to predominantly winter fishing when catch rates were high. Standardised CPUE for CRA 1 to CRA 5 showed a similar pattern: peaking in the early to mid 1980s, then declining 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 these series then declined to low levels by the early to mid-2000s. CPUE for these three QMAs has now either levelled out or is increasing, with CRA 3 and CRA 4 reversing in 2008–09. CPUE in CRA 1 and CRA 5 increased beyond the end of 1990s, although there was a drop in the CRA 5 CPUE from 2004–05 which reversed in 2008–09 and peaked in 2009–10. CRA 2 reached its lowest CPUE in 1987–88 but the other north and east coast QMAs recorded nadirs in 1992–93. The year of peak CPUE and its relative magnitude also differ between these QMAs.

Standardised CPUE in CRA 7 and CRA 8 declined steadily from 1979–80 to a low in the mid to late 1990s. Relative CPUEs in both QMAs then rose to the highest levels in each series, with the increases beginning after the first of two TACC (Total Allowable Commercial Catch) reductions were made in 1999–2000. Both CRA 7 and CRA 8 have declined since reaching peaks in 2008–09 (CRA 7) and 2009–10 (CRA 8). The CRA 7 declines have resulted in TACC reductions in 2010–11 and 2011–12.

0. TABLE OF ABBREVIATIONS AND DEFINITIONS OF TERMS

Term/Abbreviation	Definition
arithmetic CPUE	Eq. 1
autumn/winter (AW) season	1 April – 30 September period
CELR	catch/effort landing return: MFish reporting form for rock lobster fishermen since July 1989 (all catch/effort data for rock lobster are currently reported on this form)
CPUE	catch per unit effort
CRACE	name of shadow database holding groomed rock lobster catch and effort data
"concession" fishery in CRA 7	during the regulated period (currently 01 June–19 November), the MLS for commercial fishing is a tail length (TL) of 127 mm, which applies to both sexes. This measurement corresponds to 46 mm (males) and 47 mm (females) TW
fishing year	1 April – 31 March period (statutory, defined by the QMS)
FSU	Fisheries Statistics Unit: format used to report rock lobster catches, January 1979 to June 1989
LFR	Licensed Fish Receiver: processors legally allowed to receive commercially caught rock lobster
MFish	New Zealand Ministry of Fisheries (merged with the Ministry of Agriculture and Forestry [MAF] on 1 July 2011)
MHR	Monthly Harvest Return: monthly returns used after 1 October 2001. Replaced QMRs but have same definition and utility
MLS	Minimum Legal Size: tail width (TW) measurement below which rock lobster are required by law to be released. These size limits vary between sexes and among QMAs
NRLMG	National Rock Lobster Management Group: stakeholder committee charged with giving the Minister of Fisheries advice on the management of rock lobster
offset year	1 October – 30 September period
potlift	unit of effort in rock lobster potting fishery: one lift for a single trap (usually daily)
QMA	Quota Management Area: legally defined unit area used for rock lobster management (see Figure 1)
QMR	Quota Management Report: monthly harvest reports submitted by commercial fishers to MFish. Considered to be best estimates of commercial harvest. In use from 1986 to 2001.
QMS	Quota Management System: name of the management system used in New Zealand to control commercial and non-commercial catches
raw catches or potlifts	unadjusted catches or potlifts (observed from catch/effort data)
raw CPUE	synonym for arithmetic CPUE (Eq. 1)
replog	data extract identifier issued by MFish data unit
scaled catches	Eq. 5: raw catches adjusted to sum to QMR/MHR totals
scaled potlifts	Eq. 6: raw potlifts adjusted because of missing or discarded records
spring/summer (SS) season	1 October – 31 March period
standardised CPUE	Eq. 3 and Eq. 4
statistical area	sub-areas contained within a rock lobster QMA which are identified in catch/effort returns (see Figure 1). These statistical areas differ from those used for finfish.
TAC	Total Allowable Catch: catch limit for a QMA set by the Minister of Fisheries that includes allowances from all sources of fishery-related mortalities, including commercial, recreational, illegal and customary
TACC	Total Allowable Commercial Catch: catch limit set by the Minister of Fisheries for a QMA that applies to commercial fishing
unstandardised CPUE	Eq. 2

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/statistical 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 2004) and the way in which standardised indices of vulnerable biomass are calculated from them (Maunder & Starr 1995). Earlier versions of this report have been published by Starr & Bentley (2005) and Starr (2006, 2007, 2009a, 2009b, 2010, 2011).

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 catches and catch rates from a QMA (see Figure 1). 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 catch sampling effort.

The annual abundance indices generated from these data are also used to manage five of the nine QMAs that support active commercial and non-commercial fisheries (Breen et al. 2009b). These index series are used as input to management procedures which set TAC levels. Management procedures are formal rules which set TACs based on changes in the abundance indices, based on an operating model which simulates the population as it responds to the rule-based TAC changes and evaluates the changes against agreed-upon management targets.

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

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

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

(c) The percentage and number of potlifts by statistical area and fishing year,

(d) The percentage of catch by month and fishing year,

(e) The percentage of catch by month and statistical area for the 2010–11 fishing year,

(f) The cumulative monthly catch by fishing year,

(g) The arithmetic catch per unit effort by statistical area and fishing year,

(h) Arithmetic, unstandardised, and standardised indices of CPUE for each fishing year.

This report also documents one half-year (seasonal) standardisation for CRA 4 which was used to inform the 2011 CRA 4 stock assessment and to inform stakeholders (Breen et al. 2012). This report also documents annual CPUE standardisations based on a 1 October–30 September year ("offset year") for CRA 3, CRA 4, CRA 5, CRA 7, and CRA 8 which are used as inputs to management procedures (Breen et al. 2009b) to set the TAC (Total Allowable Catch) in the following fishing year. The CRA 4 offset year analysis is new in 2011, having been developed to inform a revised management procedure based on the 2011 CRA 4 stock assessment (Breen et al. in prep.).

The standardised indices of CPUE are assumed to reflect changes in vulnerable biomass within stock assessments and management procedures. The vulnerable biomass is the total weight of lobsters that can be captured by the fishery and legally retained. 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 such as changes in abundance and the spatial and temporal distribution of fishing effort. The standardisation procedure takes into account these latter changes (at the scale of statistical area and month), but cannot adjust for changes in vulnerable biomass caused by management or regulatory changes, such as size limit or escape gap changes. Therefore, the CPUE

indices within each series will not be comparable across the entire series if regulations such as these have changed the component of the stock that is vulnerable to commercial fishing during the period of analysis. Adjustments are made explicitly in the stock assessments to account for the effect of such regulation changes on the vulnerable biomass.

Changes in the definition of vulnerable biomass due to management actions need 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 1993–94, 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 caused by this management initiative. It is not possible to draw conclusions directly about the state of the stock based solely on the CPUE series presented in this report, largely because of changes over time in the definition of vulnerable biomass. The stock assessment model is better able to make these comparisons because it includes additional information such as catch sampling lengths and tagging data as well as the information in the CPUE indices about stock abundance.

2. METHODS

2.1 Data

Catch and effort data from 1 April 1979 to 30 June 1989 were obtained from the FSU, and equivalent data from 1 July 1989 to 31 March 2011 were obtained from the WAREHOU database (MFish replog 8277). These data sources were documented by Bentley et al. (2005) and the data were stored and maintained in the CRACE database (Bentley et al. 2005). A further data extract (MFish replog 8273), covering the period 1 April 2011 to 30 September 2011, was used to extend the offset-year CPUE analyses for an additional one-half year for use in management procedures. Past management procedure evaluations (Breen et al. 2008, 2009a, 2009b, Haist et al. 2011) found that adding an additional half year of data greatly improved the capacity of the rule to react to stock abundance changes, thus reducing risk to the stock .

Total annual landings, TACCs and TACs were obtained from QMRs from 1 April 1990 to 31 March 2001 and from MHRs after 1 April 2001 (Table 1). The catch totals from these two sources are considered to be the best available information for lobster removals for each QMA in any year.

2.2 Error checking

All records with error ratings equal to or greater than two, for the fields FSU statistical area, CELR pots lifted, and CELR statistical area, were excluded from this analysis. These error designations, including how they were defined and generated, were described by Bentley et al. (2005).

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

2.3 Catch correction

The FSU and CELR data nominally contain records for every event that occurs on a trip, where an event is defined as a day of fishing within a single statistical area using the method of rock lobster potting. In practice, many rock lobsters trips consist of a single event because they occur on a single day and do not include more than one statistical area. This pattern will vary between QMAs, with trips longer than a single day being common, for instance, in CRA 8. The historical FSU data, while requesting daily catch records, were collected only on a monthly basis, leading to the practice by many operators of reporting the effort expended by day of fishing but reporting only the monthly total catch. Data from the FSU system were reliable only on a monthly basis and, for this reason, the daily CELR

data have been analysed on the same basis, by rolling up the data so that each record is the summary of one vessel fishing for one month in one statistical area.

A corrected catch weight for each month/area/vessel record was calculated by proportionately 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. There will frequently be multiple effort records associated with fewer landing records. The procedure followed is method "B4" of Bentley et al. (2005) (see Appendix A for documentation of this algorithm) which corrects the estimated catch based on the landed catch for the month after excluding records where catches may not be correctly aligned with the effort. The B4 procedure excludes data from vessels in months where the landed catch was zero but the effort was not zero, as well as the data from the following month for the same vessel. This step is made to prevent linking the effort in the second month to catch which had been landed in the previous month.

2.4 Calculation of number of vessels fishing

The number of vessels that fished within each statistical area is determined for each fishing year using the same data set that was used to generate the catch summaries and CPUE standardisation. This data set is based on vessels that targeted rock lobster using the rock lobster potting method.

Many vessels 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 each had a total catch for the year of less than 1 t (five 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 reported at least 1 t of CRA from the statistical areas that make up the QMA within a fishing year.

For some Quota Management Areas, there is uncertainty in the estimated number of vessels for 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 appears to be 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 $\left(\hat{A}_y\right)$ for a QMA in year *y*, or for the set of data applicable to statistical area *a* within the QMA $\left(\hat{A}_{a,y}\right)$ in year *y*, were calculated as the total catch for the year divided by the total number of potlifts in the year:

Eq. 1
$$\hat{A}_y = \frac{\sum_{i=1}^{n_y} C_{i,y}}{\sum_{i=1}^{n_y} P_{i,y}} \quad ; \quad \hat{A}_{a,y} = \frac{\sum_{i \in k_{a,y}} C_{i,y}}{\sum_{i \in k_{a,y}} P_{i,y}}$$

where $C_{i,y}$ and $P_{i,y}$ are the catch and potlifts for the vessel-month-area record *i* in year *y*, and n_y is the number of vessel-month-area records in year *y*; $k_{a,y}$ is the set of the vessel-month-area records *i* that are from area *a* in year *y*.

Unstandardised CPUE $\left(\hat{G}_y\right)$ for a QMA in year *y* is the geometric mean of the ratio of catch to potlifts for each vessel-month-area record:

Eq. 2 $$\hat{G}_y = \exp\left[\frac{\sum_{i=1}^{n_y} \ln\left(C_{i,y} / P_{i,y}\right)}{n_y}\right]$$

where C_i, $P_{i,y}$ and n_y are as defined for Eq. 1. Unstandardised CPUE has the same log-normal distributional assumption 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 when not using additional explanatory variables. Presenting the arithmetic and unstandardised CPUE indices in this report provides measures of how much the standardisation procedure has modified the series from these two sets of indices.

Standardised CPUE (Eq. 3) is calculated from a generalised linear model (GLM) (Maunder & Starr 1995) using fishing year, month, and statistical area as explanatory variables:

Eq. 3 $$\ln(I_i) = B + Y_{y_i} + M_{m_i} + T_{t_i} + \varepsilon$$

where I_i is CPUE for the i^{th} vessel-month-area record, Y_{y_i} is the year coefficient for the year corresponding to the i^{th} record, M_{m_i} is the month coefficient for the month corresponding to the i^{th} record, T_{t_i} is the area coefficient for the area corresponding to the i^{th} record, B is the intercept and ε is an error term.

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 adequate for these data. The lack of a vessel effect may be because vessels tend to fish in relatively few statistical areas and consequently any difference among vessels has been captured using the area and month explanatory variables.

Canonical coefficients and standard errors were calculated for each categorical variable (Francis 1999). Standardised analyses typically set one of the coefficients to 1.0 without an error term and estimate the remaining coefficients and the associated error relative to the fixed coefficient. This is required because of parameter confounding. The Francis (1999) procedure rescales all coefficients by forcing the geometric mean of the coefficients to equal 1.0 and also calculates a standard error for each coefficient, including the fixed coefficient. For comparability, the normalised unstandardised and the canonical standardised coefficients were multiplied by the geometric mean of the appropriate arithmetic CPUE index (Eq. 1) so that all three sets of indices were scaled to the same mean in terms of kg/potlift.

Annual CPUE standardisations based on the offset year definition (1 October to 30 September) were prepared for CRA 3, CRA 4, CRA 5, CRA 7, and CRA 8. The methodology used to estimate these series is identical to the methodology used for the statutory fishing year (Eq. 3) and makes use of data up to 30 September 2011 (see Section 2.1). Diagnostic tables and figures for each of offset-year standardisation, including "influence" plots (Bentley et al. 2011) for the month and statistical area explanatory variables, are provided in Appendix B (CRA 3), Appendix C (CRA 4), Appendix D (CRA 5), Appendix E (CRA 7) and Appendix F (CRA 8).

2.6 Indices by assessment (seasonal) period for CRA 3, CRA 4, and CRA 5

Seasonal CPUE standardisations based on the AW and SS periods instead of complete years have been prepared for CRA 4 (Eq. 4). Thus, the fishing year explanatory variable is replaced in the standardisation model by a period explanatory variable. The model becomes:

Eq. 4 $$\ln(I_i) = B + R_{r_i} + M_{m_i} + T_{t_i} + \varepsilon$$

where I_i is CPUE for the i^{th} vessel-month-area record, R_{t_i} is the period coefficient for the period corresponding to the i^{th} record, M_{m_i} is the month coefficient for the month corresponding to the i^{th} record, T_{t_i} is the area coefficient for the area corresponding to the i^{th} record, B is the intercept, and ε is an error term.

The interpretation of the *month* explanatory variable in the model defined by Eq. 4 differs from the annual model described by Maunder & Starr (1995) and in Section 2.5. When the fishing year is split into two seasons, additional confounding occurs with the *month* effects within each season, requiring that one of the *month* coefficients be set to 1.0 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 fixed. 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 generally have the lowest standard error. The *month* coefficients in the seasonal model do not show as much variation as the *month* effects in an annual model because part of the seasonal variation is explained by differences between periods. In the seasonal standardisation, *month* effect will take into account only the within-period variation, rather than the full seasonal variation within a fishing year. Diagnostic tables and figures for the CRA 4 seasonal standardisation model are provided in Appendix G.

The geometric mean of each seasonal standardised CPUE series (AW and SS) was scaled to equal 1.0 and then scaled to the geometric mean of the arithmetic series (Eq. 1) for each season; this scales the seasonal CPUE correctly between the two seasons for stock assessment modelling.

2.7 Annual QMA catch and potlift totals by statistical area

Scaled annual catch totals (Eq. 5) for each statistical area *a* in a QMA $\left(\hat{Q}_{a,y}\right)$ were obtained by multiplying the estimated proportion, using the catch/effort data set, taken in a statistical area by the total QMA catches from the QMR/MHR (see Section 2.1):

Eq. 5 $$\hat{Q}_{a,y} = Q_y \frac{\sum_{i \in k_{a,y}} C_{i,y}}{\sum_{i=1}^{n_y} C_{i,y}}$$

where Q_y is the QMR/MHR annual catch estimate in year *y*; $C_{i,y}$ and $k_{a,y}$ are as defined for Eq. 1.

Scaled potlifts for the total QMA $\left(\hat{P}_y\right)$ and for each statistical area *a* $\left(\hat{P}_{a,y}\right)$ were calculated using Eq. 6:

Eq. 6 $$\hat{P}_y = \sum_{i=1}^{n_y} P_{i,y} \frac{Q_y}{\sum_{i=1}^{n_y} C_{i,y}} \quad ; \quad \hat{P}_{a,y} = \sum_{i \in k_{a,y}} P_{i,y} \frac{Q_y}{\sum_{i=1}^{n_y} C_{i,y}}$$

where $P_{i,y}$, $C_{i,y}$ and $k_{a,y}$ are as defined for Eq. 1; Q_y is defined for Eq. 5.

3. RESULTS

3.1 Landed catch and TACC

Total landed catch in 2010–11 rose 100 t from the 2009–10 total to nearly 2 800 t, the highest level since 2000–01 (Table 1). This increase occurred in spite of a 60 t reduction in catch in CRA 7 (due to a 100 t TACC reduction), and was mainly driven by an increase in the CRA 4 landings. The increased

landings in CRA 4 were in response to a TACC increase resulting from the operation of a management procedure in this QMA. The CRA 4 management procedure has undergone a 5 year review, along with a stock assessment, and is currently before the Minister for acceptance. The operation of management procedures in 2010–11 resulted in a large drop in TACC for CRA 7 and no change for CRA 3, CRA 5 or CRA 8 (Ministry of Fisheries, Science 2011). The remaining QMAs reported landings that were close to the specified TACCs (Table 1).

There is reasonable correspondence in all QMAs between the catch reported to the QMR/MHR system and the sum of the landings from the bottom section of the CELR form (Table 2). Over all the data since 1990–91, CELR catches have averaged 94% of the QMR/MHR catches. In the most recent five years, this average has been 91%, with all QMAs recording a shortfall in 2010–11 when the totals landed to the LFRs were compared to the official QMR/MHR landing totals. These shortfalls were in part due to the grooming procedure used to prepare the data for analysis as well as the exclusion of some landings through the operation of method B4 (see Section 2.3 and Appendix A) (Bentley et al. 2005). There appears to be some year-to-year variation in the ratio of LFR landings to reported QMR/MHR catches. For instance, in CRA 8 ratios were larger in 2005–06 to 2008–09 and again in 2010–11 than in years prior to 2004–05 or in 2009–10. The ratio in CRA 3 increased from a low value in 2004–05, but the 2009–10 ratio dropped to nearly the 2004–05 level followed by an increase to previous levels in 2010–11. In CRA 5 the ratio dropped after 2007–08 compared to the preceding four years, with the next four years showing ratios similar to those observed in the late 1990s and the early 2000s. All QMAs have ratios of LFR landings relative to MHR reports in 2009–10 near 0.9, with the exception of CRA 4 and CRA 8, which are 0.80 and 0.84 respectively (Table 2). The landed catches for CRA 9 often exceeded the QMR/MHR reports. This is likely to be because of misallocation of landings by the B4 algorithm, which assigns landings by vessel to a QMA on a monthly basis using statistical area, one of which is shared between CRA 8 and CRA 9 (Table A.1). This effect is noticeable in CRA 9 because of the relatively small landings in this QMA relative to those in CRA 8.

The number of vessels in each QMA has decreased considerably from the early 1990s (Table 3), and the number of vessels reporting at least 1 t was much greater in all QMAs during the 1980s, before the entry of this species into the QMS. In 1989–90, there was inaccurate recording of vessels in some QMAs because of a change-over in the system used to record catches (see Section 2.4). The total number of vessels has declined by about 50% since the early 1990s after rock lobster was placed in the QMS (comparing the average number of vessels in 1990–91 to 1992–93 to the average number in 2006–07 to 2010–11, see Table 3).

3.2 CRA 1

Fourteen vessels reported catch from CRA 1 in 2010–11, an increase of one compared to the 13 that reported in the four years from 2006–07 to 2009–10 (Table 4). Fewer than 20 vessels reported from this QMA since 2000–01, a considerable drop from the 30 or more vessels that reported before the early 1990s. 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 5). This pattern changed in 2003–04 when over 45% of the catch was taken in Area 902, but the predominance of Area 901 returned over the next few years, with over 40% of the catch taken from Area 901 since 2005–06 (Table 5). The remaining four statistical areas each individually account for less than 20% of the catch. Potlifts tended to be more evenly distributed across the statistical areas, without showing predominance for Area 901 in recent years (Table 6).

Cumulative monthly catch by fishing year was relatively stable in the early 1980s, with most catch taken in the late winter and spring months (Table 7, Figure 2). There was a shift towards a winter–spring fishery in the mid 1990s, with July–October accounting for 63–83% of the total annual catches since 1995–96, up from 25–45% before that fishing year. The July–October percentage of catch was 66% in 2010–11 (Table 8). Catches extended into February 2011 in Area 901 and into January for Area 939 (Table 8).

Arithmetic CPUE trajectories from 1979–80 to 2001–02 were variable between areas, although the CPUE in Areas 901 and 939 increased since the mid 1990s (Table 9, Figure 3). Area 902 had high CPUE values in the early 2000s, but these have since dropped, although the CPUEs from this statistical area are still relatively high, exceeding 1.5 kg/potlift (Table 9). CPUE from all areas combined had a shallow peak in 1982–83 followed by a long steady decline to 1992–93 (Table 10, Figure 4). Catch rates then increased rapidly to just above 1 kg/potlift in 1995–96 and remained at this level up to 2003–04 when catch rates again increased. The standardised index dropped to about 1.6 kg/potlift in 2009–10 and again to 1.25 kg/potlift in 2010–11, after being near 1.8 kg/potlift in 2008–09 (Table 10). These high CPUE levels appear to be driven by Area 901, which has consistently increased over time (see Table 9). The two unstandardised series (Eq. 1 and Eq. 2) are similar to the strong CPUE values seen in the standardised series since 2007–08 (Figure 4).

3.3 CRA 2

Thirty-four vessels reported catch greater than 1 t from CRA 2 in 2010–11, an increase of 2 vessels from the 32 that have reported since 2007–08 (Table 11). This is a drop of 4–5 vessels compared to those reporting in the early 2000s and less than half the number reporting in 1979–80. This increase of two vessels in 2010–11 was driven by a large increase from 9 to 15 vessels in Area 905 (western Bay of Plenty, see Figure 1). This increase in the number of vessels in Area 905 was not associated with a corresponding increase in the proportion of the annual catch from this statistical area (which only increased from 17 to 20%, Table 12). Area 906 (western Bay of Plenty) has been the predominant statistical area in terms of catch, accounting for 35–45% of the annual catch since 1990–91. However, this percentage dropped to 31% in 2009–10 and to 28% in 2010–11 (Table 12), more or less equalising the distribution of catch between the four statistical areas. The percentage of catch coming from the eastern Bay of Plenty (combined Areas 907 and 908) has remained relatively constant between 40 and 50% since the mid 1990s and has moved slightly above 50% in 2009–10 and 2010–11, with the relative contribution between these two statistical areas varying between years. The distribution of potlifts among statistical areas is similar to that of the catch, but with slightly greater proportional representation in Area 906 and less in the eastern Bay of Plenty (Table 13).

Cumulative monthly catch by fishing year was stable 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 14, 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 these three fishing years taken between April and September. The shift then reversed, with over 40% of the catch being taken from November onwards in the most recent nine fishing years, while in the latter half of the 1990s less than 10% of the catch was taken after October (Table 14). In 2010–11, 93% of the catch was taken between July and February, spread between the four statistical areas (Table 15).

Arithmetic CPUE increased in all areas from the early 1990s, most strongly in Area 907 (Table 16, Figure 6). Arithmetic CPUE for the QMA increased from the early 1990s to a peak in 1997–98 and 1998–99, then declined to 2002–03 where it has remained (Table 17, Figure 7). Arithmetic and standardised CPUE were similar, except that the standardised analysis estimated a somewhat higher peak for 1997–98 and 1998–99. This was likely to have been caused by the shift in effort towards the winter months which reduced the arithmetic and unstandardised CPUEs. The standardised indices reached a minor peak in 2006–07 and have since declined. CPUE has not returned to the high levels observed between 1995–96 and 2000–01 (Table 17, Figure 7).

3.4 CRA 3

There was a decrease since the 1979–80 fishing year in the number of vessels that reported catch from CRA 3 (Table 18) from about 80 in the early 1980s to about 30 in the late 1990s. Vessel numbers increased to 38–39 in 2002–03 and 2004–04 but then dropped to fewer than 30 by 2005–06 (Table 18). Relatively high numbers of vessels (near 50 or more) continued to report catch in this

QMA until the 1993–94 fishing year, the following year the TACC was cut by 50% and the main fishery shifted to the winter months.

The relative importance in terms of total annual catch among the three statistical areas in this QMA remained consistent to 2000–01, with Area 910 (Gisborne) being the most important (Table 19). 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 higher catch rates in this area. However, the proportion of the catch recorded in Area 911 dropped in 2004–05 to about 40% and stayed at this level until 2008–09, when there was another drop to about 35% where it has remained (Table 19). Area 910 has increased in relative importance at the expense of a drop in the proportion of catch coming from Area 909. The distribution of potlifts is similar, with about 50% of the effort in Area 910 taking about 50% of the catch in 2010–11 (Table 20). Proportionately, slightly more effort was recorded in Area 911 and less in Area 909 in 2010–11 compared to the distribution of catch.

This fishery was primarily a summer fishery until regulations were changed for the 1993–94 fishing year to encourage the development of a winter fishery targeted at males. Regulation changes included lowering the minimum size limit for males in June to August from 54 to 52 mm tail width, prohibiting the take of females in the same period, and closing the fishery from the beginning of September to the end of November (Sullivan 2004). The cumulative monthly catch proportions by fishing year demonstrated the shift to a winter fishery, with 65% of the catch taken by the end of August in 1993–94, which then rose to over 95% in 1995–96 and remained above 80% up to 1999–2000 (Table 21, Figure 8). This shift then reversed, with the winter catch (June–August) dropping to 58% in 2000–01 and then fluctuated around 50% until 2008–09. However, there has been a recent return to a winter fishery along with an apparent increase in abundance, with 62% and 80% of the catch taken in July–August in 2009–10 and 2010–11 respectively (Table 22). There were significant catches in November and December from 2002–03 to 2009–10, after these months were reopened to commercial fishing, but these catches disappeared in 2010–11 with the voluntary closure described below. June, July, and August have remained important months for catch, especially in Area 910, with 47% of the total 2010–11 catch coming from that statistical area in those three months (Table 22). May has been closed to commercial fishing in CRA 3 since 1993 (Ministry of Fisheries, Science 2011). Commercial operators have closed, by voluntary agreement, Areas 909 and 910 from the beginning of September to mid-January and Area 911 from mid-December to mid-January in each of 2008–09, 2009–10 and 2010–11 (Ministry of Fisheries, Science 2011). The effect of this voluntary commercial closure can be seen in Table 22, with little or no catch reported from September to December.

Arithmetic CPUE increased strongly in all statistical areas beginning in the early 1990s, with Area 909 increasing to a higher level than the other two statistical areas (
Table 23, Figure 9). CPUE in all statistical areas peaked in 1997–98 and has since declined. Area 909 dropped the least (to about 0.8 kg/potlift in the early 2000s and rising to above 1.0 kg/potlift from 2006–07) while Areas 910 and 911 dropped to about 0.5–0.6 kg/potlift, except in 2004–05 when Area 911 dropped to about 0.4 kg/potlift. All statistical areas (909, 910, and 911) have shown increasing unstandardised CPUE since 2006–07 (Table 23). CPUE for the QMA increased from the early 1990s to a peak in 1997–98, followed by a decline to a level somewhat higher than was observed in the early 1990s (Table 24, Figure 10). The CPUE trends were all similar, except that the standardised analysis estimated a relatively higher peak for 1997–98 (Table 24, Figure 10), probably caused by the shift in effort towards winter months causing a reduction in average CPUE in the arithmetic series. All three sets of indices increased from about 0.6 in 2007–08 to greater than 1.0 kg/potlift in 2010–11 (Table 24, Figure 10).

3.5 CRA 4

The decrease in the number of vessels reporting catch from CRA 4 since the 1979–80 fishing year was less than that observed in CRA 1, CRA 2, and CRA 3 (Table 25; see Table 3). There was a jump in the number of vessels in 2006–07, going from 54 to 66 in a single year, reversing a drop of 7 vessels in the previous year. Vessel numbers declined in 2007–08, dropping to 53 and then to 42 and 43 in 2008–09 and 2009–10 respectively. Vessel numbers increased again in 2010–11 to 51. The single count of

131 vessels in 1989 is probably an artefact of the changeover from the FSU to CELR systems where vessels may have been double-counted because vessel codes were not properly transferred between the systems (see Section 2.4).

The relative importance of the five statistical areas in this QMA has remained consistent, with Area 914 (South Wairarapa) being the most important in terms of total catch (Table 26). There was a decrease in the proportion of catch reported from this area since the peak (55%) observed in 2005–06, but the percentage catch from this statistical area increased considerably between 2009–10 and 2010–11, rising from 33 to 45%. The increase in Area 914 catches came with commensurate decreases in Area 913 (North Wairarapa) and Area 915 (Palliser). The distribution of effort was similar to the distribution of catch, but with a slightly lower proportion of potlifts in Area 914 and higher in Area 913 relative to the distribution of catches (Table 27).

Before 1993–94, most fishing took place in the spring and summer months, with only about 25–30% of the catch taken from April to August (Table 28, Figure 11). From 1994–95, the period from April to August accounted for over 50% of the total catch and these five months continued to account for over 50% of the catch up to 2002–03, peaking at 86% in 1997–98 (Table 28, Figure 11). This trend has since reversed, with only 43% of the catch taken by the end of August in 2004–05 and 36% in 2005–06, followed by a drop to below 20% for these same five months from 2006–07 to 2008–09. However, this trend reversed in 2009–10 and 2010–11, with 37 and 44% of the catch taken from April to August. Concurrently, the proportion of catch taken from November to March increased from 41% in 2004–05, to 50% in 2005–06 and to near to or above 60% from 2006–07 to 2008–09. This has since dropped, with 51% of the 2009–10 and 43% of the 2010–11 catch taken between November and March. Fifty percent of the total catch in 2010–11 was taken between April and September in Areas 912, 913, 914, and 915 (Table 29).

Arithmetic CPUE increased in all statistical areas (the data for Area 934 are too sparse to draw a conclusion), beginning from 1992–93 (Table 30, Figure 12). The increase in CPUE for 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 near 1.0 kg/potlift while Areas 912 and 913 increased to much higher levels (Table 30, Figure 12). CPUE in the four main statistical areas declined to about the same mean catch per potlift by 2001–02, all near 1.0 kg/potlift (Table 30). CPUE in these statistical areas dropped to below 1.0 kg/potlift in 2005–06, but have since returned to this level in the most recent two fishing years. Area 914 showed the greatest drop, going below 0.5 kg/potlift in 2007–08 but returning to above 1.0 kg/potlift in 2009–10 and 2010–11. The patterns of increase and the peak year for mean catch rate in Areas 912 and 913 resembled the patterns observed in the CRA 2 and CRA 3 statistical areas (compare Figure 6 and Figure 9 with Figure 12). Peak catch rates in CRA 3 occurred one to two years earlier than in Areas 912 and 913.

CPUE for CRA 4 was similar to that for CRA 3, showing a steady increase from the early 1990s to a peak in 1998–99, one year later than in CRA 3 (Table 31, Figure 13). The relative decline since the peak fishing year (1997–98 for CRA 3 and 1998–99 for CRA 4) was slightly less than for CRA 3: the 2010–11 decline from the peak year is 34% compared with 56% in CRA 3. However, CRA 4 was much closer to the minimum CPUE recorded for the series, with the 2007–08 CPUE only 23% greater and the 2010–11 CPUE 114% greater than the minimum. The equivalent value for CRA 3 in 2010–11 was 372%. The CPUE trends for CRA 4 were all similar, except that the standardised analysis estimated a higher peak for 1998–99 (Table 31, Figure 13), probably because of the shift in effort towards winter months, causing a reduction in average CPUE in the arithmetic and unstandardised series. The standardised CPUE index for CRA 4 was 1.03 kg/potlift in 2010–11, up from 0.59 kg/potlift in 2007–08 and confirming the recovery signalled by the 2009–10 index (Figure 13).

3.6 CRA 5

The number of vessels fishing in CRA 5 declined substantially since the 1979–80 fishing year, with fewer than 40 vessels reporting in this QMA after 2000–01, compared to 80 to 90 vessels during the 1980s (Table 32). The number of vessels has continued to decline since 2000–01, dropping to below

30 in 2006–07. There are six statistical areas in this QMA, but over 80% of the catch was reported from Area 916 (Cape Campbell) and Area 917 (Kaikoura-Motunau) and a lesser amount from Area 933 (Marlborough Sounds; Table 33). The relative catch proportions between these areas has changed somewhat, with Area 916 rising in importance in the early 2000s, peaking at 48% of the total annual catch in 2003–04. Since then, this statistical area has declined in relative importance to 30–32% of the total annual catch in 2009–10 and 2010–11 (Table 33). There has been a corresponding increase in the importance of Area 917, which exceeded 50% of the total catch for 2009–10 and 2010–11 (Table 33). The other three statistical areas accounted for less than 20% of the annual catch, with most of that occurring in Area 933. The distribution of effort is slightly different, with 45% of the effort taking 54% of the catch in Area 917 and 62% of the effort taking 32% of the catch in Area 916 in 2010–11 (Table 34).

This fishery remained predominantly a summer fishery for longer than any of the North Island QMAs, not shifting to a winter fishery until 1996–97 when the proportion of the annual catch taken in April to September exceeded 50% (Table 35, Figure 14). Also, unlike the more northerly QMAs, the relative proportion of the catch taken in the winter months continued to stay high, exceeding 80% in the AW up to 2003–04. The AW now accounts for 61 to 77% of the annual catch (73% for 2009–10 and 76% for 2010–11). About 53% of the catch was taken between April and July in Areas 916 and 917 in 2010–11, with the peak catch months being May in Area 916 and Area 917 (Table 36). Historically May has been a strong catch month in this QMA, accounting for 14–28% of the annual catch since 1996–97 (see Table 35).

Arithmetic CPUE trajectories showed similar trends in each of the statistical areas up to 1997–98. At that time, CPUE increased in all areas, especially in Area 916 (
Table 37, Figure 15). CPUE in Area 916 increased to much higher levels and more quickly than in other statistical areas, peaking in 2000–01. The arithmetic catch rate for Area 916 dropped to below 2.0 kg/potlift in 2005–06 and has ranged between 1.7 and 2.0 kg/potlift since that year. The Area 916 CPUE (Eq. 1) for 2010–11 was 1.92. CPUE for CRA 5 increased until 2003–04, then dropped to a nadir over three successive fishing years before rising to a peak in 2009–10 (Table 38, Figure 16). The unstandardised and standardised CPUE were nearly identical, while the arithmetic CPUE lay below these two series (Table 38, Figure 16). The CRA 5 2010–11 standardised CPUE index dropped to 1.64 kg/potlift, representing a 10% decline from the 2009–10 peak.

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, vessel numbers dropped to 34 and have since fluctuated near 35 (Table 39). The relative decline in vessels has been much less in CRA 6 than in the other QMAs.

There are four statistical areas in this Chatham Islands QMA, with Area 942 (Southeast Chatham Islands) generally having about 40–50% of the total landings for the QMA since 1990–91 (Table 40). The proportion of the total CRA 6 landings in Area 942 dropped to about 40% in 2006–07, with most of this catch shifting to Area 940 and some to Area 943. The percentage of catch in Area 941 has been below 20% since 2007–08 (Table 40). The two northern statistical areas (940 and 941) have accounted for about 40% of the annual catch in recent years. The distribution of potlifts by statistical area is similar to the distribution of catch (Table 41).

This fishery has been predominantly a spring-summer fishery for its entire history, with little tendency to shift to a winter fishery as in the North and South Island fisheries (Table 42, Figure 17). The fishery is closed by regulation from 01 March to 30 April in each year (Ministry of Fisheries Science 2011), accounting for the lack of data in these months (Table 42). In 2010–11, 71% of the catch was taken between October and February, with 28% of the annual catch coming from Area 942 during the same months (Table 43).

Arithmetic CPUE declined in the early to mid 1980s for all statistical areas, except for Area 941 which never had the high catch rates seen in the other three statistical areas (Table 44, Figure 18). Area 942

consistently had the highest mean catch rate beginning in the mid 1980s, likely accounting for the high catches in this area (Table 44). Mean catch rates in all four statistical areas, although variable, stabilised during the mid to late 1990s and now appear be increasing in all statistical areas, with variability between years. CPUE for the QMA dropped in the early 1980s, was relatively stable near 1.0 kg/potlift through the 1990s (Table 45, Figure 19). CPUE then increased to over 1.6 kg/potlift in 2006–07, and has remained between 1.4 and 1.6 kg/potlift since that year. There was about a 10% rise in the standardised index from 1.4 kg/potlift in 2009–10 to 1.53 kg/potlift in 2010–11. The standardised and unstandardised indices were slightly higher than the arithmetic index in recent years, with all three series showing a similar trend of a gradual increase since the late 1990s or the early 2000s.

3.8 CRA 7

The number of vessels reporting in CRA 7 has dropped precipitously over the 30+ years of record, with 70–90 vessels participating in the early 1980s compared to a low of 7 in 1997–98 (Table 46). The number of vessels increased to 25 by 2000–01, dropped to 14 in 2004–05 to 2006–07, and has since ranged between 15 and 20 vessels, with 16 qualifying vessels in 2010–11. 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 more equal distribution of catch between the two areas from 2004–05 to 2006–07. The proportion of catch in Area 920 increased to two-thirds in 2007–08 and 2008–09, but this proportion has dropped again, with Area 921 exceeding the Area 920 landings in 2010–11 (Table 47). The distribution of effort is much more skewed to Area 920 than catch, implying lower catch rates in this statistical area (Table 48).

The seasonal distribution for this fishery has tended to be consistent over most of the reported period because this fishery has been restricted by regulation to 21 June to 19 November since the 1992–93 fishing year for the take of "concession" sized lobsters (Sullivan 2004) (Table 49, Figure 20). However, catches accumulated quickly in 2004–05 (Figure 20) and even more quickly in both 2005–06 and 2006–07, with 55% of the 2005–06 and 44% of the 2006–07 annual catch taken by the end of July compared to a more usual expectation of 20 to 36% taken to the end of that month. This trend has changed again, with the proportion of catch taken in June and July dropping in each year from 2007–08 to a low of 9% in 2009–10. This percentage increased in 2010–11 to 25%. Seventy-six percent of the catch was taken from August to November 2010 in combined Areas 920 and 921, which was a drop from the 91% taken in the same months in 2009 (Table 50).

Arithmetic CPUE declined in the early 1980s, then was variable, declining to a low in 1999–2000 (Table 51, Figure 21). Area 921 consistently had higher mean catch rates, but they tended also to be more variable. Both areas had declines to the end of the 1990s, although this pattern was variable and then reversed in both 920 and 921 (Figure 21). Overall CPUE for this QMA also reflected this downward trend, but there were notable increases in mean CPUE in 1986–87, 1991–92, and 1993–94 (Table 52, Figure 22). Mean CPUE rose consistently after 1997–98, the nadir of the series, to a peak of 2.0 kg/potlift in 2008–09, the highest in the series (Figure 22). The CPUE index halved in 2009–10, to near 1.0 kg/potlift, triggering a reduction in the TACC in April 2010 through the operation of the CRA 7 Management Procedure. A further 25% decline in CPUE, to 0.71 kg/potlift, was observed in 2010–11 which triggered a further TACC drop from 1 April 2012. The three CPUE series (Eq. 1, Eq. 2, Eq. 3) were similar, with the arithmetic series lying below the others (Table 52, Figure 22).

3.9 CRA 8

Historically, CRA 8 had more vessels fishing than any other QMA (Table 53, see Table 3) and the decline in the number of vessels was almost as great as in CRA 7 (see Table 3). The number of qualifying vessels has stabilised in the low to mid-60s over the last three years. Seven statistical areas make up this QMA, with about 80% of the catch reported from the combined Areas 926 to 928 (Fiordland) since the mid 1990s (Table 54). Area 926 (Puysegur) increased in relative importance among the other Fiordland statistical areas, accounting for about 50% of the total CRA 8 landings

from 2002–03 to 2004–05. This proportion declined to less than 30% of total landings by 2008–09 and 2009–10, but increased to about one-third of the annual landings in 2010–11. With the drop in the importance of Area 926, there have been proportionate increases in the size of the relative catch in Areas 927 and 928. Area 924 (Stewart Island) contributed between 12 and 23% of the annual landings, with recent levels near 12–16% (Table 54). Distribution of effort among statistical areas is similar to the distribution of catch (Table 55), with slightly less effort in Area 924.

The seasonal distribution of catch for this fishery has been consistent except for the most recent five years, with about 60–80% of catch taken from August to November (Table 56, Figure 23). In some years, over 15% of the annual catch was taken in December and up to 16% in January, probably reflecting earlier poor catches during the period of low abundance (Table 56). After 2003–04, with the increase in abundance, the monthly distribution of catch shifted towards an earlier fishery (similar to that observed in the east coast QMAs). Catches from April to the end of July accounted for over 40% of the annual catch in 2006–07, increasing to 51% in 2010–11, except for a drop to 39% in 2009–10, compared to a more usual cumulative total of less than 10% of the annual catch in the same four months before 2003–04 (Figure 23). Over 70% of the annual catch was taken by the end of September in the eight years since 2003–04, ranging from 72% in 2009–010 to 91% in 2008–09. Seventy-six percent was taken by the end of September in 2010–11. Only 3% of the total annual catch was taken in April 2005, but the percentage of catch taken in April increased considerably after that year, ranging from 11% in April 2006 and 2010 to 15% in April 2008. The amount of catch coming from this month is much larger than in earlier years, when only a small percentage of the total catch was taken in April (usually less than 1%). This recent increase in April landings is likely to include lobsters captured in the previous fishing year and held over in holding pots. Thirty-seven percent of the total annual catch for CRA 8 was taken in Areas 926 to 928 between April and June 2010 (Table 57).

Arithmetic CPUE by statistical area showed a gradual decline during the 1980s and early 1990s (Table 58, Figure 24). CPUE was stable up to the early 2000s, with Areas 924 and 926 having the highest mean catch rates among the statistical areas with high total catch (Table 58). Catch rates then improved quickly, with increases in all statistical areas up to 2008–09 (Table 58), followed by a levelling off or drop in 2009–10 and a further drop in all statistical areas in 2010–11. CPUE for this QMA dropped from the early 1980s to the early 1990s, then was stable. A rising trend began in 1999–2000, with a strong increase in 2003–04 and successive rises from 2005–06 to 2008–09, all with large standard errors (Table 59, Figure 25). The index for 2009–10 was the same as for 2008–09, but there was a 30% drop in standardised CPUE between 2009–10 and 2010–11. The lowest CPUE values were recorded in 1992–93 and 1997–98 (Table 59). The three CPUE series (Eq. 1, Eq. 2, Eq. 3) all show similar trajectories, with the standardised index rising the most steeply of the three (Table 59, Figure 25).

3.10 CRA 9

The number of vessels reporting lobster catch in CRA 9 has more than halved, from above 20 in the early 1980s to fewer than 10 after 2002–03, and then to only 6 in 2008–09 and 2009–10 (Table 60). Many of the statistical area or month cells in this QMA had no vessels reporting catch at all or had fewer than the Ministry of Fisheries criterion requiring at least three vessels reporting before summary data can be presented. Therefore the summary tables for this QMA are missing a considerable amount of information. There are seven statistical areas in CRA 9, with Areas 931 and 935 being the most important in terms of landings, and with lower proportions of landings in Areas 930, 936, and 937 (Table 61). The proportions of the annual catches among statistical areas have fluctuated widely, but Area 935 has consistently had the highest proportion of landings, possibly reflecting the distribution of effort rather than any underlying differences in relative abundance between statistical areas (Table 61). Effort is similarly concentrated in this statistical area (Table 62). Only two of the statistical area cells in Table 61 and Table 62 met the reporting criterion of at least three vessels in 2010–11.

Catch in this fishery shifted away from the summer to the late winter in the mid 1990s, with the cumulative catch to the end of September increasing past 50% in 1995–96 (Table 63, Figure 26). This shift has been particularly strong from 2004–05, with over 80% of the annual catch taken by the end of

September in that year, increasing to over 90% from 2005–06 to 2007–08 (Table 63). This trend may have reversed, because the total percentage catch taken from April to September dropped to 62% and 69% in 2009–10 and 2010–11 respectively, possibly indicating a small shift to later months (42% of the catch was taken in Areas 931 and 935 from August to October 2009; Table 64). Note that only two of the cells in Table 64 satisfy the criterion of at least three vessels reporting.

The arithmetic CPUE trajectories by statistical area from 1979–80 to 2009–10 are difficult to interpret because many of the year/statistical area combinations cannot be reported (Table 65, Figure 27). Areas 931 and 935 have shown the highest catch rates in most years (Table 65). CPUE for this QMA increased strongly from 2002–03 to 2004–05 after a long period of stability. This was followed by a flattening of the series in 2005–06 and 2006–07, and then by a drop over two years to 2008–09 (Table 66, Figure 28). The index values for 2009–10 and 2010–11 are nearly the same and represent a 20% increase over the 2008–09 index. CPUE trends are similar for all three series, except for 2008–09 to 2010–11 where the arithmetic series shows a continuous declining trend not matched by the two geometric series (Table 66, Figure 28).

3.11 Comparison of standardised CPUE among the nine QMAs

Six of the nine CRA QMA standardised CPUE indices declined in 2010–11 from the 2009–10 values, with declines in CRA 1, CRA 2, CRA 5, CRA 7 and CRA 8 all exceeding 10% (Figure 29). CRA 9 had a drop of 2% while CRA 1, CRA 7 and CRA 8 had drops of 24%, 27% and 29% respectively. CRA 4 increased by 1%, while CRA 6 increased by 10% and CRA 3 by 32%, the largest annual change in all the CRA QMAs. The lowest value for standardised CPUE in 2010–11 was observed in CRA 2, at 0.41 kg/potlift. CRA 7 was the next lowest at 0.78 kg/potlift, and all other CRA QMAs showed standardised CPUE indices greater than 1.0 kg/potlift. These values ranged from 1.03 kg/potlift for CRA 4 to a high of 2.8 kg/potlift for CRA 8.

3.12 CRA 3 standardised CPUE: offset year

Annual standardised indices for CRA 3 were calculated for the 1 October–30 September offset year (Table 67, Figure 30). Data were available for this series up to 30 September 2011 (see Section 2.1) which provided input to the management procedure decision rule developed in 2009 for CRA 3 (Breen et al. 2009a). This series closely resembled the statutory fishing year series (Figure 10), but the upturn observed between 2009–10 and 2010–11 was stronger in the offset year series (+59% for the offset series increase compared to +32% for the fishing year series, see Table 24 and Table 67).

The total deviance explained by the standardisation analysis was good (46%, Table B.2), with most of the explanatory power lying with the *offset_year* variable and some in the *month* variable. The standardised residuals showed some deviation away from the model lognormal assumption at the extreme tails of the residual distribution, but were acceptable for about 95% of the distribution (Figure B.1). There was strong contrast in the *month* variable, with quite high relative coefficients for October to January and June and low coefficients for March to May and August and September (Figure B.2). The influence plot shows that the model adjusted for the nine years between 1993–94 and 2001–02 when there was virtually no fishing during the months of October to February by raising the annual coefficients during that period. As with the analysis presented in Section 3.4, Area 910 had the lowest relative catch rate, but there was little contrast between the three statistical areas that make up this QMA and little explanatory power in this variable (Figure B.3).

3.13 CRA 4 standardised CPUE: offset year

Annual standardised indices for CRA 4 were calculated for the 1 October–30 September offset year (Table 68, Figure 31). Data were available for this series up to 30 September 2011 (see Section 2.1) which provided input for the management procedure decision rule developed in 2011 to replace the existing CRA 4 decision rule (Breen et al. 2012). This series closely resembled the statutory fishing

year series (Figure 13), but the upturn observed between 2009–10 and 2010–11 was stronger in the offset year series (+19% for the offset series increase compared to +1% for the fishing year series, see Table 31 and Table 68).

The total deviance explained by the standardisation analysis was acceptable but not as strong as for the CRA 3 analysis (25%, Table C.2), with most of the explanatory power lying with the *offset_year* variable and the remainder in the *month* variable. The standardised residuals showed similar deviations from the model lognormal assumption as did the CRA 3 analysis at the extreme tails of the residual distribution, but were acceptable for about 95% of the distribution (Figure C.1). As for the CRA 3 analysis, there was good contrast in the *month* variable, with the model adjusting for the 4–5 years with little data in the November to March period by raising the annual coefficients during that period (Figure C.2). The *statistical_area* variable had little explanatory power and contrast between the five statistical areas that make up this QMA (Figure C.3).

3.14 CRA 5 standardised CPUE: offset year

Annual standardised indices for CRA 5 were calculated for the 1 October–30 September offset year (Table 69, Figure 32). Data were available for this series up to 30 September 2011 (see Section 2.1) which formed the input for the management procedure decision rule developed for CRA 5 in 2010 (Haist et al. 2011). This series closely resembled the statutory fishing year series (Figure 16), but the difference observed between 2009–10 and 2010–11 was not as large in the offset year series (-2% for the offset year series change compared to -10% for the statutory fishing year series, see Table 38 and Table 69).

The total deviance explained by the standardisation analysis was good (35%, Table D.2), with most of the explanatory power lying with the *offset_year* variable and lesser amounts with the *month* and *statistical_area* variables. The standardised residuals showed some deviation from the model lognormal assumption at the extreme tails of the residual distribution, but were acceptable for at least 95% of the distribution (Figure D.1). There was contrast in the *month* variable, with high relative coefficients estimated from November to February, but there was little explanatory power in this variable (Figure D.2). None of the winter months had coefficients greater than 1.0 except May, slightly above 1.0. As with the analysis presented in Section 3.6, Areas 916 and 918 had higher catch rates than the other statistical areas in this QMA, with the remainder all having coefficients less than 1.0 (Figure D.3). Again, there was little explanatory power in this variable.

3.15 CRA 7 standardised CPUE: offset year

Annual standardised indices for CRA 7 were calculated for the 1 October–30 September offset year (Table 70, Figure 33). Data were available for this series up to 30 September 2011 (see Section 2.1) which formed the input for the management procedure decision rule developed for CRA 7 in 2007 (Breen et al. 2008, 2009b). This series showed a strong drop in 2008–09, followed by almost no change in the next year, and then another drop for a total decline of 65% between 2008–09 and 2010–11. This pattern contrasts with the statutory fishing year analysis where the entire decline of 65% occurred over a period of only two years (compare Figure 22 with Figure 33). This observation leads to the conclusion that the decline in the CRA 7 CPUE began from 1 October 2008 and has shown a consistent response after that date.

The total deviance explained by the standardisation analysis was reasonable (29%, Table E.2), with most of the explanatory power lying with the *offset_year* variable, followed by *statistical_area*. There is almost no explanatory power in the *month* variable. The standardised residuals showed deviation from the model lognormal assumption at the extreme tails of the residual distribution and some clumping, but were acceptable for at least 95% of the distribution (Figure E.1). Area 921 had a much higher catch rate than Area 920 but there was no trend in the distribution of catch between these two areas and the influence on the annual coefficients is variable (Figure E.2). There was almost no contrast in the *month* variable, except for the March and April relative coefficients, which were well

below 1.0. Fishermen cannot land lobster using the concession MLS from December, resulting in little fishing in these months and low relative catch rates (Figure E.3).

3.16 CRA 8 standardised CPUE: offset year

Annual standardised indices for CRA 8 were calculated for the 1 October–30 September offset year (Table 71, Figure 34). Data were available for this series up to 30 September 2011 (see Section 2.1) which formed the input for the management procedure decision rule developed for CRA 8 in 2007 (Breen et al. 2008, 2009b). This series is similar to the statutory fishing year series (see Figure 25) except that the increase in the early 2000s was more rapid in the offset year series, and the final index shows a 20% drop spread over two years compared to a single year drop of 29% in the fishing year series (compare Table 59 with Table 71).

The total deviance explained by this standardisation analysis was the lowest of the five offset year models (24% compared to 25–45%, Table F.2), again with most of the explanatory power lying with the *offset_year* variable and relatively small amounts of explanatory power in the *month* and *statistical area* variables. The CRA 8 model standardised residuals showed slightly more deviation than the other four offset year analyses from the model lognormal assumption at both tails of the residual distribution, but were acceptable in the central 90–95% of the distribution (Figure F.1). The peak catching months in terms of CPUE extended from September to February, with considerably lower relative catch rates in the winter (Figure F.2). The influence plot shows that the model is able to compensate for the shift from a spring/summer fishery to a greater reliance on the winter period for catch lobster. Area 925 (Snares) had the highest relative catch rate, but little catch has been taken from there (Figure F.3). The relative catch rates for the other four important statistical areas (Area 924: Stewart Island; Areas 926 to 928: Fiordland), while showing some contrast, with Areas 924 and 926 being above 1.0 while Areas 927 and 928 were less than 1.0, appear to have little explanatory power (Figure F.3). The standardisation procedure raises the unstandardised analysis (Eq. 2) with the addition of the *month* explanatory variable (Figure F.4). This occurs because of the predominance of the winter fishery in the six most recent fishing years result in low overall unstandardised catch rates (Figure F.2).

3.17 CRA 4: standardised CPUE indices by period

Standardised indices by season were calculated for CRA 4 (Table 72, Figure 35), ending with the SS period in 2010–11, which was used as input to the 2011 CRA 4 stock assessment (Breen et al. 2012). The trends for the AW and SS standardised series were similar in overall shape to each other and the AW series was similar to the annual CPUE series reported in Figure 13. The absolute size of the SS peak is noticeably greater than the peak of the AW series. These series declined slowly from the beginning of the series to the early 1990s, followed by a steep increase to a peak in 1998–99 and then another decline to 2007–08. The declines have reversed partly in response to substantial cutbacks in commercial catches in recent years (see Table 1) and a likely improvement in recruitment (Breen et al. 2012).

The total deviance explained by the standardisation analysis was good (29%, Table G.2), with most of the explanatory power lying with the variable *period*. Lesser amounts of explanatory power were provided by the *month* and *statistical_area* variables. The residual patterns showed some deviation from the model lognormal assumption at the extreme tails of the residual distribution, but were acceptable through the majority of the distribution (Figure G.1). There was contrast in the *month* variable, with higher relative monthly coefficients in May-June and November-December, and with the relative coefficients dropping to below 1.0 at the end of each season (Figure G.2). Relative catch rates were slightly higher in the more northerly statistical areas of CRA 4 compared to the statistical areas near and in Cook Strait (the coefficients for Areas 912 to 914 were greater than 1.0 while the coefficients for Areas 915 and 934 were below 1.0, Figure G.2).

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Table 1: Reported commercial catch, TACC and TAC (tonnes) of *Jasus edwardsii* by QMA for each fishing year since the species was included in the QMS on 1 April 1990. –: TAC not set. N/A: current (incomplete) fishing year (Sources: QMR for 1990–91 to 2000–01 and MHR for 2001–02 to 2010–11)

	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	170.1	190.0	319.0
2006–07	130.8	131.1	–	226.7	236.1	452.6	178.7	190.0	319.0
2007–08	129.8	131.1	–	229.7	236.1	452.6	172.4	190.0	319.0
2008–09	131.0	131.1	–	232.3	236.1	452.6	189.8	190.0	319.0
2009–10	130.9	131.1	–	235.2	236.1	452.6	164.0	164.0	293.0
2010–11	130.8	131.1	–	224.8	236.1	452.6	163.7	164.0	293.0
2011–12	N/A	131.1	–	N/A	236.1	452.6	N/A	164.0	293.0

	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	349.5	350.0	467.0	351.7	360.0	370.0
2006–07	444.6	577.0	771.0	349.8	350.0	467.0	352.1	360.0	370.0
2007–08	315.2	577.0	771.0	349.8	350.0	467.0	356.0	360.0	370.0
2008–09	249.4	577.0	771.0	349.7	350.0	467.0	355.3	360.0	370.0
2009–10	262.2	266.0	461.0	349.9	350.0	467.0	345.2	360.0	370.0
2010–11	414.8	415.6	610.6	350.0	350.0	467.0	357.4	360.0	370.0
2011–12	N/A	466.9	661.9	N/A	350.0	467.0	N/A	360.0	370.0

Table 1 (cont.): Reported commercial catch (t), TACC and TAC for CRA 7, CRA 8, CRA 9 and for all New Zealand. –: TAC not set for QMA.

	CRA 7			CRA 8			CRA 9		
Fishing Year	Catch	TACC	TAC	Catch	TACC	TAC	Catch	TACC	TAC
1990–91	133.4	179.4	–	834.5	1152.4	–	45.3	54.7	–
1991–92	177.7	164.7	–	962.7	1054.6	–	47.5	50.2	–
1992–93	131.6	153.1	–	876.5	986.8	–	45.7	47.0	–
1993–94	138.1	138.7	–	896.1	888.1	–	45.5	47.0	–
1994–95	120.3	138.7	–	855.6	888.1	–	45.2	47.0	–
1995–96	81.3	138.7	–	825.6	888.1	–	45.4	47.0	–
1996–97	62.9	138.7	–	862.4	888.1	–	46.9	47.0	–
1997–98	36.0	138.7	–	785.6	888.1	–	46.7	47.0	–
1998–99	58.6	138.7	–	808.1	888.1	–	46.9	47.0	–
1999–00	56.5	111.0	131.0	709.8	711.0	798.0	47.0	47.0	–
2000–01	87.2	111.0	131.0	703.4	711.0	798.0	47.0	47.0	–
2001–02	76.9	89.0	109.0	572.1	568.0	655.0	46.8	47.0	–
2002–03	88.6	89.0	109.0	567.1	568.0	655.0	47.0	47.0	–
2003–04	81.4	89.0	109.0	567.6	568.0	655.0	45.9	47.0	–
2004–05	94.2	94.9	114.9	603.0	603.4	690.4	47.0	47.0	–
2005–06	95.0	94.9	114.9	603.2	603.4	690.4	46.6	47.0	–
2006–07	120.2	120.2	140.2	754.9	755.2	842.2	47.0	47.0	–
2007–08	120.1	120.2	140.2	752.4	755.2	842.2	47.0	47.0	–
2008–09	120.3	123.9	143.9	966.0	966.0	1053.0	47.0	47.0	–
2009–10	136.5	189.0	209.0	1018.3	1019.0	1110.0	46.6	47.0	–
2010–11	74.8	84.5	104.5	1018.2	1019.0	1110.0	47.0	47.0	–
2011–12	N/A	75.7	95.7	N/A	962.0	1053.0	N/A	47.0	–

	Total NZ		
Fishing Year	Catch[1]	TACC[2]	TAC[3]
1990–91	2907.4	3793.0	–
1991–92	3020.9	3502.9	–
1992–93	2629.9	3201.9	–
1993–94	2746.2	2912.1	–
1994–95	2621.5	2912.1	–
1995–96	2548.6	2912.1	–
1996–97	2690.5	2953.1	–
1997–98	2584.2	2864.1	1312.0
1998–99	2726.0	2926.8	1275.6
1999–00	2748.5	2850.2	3442.6
2000–01	2795.9	2850.2	3442.6
2001–02	2593.0	2685.2	3277.6
2002–03	2591.1	2685.2	3277.6
2003–04	2451.5	2685.2	3277.6
2004–05	2472.3	2726.4	3318.8
2005–06	2475.8	2589.4	3184.8
2006–07	2604.8	2766.6	3362.0
2007–08	2472.5	2766.6	3362.0
2008–09	2640.7	2981.0	3576.5
2009–10	2688.8	2762.2	3362.6
2010–11	2781.6	2807.3	3407.7
2011–12	N/A	2792.8	3393.2

[1] Catch totals exclude CRA 10 and ET catches (outside EEZ).
[2] TACC totals exclude CRA 10 (TACC=0.1 t)
[3] There is no TAC for CRA 10

Table 2: Ratio of the sum of landed catch from the bottom portion of the CELR forms to the reported QMR/MHR catch for each QMA and fishing year. Landed catches from CELRs include only records with error ratings less than or equal to one and records not excluded by the B4 algorithm (Appendix A).

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	0.97	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	0.97	0.86	0.94	0.90	1.01
2006–07	0.92	0.99	0.95	0.91	0.97	0.89	0.95	0.90	0.94
2007–08	0.95	0.91	0.95	0.88	0.92	0.88	0.95	0.88	0.89
2008–09	0.94	0.91	0.93	0.87	0.93	0.85	0.90	0.89	0.84
2009–10	0.89	0.92	0.90	0.80	0.91	0.86	0.95	0.84	0.88
2010–11	0.93	0.94	0.94	0.90	0.94	0.87	0.94	0.90	0.86

Table 3: Summary table showing the number of vessels reporting at least 1 t in each QMA by QMA and for all of New Zealand, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for an entire QMA were excluded (along with vessel=4548). The problem fishing year with overlapping vessel codes from the previous FSU and the current CELR catch reporting systems is in bold.

Fishing year	CRA1	CRA2	CRA3	CRA4	CRA5	CRA6	CRA7	CRA8	CRA9	All QMAs
1979–80	34	80	70	86	88	39	90	271	23	768
1980–81	34	89	85	86	86	42	86	253	23	778
1981–82	33	88	77	88	85	45	79	221	20	728
1982–83	33	82	85	89	93	54	42	214	19	708
1983–84	31	75	84	89	93	50	40	208	22	690
1984–85	30	73	86	90	95	53	59	212	21	715
1985–86	34	78	83	88	92	57	66	208	20	721
1986–87	35	70	76	88	91	48	58	187	20	663
1987–88	30	59	72	85	84	47	51	173	19	618
1988–89	26	55	58	87	71	42	38	135	10	518
1989–90	**27**	**17**	**77**	**131**	**66**	**55**	**17**	**178**	**18**	**577**
1990–91	27	57	58	85	62	40	37	134	12	503
1991–92	33	51	65	88	68	45	46	143	13	542
1992–93	31	47	54	94	59	50	35	144	12	519
1993–94	27	46	48	100	59	53	37	143	12	518
1994–95	22	47	41	89	51	59	32	122	16	474
1995–96	23	44	34	80	49	51	27	112	14	429
1996–97	26	40	32	74	47	50	22	111	18	410
1997–98	21	42	30	72	45	50	7	107	19	386
1998–99	19	35	30	65	41	42	18	104	16	361
1999–00	20	34	32	70	39	34	17	91	17	347
2000–01	18	39	33	61	36	33	25	87	9	336
2001–02	18	36	33	62	34	32	22	74	11	316
2002–03	17	37	38	65	34	32	20	69	10	316
2003–04	16	34	39	65	34	35	17	66	9	312
2004–05	15	31	33	61	32	34	14	62	8	284
2005–06	15	36	29	54	31	35	14	60	8	276
2006–07	13	35	28	66	28	36	14	57	7	281
2007–08	13	32	28	53	27	35	20	59	7	269
2008–09	13	32	26	42	26	35	15	64	6	258
2009–10	13	32	24	43	25	35	19	62	6	258
2010–11	14	34	26	51	27	36	16	64	6	272
Mean: 1979–80 to 1983–84	33.0	82.8	80.2	87.6	89.0	46.0	67.4	233.4	21.4	734.4
Mean: 2006–07 to 2010–11	13.2	33.0	26.4	51.0	26.6	35.4	16.8	61.2	6.4	267.6
Percent drop	-60%	-60%	-67%	-42%	-70%	-23%	-75%	-74%	-70%	-64%

Table 4: Number of vessels by statistical area from CRA 1, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the QMA were 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
2006–07	5	2	3	2	3	13
2007–08	5	4	4	2	3	13
2008–09	6	3	3	2	3	13
2009–10	5	3	2	2	3	13
2010–11	5	6	2	2	3	14

Table 5: Distribution and annual catch by statistical area from CRA 1, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels in the year/statistical area cell.

Fishing	Distribution (%)					Annual Catch (t)					
Year	901	902	903	904	939	901	902	903	904	939	CRA 1
1979–80	16.9	23.6	19.8	15.3	24.4	19.4	27.2	22.8	17.6	28.0	115.0
1980–81	12.5	31.0	13.4	17.8	25.2	22.4	55.8	24.1	32.1	45.4	179.8
1981–82	11.1	35.4	20.6	12.1	20.8	20.4	65.0	37.8	22.1	38.1	183.3
1982–83	18.3	32.4	12.1	14.1	23.1	40.8	72.3	26.9	31.4	51.4	222.9
1983–84	21.3	31.7	7.9	14.3	24.7	49.4	73.5	18.4	33.2	57.2	231.7
1984–85	16.4	39.6	7.4	14.7	21.9	34.8	83.7	15.8	31.0	46.3	211.6
1985–86	17.4	31.1	8.6	19.2	23.7	38.0	68.0	18.8	42.1	51.9	218.8
1986–87	11.0	25.0	19.5	22.2	22.2	23.3	52.9	41.2	47.0	47.0	211.4
1987–88	18.3	23.9	15.7	18.3	23.8	34.3	44.8	29.5	34.4	44.7	187.7
1988–89	20.1	25.2	12.0	19.6	23.1	35.9	45.0	21.4	35.0	41.2	178.6
1989–90	28.3	20.4	11.3	19.7	20.4	49.2	35.5	19.6	34.2	35.5	174.0
1990–91	27.2	27.9	10.0	14.0	20.9	35.7	36.5	13.0	18.4	27.4	131.1
1991–92	7.9	30.7	16.7	18.4	26.3	10.2	39.3	21.4	23.5	33.8	128.3
1992–93	15.5	28.6	14.0	20.1	21.8	17.2	31.5	15.4	22.2	24.1	110.5
1993–94	27.0	27.9	11.7	16.8	16.6	34.4	35.6	14.8	21.4	21.2	127.4
1994–95	25.2	20.7	13.6	24.4	16.2	32.7	26.9	17.7	31.7	21.0	130.0
1995–96	15.3	16.6	17.0	31.9	19.2	19.4	21.0	21.5	40.4	24.4	126.7
1996–97	16.3	16.1	19.1	30.6	18.0	21.1	20.9	24.7	39.5	23.3	129.4
1997–98	13.8	19.4	16.0	22.9	27.9	17.8	25.1	20.7	29.6	36.1	129.3
1998–99	x	18.5	12.0	15.7	30.6	x	23.8	15.4	20.2	39.4	128.7
1999–00	45.1	8.3	5.3	10.3	30.9	56.7	10.4	6.7	13.0	38.9	125.7
2000–01	51.5	10.9	8.0	10.2	19.4	67.4	14.3	10.5	13.4	25.4	130.9
2001–02	49.2	9.5	8.5	8.6	24.1	64.3	12.5	11.1	11.2	31.5	130.6
2002–03	36.8	21.1	7.0	6.9	28.3	48.1	27.6	9.1	9.0	37.0	130.8
2003–04	x	47.0	6.1	10.2	21.5	.	60.5	7.9	13.1	27.7	128.7
2004–05	28.2	30.7	7.8	9.3	24.0	36.9	40.1	10.2	12.2	31.4	130.8
2005–06	40.3	19.1	8.8	x	21.2	52.5	25.0	11.5	x	27.6	130.5
2006–07	44.8	x	13.9	x	15.7	58.6	x	18.2	x	20.6	130.8
2007–08	52.7	15.4	10.8	9.1	12.1	68.4	20.0	14.0	11.8	15.7	129.8
2008–09	45.0	16.2	11.1	x	16.5	58.9	21.2	14.6	x	21.6	131.0
2009–10	42.2	16.3	10.3	x	21.0	55.3	21.4	13.5	x	27.5	130.9
2010–11	43.1	18.2	10.6	8.4	19.7	56.4	23.8	13.9	11.0	25.8	130.8

Table 6: Distribution and annual potlifts by statistical area from CRA 1, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels in the year/statistical area cell.

Fishing	Distribution (%)					Annual Potlifts (000's)					
Year	901	902	903	904	939	901	902	903	904	939	CRA 1
1979–80	6.5	12.3	21.0	21.8	38.5	10.2	19.2	32.8	34.0	60.2	156.5
1980–81	6.2	17.5	19.3	23.8	33.2	11.0	31.0	34.3	42.2	58.9	177.2
1981–82	6.0	21.7	24.8	18.3	29.1	10.1	36.5	41.8	30.9	49.1	168.4
1982–83	7.1	17.6	23.3	21.8	30.2	14.2	35.1	46.4	43.4	60.2	199.4
1983–84	12.6	23.9	14.7	24.3	24.6	26.2	49.9	30.5	50.6	51.2	208.4
1984–85	9.4	27.7	11.3	24.4	27.3	20.7	61.0	24.8	53.7	60.1	220.2
1985–86	13.3	21.3	11.5	27.5	26.4	32.7	52.3	28.2	67.7	64.9	245.8
1986–87	6.1	19.3	19.7	31.4	23.5	17.3	54.4	55.7	88.7	66.3	282.4
1987–88	8.6	18.9	18.2	26.6	27.8	21.7	47.7	46.1	67.2	70.2	252.9
1988–89	10.0	20.8	20.6	23.3	25.3	22.1	46.1	45.8	51.6	56.2	221.9
1989–90	14.1	13.4	16.7	30.1	25.6	32.9	31.3	39.0	70.0	59.7	232.8
1990–91	16.7	27.7	11.9	19.9	23.7	32.4	53.7	23.0	38.7	46.0	193.8
1991–92	3.3	22.7	22.7	26.8	24.5	7.0	48.4	48.5	57.2	52.3	213.3
1992–93	4.7	23.0	15.6	33.1	23.5	9.9	48.4	32.8	69.7	49.5	210.4
1993–94	9.3	17.5	18.3	33.2	21.7	18.3	34.4	35.9	65.2	42.5	196.3
1994–95	11.0	13.3	17.1	39.9	18.8	18.5	22.5	28.9	67.4	31.7	169.1
1995–96	7.8	12.0	17.7	44.7	17.7	10.6	16.2	24.0	60.4	24.0	135.2
1996–97	6.3	14.8	21.6	43.7	13.6	8.7	20.3	29.6	59.8	18.6	137.0
1997–98	5.8	13.9	19.3	38.9	22.1	8.4	20.2	28.2	56.9	32.3	146.0
1998–99	x	16.4	15.6	30.3	29.5	x	20.2	19.3	37.4	36.4	123.2
1999–00	17.4	8.1	12.3	33.2	29.1	19.9	9.2	14.1	38.1	33.4	114.8
2000–01	21.4	10.4	13.1	29.7	25.3	23.9	11.7	14.7	33.3	28.4	112.0
2001–02	22.0	4.5	14.5	22.4	36.6	22.0	4.5	14.5	22.5	36.6	100.1
2002–03	21.5	8.3	11.7	23.1	35.3	23.4	9.1	12.7	25.2	38.4	108.9
2003–04	x	17.4	9.5	34.1	32.4	x	18.4	10.0	36.1	34.3	105.9
2004–05	10.0	18.8	8.8	19.7	42.6	10.6	20.0	9.3	20.9	45.2	106.0
2005–06	14.4	9.9	12.4	x	42.6	16.5	11.4	14.2	x	48.8	114.5
2006–07	20.5	x	15.7	x	26.4	20.3	x	15.6	x	26.2	99.4
2007–08	26.3	12.9	15.8	26.5	18.4	20.8	10.2	12.5	21.0	14.6	79.0
2008–09	19.6	13.7	16.1	x	19.3	16.4	11.4	13.4	x	16.1	83.4
2009–10	20.3	13.3	19.2	x	19.1	16.3	10.7	15.4	x	15.3	80.2
2010–11	23.4	16.7	18.1	24.9	16.9	21.9	15.6	16.9	23.3	15.9	93.6

Table 7: Percentage of annual catch by month from CRA 1, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/month cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	0.9	x	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	x	x	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	x	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	x	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	x	0.4
2002–03	4.1	5.0	2.5	15.5	19.0	16.9	21.0	8.4	4.0	3.0	x	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	x	1.0	1.6	9.8	17.7	19.0	21.1	13.5	8.5	3.9	0.9	0.6
2006–07	1.4	2.5	2.2	20.6	19.9	14.6	14.1	8.8	4.6	5.7	4.5	1.0
2007–08	3.5	4.1	2.7	14.5	17.9	18.6	11.7	9.9	6.3	6.1	2.7	1.8
2008–09	7.1	4.5	1.2	12.3	16.9	24.9	17.2	6.5	5.8	3.7	.	.
2009–10	8.3	1.5	2.0	14.7	17.3	20.3	20.3	7.6	1.6	2.8	3.3	x
2010–11	6.7	3.0	3.3	14.1	17.3	11.4	22.7	6.6	4.7	5.1	3.1	2.0

Table 8: Percentage of catch from CRA 1 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (42 instances representing 40% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	901	902	903	904	939
Apr	x	.	x	.	4.8
May	x	x	x	x	x
Jun	x	x	x	.	x
Jul	6.8	x	x	x	x
Aug	7.2	3.9	1.5	x	x
Sep	4.8	2.2	x	x	3.3
Oct	11.0	7.0	x	x	x
Nov	x	x	2.6	x	x
Dec	x	x	x	x	x
Jan	2.4	x	0.6	x	x
Feb	1.9	x	x	x	.
Mar	x	x	x	x	x

Table 9: Arithmetic CPUE (kg/potlift) for CRA 1 by fishing year and statistical area, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels in the year/statistical area cell.

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	x	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	x	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	x	0.57
2006–07	2.88	x	1.17	x	0.78
2007–08	3.29	1.97	1.12	0.56	1.08
2008–09	3.60	1.85	1.09	x	1.34
2009–10	3.40	2.01	0.88	x	1.79
2010–11	2.57	1.53	0.82	0.47	1.63

Table 10: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 1 (kg/potlift) for 1979–80 to 2010–11.

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.74	0.76	0.80	0.041
1980–81	1.01	0.88	0.96	0.043
1981–82	1.09	0.89	0.91	0.046
1982–83	1.12	0.93	0.98	0.044
1983–84	1.11	0.97	0.93	0.043
1984–85	0.96	0.91	0.87	0.043
1985–86	0.89	0.81	0.81	0.042
1986–87	0.75	0.78	0.79	0.041
1987–88	0.74	0.73	0.74	0.042
1988–89	0.80	0.67	0.65	0.049
1989–90	0.75	0.71	0.64	0.047
1990–91	0.68	0.62	0.54	0.046
1991–92	0.60	0.63	0.64	0.041
1992–93	0.53	0.52	0.54	0.043
1993–94	0.65	0.60	0.62	0.044
1994–95	0.77	0.77	0.79	0.048
1995–96	0.94	1.03	1.21	0.054
1996–97	0.94	0.96	1.17	0.053
1997–98	0.89	0.94	1.17	0.058
1998–99	1.04	1.13	1.35	0.061
1999–00	1.09	1.02	1.11	0.064
2000–01	1.17	1.07	1.12	0.063
2001–02	1.30	1.22	1.28	0.064
2002–03	1.20	1.20	1.12	0.062
2003–04	1.22	1.11	1.12	0.068
2004–05	1.23	1.38	1.27	0.068
2005–06	1.14	1.46	1.31	0.072
2006–07	1.32	1.58	1.41	0.071
2007–08	1.64	2.13	1.72	0.068
2008–09	1.57	2.05	1.78	0.076
2009–10	1.63	1.82	1.64	0.074
2010–11	1.40	1.46	1.25	0.068

Table 11: Number of vessels by statistical area from CRA 2, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were 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
2006–07	9	16	5	11	35
2007–08	9	12	6	10	32
2008–09	10	13	4	10	32
2009–10	9	13	5	7	32
2010–11	15	11	4	8	34

Table 12: Distribution and annual catch by statistical area for CRA 2, 1979–80 to 2010–11.

Fishing	Distribution (%)				Annual Catch (t)				
year	905	906	907	908	905	906	907	908	CRA 2
1979–80	10.6	31.4	25.0	32.9	31.0	92.1	73.4	96.5	292.9
1980–81	9.8	38.6	24.0	27.6	43.5	172.3	106.9	123.2	446.0
1981–82	12.0	40.0	18.6	29.4	47.0	156.3	72.7	115.0	391.0
1982–83	14.0	42.9	18.9	24.3	45.6	140.1	61.7	79.2	326.6
1983–84	13.8	41.5	18.7	26.0	37.9	114.0	51.4	71.3	274.6
1984–85	11.0	38.8	18.2	31.9	29.8	104.9	49.2	86.3	270.3
1985–86	11.2	38.4	25.1	25.3	37.9	129.5	84.8	85.5	337.7
1986–87	9.8	44.1	19.6	26.5	27.0	121.1	53.8	72.9	274.9
1987–88	8.2	50.2	17.3	24.3	20.8	127.7	44.0	61.9	254.4
1988–89	10.5	49.8	18.3	21.4	23.2	110.7	40.6	47.6	222.2
1989–90	68.1	15.2	5.8	10.9	172.0	38.5	14.7	27.5	252.7
1990–91	14.9	41.8	17.3	26.1	35.4	99.2	41.1	62.0	237.6
1991–92	11.1	44.8	19.3	24.9	25.5	102.8	44.2	57.1	229.7
1992–93	14.6	44.0	11.7	29.8	27.7	83.6	22.2	56.7	190.3
1993–94	15.2	45.1	14.4	25.3	32.7	97.0	30.8	54.4	214.9
1994–95	14.8	46.4	17.9	20.9	31.4	98.7	38.2	44.5	212.8
1995–96	13.8	47.6	14.7	23.9	29.4	101.2	31.2	50.7	212.5
1996–97	15.7	48.9	14.8	20.6	33.4	104.2	31.6	44.0	213.2
1997–98	15.0	45.9	21.4	17.7	35.1	107.7	50.2	41.5	234.4
1998–99	19.3	39.8	21.6	19.3	44.9	92.5	50.1	44.9	232.3
1999–00	15.7	41.7	25.2	17.4	37.0	97.9	59.4	40.8	235.1
2000–01	16.3	42.3	23.0	18.4	38.4	99.6	54.1	43.4	235.4
2001–02	15.9	41.7	21.2	21.2	35.8	93.7	47.8	47.7	225.0
2002–03	14.6	34.7	21.8	29.0	30.0	71.3	44.7	59.6	205.7
2003–04	17.2	35.6	24.5	22.7	33.7	69.7	48.1	44.6	196.0
2004–05	11.2	38.3	23.4	27.1	22.1	75.6	46.1	53.5	197.3
2005–06	16.7	37.7	24.1	21.6	37.5	84.8	54.2	48.6	225.2
2006–07	15.4	38.2	21.4	25.0	35.0	86.5	48.6	56.6	226.7
2007–08	15.6	39.8	21.3	23.3	35.9	91.3	48.8	53.6	229.7
2008–09	14.9	36.5	23.5	25.1	34.5	84.9	54.5	58.4	232.3
2009–10	17.4	31.4	26.8	24.4	41.0	73.7	63.1	57.3	235.2
2010–11	19.6	28.0	26.3	26.2	44.0	62.8	59.0	59.0	224.8

Table 13: Distribution and annual potlifts by statistical area from CRA 2, 1979–80 to 2010–11.

Fishing	Distribution (%)				Annual Potlifts (000's)				
year	905	906	907	908	905	906	907	908	CRA 2
1979–80	8.1	41.3	19.0	31.6	45.7	232.2	106.7	178.0	562.6
1980–81	8.1	42.6	18.6	30.7	59.2	311.4	136.1	224.9	731.5
1981–82	11.8	42.0	15.3	30.9	83.3	297.1	108.6	219.0	708.0
1982–83	11.8	44.2	16.3	27.7	86.1	322.5	119.2	202.1	729.9
1983–84	11.2	45.4	16.5	27.0	79.2	322.4	117.2	191.5	710.4
1984–85	9.5	44.4	16.3	29.8	69.0	323.2	118.5	216.6	727.2
1985–86	10.5	42.2	20.8	26.5	82.2	331.8	163.5	208.0	785.5
1986–87	8.4	46.1	17.8	27.7	61.6	339.9	131.1	204.4	737.0
1987–88	7.0	49.3	16.9	26.9	51.8	363.4	124.3	198.1	737.7
1988–89	10.2	48.8	19.9	21.1	62.7	300.3	122.1	129.8	614.9
1989–90	56.4	22.3	10.0	11.3	378.7	149.4	67.1	75.7	670.9
1990–91	14.7	44.2	17.2	24.0	71.2	214.3	83.5	116.4	485.3
1991–92	9.8	44.6	18.3	27.2	52.6	239.6	98.2	146.2	536.7
1992–93	11.9	44.3	13.0	30.9	57.1	212.6	62.4	148.3	480.5
1993–94	14.0	44.3	11.3	30.3	68.0	214.6	54.9	146.8	484.3
1994–95	17.0	45.6	10.9	26.6	66.6	178.9	42.7	104.2	392.5
1995–96	12.9	47.4	8.0	31.7	39.5	145.0	24.5	97.0	306.0
1996–97	14.4	52.7	6.4	26.4	37.1	135.4	16.5	68.0	257.0
1997–98	14.5	48.8	8.5	28.2	39.9	134.0	23.2	77.3	274.4
1998–99	18.3	43.8	8.9	29.0	46.8	111.8	22.8	74.0	255.4
1999–00	15.0	43.8	15.1	26.1	49.6	145.3	50.2	86.6	331.7
2000–01	16.2	46.4	18.4	18.9	53.6	153.2	60.7	62.2	329.7
2001–02	15.0	49.1	18.3	17.7	60.8	198.8	74.1	71.6	405.3
2002–03	14.6	42.3	19.3	23.8	69.0	199.9	91.2	112.3	472.4
2003–04	13.9	42.1	22.7	21.2	63.5	192.7	104.0	97.1	457.4
2004–05	8.7	43.0	21.7	26.6	39.7	195.7	98.8	121.4	455.5
2005–06	15.2	37.2	24.0	23.7	73.4	180.0	116.2	114.5	484.1
2006–07	13.9	40.7	20.9	24.5	57.8	169.3	87.2	102.1	416.3
2007–08	14.4	38.3	18.7	28.6	62.6	166.6	81.5	124.2	434.8
2008–09	13.2	44.0	15.3	27.5	57.5	191.3	66.7	119.4	434.9
2009–10	16.0	38.3	19.1	26.6	76.6	183.1	91.0	126.9	477.5
2010–11	21.0	31.5	19.4	28.1	105.3	158.6	97.4	141.4	502.8

Table 14: Distribution of annual catch by month (%) from CRA 2, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/month cell.

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	x	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	.	x	x
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	16.2	12.5	11.1	10.2	9.4	4.8
2006–07	1.6	0.5	1.2	10.2	11.6	14.2	18.1	11.5	10.6	9.9	6.0	4.5
2007–08	1.4	0.6	1.1	8.8	11.4	14.0	14.5	15.9	10.2	10.4	7.4	4.3
2008–09	2.3	0.7	0.8	8.3	12.4	13.5	18.3	15.9	10.2	8.6	4.7	4.4
2009–10	0.9	0.6	1.7	11.4	9.2	11.6	19.7	13.7	12.2	10.2	6.3	2.5
2010–11	0.7	0.4	1.9	9.4	10.4	9.5	18.5	17.4	11.3	10.0	6.5	4.0

Table 15: Distribution of catch (%) from CRA 2 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (4 instances representing 1.6% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	905	906	907	908
Apr	0.7	x	.	.
May	0.4	.	.	.
Jun	0.3	0.2	1.2	x
Jul	1.0	2.4	2.8	3.1
Aug	1.6	2.1	2.7	4.0
Sep	1.5	1.8	3.8	2.4
Oct	3.1	5.3	5.5	4.6
Nov	3.5	5.5	4.7	3.7
Dec	2.5	3.8	2.6	2.4
Jan	2.1	3.1	1.6	3.1
Feb	1.4	2.4	x	1.9
Mar	1.4	1.3	x	0.9

Table 16: Arithmetic CPUE (kg/potlift) for CRA 2 by fishing year and statistical area, 1979–80 to 2010–11.

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
2006–07	0.61	0.51	0.56	0.55
2007–08	0.57	0.55	0.60	0.43
2008–09	0.60	0.44	0.82	0.49
2009–10	0.54	0.40	0.69	0.45
2010–11	0.42	0.40	0.61	0.42

Table 17: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 2 (kg/potlift).

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	0.44	0.43	0.023
1983–84	0.39	0.36	0.35	0.023
1984–85	0.37	0.35	0.34	0.023
1985–86	0.43	0.40	0.40	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	0.42	0.031
1993–94	0.44	0.44	0.44	0.031
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	0.90	0.043
1997–98	0.85	0.93	1.02	0.045
1998–99	0.91	1.03	1.11	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	0.035
2003–04	0.43	0.43	0.42	0.036
2004–05	0.43	0.47	0.48	0.035
2005–06	0.47	0.49	0.48	0.035
2006–07	0.54	0.56	0.56	0.036
2007–08	0.53	0.56	0.55	0.038
2008–09	0.53	0.51	0.51	0.039
2009–10	0.49	0.47	0.46	0.037
2010–11	0.45	0.42	0.41	0.037

Table 18: Number of vessels by statistical area from CRA 3, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were 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
2006–07	4	13	12	28
2007–08	3	13	12	28
2008–09	4	13	9	26
2009–10	3	13	9	24
2010–11	3	15	9	26

Table 19: Distribution and annual catch by statistical area from CRA 3, 1979–80 to 2010–11.

Fishing	Distribution (%)			Annual Catch (t)			
Year	909	910	911	909	910	911	CRA 3
1979–80	12.3	53.0	34.7	59.1	254.6	166.5	480.3
1980–81	16.1	44.8	39.1	97.5	271.7	237.2	606.3
1981–82	19.2	48.3	32.5	110.3	277.4	186.4	574.1
1982–83	16.8	51.9	31.3	123.6	380.7	229.7	733.9
1983–84	11.7	52.9	35.4	89.3	404.1	270.3	763.7
1984–85	16.7	41.7	41.7	118.1	295.5	295.4	708.9
1985–86	15.4	41.8	42.8	100.6	273.3	280.1	654.1
1986–87	13.2	51.1	35.7	75.3	291.2	203.5	570.0
1987–88	19.8	47.6	32.6	70.5	169.2	115.8	355.4
1988–89	14.9	42.0	43.1	42.1	118.4	121.3	281.8
1989–90	11.8	52.8	35.4	45.4	203.7	136.8	385.9
1990–91	11.0	49.8	39.3	35.6	161.2	127.2	324.1
1991–92	11.8	41.1	47.1	31.7	110.5	126.6	268.8
1992–93	12.1	40.1	47.9	23.1	76.7	91.7	191.5
1993–94	17.9	46.1	36.0	32.2	82.7	64.5	179.5
1994–95	16.8	47.7	35.5	26.9	76.7	57.1	160.7
1995–96	13.4	54.4	32.2	21.0	85.3	50.6	156.9
1996–97	14.9	55.6	29.4	30.3	113.3	59.9	203.5
1997–98	17.2	54.9	27.9	38.4	122.6	62.4	223.4
1998–99	17.3	59.3	23.4	56.4	193.0	76.4	325.7
1999–00	17.2	54.6	28.1	56.2	178.2	91.7	326.1
2000–01	15.0	45.4	39.6	49.3	149.0	129.8	328.1
2001–02	15.5	35.5	49.1	44.8	102.8	142.2	289.9
2002–03	12.0	36.3	51.8	34.8	105.7	150.8	291.3
2003–04	13.9	36.1	50.0	30.0	77.9	108.0	215.9
2004–05	18.5	41.0	40.4	30.1	66.4	65.5	162.0
2005–06	13.5	45.6	40.9	22.9	77.6	69.6	170.1
2006–07	15.3	41.2	43.5	27.3	73.6	77.8	178.7
2007–08	16.0	45.8	38.2	27.6	78.9	66.0	172.4
2008–09	20.9	44.9	34.2	39.6	85.2	65.0	189.8
2009–10	15.9	51.3	32.8	26.0	84.1	53.9	164.0
2010–11	12.1	52.5	35.4	19.8	85.9	58.0	163.7

Table 20: Distribution and annual potlifts by statistical area from CRA 3, 1979–80 to 2010–11.

Fishing	Distribution (%)			Annual Potlifts (000's)			
Year	909	910	911	909	910	911	CRA 3
1979–80	11.2	50.8	38.0	58.8	267.1	199.5	525.4
1980–81	12.5	49.4	38.1	81.5	322.9	248.8	653.2
1981–82	13.5	50.4	36.1	83.3	311.6	223.1	618.0
1982–83	16.9	53.5	29.6	129.1	408.6	226.5	764.3
1983–84	12.6	55.9	31.6	111.4	494.4	279.2	885.0
1984–85	16.4	49.2	34.4	154.3	462.4	322.8	939.6
1985–86	17.0	48.0	35.0	152.5	430.4	313.6	896.5
1986–87	12.9	53.0	34.1	109.2	448.7	288.4	846.3
1987–88	17.7	53.7	28.7	143.5	435.9	232.7	812.1
1988–89	14.3	53.3	32.4	90.0	334.9	203.3	628.3
1989–90	10.8	62.7	26.5	81.3	474.1	200.4	755.9
1990–91	10.8	53.7	35.6	77.6	387.0	256.3	720.9
1991–92	12.1	47.6	40.4	99.9	393.0	333.5	826.3
1992–93	9.8	41.7	48.5	68.2	289.0	336.3	693.5
1993–94	14.6	48.2	37.2	54.8	181.5	139.9	376.2
1994–95	14.1	49.4	36.5	25.9	90.9	67.1	183.9
1995–96	14.2	45.0	40.8	17.1	54.3	49.2	120.7
1996–97	13.0	52.4	34.6	15.1	60.7	40.0	115.8
1997–98	14.3	56.9	28.8	14.7	58.4	29.5	102.6
1998–99	14.6	61.7	23.7	29.1	123.1	47.4	199.5
1999–00	15.9	56.9	27.3	33.2	118.8	57.0	209.0
2000–01	12.3	58.3	29.3	34.0	160.9	80.9	275.8
2001–02	14.6	47.5	38.0	44.7	145.6	116.4	306.6
2002–03	10.8	48.5	40.7	43.1	193.7	162.7	399.5
2003–04	9.8	37.8	52.4	34.0	130.5	181.0	345.5
2004–05	11.8	38.7	49.5	36.8	120.5	154.4	311.7
2005–06	10.2	47.9	42.0	27.9	131.0	114.9	273.8
2006–07	8.9	50.1	41.0	27.5	154.9	126.5	308.9
2007–08	9.4	45.5	45.1	27.0	130.8	129.5	287.3
2008–09	13.9	44.2	42.0	37.3	118.8	112.9	269.0
2009–10	11.4	49.0	39.6	22.1	95.1	76.9	194.1
2010–11	11.2	50.2	38.6	17.4	77.9	59.8	155.0

Table 21: Percentage of annual catch by month from CRA 3, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the 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	x	x	x	x	x	29.5	4.1
1994–95	7.5	.	42.9	24.0	14.9	x	x	x	x	x	7.7	1.6
1995–96	6.1	x	38.2	37.7	13.4	x	x	x	x	.	3.3	0.6
1996–97	9.2	.	37.5	35.5	15.2	0.5	x	x	.	.	x	0.7
1997–98	7.2	.	32.3	42.9	16.2	x	.	.	.	.	x	0.6
1998–99	14.4	.	27.9	24.5	21.8	x	x	.	x	.	8.5	0.9
1999–00	4.6	x	32.1	31.5	18.3	x	x	.	.	.	8.8	3.0
2000–01	8.4	.	24.2	20.0	13.4	10.8	x	.	.	x	15.5	7.8
2001–02	9.1	x	25.7	16.9	11.7	x	x	.	.	x	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
2006–07	1.8	.	16.3	16.2	13.1	2.6	7.5	15.5	5.0	7.5	6.3	8.3
2007–08	0.6	.	15.7	23.8	10.0	2.6	6.0	15.5	5.5	4.8	7.5	8.0
2008–09	2.7	.	21.6	21.1	11.3	1.4	3.8	6.1	4.7	12.2	12.3	2.7
2009–10	.	.	11.8	29.7	20.1	2.8	1.6	3.5	4.4	17.1	8.7	0.3
2010–11	x	.	29.5	31.4	18.9	4.0	4.3	x	.	5.3	4.8	0.8

Table 22: Percentage of catch from CRA 3 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (7 instances representing 5.3% of the catch). A '.' indicates no fishing in the month/statistical area cell.

Month	909	910	911
Apr	.	.	x
May	.	.	.
Jun	x	21.4	5.5
Jul	4.9	16.4	10.0
Aug	2.9	9.3	6.6
Sep	x	x	3.9
Oct	.	.	4.3
Nov	.	.	x
Dec	.	.	.
Jan	x	3.7	0.3
Feb	x	1.7	2.9
Mar	.	.	0.8

Table 23: Arithmetic CPUE (kg/potlift) for CRA 3 by fishing year and statistical area, 1979–80 to 2010–11.

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
2006–07	0.99	0.48	0.62
2007–08	1.02	0.60	0.51
2008–09	1.06	0.72	0.58
2009–10	1.18	0.88	0.70
2010–11	1.14	1.10	0.97

Table 24: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 3 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.91	0.84	0.80	0.022
1980–81	0.93	0.92	0.89	0.021
1981–82	0.93	0.91	0.87	0.021
1982–83	0.96	0.97	0.95	0.021
1983–84	0.86	0.88	0.86	0.020
1984–85	0.75	0.72	0.70	0.020
1985–86	0.73	0.69	0.67	0.020
1986–87	0.67	0.61	0.58	0.022
1987–88	0.44	0.42	0.41	0.022
1988–89	0.45	0.44	0.42	0.025
1989–90	0.51	0.46	0.46	0.023
1990–91	0.45	0.43	0.43	0.023
1991–92	0.33	0.30	0.30	0.022
1992–93	0.28	0.26	0.25	0.022
1993–94	0.48	0.45	0.49	0.033
1994–95	0.87	0.88	0.92	0.043
1995–96	1.30	1.36	1.41	0.048
1996–97	1.76	1.78	1.89	0.049
1997–98	2.18	2.48	2.66	0.052
1998–99	1.63	1.85	2.02	0.047
1999–00	1.56	1.75	1.89	0.045
2000–01	1.19	1.26	1.40	0.040
2001–02	0.95	1.00	1.07	0.040
2002–03	0.73	0.72	0.73	0.032
2003–04	0.62	0.59	0.57	0.032
2004–05	0.52	0.51	0.49	0.035
2005–06	0.62	0.61	0.59	0.035
2006–07	0.58	0.59	0.57	0.034
2007–08	0.60	0.63	0.60	0.036
2008–09	0.71	0.72	0.69	0.041
2009–10	0.84	0.91	0.89	0.045
2010–11	1.06	1.14	1.18	0.048

Table 25: Number of vessels by statistical area from CRA 4, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were excluded. A '.' indicates no fishing in the statistical area/fishing year cell. A '0' indicates that fishing took place but no 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	41	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
2006–07	14	15	33	11	4	66
2007–08	10	11	24	11	6	53
2008–09	10	13	18	7	1	42
2009–10	10	12	16	10	1	43
2010–11	12	12	21	12	1	51

Table 26: Distribution and annual catch by statistical area from CRA 4, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing	Distribution (%)					Annual Catch (t)					
Year	912	913	914	915	934	912	913	914	915	934	CRA 4
1979–80	21.4	30.2	38.2	10.1	x	107.6	152.3	192.3	50.9	x	503.7
1980–81	32.4	21.7	33.5	12.2	0.2	197.1	131.6	203.6	74.4	1.0	607.7
1981–82	35.6	22.6	29.3	12.4	x	218.9	138.9	180.1	76.4	x	614.2
1982–83	25.7	21.8	37.6	14.8	x	219.6	186.1	321.1	125.9	x	853.5
1983–84	19.8	27.8	40.0	12.2	x	185.9	261.7	376.5	115.0	x	940.4
1984–85	25.1	25.7	37.1	11.6	x	216.6	222.1	320.0	100.5	x	863.3
1985–86	27.0	21.2	36.7	14.7	0.4	228.9	180.1	310.9	124.3	3.8	848.0
1986–87	21.9	29.3	37.4	11.2	x	207.3	277.8	354.0	106.0	x	947.5
1987–88	19.3	25.0	44.3	11.4	x	179.2	232.5	411.3	106.2	x	929.3
1988–89	17.6	27.0	45.5	9.9	x	134.7	206.7	347.9	76.1	x	765.3
1989–90	23.0	35.3	33.8	7.9	x	174.5	267.4	256.3	60.1	x	758.4
1990–91	28.3	29.5	31.7	10.5	x	147.9	154.2	165.7	54.8	x	523.2
1991–92	31.6	29.3	30.0	8.8	x	167.5	155.3	159.3	46.9	x	530.5
1992–93	30.1	26.3	32.6	10.6	0.4	149.3	130.4	161.5	52.6	1.8	495.7
1993–94	23.8	28.8	36.7	9.9	x	116.9	141.5	180.6	48.8	x	492.0
1994–95	21.9	24.5	41.7	9.7	2.1	107.5	120.3	204.6	47.5	10.5	490.4
1995–96	22.9	23.1	46.8	6.3	0.9	111.4	112.5	228.2	30.6	4.5	487.2
1996–97	24.6	19.6	46.0	9.2	x	121.3	96.7	227.2	45.2	x	493.6
1997–98	25.5	22.0	45.0	7.5	.	125.2	107.7	220.6	36.9	.	490.4
1998–99	31.3	21.9	38.2	8.5	.	154.6	108.2	188.5	42.0	.	493.3
1999–00	26.5	22.4	39.7	10.6	0.8	153.0	129.2	228.7	60.8	4.8	576.5
2000–01	26.9	23.5	37.8	10.9	0.9	154.5	134.6	216.8	62.7	5.2	573.8
2001–02	22.2	21.6	42.3	12.8	1.3	127.3	123.7	242.6	73.2	7.2	574.1
2002–03	23.4	27.0	36.5	12.5	x	134.8	155.6	210.1	72.0	x	575.7
2003–04	19.3	31.9	40.8	8.0	.	110.9	183.9	234.8	46.1	.	575.7
2004–05	15.6	28.4	48.8	6.3	x	88.7	162.1	277.9	35.8	x	569.9
2005–06	9.7	21.1	55.0	12.9	x	48.9	106.5	277.2	65.0	x	504.1
2006–07	12.1	23.3	43.9	16.9	3.9	53.6	103.4	195.3	74.9	17.4	444.6
2007–08	15.9	21.0	38.4	21.1	3.6	50.1	66.1	121.1	66.6	11.3	315.2
2008–09	18.8	28.8	35.6	14.5	x	46.8	71.9	88.9	36.3	x	249.4
2009–10	17.1	25.8	33.4	22.4	x	44.9	67.7	87.5	58.7	x	262.2
2010–11	16.0	20.1	45.3	17.1	x	66.3	83.5	187.9	70.9	x	414.8

Table 27: Distribution and annual potlifts by statistical area from CRA 4, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing	Distribution (%)					Annual Potlifts (000's)					
Year	912	913	914	915	934	912	913	914	915	934	CRA 4
1979–80	20.1	27.0	37.1	15.8	x	116.1	155.9	214.1	91.1	x	577.6
1980–81	25.5	23.2	33.6	17.5	0.1	187.1	170.2	246.3	128.0	1.1	732.7
1981–82	27.0	22.6	33.0	17.4	x	200.3	168.1	244.9	128.9	x	742.4
1982–83	26.3	21.2	31.8	20.6	x	244.8	197.7	297.0	192.1	x	932.6
1983–84	23.2	24.7	34.3	17.4	x	241.3	257.2	357.1	180.4	x	1 039.5
1984–85	22.6	23.8	36.9	16.3	x	252.4	265.5	412.0	182.1	x	1 116.5
1985–86	24.7	20.0	37.1	17.7	0.4	288.6	232.8	433.2	206.6	5.0	1 166.3
1986–87	21.6	26.8	35.8	15.5	x	243.8	302.5	403.2	174.2	x	1 127.0
1987–88	21.6	23.3	40.8	14.2	x	275.0	297.2	520.5	181.4	x	1 274.3
1988–89	21.4	26.4	40.7	11.6	x	264.7	327.3	503.7	143.1	x	1 238.9
1989–90	21.2	28.1	39.2	11.5	x	271.4	359.3	500.6	146.5	x	1 278.5
1990–91	18.7	27.9	40.0	13.3	x	197.2	293.9	421.9	140.1	x	1 054.0
1991–92	21.3	27.3	39.6	11.6	x	226.2	289.7	419.7	122.8	x	1 061.2
1992–93	24.8	27.0	35.8	12.0	0.4	236.9	257.6	341.0	114.1	3.9	953.6
1993–94	25.1	25.7	34.3	14.1	x	212.4	217.9	290.8	119.3	x	847.8
1994–95	19.3	24.5	37.9	14.7	3.6	137.1	173.7	268.8	104.3	25.3	709.2
1995–96	20.7	24.1	44.0	9.1	2.1	117.5	136.8	249.4	51.6	12.1	567.4
1996–97	20.8	19.5	45.9	12.8	x	99.9	93.6	220.7	61.4	x	481.0
1997–98	18.5	18.2	52.2	11.1	.	73.2	72.1	207.0	44.0	.	396.3
1998–99	23.9	11.5	49.1	15.5	.	89.9	43.0	184.5	58.2	.	375.7
1999–00	24.3	15.8	47.8	10.8	1.3	110.8	71.9	217.6	49.3	5.8	455.4
2000–01	29.1	15.5	41.8	12.4	1.2	132.9	70.7	190.8	56.3	5.5	456.1
2001–02	25.2	19.5	41.4	12.2	1.6	136.7	105.8	223.8	66.1	8.9	541.3
2002–03	23.6	24.9	39.1	11.3	x	124.7	131.5	206.6	59.5	x	528.0
2003–04	20.0	26.8	43.1	10.1	.	100.5	135.0	216.9	51.0	.	503.5
2004–05	20.3	23.7	46.2	9.0	x	115.4	134.7	262.9	51.4	x	569.3
2005–06	14.1	19.7	51.5	14.0	x	81.4	113.3	296.5	80.8	x	575.4
2006–07	13.4	19.7	49.6	15.7	1.6	92.0	135.8	341.2	107.9	11.2	687.9
2007–08	14.4	17.8	49.2	16.0	2.6	76.2	93.9	260.3	84.3	14.0	528.7
2008–09	18.7	24.0	43.7	12.4	x	66.1	84.8	154.3	43.7	x	352.7
2009–10	22.3	25.2	33.0	18.8	x	57.4	64.9	84.9	48.5	x	257.5
2010–11	20.1	17.8	42.7	18.4	x	84.8	74.8	180.0	77.5	x	421.2

Table 28: Percentage of annual catch by month from CRA 4, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the month/year cell.

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	x	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
2006–07	0.8	3.0	6.0	5.6	4.1	5.4	11.9	16.8	13.3	18.5	8.9	5.6
2007–08	.	2.8	3.8	6.1	3.9	6.8	10.6	19.4	13.9	15.5	11.7	5.5
2008–09	0.1	x	7.5	6.8	5.5	7.7	14.1	15.4	18.5	19.8	4.3	0.3
2009–10	0.9	0.6	7.3	12.1	16.2	9.0	2.7	4.6	10.9	21.5	12.6	1.6
2010–11	2.8	9.3	13.1	9.9	8.4	6.3	8.9	6.9	4.3	15.6	11.9	2.6

Table 29: Percentage of catch from CRA 4 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (8 instances representing 2.2% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	912	913	914	915	934
Apr	0.8	x	1.3	0.4	.
May	0.7	4.0	4.3	0.3	.
Jun	1.6	3.3	6.3	1.9	x
Jul	0.9	2.5	4.2	2.1	x
Aug	0.9	1.3	3.9	1.8	x
Sep	1.9	1.0	1.6	1.5	x
Oct	1.7	0.8	3.6	2.5	x
Nov	0.9	1.2	3.5	1.3	x
Dec	1.8	0.5	1.2	0.9	.
Jan	3.3	2.1	8.3	1.9	.
Feb	1.0	3.1	5.7	2.0	.
Mar	x	0.2	1.5	0.4	.

Table 30: Arithmetic CPUE (kg/potlift) for CRA 4 by fishing year and statistical area, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing year	912	913	914	915	934
1979–80	0.93	0.98	0.90	0.56	x
1980–81	1.05	0.77	0.83	0.58	0.93
1981–82	1.09	0.83	0.74	0.59	x
1982–83	0.90	0.94	1.08	0.66	x
1983–84	0.77	1.02	1.05	0.64	x
1984–85	0.86	0.84	0.78	0.55	x
1985–86	0.79	0.77	0.72	0.60	0.75
1986–87	0.85	0.92	0.88	0.61	x
1987–88	0.65	0.78	0.79	0.59	x
1988–89	0.51	0.63	0.69	0.53	x
1989–90	0.64	0.74	0.51	0.41	x
1990–91	0.75	0.53	0.39	0.39	x
1991–92	0.74	0.54	0.38	0.38	x
1992–93	0.63	0.51	0.47	0.46	0.46
1993–94	0.55	0.65	0.62	0.41	x
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	x
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	1.11	0.95
2001–02	0.93	1.17	1.08	1.11	0.81
2002–03	1.08	1.18	1.02	1.21	x
2003–04	1.10	1.36	1.08	0.90	.
2004–05	0.77	1.20	1.06	0.70	x
2005–06	0.60	0.94	0.94	0.81	x
2006–07	0.58	0.76	0.57	0.70	1.55
2007–08	0.66	0.70	0.47	0.79	0.81
2008–09	0.71	0.85	0.58	0.83	x
2009–10	0.78	1.04	1.03	1.21	x
2010–11	0.78	1.12	1.04	0.92	x

Table 31: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 4 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.87	0.86	0.82	0.021
1980–81	0.83	0.82	0.79	0.020
1981–82	0.83	0.86	0.85	0.021
1982–83	0.92	0.94	0.91	0.020
1983–84	0.90	0.85	0.83	0.020
1984–85	0.77	0.77	0.76	0.020
1985–86	0.73	0.74	0.72	0.020
1986–87	0.84	0.79	0.77	0.020
1987–88	0.73	0.69	0.67	0.021
1988–89	0.62	0.58	0.56	0.021
1989–90	0.59	0.56	0.54	0.020
1990–91	0.50	0.51	0.50	0.021
1991–92	0.50	0.52	0.50	0.020
1992–93	0.52	0.50	0.48	0.020
1993–94	0.58	0.56	0.54	0.021
1994–95	0.69	0.68	0.67	0.022
1995–96	0.86	0.84	0.86	0.025
1996–97	1.03	1.08	1.18	0.028
1997–98	1.24	1.29	1.40	0.030
1998–99	1.31	1.42	1.56	0.030
1999–00	1.27	1.34	1.47	0.029
2000–01	1.26	1.17	1.26	0.030
2001–02	1.06	1.04	1.10	0.028
2002–03	1.09	1.13	1.19	0.027
2003–04	1.14	1.19	1.22	0.027
2004–05	1.00	0.96	0.95	0.026
2005–06	0.88	0.83	0.82	0.027
2006–07	0.65	0.69	0.68	0.025
2007–08	0.60	0.61	0.59	0.028
2008–09	0.71	0.74	0.71	0.033
2009–10	1.02	1.02	1.03	0.035
2010–11	0.98	1.01	1.03	0.029

Table 32: Number of vessels by statistical area from CRA 5, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were excluded. A '.' indicates no fishing in the statistical area/fishing year cell. A '0' indicates fishing but no 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	14	2	.	0	8	31
2006–07	10	14	2	.	.	8	28
2007–08	8	14	2	.	0	7	27
2008–09	6	12	5	1	.	7	26
2009–10	6	11	1	.	.	8	25
2010–11	8	12	2	.	0	8	27

Table 33: Distribution and annual catch by statistical area from CRA 5, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

	Distribution (%)						Annual Catch (t)						
Year	916	917	918	919	932	933	916	917	918	919	932	933	CRA 5
1979–80	26.7	47.9	12.8	1.1	x	10.4	107.4	192.6	51.5	4.5	x	41.9	402.0
1980–81	29.3	50.2	6.3	0.4	x	13.5	147.9	253.5	31.7	1.9	x	68.3	505.1
1981–82	23.0	52.0	7.3	x	x	16.1	109.6	247.5	34.6	x	x	76.6	476.0
1982–83	19.9	57.3	4.0	0.7	x	18.0	124.4	358.3	25.1	4.2	x	112.5	625.5
1983–84	19.2	57.5	5.6	0.3	.	17.4	114.8	344.8	33.5	1.6	.	104.4	599.1
1984–85	19.5	61.4	4.7	0.7	x	13.6	140.6	443.5	33.8	5.2	x	98.2	721.9
1985–86	19.4	62.1	6.7	0.7	0.3	10.8	140.2	450.1	48.6	5.2	2.5	78.0	724.6
1986–87	15.9	65.3	7.3	1.9	1.6	8.0	99.8	408.9	45.8	11.7	9.8	50.1	626.1
1987–88	22.4	58.0	6.3	3.2	x	9.4	111.2	288.1	31.4	15.8	x	46.5	496.5
1988–89	19.3	58.6	8.2	3.2	x	10.0	68.0	206.3	29.0	11.1	x	35.0	351.7
1989–90	28.7	56.1	9.5	x	x	5.6	89.6	175.1	29.7	x	x	17.4	312.4
1990–91	28.4	57.6	4.9	x	0.6	8.4	87.6	177.8	15.3	x	1.9	26.0	308.6
1991–92	29.9	46.2	10.9	x	0.1	13.0	86.0	132.7	31.2	x	0.2	37.3	287.4
1992–93	24.9	58.4	7.0	x	.	9.6	64.3	151.2	18.1	x	.	24.8	258.8
1993–94	23.5	54.3	8.1	.	x	14.1	73.0	168.8	25.2	.	x	43.8	311.0
1994–95	28.0	50.5	4.3	.	x	17.2	82.1	148.4	12.8	.	x	50.5	293.9
1995–96	26.9	43.2	3.2	x	x	25.3	80.2	128.7	9.5	x	x	75.2	297.6
1996–97	24.4	45.0	4.8	x	x	23.7	73.3	135.1	14.3	x	x	71.2	300.3
1997–98	23.9	42.4	4.4	x	x	26.9	71.7	126.9	13.2	x	x	80.7	299.6
1998–99	23.3	41.7	5.8	.	x	25.7	69.4	124.5	17.4	.	x	76.7	298.2
1999–00	29.6	41.7	4.0	x	x	24.7	103.4	145.8	14.1	x	x	86.2	349.5
2000–01	31.0	40.1	2.8	.	.	26.1	107.9	139.3	9.7	.	.	90.5	347.4
2001–02	42.8	39.2	1.5	.	x	16.4	149.3	136.9	5.3	.	x	57.1	349.1
2002–03	45.8	35.6	1.0	.	.	17.6	159.7	124.0	3.5	.	.	61.5	348.7
2003–04	47.8	32.4	0.9	.	.	18.9	167.2	113.4	3.2	.	.	66.1	349.9
2004–05	43.4	39.7	0.9	.	x	16.0	149.9	136.9	3.1	.	x	55.1	345.1
2005–06	44.4	40.8	1.4	.	x	13.4	155.1	142.6	5.1	.	x	46.8	349.5
2006–07	41.2	45.6	x	.	.	12.4	144.1	159.6	x	.	.	43.2	349.8
2007–08	37.4	45.3	x	.	x	16.2	130.7	158.4	x	.	x	56.6	349.8
2008–09	30.5	48.6	3.6	x	.	17.3	106.7	169.9	12.6	x	.	60.4	349.7
2009–10	29.1	50.6	.	x	.	18.8	101.9	177.1	x	.	.	65.9	349.9
2010–11	31.9	53.9	.	x	.	12.4	111.6	188.7	x	.	.	43.4	350.0

Table 34: Distribution and annual potlifts by statistical area from CRA 5, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

	Distribution (%)						Annual Potlifts (000's)						
Year	916	917	918	919	932	933	916	917	918	919	932	933	CRA 5
1979–80	24.2	53.5	8.8	0.9	x	10.7	128.9	284.7	46.9	4.8	x	57.1	532.2
1980–81	26.6	52.1	6.6	0.3	x	13.6	148.5	291.3	37.2	1.6	x	76.2	559.1
1981–82	28.5	48.1	7.1	x	x	15.7	171.3	289.6	42.4	x	x	94.5	601.7
1982–83	25.1	51.3	5.5	0.8	x	16.8	186.6	381.8	41.0	6.3	x	125.3	744.7
1983–84	22.5	53.7	5.8	0.5	.	17.5	180.5	430.3	46.1	4.0	.	140.4	801.3
1984–85	19.7	57.7	5.1	1.3	x	16.0	187.4	547.8	48.1	12.1	x	151.7	949.0
1985–86	17.0	60.2	6.1	1.1	0.5	15.1	181.4	641.8	64.7	11.7	5.5	160.6	1 065.8
1986–87	16.3	60.9	5.7	2.0	1.2	13.9	162.7	607.5	57.3	19.9	11.7	139.0	998.1
1987–88	17.9	61.4	4.2	2.6	x	13.1	188.1	645.1	44.2	27.7	x	138.1	1 051.4
1988–89	15.8	62.3	4.6	3.9	x	13.1	141.1	555.7	40.7	34.9	x	116.4	892.1
1989–90	21.6	62.8	6.9	x	x	8.2	159.5	464.3	50.9	x	x	61.0	739.9
1990–91	27.4	58.8	4.5	x	0.5	8.8	197.8	424.3	32.2	x	3.5	63.4	721.3
1991–92	25.0	54.8	7.3	x	0.1	12.8	195.6	428.6	56.8	x	1.0	100.5	782.7
1992–93	23.7	59.9	5.4	x	.	10.9	174.0	439.4	39.8	x	.	80.0	733.8
1993–94	21.3	58.2	6.4	.	x	14.0	170.3	465.5	51.1	.	x	112.2	800.6
1994–95	20.9	60.2	4.8	.	x	14.0	147.1	424.3	34.1	.	x	98.5	704.9
1995–96	20.7	54.9	3.8	x	x	19.5	125.8	334.3	23.1	x	x	118.7	608.6
1996–97	19.9	54.2	4.1	x	x	20.1	106.8	291.0	22.1	x	x	108.1	537.3
1997–98	17.9	50.7	5.6	x	x	22.2	68.6	194.0	21.6	x	x	85.0	382.4
1998–99	18.5	49.4	5.9	.	x	22.0	62.1	166.1	19.8	.	x	74.0	335.9
1999–00	13.8	54.4	4.6	x	x	27.1	48.4	190.6	16.1	x	x	94.8	350.2
2000–01	10.4	56.1	2.3	.	.	31.2	31.0	167.8	6.9	.	.	93.3	299.1
2001–02	19.1	59.9	1.2	.	x	19.7	52.5	164.7	3.2	.	x	54.2	275.0
2002–03	25.7	48.0	1.0	.	.	25.3	71.1	132.8	2.7	.	.	70.1	276.7
2003–04	28.1	40.6	0.9	.	.	30.4	70.7	102.2	2.3	.	.	76.6	251.9
2004–05	24.8	51.2	0.8	.	x	23.2	67.7	139.9	2.3	.	x	63.3	273.4
2005–06	27.4	49.3	1.0	.	x	22.4	81.5	146.6	2.9	.	x	66.5	297.6
2006–07	29.0	49.2	x	.	.	21.3	85.9	145.9	x	.	.	63.2	296.6
2007–08	25.8	45.2	x	.	x	28.2	75.6	132.6	x	.	x	82.9	293.4
2008–09	19.6	45.7	3.0	x	.	31.6	53.4	124.4	8.3	x	.	86.2	272.3
2009–10	22.6	39.3	x	.	.	36.8	55.1	95.8	x	.	.	89.7	243.7
2010–11	25.8	44.8	x	.	.	26.9	58.2	101.2	x	.	.	60.8	225.6

Table 35: Percentage of annual catch by month from CRA 5, 1979–80 to 2010–11.

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	10.5	8.3	5.6	8.8	7.3	6.2	6.6	1.4	1.0
2006–07	8.7	25.8	11.3	5.9	5.1	4.1	5.5	11.6	7.8	10.7	3.1	0.4
2007–08	10.0	25.7	8.4	6.2	4.3	6.1	6.9	4.9	8.8	13.7	3.9	1.1
2008–09	10.9	24.0	15.8	7.0	3.2	6.8	8.5	4.6	3.5	14.5	0.9	0.3
2009–10	8.5	19.1	13.1	18.7	6.7	7.0	3.8	4.5	2.6	9.7	5.8	0.6
2010–11	10.9	31.0	8.5	5.8	13.8	6.1	3.5	3.2	2.9	10.6	3.3	0.5

Table 36: Percentage of catch from CRA 5 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (14 instances representing 4.8% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	916	917	918	919	932	933
Apr	4.5	6.2	.	.	.	x
May	11.2	19.5	.	.	.	0.4
Jun	2.4	4.6	.	.	.	1.5
Jul	.	4.2	x	.	.	1.0
Aug	2.1	10.6	x	.	x	x
Sep	1.5	4.1	x	.	.	x
Oct	x	0.7	x	.	.	2.2
Nov	.	x	.	.	.	3.0
Dec	x	0.5	x	.	.	1.4
Jan	7.1	1.8	x	.	.	1.4
Feb	1.8	1.0	.	.	.	x
Mar	.	0.5	.	.	.	.

Table 37: Arithmetic CPUE (kg/potlift) for CRA 5 by fishing year and statistical area, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing year	916	917	918	919	932	933
1979–80	0.83	0.68	1.10	0.95	X	0.73
1980–81	1.00	0.87	0.85	1.22	X	0.90
1981–82	0.64	0.86	0.82	x	X	0.81
1982–83	0.67	0.94	0.61	0.67	X	0.90
1983–84	0.64	0.80	0.73	0.40	.	0.74
1984–85	0.75	0.81	0.70	0.43	X	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	X	0.34
1988–89	0.48	0.37	0.71	0.32	X	0.30
1989–90	0.56	0.38	0.58	x	X	0.29
1990–91	0.44	0.42	0.48	x	0.55	0.41
1991–92	0.44	0.31	0.55	x	0.24	0.37
1992–93	0.37	0.34	0.45	x	.	0.31
1993–94	0.43	0.36	0.49	.	X	0.39
1994–95	0.56	0.35	0.37	.	X	0.51
1995–96	0.64	0.39	0.41	x	X	0.63
1996–97	0.69	0.46	0.65	x	X	0.66
1997–98	1.05	0.65	0.61	x	X	0.95
1998–99	1.12	0.75	0.88	.	X	1.04
1999–00	2.13	0.77	0.87	x	X	0.91
2000–01	3.48	0.83	1.40	.	.	0.97
2001–02	2.84	0.83	1.64	.	X	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	.	X	0.87
2005–06	1.90	0.97	1.72	.	X	0.70
2006–07	1.68	1.09	x	.	.	0.68
2007–08	1.73	1.20	x	.	X	0.68
2008–09	2.00	1.37	1.52	x	.	0.70
2009–10	1.85	1.85	.	.	.	0.74
2010–11	1.92	1.87	.	.	.	0.71

Table 38: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 5 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.76	0.67	0.63	0.024
1980–81	0.90	0.79	0.77	0.026
1981–82	0.79	0.72	0.68	0.027
1982–83	0.84	0.77	0.75	0.025
1983–84	0.75	0.69	0.67	0.025
1984–85	0.76	0.69	0.68	0.026
1985–86	0.68	0.57	0.56	0.026
1986–87	0.63	0.50	0.49	0.026
1987–88	0.47	0.42	0.41	0.027
1988–89	0.39	0.37	0.36	0.029
1989–90	0.42	0.41	0.38	0.030
1990–91	0.43	0.40	0.37	0.029
1991–92	0.37	0.33	0.31	0.027
1992–93	0.35	0.32	0.30	0.028
1993–94	0.39	0.38	0.37	0.030
1994–95	0.42	0.39	0.38	0.032
1995–96	0.49	0.46	0.45	0.033
1996–97	0.56	0.60	0.61	0.035
1997–98	0.78	0.84	0.87	0.038
1998–99	0.89	1.04	1.11	0.041
1999–00	1.00	1.09	1.13	0.040
2000–01	1.16	1.24	1.33	0.046
2001–02	1.27	1.35	1.48	0.051
2002–03	1.26	1.46	1.56	0.049
2003–04	1.39	1.62	1.70	0.048
2004–05	1.26	1.50	1.52	0.047
2005–06	1.17	1.38	1.39	0.047
2006–07	1.18	1.31	1.34	0.048
2007–08	1.19	1.32	1.34	0.048
2008–09	1.28	1.41	1.46	0.051
2009–10	1.44	1.76	1.83	0.054
2010–11	1.55	1.60	1.64	0.055

Table 39: Number of vessels by statistical area from CRA 6, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were 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	19	6	35
2006–07	11	13	16	9	36
2007–08	10	11	12	7	35
2008–09	15	10	15	5	35
2009–10	10	10	15	7	35
2010–11	9	10	16	7	36

Table 40: Distribution and annual catch by statistical area from CRA 6, 1979–80 to 2010–11.

Fishing	Distribution (%)				Annual Catch (t)				
Year	940	941	942	943	940	941	942	943	CRA 6
1979–80	21.5	24.6	38.4	15.5	86.0	98.5	153.8	62.0	400.3
1980–81	28.5	21.3	31.2	19.0	101.5	75.8	110.9	67.7	355.9
1981–82	19.6	29.0	34.8	16.6	91.4	134.8	162.1	77.1	465.4
1982–83	24.6	19.1	40.1	16.1	116.2	90.3	189.3	75.8	471.7
1983–84	21.8	24.2	38.9	15.1	119.3	132.8	213.2	82.4	547.7
1984–85	25.6	25.1	36.7	12.6	126.2	123.4	180.5	61.9	492.0
1985–86	28.4	22.1	33.1	16.5	171.5	133.2	199.6	99.3	603.6
1986–87	29.0	15.6	37.1	18.3	168.3	90.3	215.5	106.2	580.3
1987–88	24.0	19.2	41.1	15.7	107.7	86.1	184.5	70.3	448.5
1988–89	20.4	13.9	50.0	15.6	92.0	62.5	225.3	70.4	450.2
1989–90	30.0	21.9	38.7	9.4	95.5	69.6	123.3	30.0	318.3
1990–91	23.4	19.2	50.5	6.9	86.5	71.1	186.6	25.5	369.7
1991–92	21.2	22.0	52.3	4.5	82.3	85.3	203.0	17.7	388.3
1992–93	23.1	21.2	47.5	8.2	76.1	69.7	156.6	27.0	329.4
1993–94	24.9	20.2	45.4	9.5	85.1	69.0	155.2	32.4	341.8
1994–95	22.5	19.5	49.4	8.7	70.2	60.8	154.3	27.1	312.5
1995–96	27.9	14.1	46.8	11.2	88.0	44.6	147.5	35.2	315.3
1996–97	27.0	18.2	43.0	11.8	102.2	68.9	162.6	44.5	378.3
1997–98	29.2	19.9	43.4	7.4	99.0	67.4	147.0	25.2	338.7
1998–99	29.0	19.4	43.5	8.2	96.9	64.8	145.3	27.3	334.2
1999–00	24.0	21.6	47.2	7.1	77.5	69.7	152.1	23.0	322.4
2000–01	24.1	17.4	51.8	6.6	82.8	59.6	177.7	22.6	342.7
2001–02	24.2	18.5	48.2	9.1	79.7	60.8	158.5	29.8	328.7
2002–03	19.5	24.2	43.1	13.2	65.6	81.4	145.0	44.2	336.3
2003–04	23.4	21.4	45.7	9.5	68.0	62.1	132.6	27.7	290.4
2004–05	20.3	23.7	50.5	5.5	65.5	76.5	163.2	17.7	323.0
2005–06	22.0	20.5	48.0	9.5	77.5	72.2	168.7	33.3	351.7
2006–07	28.3	20.9	39.7	11.2	99.5	73.6	139.7	39.3	352.1
2007–08	26.5	19.2	41.3	13.1	94.2	68.4	147.0	46.5	356.0
2008–09	24.2	18.0	43.9	13.8	86.1	64.0	156.0	49.2	355.3
2009–10	23.1	15.4	42.2	19.3	79.7	53.1	145.6	66.8	345.2
2010–11	24.7	17.8	39.7	17.9	88.1	63.4	141.9	64.0	357.4

Table 41: Distribution and annual potlifts by statistical area from CRA 6, 1979–80 to 2010–11.

Fishing	Distribution (%)				Annual Potlifts (000's)				
Year	940	941	942	943	940	941	942	943	CRA 6
1979–80	24.5	40.0	24.3	11.2	42.2	68.9	41.9	19.2	172.2
1980–81	24.0	33.6	27.8	14.7	39.2	54.9	45.4	24.0	163.5
1981–82	15.9	45.2	24.6	14.4	33.7	96.1	52.3	30.6	212.6
1982–83	20.2	35.3	32.0	12.6	53.6	93.6	84.8	33.3	265.3
1983–84	16.1	32.8	37.3	13.8	51.0	103.9	118.2	43.8	317.0
1984–85	22.5	31.5	34.8	11.2	82.0	115.1	127.3	41.0	365.4
1985–86	23.4	27.4	32.9	16.3	100.2	117.4	140.7	69.7	428.0
1986–87	31.6	19.5	30.8	18.1	110.8	68.5	108.0	63.4	350.6
1987–88	23.5	26.2	34.2	16.1	71.0	79.2	103.4	48.6	302.2
1988–89	23.4	17.8	43.3	15.6	75.2	57.2	139.2	50.0	321.7
1989–90	27.4	26.9	34.7	11.0	65.1	64.0	82.5	26.1	237.7
1990–91	23.8	28.8	37.4	10.1	63.6	77.0	100.0	27.1	267.7
1991–92	22.1	32.9	38.0	7.0	66.6	98.8	114.2	21.1	300.6
1992–93	28.0	30.3	31.5	10.3	81.1	87.9	91.2	29.8	290.0
1993–94	27.6	24.6	35.1	12.7	88.0	78.5	112.2	40.5	319.2
1994–95	22.1	28.4	36.2	13.3	64.5	82.7	105.6	38.9	291.7
1995–96	30.2	19.9	35.2	14.8	87.7	57.8	102.2	43.1	290.7
1996–97	31.3	22.2	33.9	12.6	116.3	82.4	125.8	46.7	371.2
1997–98	35.2	22.8	35.1	6.9	136.1	88.1	135.9	26.8	386.9
1998–99	37.3	21.7	33.2	7.7	106.7	62.1	94.9	22.0	285.7
1999–00	29.4	27.5	32.9	10.3	79.7	74.6	89.2	27.9	271.3
2000–01	30.1	21.9	38.8	9.1	89.6	65.3	115.7	27.2	297.8
2001–02	28.5	24.8	37.8	9.0	81.5	70.9	108.1	25.8	286.2
2002–03	20.3	28.4	38.3	13.0	58.8	82.1	110.9	37.5	289.3
2003–04	22.4	30.9	36.0	10.7	59.0	81.5	95.0	28.1	263.7
2004–05	21.6	32.2	39.8	6.4	57.6	85.8	106.3	17.1	266.8
2005–06	22.8	30.3	38.4	8.4	59.5	79.0	100.0	22.0	260.5
2006–07	32.6	29.2	29.9	8.2	79.7	71.3	73.1	20.1	244.2
2007–08	29.2	25.5	31.1	14.2	68.1	59.4	72.5	33.2	233.3
2008–09	27.0	20.2	38.9	13.9	64.0	48.0	92.4	32.9	237.4
2009–10	28.6	17.2	33.5	20.7	72.6	43.5	84.9	52.4	253.4
2010–11	26.2	17.6	39.5	16.8	66.1	44.4	99.9	42.3	252.6

Table 42: Percentage of annual catch by month from CRA 6, 1979–80 to 2010–11. A 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/month 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	7.9	6.5	2.6	7	17.6	15.9	18.7	15.4	.
1984–85	.	4.1	6	5	3.2	2	12.3	13.7	19.1	20.8	13.8	x
1985–86	.	4.1	5.9	3.4	1.8	6.3	12.2	13	19.1	14.8	19.2	.
1986–87	.	2.1	4	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	x
1990–91	.	1.9	5.5	3.4	1.6	1.5	16	15	16.7	17	21.3	x
1991–92	.	1.4	5.9	4	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	3.3	2.4	10.1	16	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	21.9	.
1994–95	x	4.4	6.2	5.1	4.4	2.6	8.6	16.1	14.8	20.9	17	.
1995–96	.	4.2	6.8	3.8	5.9	6.7	23.7	11.9	10	12.2	14.6	0.3
1996–97	.	5.3	8.3	5.7	5.1	8.7	20.3	11.1	13	12.5	10.1	x
1997–98	x	8	9.4	8.2	5.4	6.7	11.3	12.1	14.8	11.7	12.4	x
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	x
2000–01	.	5.2	6.8	6.7	4.8	9.7	17.8	16	10.2	10.7	11.9	x
2001–02	.	2.9	7.9	6.3	4.1	4.3	15.1	14.3	13.2	17	14.8	x
2002–03	.	2.2	6.2	9.5	5.9	5.7	8	15.9	11.1	18.4	17	x
2003–04	.	1.7	5.3	6.6	8.6	6.3	15.9	12.8	12.4	19	11.2	x
2004–05	.	3.9	7.1	10.1	3.9	4.8	10.3	15.1	12.4	17	14.9	0.6
2005–06	.	3.8	6.4	7.2	5.5	5.5	10.3	14.1	18.1	16.8	12.3	.
2006–07	.	3.3	8.1	9.6	6.7	6.7	15.7	11.3	12.7	11.6	13.6	x
2007–08	.	1.4	4.9	9.7	8.7	6.5	5.7	17.2	13.5	20.4	11.8	x
2008–09	.	2.5	6.9	6.7	5.8	7	15.9	16.6	10.1	17.8	10.7	.
2009–10	.	1.6	2.5	6.9	6.9	5.1	5.2	12.2	19.6	19.3	20.7	.
2010–11	.	4.9	8.2	6.4	3.5	6.6	16	15.1	9.1	15.5	14.9	.

Table 43: Percentage of catch from CRA 6 by statistical area and month for 2010–11. A '.' indicates no fishing in the month/statistical area cell.

Month	940	941	942	943
Apr	.	.	.	.
May	1.4	0.6	2.2	0.7
Jun	1.9	1.3	3.3	1.7
Jul	2.1	1.3	1.7	1.2
Aug	1.1	0.5	1.2	0.7
Sep	1.2	0.5	3.3	1.5
Oct	5.3	2.7	6.4	1.6
Nov	3.3	2.9	5.7	3.1
Dec	2.0	1.6	3.8	1.7
Jan	3.6	3.9	6.0	2.0
Feb	2.7	2.5	6.1	3.6
Mar	.	.	.	.

Table 44: Arithmetic CPUE (kg/potlift) for CRA 6 by fishing year and statistical area, 1979–80 to 2010–11.

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	1.69	1.51
2006–07	1.25	1.03	1.91	1.96
2007–08	1.38	1.15	2.03	1.40
2008–09	1.34	1.33	1.69	1.49
2009–10	1.10	1.22	1.72	1.27
2010–11	1.33	1.43	1.42	1.51

Table 45: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 6 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	2.33	2.10	2.16	0.036
1980–81	2.18	2.03	2.00	0.037
1981–82	2.19	2.27	2.27	0.034
1982–83	1.78	1.61	1.64	0.031
1983–84	1.73	1.62	1.61	0.031
1984–85	1.35	1.29	1.28	0.031
1985–86	1.41	1.37	1.36	0.031
1986–87	1.66	1.51	1.49	0.033
1987–88	1.48	1.34	1.30	0.033
1988–89	1.40	1.28	1.25	0.035
1989–90	1.34	1.19	1.13	0.035
1990–91	1.38	1.19	1.16	0.035
1991–92	1.29	1.24	1.20	0.032
1992–93	1.14	1.20	1.17	0.031
1993–94	1.07	1.04	1.04	0.029
1994–95	1.07	1.03	1.03	0.029
1995–96	1.08	1.02	1.05	0.028
1996–97	1.02	1.09	1.11	0.029
1997–98	0.88	1.03	1.05	0.031
1998–99	1.17	1.25	1.29	0.035
1999–00	1.19	1.28	1.32	0.038
2000–01	1.15	1.17	1.18	0.037
2001–02	1.15	1.16	1.18	0.038
2002–03	1.16	1.26	1.28	0.038
2003–04	1.10	1.20	1.21	0.038
2004–05	1.21	1.35	1.33	0.037
2005–06	1.35	1.45	1.44	0.036
2006–07	1.44	1.60	1.64	0.037
2007–08	1.53	1.59	1.61	0.038
2008–09	1.50	1.58	1.59	0.037
2009–10	1.36	1.41	1.40	0.038
2010–11	1.41	1.52	1.53	0.037

Table 46: Number of vessels by statistical area from CRA 7, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were 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
2006–07	9	7	14
2007–08	15	8	20
2008–09	11	5	15
2009–10	15	7	19
2010–11	11	8	16

Table 47: Distribution and annual catch by statistical area from CRA 7, 1979–80 to 2010–11.

Fishing	Distribution (%)		Annual Catch (t)		
Year	920	921	920	921	CRA 7
1979–80	61.3	38.7	247.3	156.1	403.4
1980–81	62.0	38.0	184.7	113.0	297.8
1981–82	60.5	39.5	161.7	105.4	267.0
1982–83	53.6	46.4	69.3	60.1	129.4
1983–84	52.3	47.7	57.1	52.1	109.1
1984–85	63.5	36.5	121.6	70.0	191.7
1985–86	74.5	25.5	238.4	81.5	319.9
1986–87	72.6	27.4	237.5	89.6	327.1
1987–88	78.5	21.5	232.1	63.7	295.8
1988–89	70.1	29.9	150.0	63.9	213.9
1989–90	63.9	36.1	64.8	36.6	101.4
1990–91	66.5	33.5	88.7	44.6	133.4
1991–92	71.9	28.1	127.8	49.9	177.7
1992–93	69.9	30.1	91.9	39.6	131.6
1993–94	67.4	32.6	93.1	45.0	138.1
1994–95	64.9	35.1	78.1	42.3	120.3
1995–96	57.2	42.8	46.5	34.8	81.3
1996–97	62.9	37.1	39.6	23.3	62.9
1997–98	51.6	48.4	18.6	17.4	36.0
1998–99	48.3	51.7	28.3	30.3	58.6
1999–00	74.0	26.0	41.8	14.7	56.5
2000–01	50.7	49.3	44.3	43.0	87.2
2001–02	72.7	27.3	55.9	21.0	76.9
2002–03	76.5	23.5	67.8	20.8	88.6
2003–04	70.5	29.5	57.4	24.0	81.4
2004–05	58.4	41.6	55.1	39.1	94.2
2005–06	52.0	48.0	49.4	45.6	95.0
2006–07	51.4	48.6	61.7	58.5	120.2
2007–08	64.5	35.5	77.5	42.6	120.1
2008–09	64.7	35.3	77.8	42.5	120.3
2009–10	56.8	43.2	77.5	59.0	136.5
2010–11	45.0	55.0	33.7	41.1	74.8

Table 48: Distribution and annual potlifts by statistical area from CRA 7, 1979–80 to 2010–11.

Fishing	Distribution (%)		Annual Potlifts (000's)		
Year	920	921	920	921	CRA 7
1979–80	70.6	29.4	271.0	112.7	383.7
1980–81	73.5	26.5	245.5	88.7	334.2
1981–82	71.9	28.1	244.2	95.5	339.7
1982–83	67.5	32.5	173.3	83.6	256.9
1983–84	63.7	36.3	172.1	98.2	270.3
1984–85	71.5	28.5	232.4	92.7	325.1
1985–86	77.5	22.5	330.0	95.6	425.5
1986–87	79.4	20.6	321.6	83.3	404.9
1987–88	81.4	18.6	332.3	75.7	408.0
1988–89	78.0	22.0	373.7	105.4	479.0
1989–90	81.0	19.0	228.0	53.6	281.6
1990–91	81.3	18.7	262.5	60.4	322.9
1991–92	77.2	22.8	166.0	49.0	215.0
1992–93	84.1	15.9	276.7	52.1	328.9
1993–94	82.5	17.5	180.9	38.5	219.4
1994–95	84.0	16.0	209.4	39.8	249.2
1995–96	73.1	26.9	191.0	70.5	261.5
1996–97	78.5	21.5	194.3	53.3	247.6
1997–98	68.6	31.4	105.0	48.1	153.1
1998–99	59.3	40.7	115.5	79.3	194.8
1999–00	81.4	18.6	205.9	46.9	252.8
2000–01	65.2	34.8	163.8	87.3	251.1
2001–02	75.1	24.9	125.7	41.6	167.3
2002–03	88.6	11.4	151.6	19.4	171.0
2003–04	90.9	9.1	128.2	12.8	141.0
2004–05	80.6	19.4	100.9	24.3	125.2
2005–06	70.3	29.7	59.8	25.2	85.0
2006–07	62.9	37.1	48.6	28.7	77.2
2007–08	74.3	25.7	67.9	23.5	91.4
2008–09	70.9	29.1	50.6	20.7	71.3
2009–10	74.0	26.0	99.3	35.0	134.2
2010–11	59.6	40.4	61.6	41.7	103.3

Table 49: Percentage of annual catch by month from CRA 7, 1979–80 to 2010–11. A 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/month cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	1.7	x	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	x	x	5.7	25.8	24.3	15.3	11.6	10.0	5.0	1.8	0.3	x
1983–84	.	.	5.8	19.0	24.9	19.9	15.4	6.6	5.3	2.0	0.8	0.2
1984–85	x	x	15.8	30.5	16.6	12.6	11.7	7.6	3.1	1.5	0.5	0.1
1985–86	x	x	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	x	7.1	24.7	27.4	16.0	12.0	7.0	2.8	1.6	0.9	0.5
1988–89	x	.	4.3	18.6	28.1	14.8	18.3	11.5	1.8	1.5	1.0	x
1989–90	.	x	2.6	6.0	18.0	27.2	16.5	11.7	8.6	6.5	2.7	0.2
1990–91	x	.	7.0	25.0	20.0	19.6	9.1	5.9	6.8	4.2	1.9	0.2
1991–92	x	x	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	x	x
1993–94	x	.	15.7	40.1	24.4	11.6	8.0	0.1	x	x	.	.
1994–95	.	x	9.4	28.7	33.5	19.6	7.4	1.2	.	.	x	.
1995–96	.	x	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	x	.	.	.
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	.	x	.	.
2001–02	.	.	9.0	27.1	25.7	18.6	12.6	6.9	.	.	x	.
2002–03	.	x	10.2	21.2	30.5	20.6	15.8	1.8	.	.	.	.
2003–04	.	x	7.1	29.1	25.5	15.2	18.4	4.8	.	.	.	.
2004–05	x	.	11.5	36.2	30.8	12.8	5.9	2.9	.	.	.	.
2005–06	.	.	9.0	45.7	32.1	10.9	2.0	x	.	.	.	.
2006–07	.	.	11.1	33.3	33.3	17.6	4.4	x	.	.	.	.
2007–08	.	x	3.3	26.5	34.4	24.3	10.6	0.6	.	.	.	.
2008–09	.	.	3.7	9.2	36.2	32.0	18.9	x	.	.	.	.
2009–10	.	.	1.6	7.6	17.5	30.3	23.0	20.0	.	.	.	.
2010–11	.	.	11.0	13.3	13.8	23.7	13.6	24.7	.	.	.	.

Table 50: Percentage of catch from CRA 7 by statistical area and month for 2010–11. A '.' indicates no fishing in the month/statistical area cell.

Month	920	921
Apr	.	.
May	.	.
Jun	2.9	8.1
Jul	4.3	9.0
Aug	9.0	4.8
Sep	14.0	9.7
Oct	6.1	7.4
Nov	8.7	16.0
Dec	.	.
Jan	.	.
Feb	.	.
Mar	.	.

Table 51: Arithmetic CPUE (kg/potlift) for CRA 7 by fishing year and statistical area, 1979–80 to 2010–11.

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
2006–07	1.27	2.04
2007–08	1.14	1.81
2008–09	1.54	2.05
2009–10	0.78	1.69
2010–11	0.55	0.99

Table 52: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 7 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.05	0.98	0.98	0.031
1980–81	0.89	0.85	0.86	0.033
1981–82	0.79	0.73	0.73	0.034
1982–83	0.50	0.48	0.47	0.037
1983–84	0.40	0.41	0.41	0.038
1984–85	0.59	0.55	0.55	0.038
1985–86	0.75	0.72	0.73	0.037
1986–87	0.81	0.82	0.83	0.039
1987–88	0.73	0.68	0.70	0.041
1988–89	0.45	0.41	0.41	0.047
1989–90	0.36	0.32	0.34	0.045
1990–91	0.41	0.41	0.43	0.042
1991–92	0.83	0.95	0.95	0.054
1992–93	0.40	0.39	0.41	0.045
1993–94	0.63	0.60	0.61	0.056
1994–95	0.48	0.45	0.46	0.053
1995–96	0.31	0.28	0.27	0.052
1996–97	0.25	0.23	0.23	0.056
1997–98	0.24	0.17	0.17	0.062
1998–99	0.30	0.27	0.26	0.061
1999–00	0.22	0.27	0.27	0.065
2000–01	0.35	0.36	0.35	0.058
2001–02	0.46	0.46	0.45	0.063
2002–03	0.52	0.61	0.62	0.068
2003–04	0.58	0.57	0.61	0.076
2004–05	0.75	0.83	0.84	0.091
2005–06	1.12	1.25	1.24	0.102
2006–07	1.56	1.87	1.76	0.096
2007–08	1.31	1.66	1.60	0.084
2008–09	1.69	2.04	2.01	0.096
2009–10	1.02	0.97	0.98	0.073
2010–11	0.72	0.73	0.71	0.078

Table 53: Number of vessels by statistical area from CRA 8, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA were excluded. A '.' indicates no fishing in the statistical area/fishing year cell.

Fishing year	922	923	924	925	926	927	928	CRA 8
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
2006–07	2	4	7	.	25	11	13	57
2007–08	2	5	12	3	22	13	16	59
2008–09	2	4	14	2	21	13	17	64
2009–10	3	2	12	1	23	16	18	62
2010–11	2	2	12	2	28	14	20	64

Table 54: Distribution and annual catch by statistical area from CRA 8, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

	Distribution (%)							Annual Catch (t)							
Fishing	922	923	924	925	926	927	928	922	923	924	925	926	927	928	CRA 8
1979–80	1.9	12.7	25.6	0.4	22.4	19.5	17.6	32.5	218.9	442.0	7.2	385.7	335.8	303.5	1 725.6
1980–81	1.2	11.3	30.5	1.3	24.1	17.1	14.5	17.4	165.8	446.1	18.5	353.1	250.3	212.2	1 463.4
1981–82	1.5	11.9	27.5	1.9	32.4	13.8	11.0	20.8	166.1	383.8	26.2	452.1	192.7	153.9	1 395.7
1982–83	1.4	9.9	24.9	1.0	33.2	18.8	10.8	21.4	148.4	374.3	14.7	498.8	283.1	161.6	1 502.4
1983–84	1.1	10.2	22.3	1.5	35.8	17.2	11.9	16.1	154.9	339.8	22.5	546.6	263.0	182.0	1 524.9
1984–85	1.3	9.4	22.0	0.8	30.5	24.9	11.2	20.1	145.5	341.4	11.9	472.0	385.2	173.2	1 549.3
1985–86	0.7	10.5	21.3	1.0	29.5	24.2	12.9	12.2	196.2	397.0	18.7	549.6	452.1	239.7	1 865.6
1986–87	1.1	9.9	27.8	0.4	30.2	16.2	14.3	18.1	159.0	444.3	6.6	483.8	259.0	229.3	1 600.1
1987–88	1.3	12.5	27.8	x	32.0	15.5	10.8	21.5	207.6	462.5	x	532.9	258.6	179.6	1 665.3
1988–89	1.7	16.2	23.8	1.0	32.8	11.5	12.9	18.3	169.8	249.8	10.6	343.4	120.9	134.8	1 047.7
1989–90	1.1	8.9	23.0	0.5	36.5	19.3	10.7	14.3	110.9	287.8	6.0	456.6	241.3	133.4	1 250.2
1990–91	0.9	6.7	23.0	1.4	37.9	18.9	11.2	7.2	56.1	192.3	11.6	316.2	157.3	93.7	834.5
1991–92	1.0	6.0	19.6	1.3	32.3	23.1	16.6	9.9	58.0	189.1	12.6	310.8	222.4	159.9	962.7
1992–93	0.8	5.6	19.6	1.4	33.0	18.4	21.2	7.0	49.3	171.4	12.2	289.4	161.3	185.8	876.5
1993–94	1.5	6.4	22.9	1.7	30.2	17.4	19.8	13.8	57.3	205.3	15.7	270.2	156.1	177.6	896.1
1994–95	1.0	3.9	24.2	4.0	27.8	18.7	20.3	8.1	33.7	207.4	34.0	238.3	160.2	173.9	855.6
1995–96	0.8	5.1	17.0	3.6	30.4	21.1	21.9	6.8	41.7	140.5	29.9	251.1	174.5	181.2	825.6
1996–97	0.8	5.5	16.1	2.7	33.3	21.7	20.0	6.7	47.8	138.6	23.0	287.5	186.8	172.2	862.4
1997–98	0.3	4.4	16.6	1.2	32.6	19.2	25.6	2.7	34.8	130.7	9.1	256.1	151.0	201.3	785.6
1998–99	x	6.0	11.6	1.3	35.0	20.0	25.7	x	48.1	94.1	10.6	282.9	161.6	207.9	808.1
1999–00	x	6.5	13.7	3.1	36.4	22.8	17.1	x	46.4	96.9	22.0	258.2	162.0	121.1	709.8
2000–01	x	3.6	15.5	2.1	40.8	25.3	12.1	x	25.3	109.3	14.8	286.8	178.0	85.4	703.4
2001–02	x	3.3	14.9	0.3	42.8	22.9	15.0	x	19.1	85.0	1.7	244.9	131.1	85.8	572.1
2002–03	x	x	15.6	x	48.4	18.3	13.9	x	x	88.4	x	274.3	103.9	78.8	567.1
2003–04	x	3.9	12.8	0.3	51.5	16.8	14.2	x	22.2	72.6	1.5	292.2	95.3	80.4	567.6
2004–05	x	3.8	12.1	1.2	50.0	16.7	15.6	x	22.7	72.7	7.2	301.2	100.6	93.8	603.0
2005–06	x	2.9	12.4	x	45.9	19.8	18.0	x	17.6	74.7	x	276.8	119.2	108.3	603.2
2006–07	x	3.2	13.4	.	41.2	23.0	18.1	x	24.1	101.5	.	311.0	173.4	136.5	754.9
2007–08	x	2.5	13.3	0.8	35.6	21.3	25.6	x	18.8	100.1	6.1	267.6	160.3	192.9	752.4
2008–09	x	0.4	15.3	x	28.8	22.4	32.3	x	4.3	147.6	x	278.2	216.8	311.6	966.0
2009–10	0.6	x	14.1	x	27.6	21.3	35.2	6.6	x	143.5	x	280.9	216.7	358.8	1 018.3
2010–11	x	0.1	12.5	x	34.1	24.5	28.3	x	0.9	127.4	x	346.8	249.2	288.4	1 018.2

Table 55: Distribution and annual potlifts by statistical area from CRA 8, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing	Distribution (%)							Annual Potlifts (000's)							
Year	922	923	924	925	926	927	928	922	923	924	925	926	927	928	CRA 8
1979–80	1.7	10.2	24.2	0.1	21.7	22.9	19.2	16.3	98.2	233.7	1.4	209.7	220.9	185.7	966.0
1980–81	1.5	10.3	26.2	0.3	21.2	22.2	18.2	13.1	87.4	222.8	2.3	180.2	188.5	154.8	849.2
1981–82	1.8	11.8	25.9	0.3	27.0	17.1	16.1	13.7	92.0	202.3	2.5	210.9	133.2	125.9	780.5
1982–83	2.0	8.6	22.6	0.3	26.3	24.3	15.8	19.4	81.8	216.2	3.3	251.0	232.2	150.5	954.4
1983–84	1.6	10.7	22.5	0.4	29.3	21.8	13.7	19.9	130.9	275.2	5.1	357.9	266.4	167.3	1 222.8
1984–85	1.8	9.2	20.2	0.3	28.7	25.5	14.3	23.4	116.8	256.4	3.2	363.2	323.3	181.1	1 267.3
1985–86	0.9	9.6	17.4	0.1	26.4	28.8	16.8	13.0	131.8	239.7	1.4	363.0	396.4	231.5	1 376.8
1986–87	1.2	9.8	18.9	0.2	28.1	23.6	18.2	16.4	136.1	263.2	3.1	392.0	328.6	253.1	1 392.7
1987–88	1.6	10.7	20.0	x	29.4	23.5	14.8	21.3	143.1	268.6	x	393.9	314.2	198.0	1 339.6
1988–89	3.0	14.0	20.6	0.6	29.2	15.2	17.4	34.0	159.1	233.3	6.7	331.3	172.7	196.9	1 133.9
1989–90	1.3	9.0	16.1	0.7	35.9	23.7	13.4	17.8	126.9	226.4	9.9	505.2	334.2	188.2	1 408.5
1990–91	1.2	6.3	16.3	0.9	35.1	22.9	17.3	11.8	60.4	156.2	8.4	335.4	219.0	165.3	956.5
1991–92	2.0	5.7	14.3	0.5	31.7	25.6	20.1	23.5	67.4	168.5	6.3	371.6	300.4	236.3	1 174.1
1992–93	1.1	4.9	12.5	1.0	31.8	23.3	25.3	14.8	62.7	160.8	13.2	410.4	300.7	326.4	1 289.0
1993–94	1.2	4.4	12.9	0.9	29.6	22.8	28.1	11.5	43.0	124.9	8.8	286.8	221.4	272.7	969.1
1994–95	1.1	3.9	17.5	2.7	27.3	22.0	25.4	11.1	37.8	169.5	26.3	265.0	214.0	247.0	970.8
1995–96	0.8	6.0	14.0	2.6	25.5	22.4	28.7	7.3	54.6	128.5	24.1	233.3	204.8	263.1	915.7
1996–97	0.9	6.4	14.6	1.9	29.0	22.9	24.3	8.4	63.5	144.5	19.1	285.7	225.8	239.6	986.8
1997–98	0.4	4.9	13.4	0.9	30.3	20.3	29.8	4.2	53.1	145.5	9.7	329.5	220.7	323.8	1 086.5
1998–99	x	6.4	13.0	1.2	27.6	18.4	32.9	x	65.7	132.6	12.0	280.9	187.8	335.7	1 018.8
1999–00	x	7.3	13.0	3.2	26.8	21.6	27.7	x	61.6	109.9	26.7	226.7	182.9	234.4	845.4
2000–01	x	2.9	12.1	1.3	31.4	30.2	21.6	x	21.0	86.9	9.5	225.0	216.8	154.9	717.5
2001–02	x	2.1	10.3	0.5	38.2	26.8	21.5	x	13.3	64.1	2.8	236.6	166.3	133.5	620.0
2002–03	x	x	12.8	x	41.4	21.8	20.9	x	x	66.0	x	213.1	112.0	107.3	514.1
2003–04	x	2.4	9.2	0.3	44.6	17.9	25.3	x	8.1	31.2	1.0	152.1	61.1	86.0	340.7
2004–05	x	2.4	9.9	1.6	45.3	18.4	21.7	x	9.3	37.9	6.3	172.9	70.2	82.8	381.8
2005–06	x	1.2	7.0	x	41.7	28.6	20.9	x	4.1	24.3	x	144.1	98.8	72.4	345.5
2006–07	x	3.5	7.5	.	37.4	32.2	18.5	x	11.9	26.0	.	128.9	111.0	64.0	345.1
2007–08	x	1.6	11.8	0.7	44.0	23.9	15.9	x	4.9	36.0	2.1	134.2	72.9	48.6	305.1
2008–09	x	0.4	14.7	x	36.3	24.6	22.0	x	1.2	44.3	x	109.5	74.1	66.3	301.5
2009–10	1.8	x	11.0	x	35.0	20.5	31.1	5.8	x	36.1	x	114.6	67.2	101.8	327.3
2010–11	x	0.3	10.4	x	34.0	28.7	25.6	x	1.5	46.3	x	150.9	127.3	113.3	443.1

Table 56: Percentage of annual catch by month from CRA 8, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the month/year cell.

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	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
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	6	1.9
1988–89	0.7	0.7	2.9	3.2	5.7	12.1	17.0	17.9	14	16	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	6.2	2
1990–91	0.3	x	0.9	2.5	8.3	17.6	17.1	19.7	10.5	11.9	7	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	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	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	17.5	16.6	22.4	13.2	10.4	6.3	1.8
1999–00	x	0.1	0.6	2.1	16.0	24.9	22.5	14.0	8.7	7.9	2.1	1.1
2000–01	0.1	x	0.4	2.6	14.9	37.7	15.3	13.0	6.5	4.9	3.7	1
2001–02	x	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	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	7.6	13.5	23.7	37.1	5.7	0.7	0.5	4.2	0.6	0.9
2006–07	10.9	7.4	11.5	11	24.7	24.6	3.5	0.2	0.1	0.6	3.3	2
2007–08	12.7	8.5	12.5	11.6	17.1	20.8	3.6	1	0.4	8.2	3.2	0.3
2008–09	14.7	12.5	7.1	14.4	19.6	22.7	4.2	0.5	x	4.2	.	0.1
2009–10	13.5	9.8	9.5	6.4	9.4	23.7	8.9	2.1	1.6	7.0	7.5	0.6
2010–11	10.6	13.2	13.3	14.0	9.5	15.9	11.4	3.2	0.3	3.6	2.9	2.3

Table 57: Percentage of catch from CRA 8 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (20 instances representing 3.0% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	922	923	924	925	926	927	928
Apr	.	.	.	.	2.1	4.8	3.6
May	.	.	.	.	5.0	4.4	3.7
Jun	.	.	x	.	5.5	3.4	4.1
Jul	x	x	0.4	.	5.0	3.9	4.8
Aug	x	x	2.0	x	3.3	1.8	2.3
Sep	x	x	4.5	x	3.4	3.7	3.8
Oct	x	x	3.9	.	3.3	1.7	2.5
Nov	.	.	0.9	.	1.9	x	x
Dec	.	.	x	.	x	.	.
Jan	.	.	0.5	.	1.5	x	1.2
Feb	x	.	.	.	1.4	x	1.2
Mar	.	.	.	.	1.4	x	x

Table 58: Arithmetic CPUE (kg/potlift) for CRA 8 by fishing year and statistical area, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

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	x	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	x	0.73	0.71	0.88	1.01	0.86	0.62
1999–00	x	0.75	0.88	0.82	1.14	0.89	0.52
2000–01	x	1.20	1.26	1.56	1.28	0.82	0.55
2001–02	x	1.44	1.33	0.61	1.04	0.79	0.64
2002–03	x	x	1.34	x	1.29	0.93	0.74
2003–04	x	2.75	2.32	1.57	1.92	1.56	0.94
2004–05	x	2.46	1.92	1.15	1.74	1.43	1.13
2005–06	x	4.27	3.08	x	1.92	1.21	1.50
2006–07	x	2.02	3.90	.	2.41	1.56	2.13
2007–08	x	3.82	2.78	2.87	1.99	2.20	3.97
2008–09	x	3.58	3.34	x	2.54	2.92	4.70
2009–10	1.14	x	3.98	x	2.45	3.23	3.53
2010–11	x	0.60	2.76	x	2.30	1.96	2.55

Table 59: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 8 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.79	2.04	2.01	0.020
1980–81	1.72	1.81	1.75	0.022
1981–82	1.79	1.80	1.69	0.023
1982–83	1.57	1.50	1.44	0.022
1983–84	1.25	1.14	1.08	0.021
1984–85	1.22	1.10	1.05	0.022
1985–86	1.36	1.27	1.24	0.022
1986–87	1.15	1.13	1.10	0.022
1987–88	1.24	1.20	1.15	0.024
1988–89	0.92	0.92	0.86	0.028
1989–90	0.89	0.86	0.79	0.024
1990–91	0.87	0.87	0.80	0.026
1991–92	0.82	0.79	0.77	0.024
1992–93	0.68	0.70	0.69	0.024
1993–94	0.92	0.93	0.93	0.027
1994–95	0.88	0.85	0.84	0.027
1995–96	0.90	0.89	0.86	0.029
1996–97	0.87	0.83	0.81	0.029
1997–98	0.72	0.69	0.69	0.028
1998–99	0.79	0.73	0.71	0.029
1999–00	0.84	0.76	0.73	0.033
2000–01	0.98	0.90	0.88	0.036
2001–02	0.92	0.94	0.94	0.041
2002–03	1.10	1.16	1.17	0.044
2003–04	1.67	1.74	1.78	0.050
2004–05	1.58	1.68	1.74	0.049
2005–06	1.75	1.88	2.10	0.050
2006–07	2.19	2.35	2.70	0.050
2007–08	2.47	2.69	2.92	0.048
2008–09	3.20	3.39	3.87	0.047
2009–10	3.11	3.55	3.87	0.044
2010–11	2.30	2.41	2.76	0.042

Table 60: Number of vessels by statistical area from CRA 9, 1979–80 to 2010–11. Vessels catching less than 1 t in a year for the entire QMA have been excluded. A '.' indicates no fishing in the statistical area/fishing year cell. A '0' indicates fishing 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
2006–07	.	1	2	3	.	1	.	7
2007–08	.	1	2	3	1	1	.	7
2008–09	.	1	2	2	0	1	.	6
2009–10	.	1	2	2	1	1	.	6
2010–11	0	1	3	2	1	0	.	6

Table 61: Distribution and annual catch by statistical area from CRA 9, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing	Distribution (%)							Annual Catch (t)							
year	929	930	931	935	936	937	938	929	930	931	935	936	937	938	CRA 9
1979–80	14.7	14.7	28.8	13.1	13.4	15.3	.	13.1	13.1	25.6	11.7	11.9	13.7	.	89.0
1980–81	3.3	10.9	16.9	14.4	29.2	25.0	X	3.3	10.5	16.5	14.0	28.3	24.3	x	97.1
1981–82	4.3	8.9	32.5	10.2	20.0	24.1	.	3.1	6.4	23.4	7.4	14.4	17.3	.	72.0
1982–83	7.2	9.0	42.3	16.0	8.5	17.1	.	4.2	5.4	25.0	9.5	5.0	10.1	.	59.1
1983–84	x	6.3	50.1	8.2	12.6	20.7	.	x	4.4	35.4	5.8	8.9	14.6	.	70.6
1984–85	x	12.2	42.1	16.5	12.4	16.1	.	x	9.8	34.0	13.3	10.0	13.0	.	80.8
1985–86	x	7.0	38.6	18.8	16.3	19.2	.	x	5.6	30.6	14.9	12.9	15.2	.	79.2
1986–87	x	6.3	34.6	23.2	23.4	11.5	.	x	5.9	32.2	21.6	21.8	10.8	.	93.3
1987–88	x	x	33.5	36.3	16.1	11.2	.	x	x	31.0	33.7	15.0	10.4	.	92.7
1988–89	.	5.5	x	46.9	19.5	8.0	x	.	1.4	x	12.2	5.1	2.1	x	26.0
1989–90	2.1	19.5	24.2	43.4	6.5	4.4	.	0.5	5.2	6.5	11.6	1.7	1.2	.	26.8
1990–91	x	x	40.4	46.5	5.3	x	2.1	x	x	18.3	21.1	2.4	x	1.0	45.3
1991–92	.	x	49.8	40.2	x	x	x	.	x	23.7	19.1	x	x	x	47.5
1992–93	.	12.5	41.7	40.2	x	x	x	.	5.7	19.0	18.4	x	x	x	45.7
1993–94	x	23.0	26.3	47.5	x	x	.	x	10.5	12.0	21.6	x	x	.	45.5
1994–95	x	31.9	13.2	46.1	x	x	.	x	14.4	6.0	20.9	x	x	.	45.2
1995–96	5.7	27.9	x	43.2	x	x	.	2.6	12.7	x	19.6	x	x	.	45.4
1996–97	x	19.0	22.8	45.5	x	x	.	x	8.9	10.7	21.3	x	x	.	46.9
1997–98	5.7	16.5	19.7	45.4	9.9	x	.	2.7	7.7	9.2	21.2	4.6	x	.	46.7
1998–99	4.7	31.1	19.2	35.2	x	x	x	2.2	14.6	9.0	16.5	x	x	x	46.9
1999–00	x	34.8	28.4	28.7	x	x	.	x	16.3	13.3	13.5	x	x	.	47.0
2000–01	1.2	7.5	x	35.3	10.3	x	x	0.6	3.5	x	16.6	4.9	x	x	47.0
2001–02	x	10.0	24.0	41.6	x	11.5	x	x	4.7	11.2	19.5	x	5.4	x	46.8
2002–03	x	x	x	44.4	x	x	.	x	x	x	20.9	x	x	.	47.0
2003–04	.	x	36.5	30.7	x	x	.	.	x	16.8	14.1	x	x	.	45.9
2004–05	.	x	x	54.7	x	x	.	.	x	x	25.7	x	x	.	47.0
2005–06	x	x	x	56.2	x	5.1	.	x	x	x	26.2	x	2.4	.	46.6
2006–07	.	x	28.8	59.1	.	x	.	.	x	13.5	27.8	.	x	.	47.0
2007–08	.	x	x	63.9	x	x	.	.	x	x	30.1	x	x	.	47.0
2008–09	.	x	x	39.6	x	x	.	.	x	x	18.6	x	x	.	47.0
2009–10	.	x	x	x	x	x	.	.	x	x	x	x	x	.	46.6
2010–11	x	x	45.3	38.0	x	x	.	x	x	21.3	17.8	x	x	.	47.0

Table 62: Distribution and annual potlifts by statistical area from CRA 9, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

Fishing	Distribution (%)							Annual Potlifts (000's)							
year	929	930	931	935	936	937	938	929	930	931	935	936	937	938	CRA 9
1979–80	13.5	15.8	12.8	23.0	21.8	13.1	.	10.8	12.7	10.2	18.5	17.5	10.5	.	80.2
1980–81	5.9	11.8	8.5	20.1	37.7	15.8	.	5.0	10.1	7.2	17.1	32.2	13.5	.	85.4
1981–82	5.8	10.5	13.6	20.3	31.3	18.4	.	4.3	7.7	10.0	14.9	22.9	13.5	.	73.3
1982–83	7.5	16.2	23.0	19.9	15.8	17.6	.	5.2	11.1	15.8	13.6	10.9	12.1	.	68.7
1983–84	x	8.4	26.2	12.3	27.4	22.1	.	x	6.3	19.6	9.2	20.5	16.5	.	74.7
1984–85	x	17.6	20.9	19.5	21.6	18.7	.	x	16.1	19.1	17.8	19.7	17.0	.	91.2
1985–86	x	9.9	26.8	20.8	22.5	19.8	.	x	10.5	28.6	22.2	24.0	21.1	.	106.8
1986–87	x	8.6	26.2	22.4	25.8	15.9	.	x	9.2	28.2	24.1	27.7	17.1	.	107.6
1987–88	x	x	31.8	25.6	22.4	15.5	.	x	x	34.8	28.1	24.5	17.0	.	109.6
1988–89	.	10.7	x	29.2	30.1	9.8	x	.	3.5	x	9.4	9.7	3.2	x	32.3
1989–90	3.7	26.6	14.0	34.9	12.9	7.8	.	1.2	8.5	4.5	11.2	4.1	2.5	.	32.1
1990–91	x	x	28.9	52.7	4.6	x	3.0	x	x	13.4	24.4	2.1	x	1.4	46.2
1991–92	.	x	34.3	46.3	x	x	x	.	x	17.5	23.6	x	x	x	51.0
1992–93	.	17.5	25.8	45.7	x	x	x	.	9.1	13.3	23.6	x	x	x	51.7
1993–94	x	24.9	23.0	48.5	x	x	.	x	8.7	8.1	16.9	x	x	.	34.9
1994–95	x	45.1	9.2	34.7	x	x	.	x	22.0	4.5	16.9	x	x	.	48.8
1995–96	11.2	39.1	x	33.4	x	x	.	5.2	18.1	x	15.5	x	x	.	46.3
1996–97	x	26.9	25.9	35.7	x	x	.	x	12.9	12.4	17.1	x	x	.	47.9
1997–98	5.4	23.6	25.7	35.1	7.4	x	.	3.2	14.0	15.2	20.8	4.4	x	.	59.4
1998–99	6.9	38.8	14.5	33.2	x	x	x	3.5	19.7	7.4	16.9	x	x	x	50.9
1999–00	x	41.2	25.0	24.9	x	x	.	x	22.2	13.5	13.4	x	x	.	53.8
2000–01	1.6	9.9	x	43.9	20.2	x	x	0.8	5.0	x	22.3	10.2	x	x	50.8
2001–02	x	15.1	10.9	51.9	x	10.3	x	x	8.6	6.2	29.6	x	5.9	x	57.0
2002–03	x	x	x	40.8	x	x	.	x	x	x	17.2	x	x	.	42.2
2003–04	.	x	33.2	22.6	x	x	.	.	x	9.4	6.4	x	x	.	28.2
2004–05	.	x	x	50.8	x	x	.	.	x	x	11.2	x	x	.	22.0
2005–06	x	x	x	58.1	x	7.1	.	x	x	x	12.2	x	1.5	.	21.0
2006–07	.	x	19.0	67.9	.	x	.	.	x	4.6	16.4	.	x	.	24.2
2007–08	.	x	x	67.3	x	x	.	.	x	x	17.1	x	x	.	25.4
2008–09	.	x	x	28.6	x	x	.	.	x	x	7.6	x	x	.	26.8
2009–10	.	x	x	x	x	x	.	.	x	x	x	x	x	.	28.4
2010–11	x	x	33.0	45.5	x	x	.	x	x	9.7	13.4	x	x	.	29.4

Table 63: Percentage of annual catch by month from CRA 9, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/month cell.

Fishing year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1979–80	3.4	x	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	x	2.4	4.6	8.1	3.1	8.2	8.0	16.0	14.8	20.8	9.3
1983–84	2.6	x	x	11.2	5.2	0.9	5.5	11.6	11.6	21.1	18.4	8.2
1984–85	0.8	2.3	x	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	x	x	3.0	5.9	4.8	15.9	18.0	13.6	15.2	11.4	7.8
1988–89	4.4	.	x	4.9	3.0	8.3	3.7	13.6	18.6	21.3	12.9	8.8
1989–90	1.3	x	x	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	x	x	17.1	6.1	8.9	9.8	17.4	12.5	10.1	7.4	7.4
1992–93	0.5	x	11.7	11.9	3.4	13.6	11.6	11.1	10.4	9.1	11.7	4.3
1993–94	1.0	x	1.0	24.3	9.3	12.7	16.3	7.1	11.0	5.7	8.7	2.5
1994–95	x	x	4.4	12.0	11.6	13.7	22.4	8.9	13.8	9.4	2.0	1.4
1995–96	x	x	2.4	7.4	16.5	24.1	23.9	13.1	5.1	3.7	0.5	x
1996–97	x	0.5	4.6	16.2	17.2	22.3	17.0	8.1	7.3	4.6	0.7	1.1
1997–98	x	x	12.5	21.0	15.0	17.1	12.0	7.3	7.0	3.6	3.9	x
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	x	x
2000–01	3.2	2.3	6.0	20.4	19.5	12.6	13.9	12.5	6.8	x	x	x
2001–02	4.2	2.7	8.8	25.3	13.5	23.3	13.9	3.8	2.8	x	x	x
2002–03	11.3	5.0	1.9	18.0	14.1	14.2	6.3	8.1	8.1	3.2	8.2	x
2003–04	8.0	0.7	x	16.1	28.8	9.0	8.7	5.8	9.5	10.7	.	x
2004–05	x	x	3.6	34.6	27.6	16.3	13.3	.	1.1	x	x	x
2005–06	x	2.5	12.0	20.6	28.8	29.5	2.6	x	0.8	x	x	x
2006–07	x	7.8	21.4	30.4	17.5	16.3	.	x	1.8	.	.	.
2007–08	x	x	16.1	39.2	23.5	12.2	x	x	x	x	.	x
2008–09	x	2.9	7.4	11.4	22.8	34.4	12.9	x	1.7	x	x	x
2009–10	4.9	3.1	8.2	11.6	5.3	28.9	25.3	3.2	5.3	x	x	x
2010–11	5.5	3.2	9.0	28.8	11.8	11.5	23.4	.	x	x	x	.

Table 64: Percentage of catch from CRA 9 by statistical area and month for 2010–11. An 'x' indicates fewer than three vessels in the month/statistical area cell (31 instances representing 87% of the annual catch). A '.' indicates no fishing in the month/statistical area cell.

Month	929	930	931	935	936	937	938
Apr	x	x	.	x	.	.	.
May	.	x	.	x	.	x	.
Jun	.	x	x	5.9	.	x	.
Jul	.	x	6.8	x	.	x	.
Aug	.	x	x	x	x	x	.
Sep	.	x	x	x	x	x	.
Oct	.	.	x	x	x	x	.
Nov	.	.	.	.	.	.	.
Dec	.	.	.	x	x	.	.
Jan	.	.	.	x	x	.	.
Feb	.	.	.	.	x	.	.
Mar	.	.	.	.	.	.	.

Table 65: Arithmetic CPUE (kg/potlift) for CRA 9 by fishing year and statistical area, 1979–80 to 2010–11. An 'x' indicates fewer than three vessels, and a '.' indicates no fishing, in the year/statistical area cell.

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	x
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	x	0.70	1.81	0.63	0.44	0.89	.
1984–85	x	0.61	1.78	0.75	0.51	0.77	.
1985–86	x	0.53	1.07	0.67	0.54	0.72	.
1986–87	x	0.64	1.14	0.90	0.79	0.63	.
1987–88	x	x	0.89	1.20	0.61	0.61	.
1988–89	.	0.42	x	1.29	0.52	0.66	x
1989–90	0.46	0.61	1.44	1.03	0.42	0.47	.
1990–91	x	x	1.37	0.86	1.14	x	0.70
1991–92	.	x	1.36	0.81	X	x	x
1992–93	.	0.63	1.43	0.78	X	x	x
1993–94	x	1.20	1.49	1.28	X	x	.
1994–95	x	0.66	1.33	1.23	X	x	.
1995–96	0.50	0.70	x	1.27	X	x	.
1996–97	x	0.70	0.86	1.25	X	x	.
1997–98	0.83	0.55	0.61	1.02	1.06	x	.
1998–99	0.63	0.74	1.22	0.98	X	x	x
1999–00	x	0.74	0.99	1.01	X	x	.
2000–01	0.72	0.70	x	0.74	0.47	x	x
2001–02	x	0.54	1.81	0.66	X	0.92	x
2002–03	x	x	x	1.21	X	x	.
2003–04	.	x	1.79	2.21	X	x	.
2004–05	.	x	x	2.30	X	x	.
2005–06	x	x	x	2.15	X	1.58	.
2006–07	.	x	2.94	1.69	.	x	.
2007–08	.	x	x	1.76	X	x	.
2008–09	.	x	x	2.43	X	x	.
2009–10	.	x	x	x	X	x	.
2010–11	x	x	2.20	1.33	X	x	.

Table 66: Annual arithmetic, unstandardised, and standardised (with standard error) CPUE indices for CRA 9 (kg/potlift).

Fishing year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.11	1.08	1.18	0.050
1980–81	1.14	1.13	1.27	0.049
1981–82	0.98	0.93	0.98	0.057
1982–83	0.86	0.81	0.82	0.057
1983–84	0.94	0.88	0.86	0.058
1984–85	0.89	0.82	0.81	0.056
1985–86	0.74	0.71	0.72	0.057
1986–87	0.87	0.84	0.83	0.058
1987–88	0.85	0.88	0.85	0.062
1988–89	0.81	0.77	0.83	0.075
1989–90	0.83	0.73	0.74	0.064
1990–91	0.98	0.92	0.83	0.081
1991–92	0.93	0.99	0.86	0.079
1992–93	0.88	1.05	0.96	0.083
1993–94	1.30	1.19	1.12	0.083
1994–95	0.93	0.84	0.89	0.072
1995–96	0.98	0.99	1.08	0.082
1996–97	0.98	0.96	0.97	0.072
1997–98	0.79	0.82	0.83	0.070
1998–99	0.92	1.05	1.10	0.073
1999–00	0.87	0.91	0.91	0.075
2000–01	0.93	1.04	1.08	0.088
2001–02	0.82	1.03	1.05	0.092
2002–03	1.11	1.23	1.24	0.091
2003–04	1.63	1.92	1.77	0.112
2004–05	2.14	2.47	2.31	0.122
2005–06	2.22	2.11	2.12	0.114
2006–07	1.94	2.20	2.19	0.138
2007–08	1.85	1.90	1.83	0.135
2008–09	1.75	1.23	1.25	0.114
2009–10	1.64	1.57	1.49	0.115
2010–11	1.60	1.43	1.46	0.115

Table 67: Annual standardised offset year CPUE analysis, with standard errors, used to operate the 2010–11 CRA 3 decision rule.

Offset year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.9325	0.8880	0.8494	0.0216
1980–81	0.9246	0.9143	0.8729	0.0212
1981–82	0.9356	0.9517	0.9321	0.0211
1982–83	0.9232	0.9291	0.9132	0.0205
1983–84	0.8148	0.7846	0.7706	0.0201
1984–85	0.7384	0.6951	0.6698	0.0202
1985–86	0.7119	0.6721	0.6379	0.0219
1986–87	0.6433	0.5339	0.5206	0.0214
1987–88	0.4426	0.4340	0.4076	0.0237
1988–89	0.4417	0.4241	0.4233	0.0242
1989–90	0.4900	0.4743	0.4685	0.0225
1990–91	0.4142	0.3606	0.3569	0.0231
1991–92	0.3147	0.2729	0.2629	0.0221
1992–93	0.3581	0.3533	0.3350	0.0240
1993–94	0.7881	0.8267	0.8649	0.0388
1994–95	1.2423	1.2904	1.3477	0.0470
1995–96	1.7305	1.7003	1.8037	0.0481
1996–97	2.1664	2.4757	2.6413	0.0514
1997–98	1.6005	1.7979	1.9950	0.0496
1998–99	1.6256	1.8631	2.0058	0.0472
1999–00	1.1891	1.2951	1.4637	0.0417
2000–01	0.9928	1.0579	1.1514	0.0426
2001–02	0.8226	0.7787	0.8618	0.0374
2002–03	0.7184	0.6946	0.6879	0.0329
2003–04	0.5514	0.5276	0.5016	0.0333
2004–05	0.5676	0.5850	0.5621	0.0365
2005–06	0.5867	0.5959	0.5715	0.0350
2006–07	0.5951	0.6106	0.5859	0.0352
2007–08	0.6613	0.6692	0.6301	0.0380
2008–09	0.7391	0.8227	0.7912	0.0429
2009–10	0.9952	1.0189	1.0067	0.0441
2010–11	1.4209	1.5416	1.5967	0.0494

Table 68: Annual standardised offset year CPUE analysis, with standard errors, used to operate the 2010–11 CRA 4 decision rule.

Offset year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.8869	0.8742	0.8394	0.0207
1980–81	0.8224	0.8336	0.8076	0.0207
1981–82	0.8536	0.8936	0.8870	0.0209
1982–83	0.9250	0.9155	0.8994	0.0199
1983–84	0.8385	0.8083	0.7883	0.0198
1984–85	0.7163	0.7130	0.6963	0.0204
1985–86	0.7543	0.7662	0.7493	0.0203
1986–87	0.8101	0.7436	0.7151	0.0207
1987–88	0.6908	0.6531	0.6314	0.0210
1988–89	0.6092	0.5564	0.5424	0.0213
1989–90	0.5729	0.5535	0.5305	0.0207
1990–91	0.4868	0.5108	0.4998	0.0203
1991–92	0.5205	0.5098	0.4906	0.0202
1992–93	0.5429	0.5293	0.5066	0.0200
1993–94	0.6371	0.6440	0.6285	0.0213
1994–95	0.8102	0.7845	0.7751	0.0235
1995–96	1.0119	1.0666	1.1067	0.0256
1996–97	1.2389	1.2807	1.3666	0.0295
1997–98	1.2947	1.3707	1.5094	0.0306
1998–99	1.2753	1.3972	1.5257	0.0293
1999–00	1.2286	1.1207	1.2171	0.0307
2000–01	1.0762	1.0623	1.1530	0.0290
2001–02	1.0336	1.0712	1.1309	0.0284
2002–03	1.1436	1.1972	1.2394	0.0283
2003–04	0.9935	0.9724	0.9988	0.0278
2004–05	1.0448	1.0004	0.9771	0.0278
2005–06	0.7665	0.7624	0.7593	0.0272
2006–07	0.6546	0.6751	0.6466	0.0263
2007–08	0.6112	0.6342	0.6130	0.0292
2008–09	0.8230	0.8867	0.8544	0.0330
2009–10	0.9637	0.9653	1.0003	0.0310
2010–11	1.2147	1.2058	1.1938	0.0299

Table 69: Annual standardised offset year CPUE analysis, with standard errors, used to operate the CRA 5 decision rule.

Offset year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.7693	0.6950	0.6621	0.0245
1980–81	0.8630	0.7419	0.7067	0.0274
1981–82	0.7832	0.7598	0.7462	0.0257
1982–83	0.8410	0.7499	0.7389	0.0254
1983–84	0.7478	0.6996	0.6887	0.0254
1984–85	0.7255	0.6121	0.5999	0.0259
1985–86	0.6694	0.5462	0.5359	0.0257
1986–87	0.6002	0.4726	0.4624	0.0266
1987–88	0.4548	0.4069	0.3966	0.0277
1988–89	0.4081	0.3800	0.3648	0.0307
1989–90	0.4166	0.4103	0.3879	0.0299
1990–91	0.3979	0.3462	0.3336	0.0277
1991–92	0.3692	0.3287	0.3095	0.0270
1992–93	0.3647	0.3512	0.3379	0.0281
1993–94	0.3998	0.3768	0.3641	0.0305
1994–95	0.4360	0.4222	0.4102	0.0326
1995–96	0.5301	0.5332	0.5321	0.0323
1996–97	0.7088	0.7364	0.7552	0.0366
1997–98	0.8656	0.9984	1.0319	0.0391
1998–99	0.9821	1.0598	1.1221	0.0404
1999–00	1.1431	1.1869	1.2228	0.0430
2000–01	1.2854	1.3942	1.4817	0.0470
2001–02	1.2404	1.3616	1.5022	0.0527
2002–03	1.3104	1.4709	1.5730	0.0489
2003–04	1.2792	1.5382	1.6027	0.0499
2004–05	1.1673	1.4094	1.4358	0.0465
2005–06	1.1170	1.3289	1.3483	0.0472
2006–07	1.1958	1.3587	1.3879	0.0500
2007–08	1.3275	1.4006	1.4214	0.0481
2008–09	1.4600	1.6448	1.6939	0.0541
2009–10	1.5509	1.7348	1.7789	0.0535
2010–11	1.5689	1.7497	1.7399	0.0618

Table 70: Annual standardised offset year CPUE analysis, with standard errors, used to operate the 2010–11 CRA 7 decision rule.

Offset year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	0.9429	0.9671	0.9716	0.0327
1980–81	0.8043	0.7681	0.7696	0.0330
1981–82	0.5021	0.4942	0.4943	0.0362
1982–83	0.4410	0.4465	0.4387	0.0386
1983–84	0.5801	0.5411	0.5383	0.0378
1984–85	0.7586	0.7056	0.7081	0.0380
1985–86	0.7490	0.7224	0.7303	0.0383
1986–87	0.7783	0.8089	0.8313	0.0409
1987–88	0.4722	0.4695	0.4740	0.0427
1988–89	0.3718	0.3072	0.3155	0.0483
1989–90	0.4524	0.4477	0.4744	0.0423
1990–91	0.6968	0.6251	0.6460	0.0424
1991–92	0.4170	0.4350	0.4351	0.0550
1992–93	0.5245	0.5553	0.5822	0.0470
1993–94	0.5447	0.4920	0.4970	0.0566
1994–95	0.3192	0.3003	0.2991	0.0515
1995–96	0.2395	0.2196	0.2198	0.0557
1996–97	0.2155	0.1803	0.1807	0.0595
1997–98	0.2942	0.2526	0.2394	0.0619
1998–99	0.2574	0.2864	0.2888	0.0648
1999–00	0.3249	0.3384	0.3261	0.0600
2000–01	0.4545	0.4722	0.4532	0.0613
2001–02	0.4803	0.5226	0.5297	0.0645
2002–03	0.5722	0.6237	0.6528	0.0774
2003–04	0.7878	0.7399	0.7735	0.0820
2004–05	1.0166	1.1553	1.1253	0.0984
2005–06	1.5430	1.8431	1.7334	0.0985
2006–07	1.3202	1.6671	1.6276	0.0883
2007–08	1.5994	2.0273	1.9919	0.0919
2008–09	0.9585	0.8835	0.8835	0.0871
2009–10	0.9465	0.9346	0.9143	0.0745
2010–11	0.7370	0.7255	0.6988	0.0860

Table 71: Annual standardised offset year CPUE analysis, with standard errors, used to operate the 2010–11 CRA 8 decision rule.

Offset year	Arithmetic	Unstandardised	Standardised	s.e.
1979–80	1.8442	2.0166	1.9573	0.0208
1980–81	1.7787	1.8319	1.7144	0.0219
1981–82	1.6015	1.5990	1.5220	0.0225
1982–83	1.4111	1.2735	1.2151	0.0220
1983–84	1.3159	1.2311	1.1538	0.0213
1984–85	1.3478	1.2086	1.1640	0.0212
1985–86	1.1665	1.0830	1.0490	0.0225
1986–87	1.2025	1.1845	1.1351	0.0229
1987–88	1.1362	1.1179	1.0397	0.0246
1988–89	0.9233	0.8943	0.8392	0.0265
1989–90	0.8740	0.8599	0.7752	0.0252
1990–91	0.8096	0.8182	0.7858	0.0247
1991–92	0.7962	0.7721	0.7476	0.0240
1992–93	0.7912	0.7896	0.7701	0.0244
1993–94	0.8967	0.8867	0.8892	0.0270
1994–95	0.8822	0.8784	0.8427	0.0281
1995–96	0.8538	0.8166	0.7969	0.0289
1996–97	0.8038	0.7536	0.7518	0.0281
1997–98	0.7636	0.7101	0.6896	0.0288
1998–99	0.8418	0.7984	0.7590	0.0294
1999–00	0.9627	0.8396	0.8037	0.0340
2000–01	0.8566	0.8686	0.8501	0.0360
2001–02	1.0473	1.0548	1.0445	0.0414
2002–03	1.5306	1.6612	1.6513	0.0452
2003–04	1.5493	1.6089	1.6925	0.0482
2004–05	1.7341	1.8425	2.0084	0.0471
2005–06	2.1911	2.3832	2.7595	0.0494
2006–07	2.3506	2.5319	2.8868	0.0501
2007–08	3.1867	3.2144	3.6167	0.0452
2008–09	2.8472	3.1981	3.6701	0.0479
2009–10	2.3856	2.6979	3.0492	0.0402
2010–11	2.2801	2.5613	2.9472	0.0446

Table 72: Seasonal standardised indices with associated standard error and the corresponding arithmetic CPUE (kg/potlift) for CRA 4 from AW 1979–80 through AW 2010–11

Fishing	AW season			SS season		
year	Arithmetic	Standardised	s.e.	Arithmetic	Standardised	s.e.
1979–80	0.7906	0.8183	0.0342	0.9159	0.8593	0.0282
1980–81	0.8460	0.8468	0.0326	0.8200	0.7925	0.0280
1981–82	0.8264	0.8711	0.0329	0.8280	0.8591	0.0294
1982–83	0.8880	0.9396	0.0317	0.9311	0.9327	0.0276
1983–84	0.9162	0.8863	0.0309	0.8972	0.8209	0.0275
1984–85	0.7561	0.7697	0.0304	0.7848	0.7604	0.0288
1985–86	0.6132	0.6378	0.0307	0.7970	0.8220	0.0284
1986–87	0.6751	0.6842	0.0310	0.9321	0.8652	0.0285
1987–88	0.5988	0.5745	0.0322	0.8041	0.7769	0.0289
1988–89	0.5041	0.4968	0.0326	0.6897	0.6411	0.0303
1989–90	0.4792	0.4544	0.0318	0.6630	0.6409	0.0284
1990–91	0.4158	0.4262	0.0323	0.5454	0.5789	0.0294
1991–92	0.3992	0.4292	0.0297	0.5701	0.5806	0.0292
1992–93	0.4458	0.4115	0.0296	0.5766	0.5680	0.0290
1993–94	0.5039	0.4492	0.0291	0.6731	0.6590	0.0331
1994–95	0.6064	0.5856	0.0290	0.8357	0.7958	0.0384
1995–96	0.7943	0.7253	0.0308	1.0699	1.0927	0.0467
1996–97	0.9943	1.0370	0.0316	1.5449	1.4157	0.0694
1997–98	1.2166	1.2326	0.0334	1.6700	1.6913	0.0833
1998–99	1.2750	1.3389	0.0337	1.8419	2.1022	0.0748
1999–00	1.2424	1.3042	0.0327	1.7168	1.6762	0.0768
2000–01	1.2028	1.0377	0.0343	1.8800	1.9458	0.0675
2001–02	1.0130	0.9342	0.0329	1.3841	1.4520	0.0587
2002–03	0.9807	0.9622	0.0333	1.7350	1.6758	0.0505
2003–04	1.0116	1.0082	0.0351	1.4876	1.6002	0.0470
2004–05	0.7852	0.7306	0.0353	1.3025	1.3147	0.0401
2005–06	0.7885	0.7255	0.0397	0.9446	0.9361	0.0383
2006–07	0.5129	0.6075	0.0401	0.7074	0.7588	0.0329
2007–08	0.4848	0.5238	0.0465	0.6413	0.6717	0.0364
2008–09	0.5242	0.5746	0.0514	0.8149	0.8524	0.0442
2009–10	0.8366	0.8883	0.0508	1.2513	1.1974	0.0501
2010–11	0.8458	0.8510	0.0404	1.1771	1.2737	0.0428

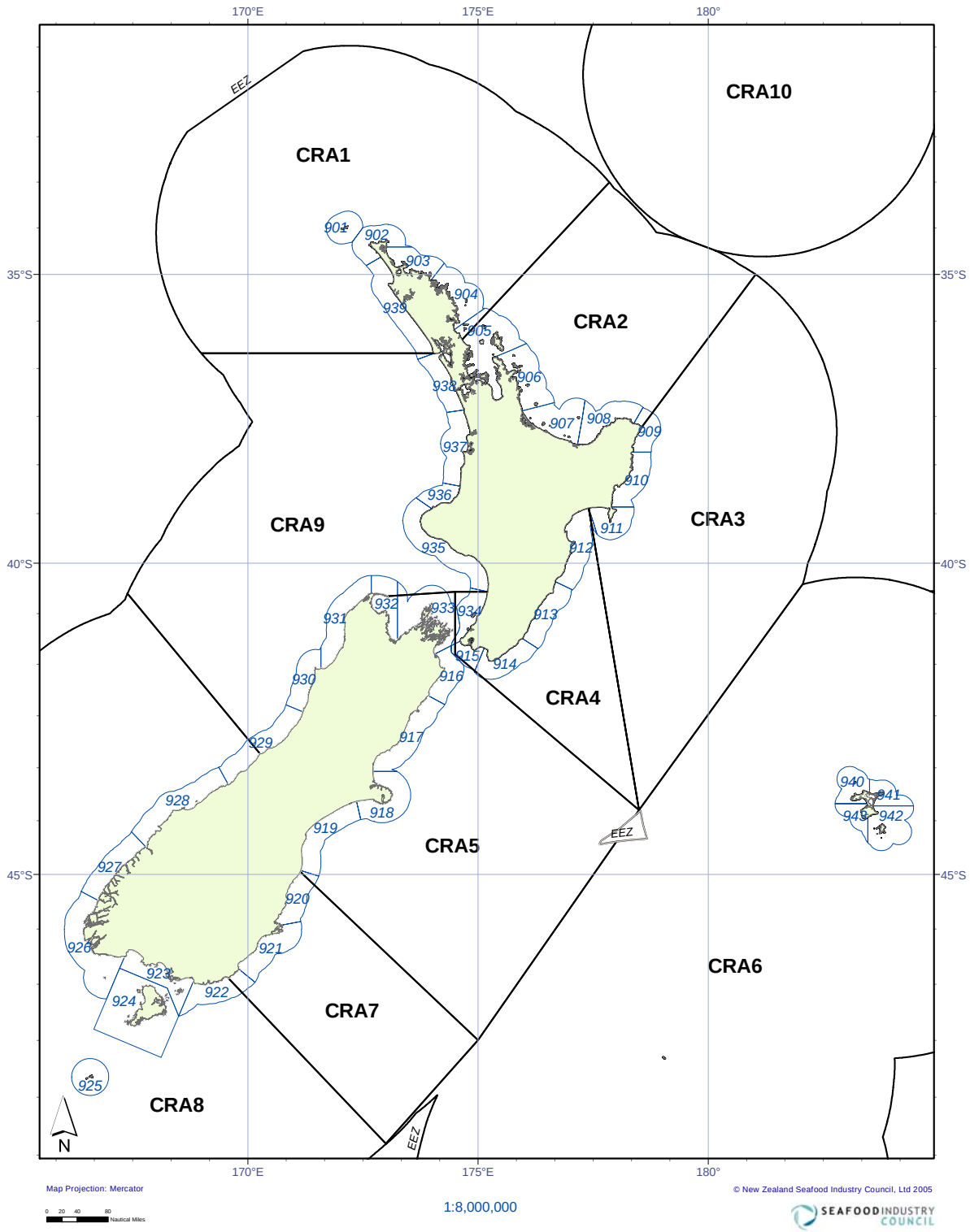

Figure 1: Map of rock lobster statistical areas and Quota Management Areas.

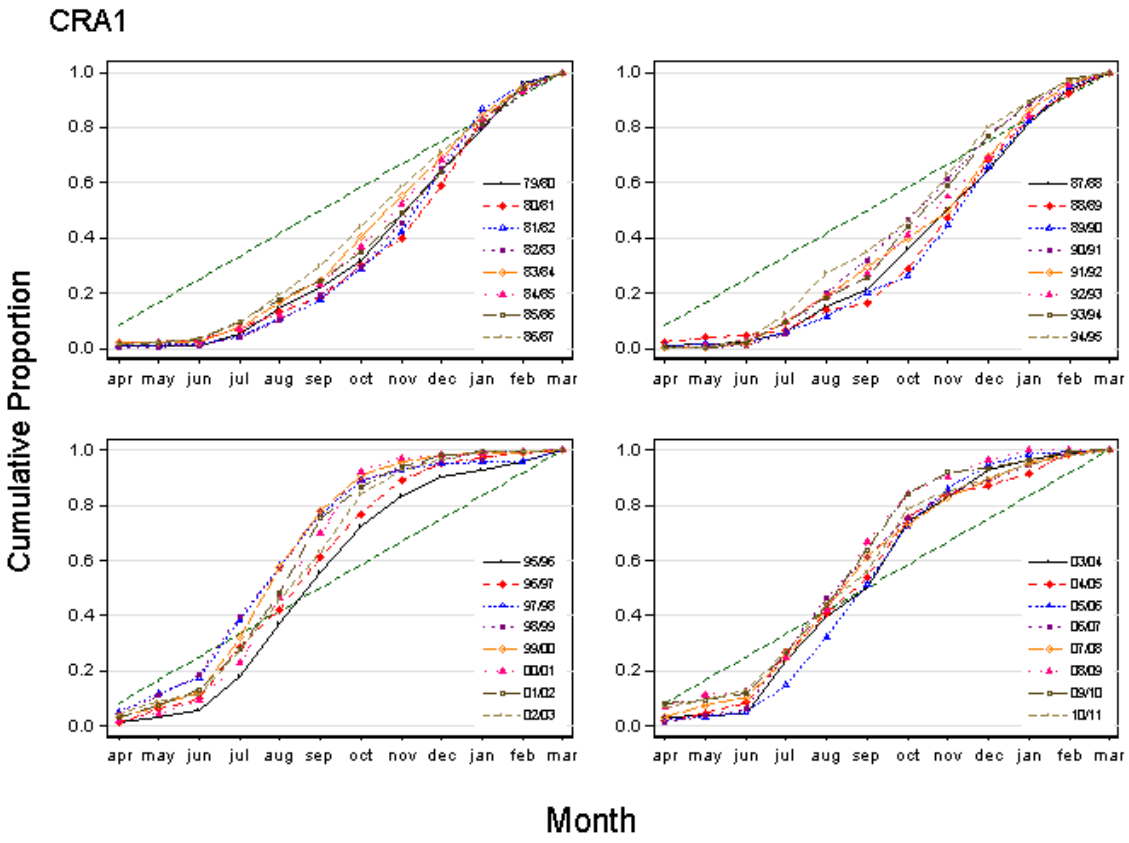

Figure 2: Cumulative catch percentages by fishing month for CRA 1, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

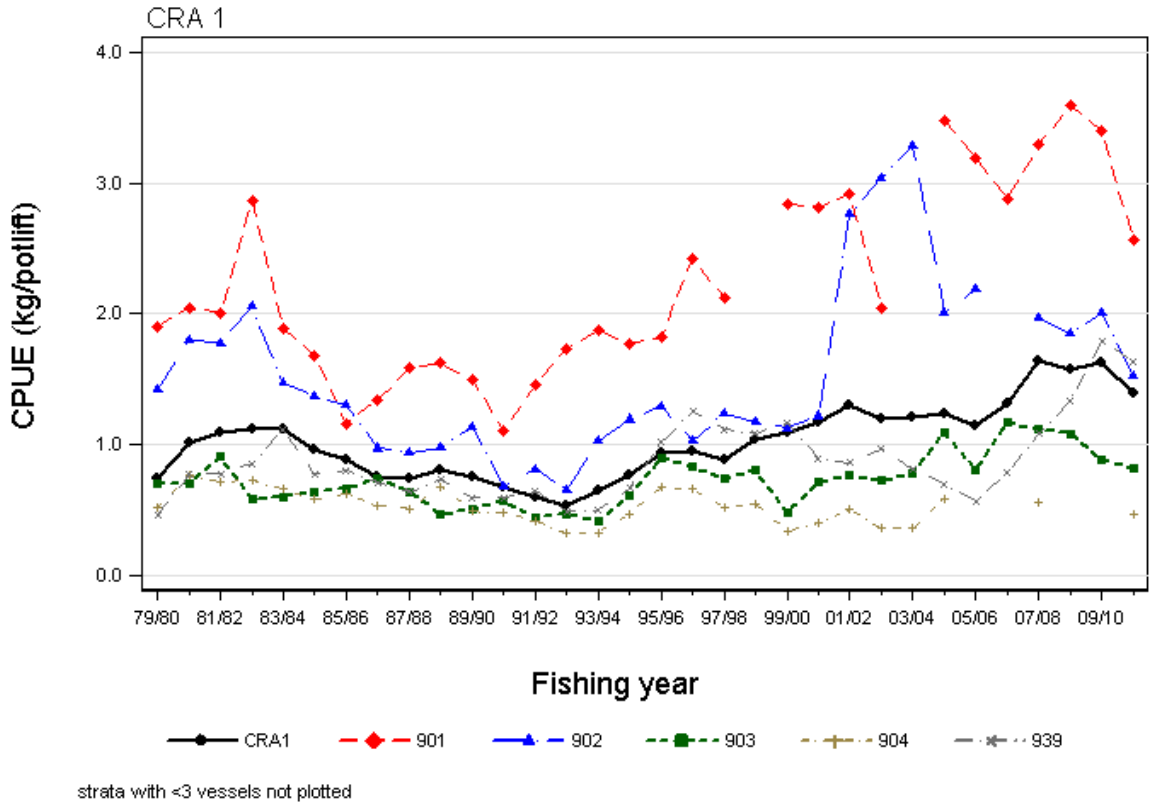

Figure 3: Arithmetic CPUE for CRA 1 by fishing year and statistical area from 1979–80 to 2010–11.

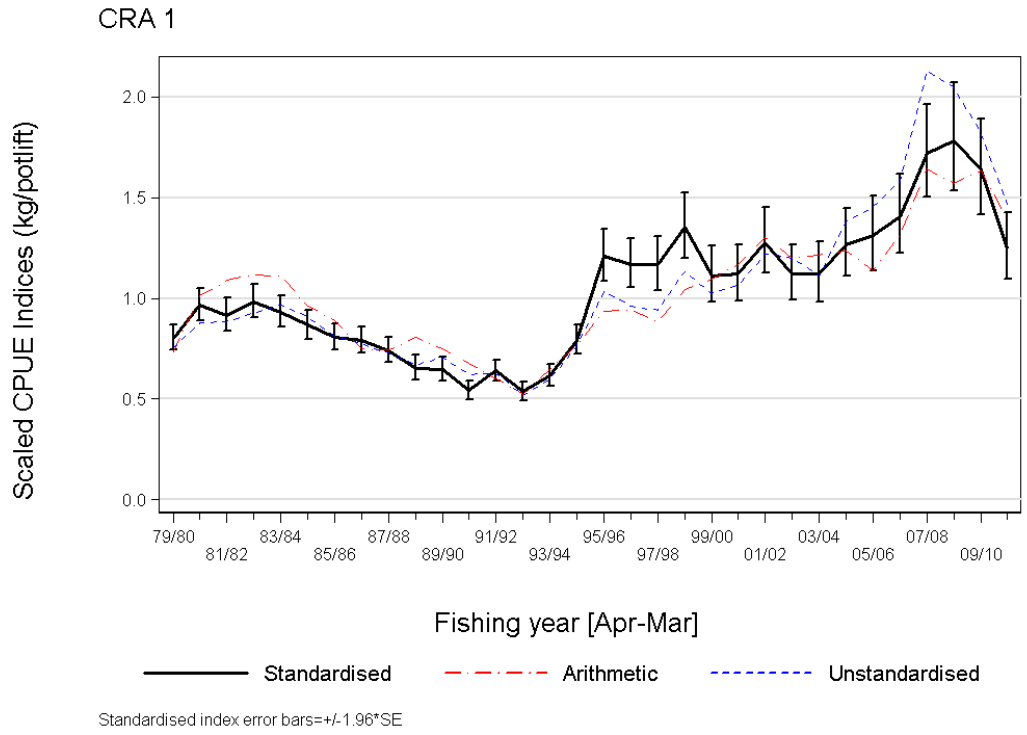

Figure 4: Annual CPUE indices for CRA 1: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.99 kg/potlift.

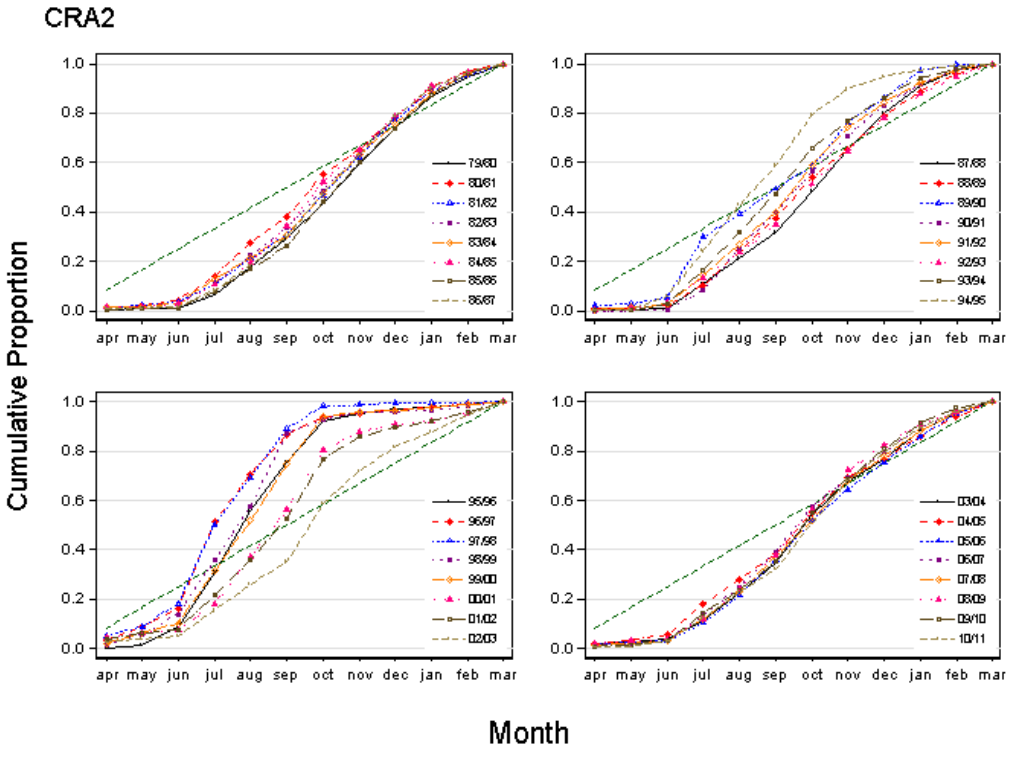

Figure 5: Cumulative catch percentages by fishing month for CRA 2, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

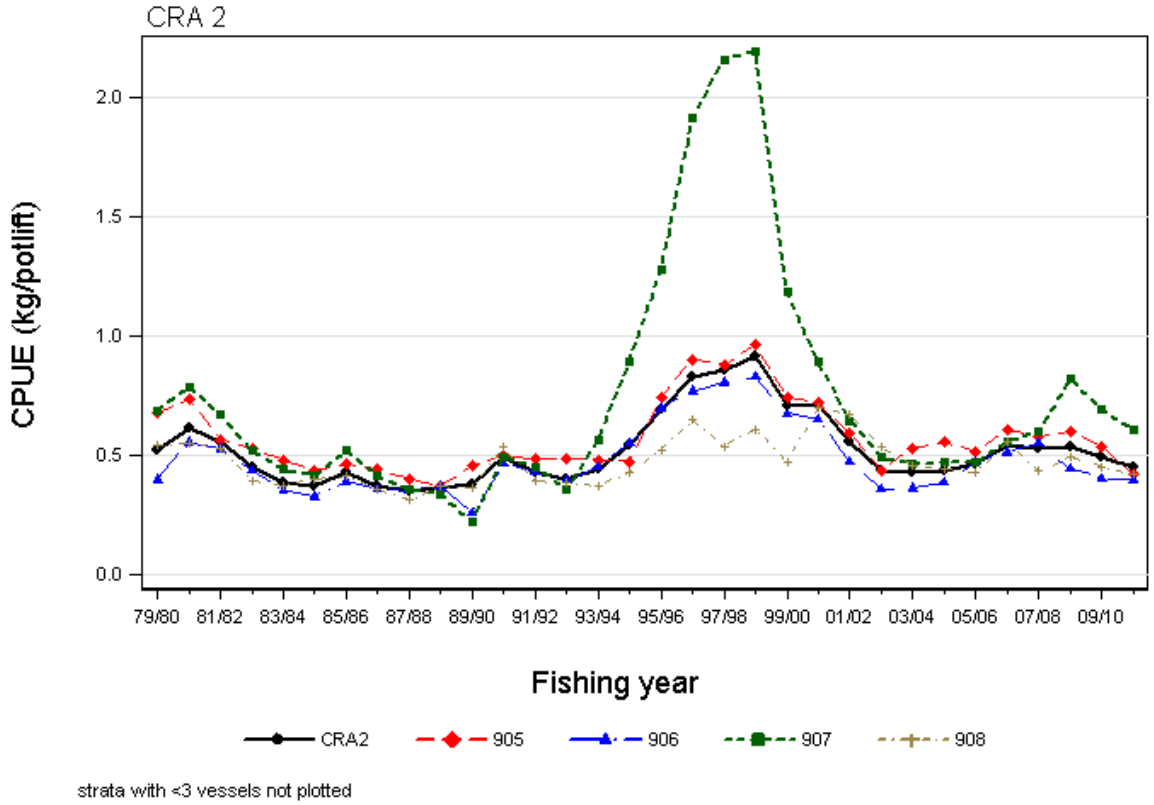

Figure 6: Arithmetic CPUE for CRA 2 by fishing year and statistical area from 1979–80 to 2010–11.

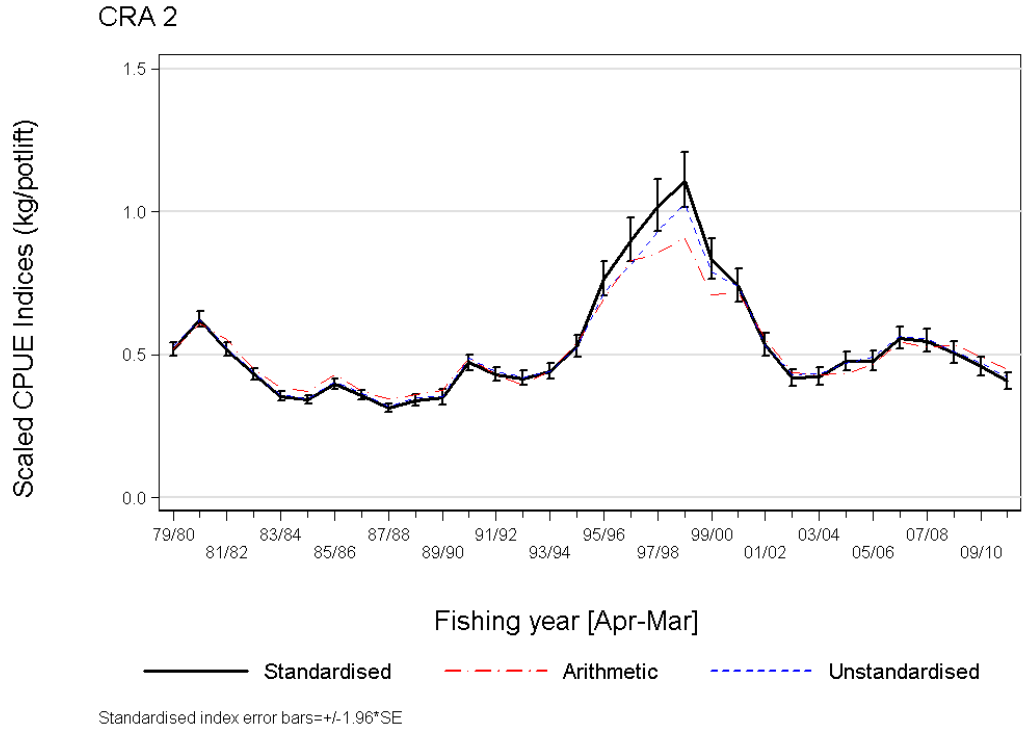

Figure 7: Annual CPUE indices for CRA 2: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.50 kg/potlift.

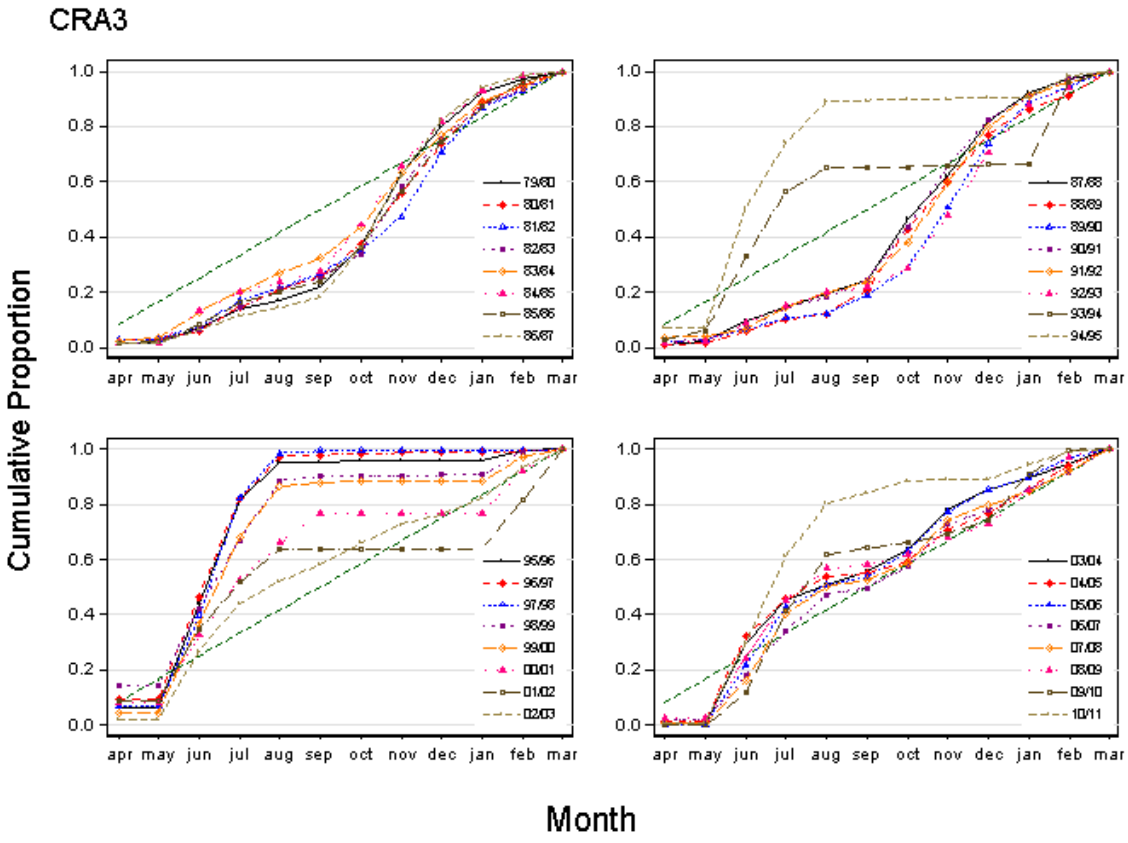

Figure 8: Cumulative catch percentages by fishing month for CRA 3, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

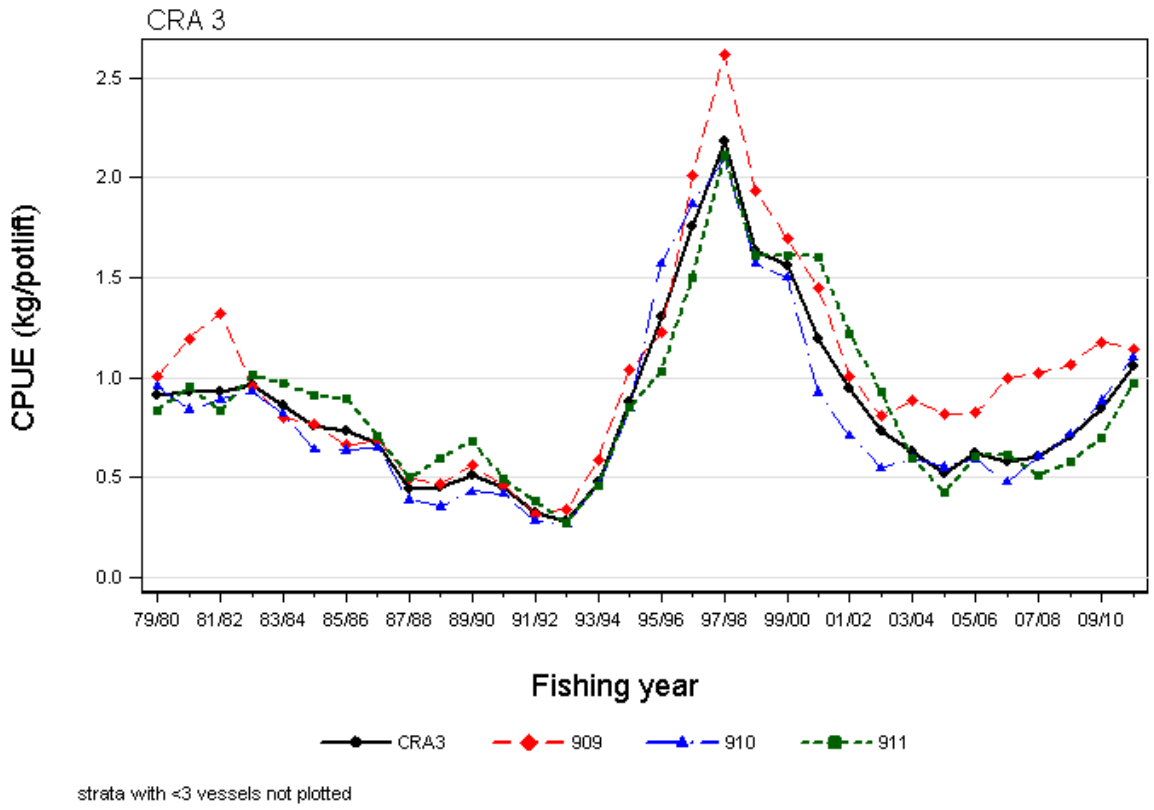

Figure 9: Arithmetic CPUE for CRA 3 by fishing year and statistical area from 1979–80 to 2010–11.

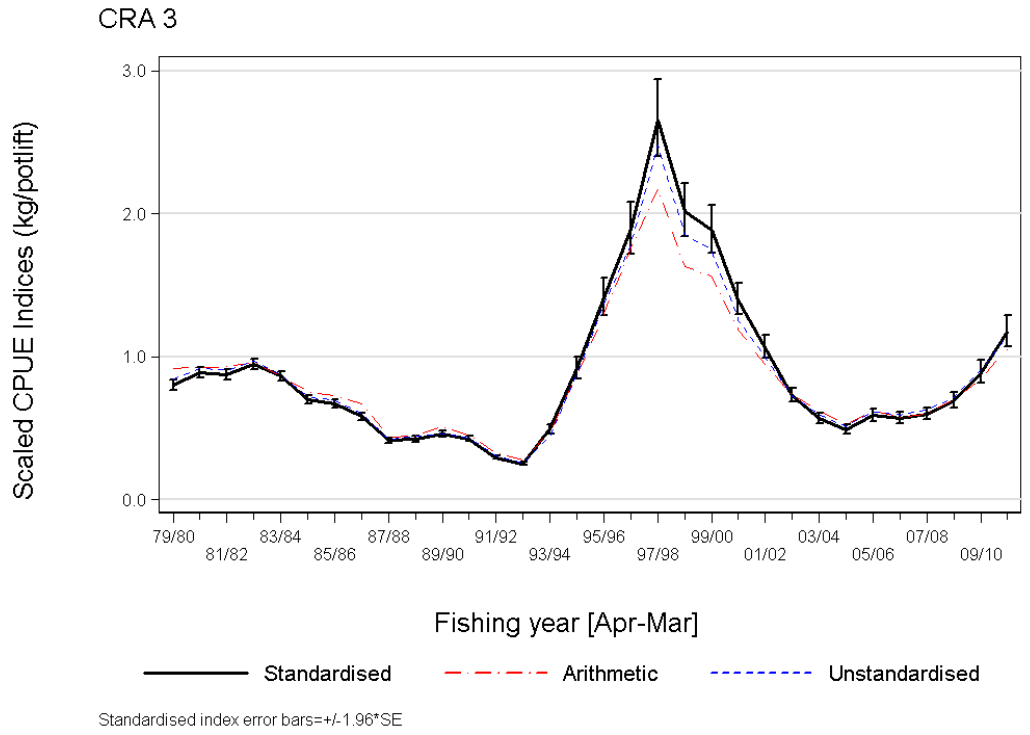

Figure 10: Annual CPUE indices for CRA 3: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.76 kg/potlift.

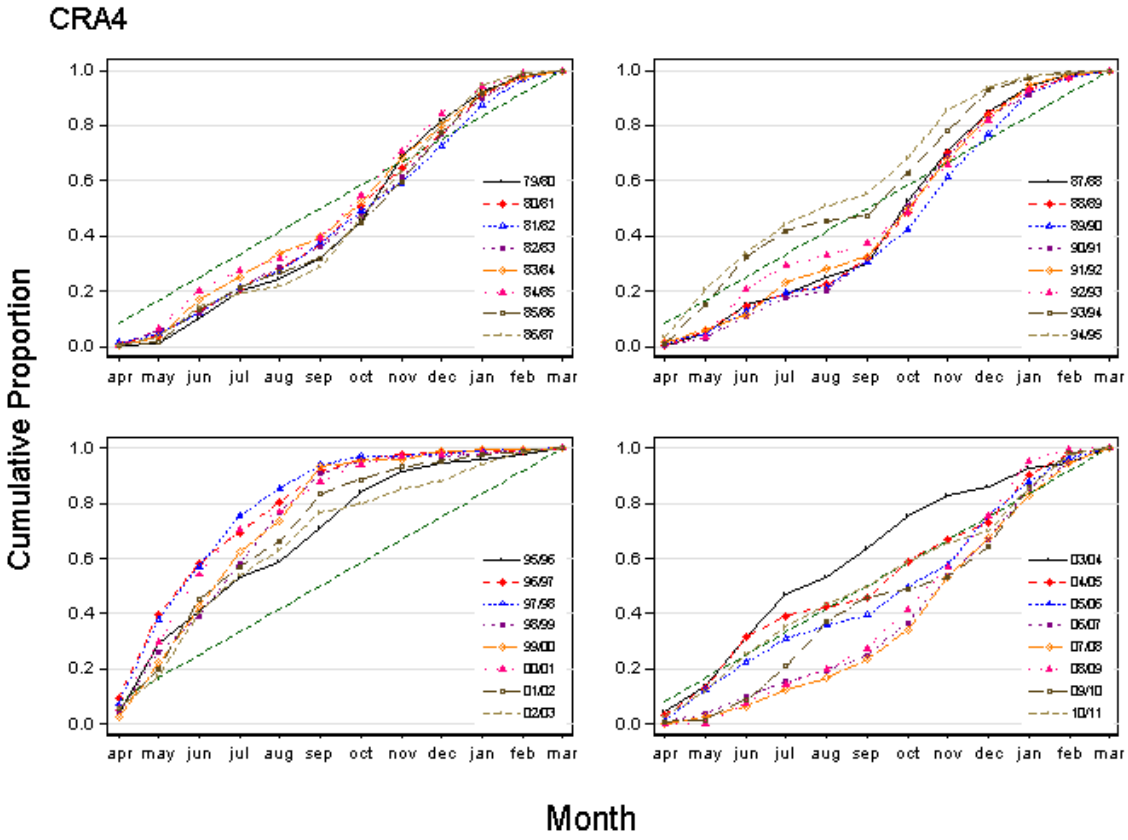

Figure 11: Cumulative catch percentages by fishing month for CRA 4, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

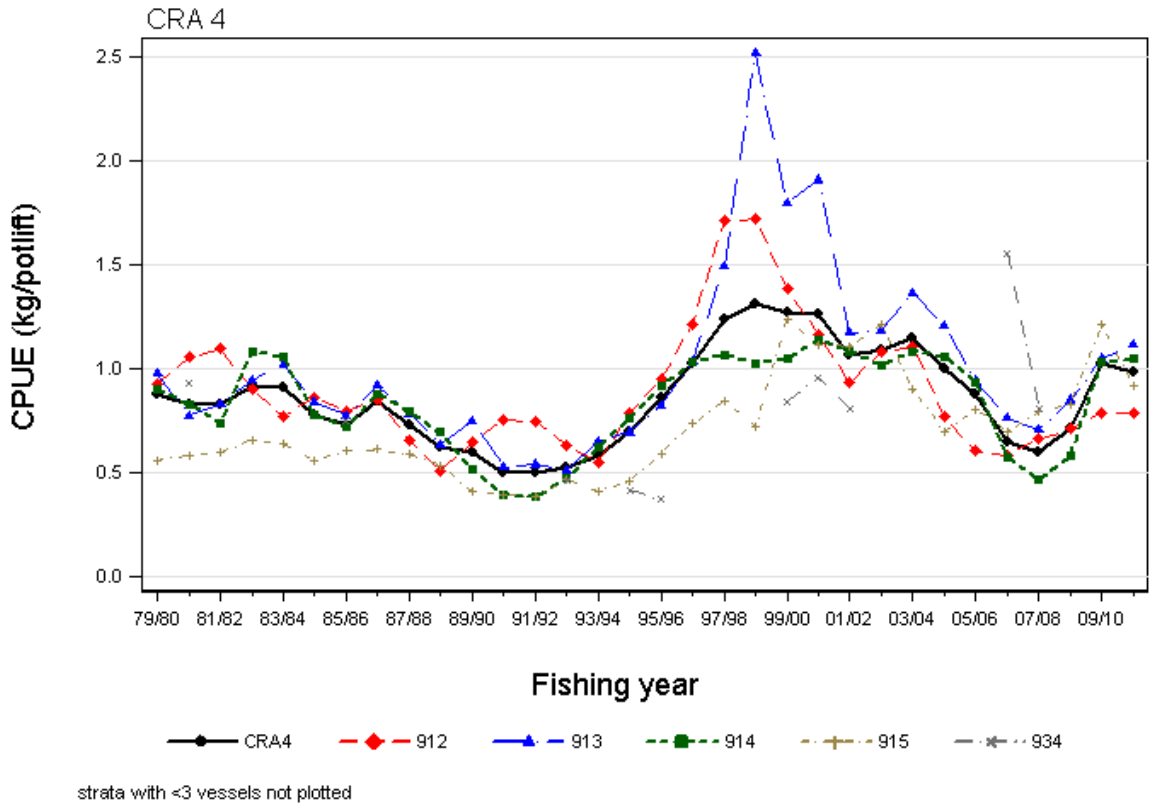

Figure 12: Arithmetic CPUE for CRA 4 by fishing year and statistical area from 1979–80 to 2010–11.

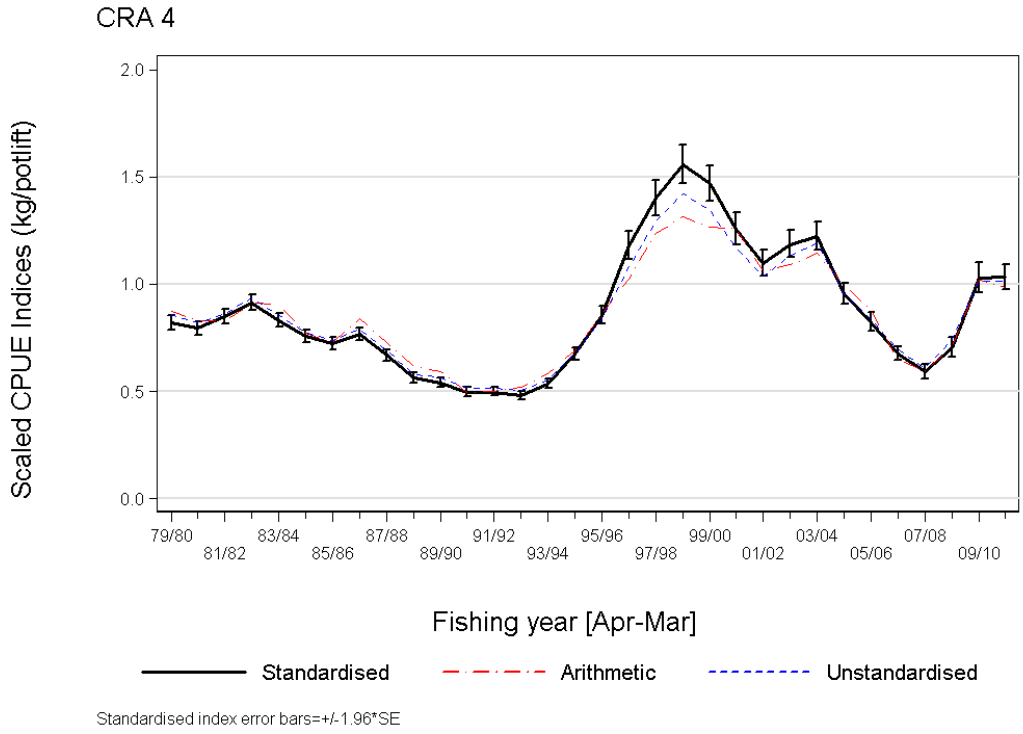

Figure 13: Annual CPUE indices for CRA 4: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.83 kg/potlift.

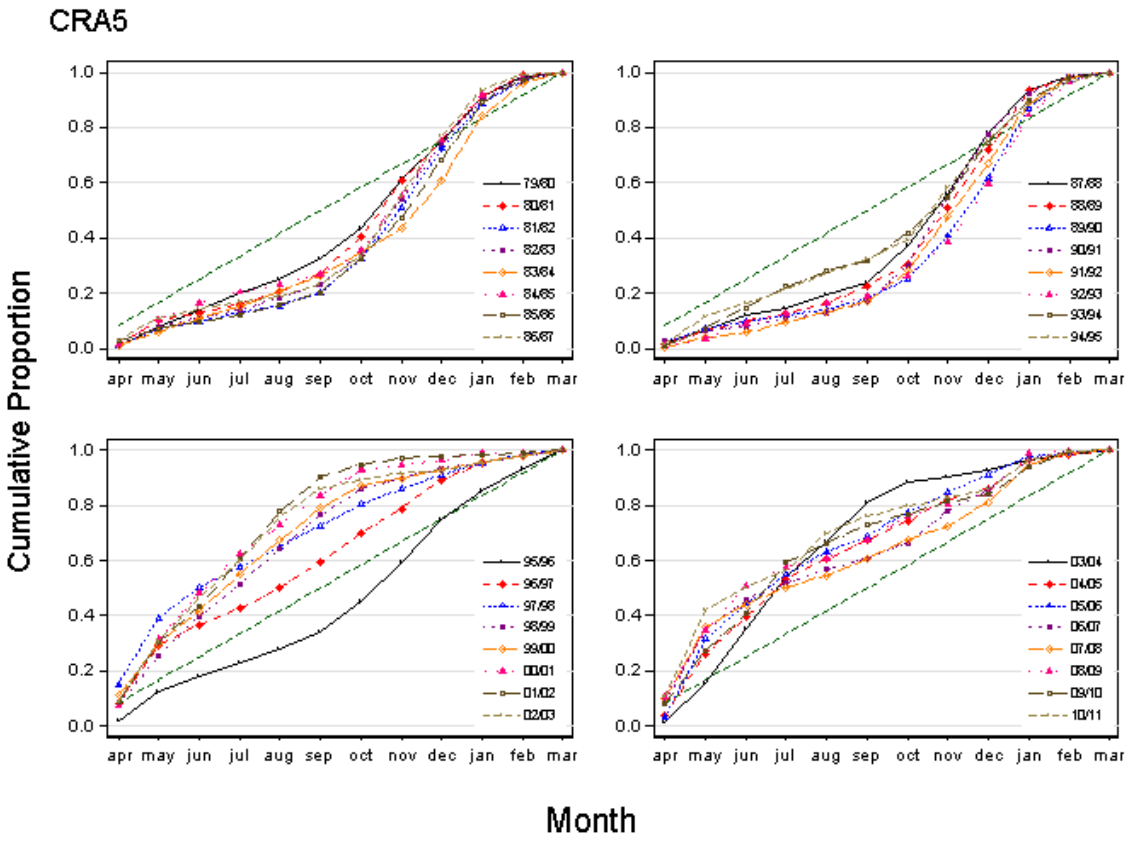

Figure 14: Cumulative catch percentages by fishing month for CRA 5, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

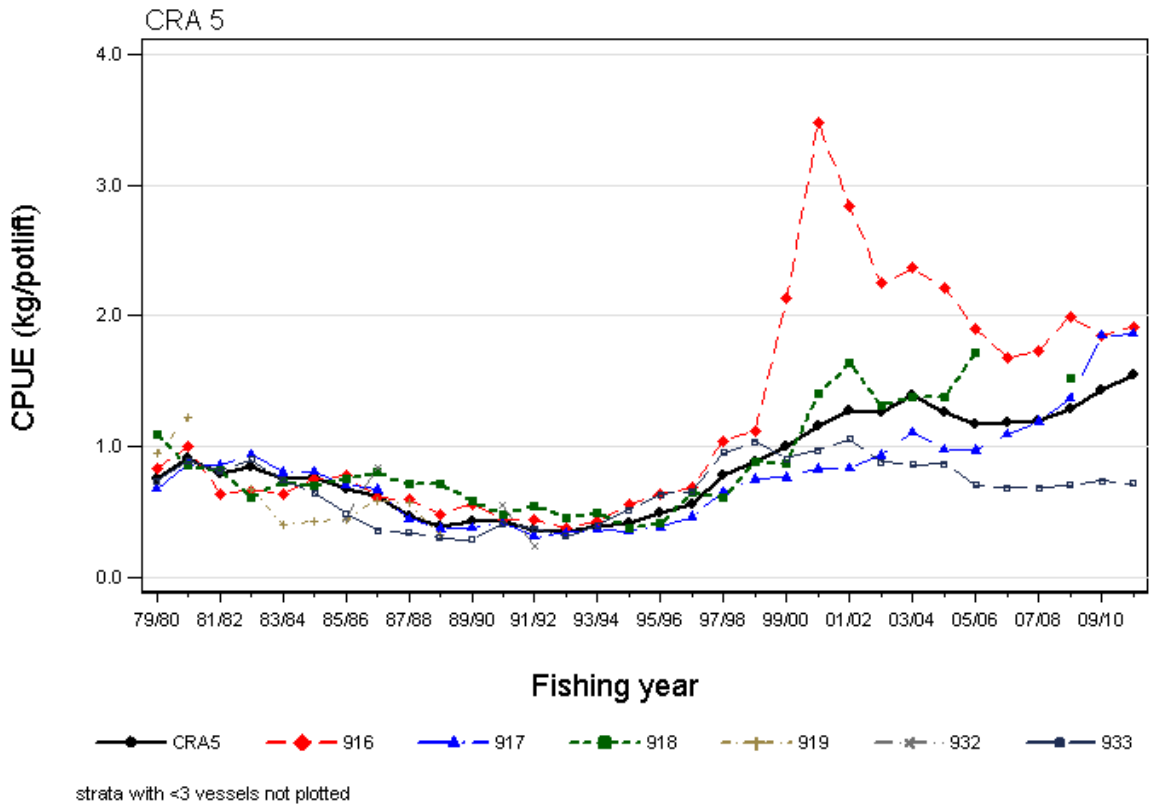

Figure 15: Arithmetic CPUE for CRA 5 by fishing year and statistical area from 1979–80 to 2010–11.

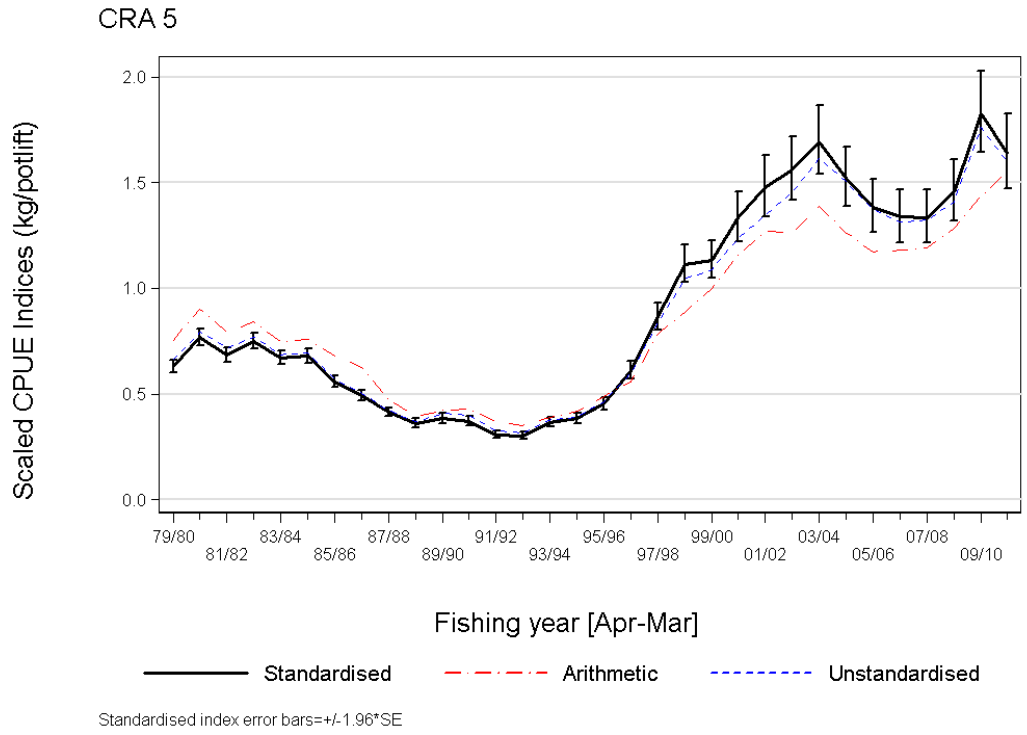

Figure 16: Annual CPUE indices for CRA 5: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.77 kg/potlift.

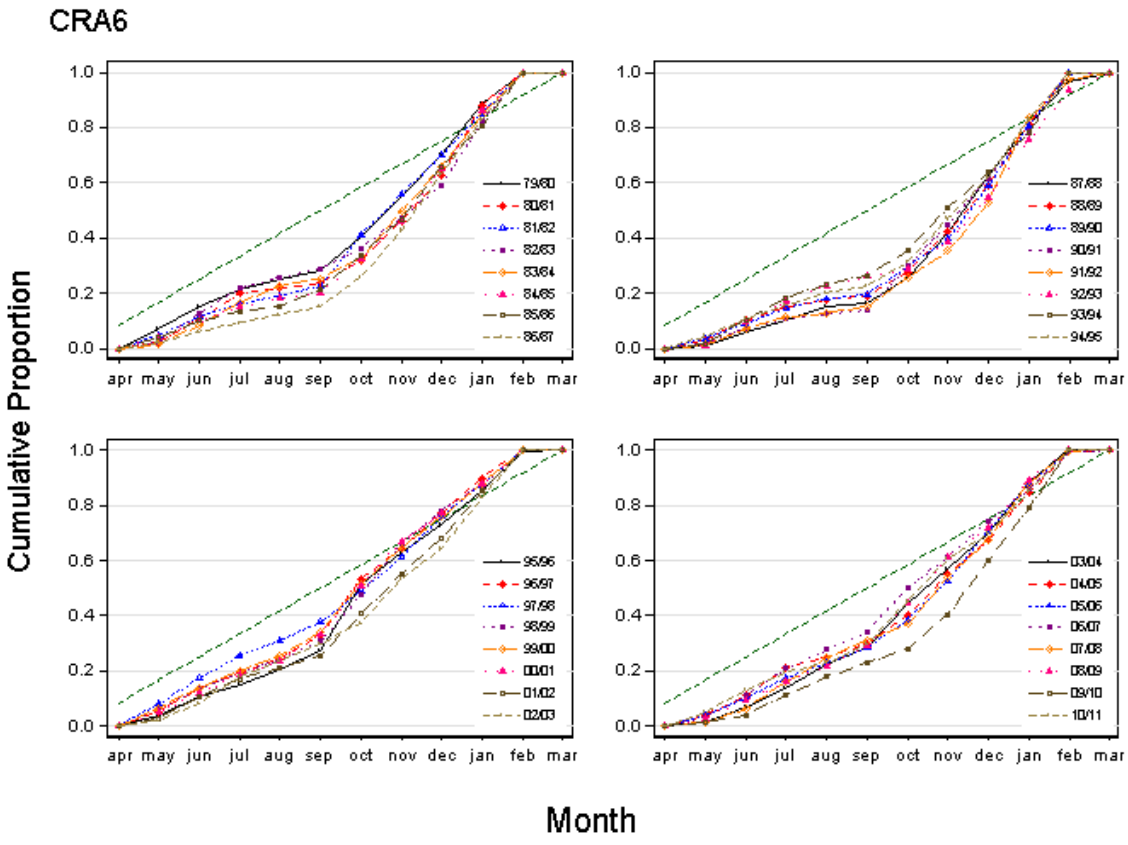

Figure 17: Cumulative catch percentages by fishing month for CRA 6, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

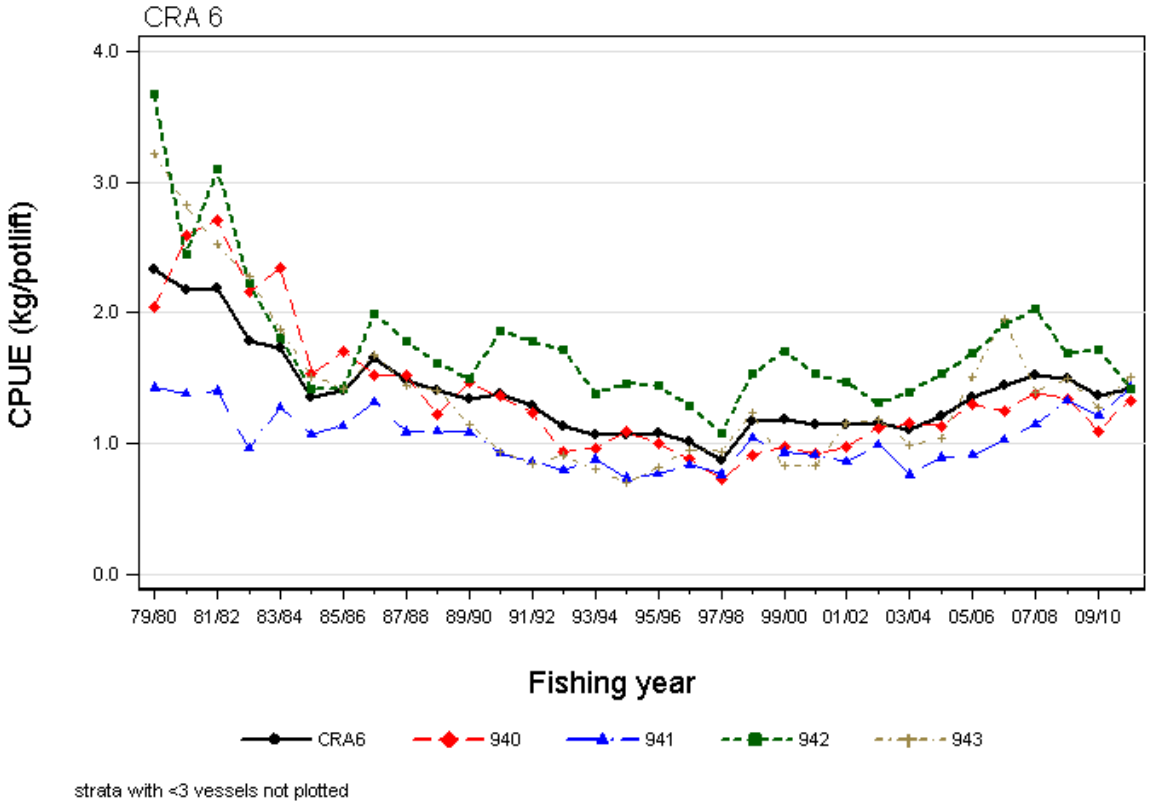

Figure 18: Arithmetic CPUE for CRA 6 by fishing year and statistical area from 1979–80 to 2010–11.

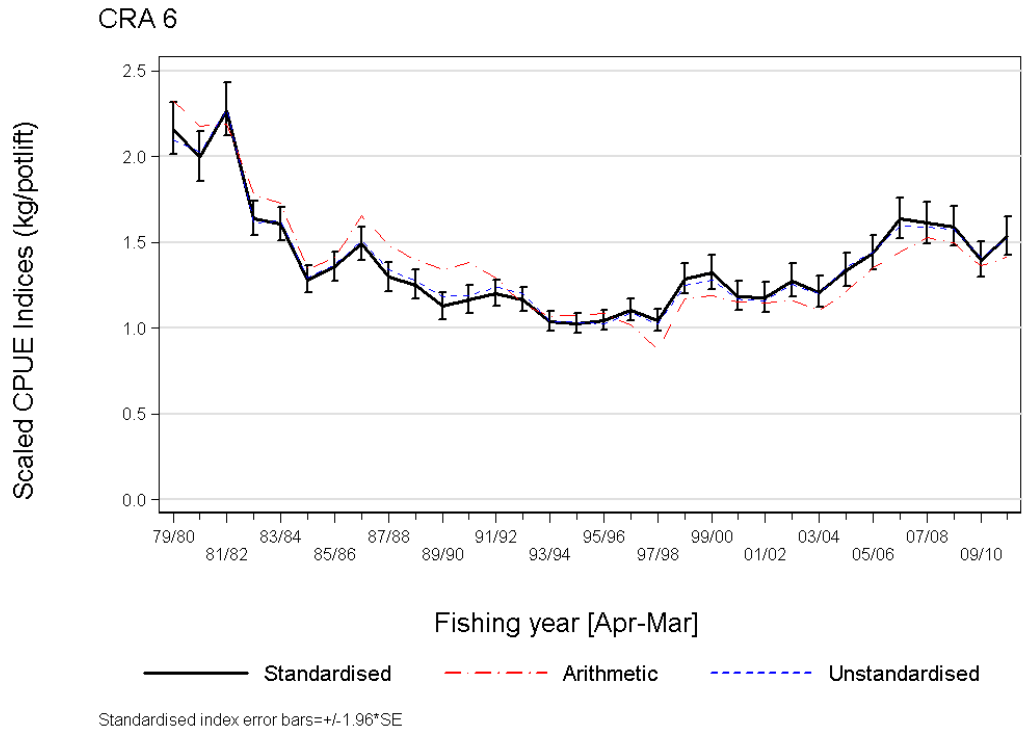

Figure 19: Annual CPUE indices for CRA 6: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 1.35 kg/potlift.

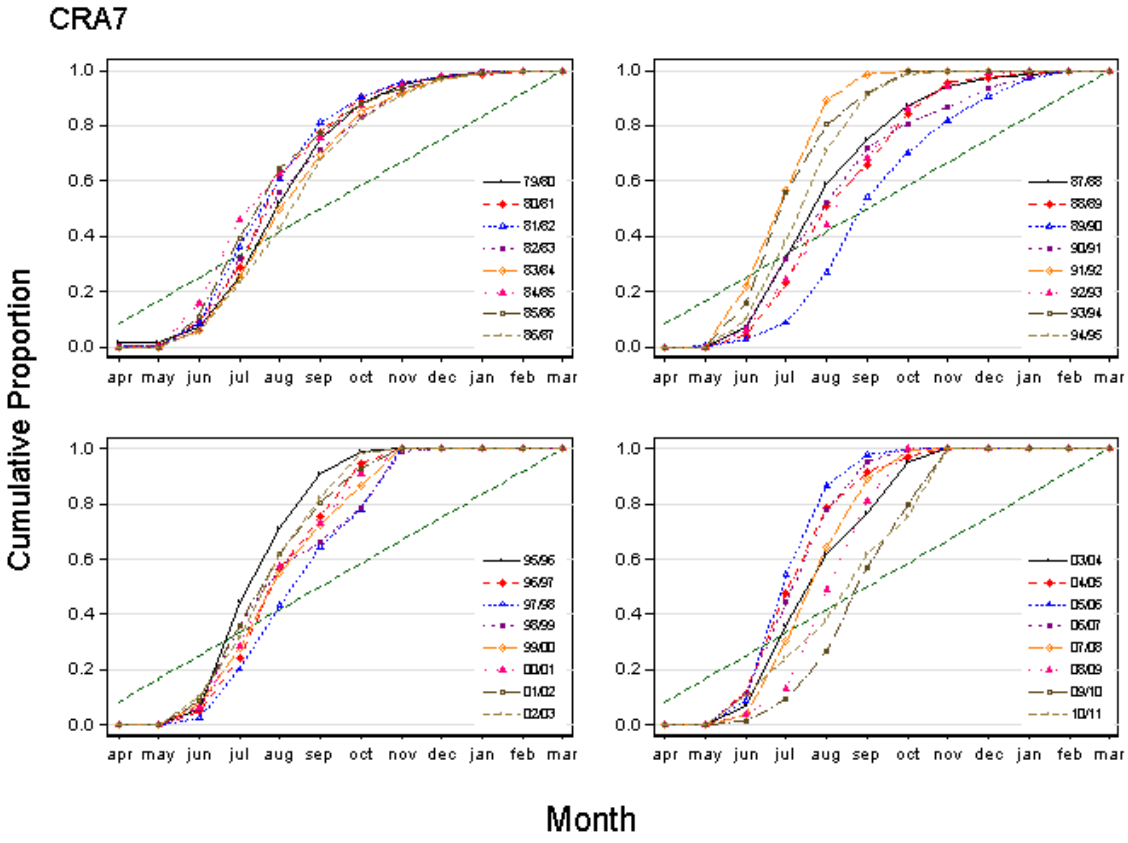

Figure 20: Cumulative catch percentages by fishing month for CRA 7, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

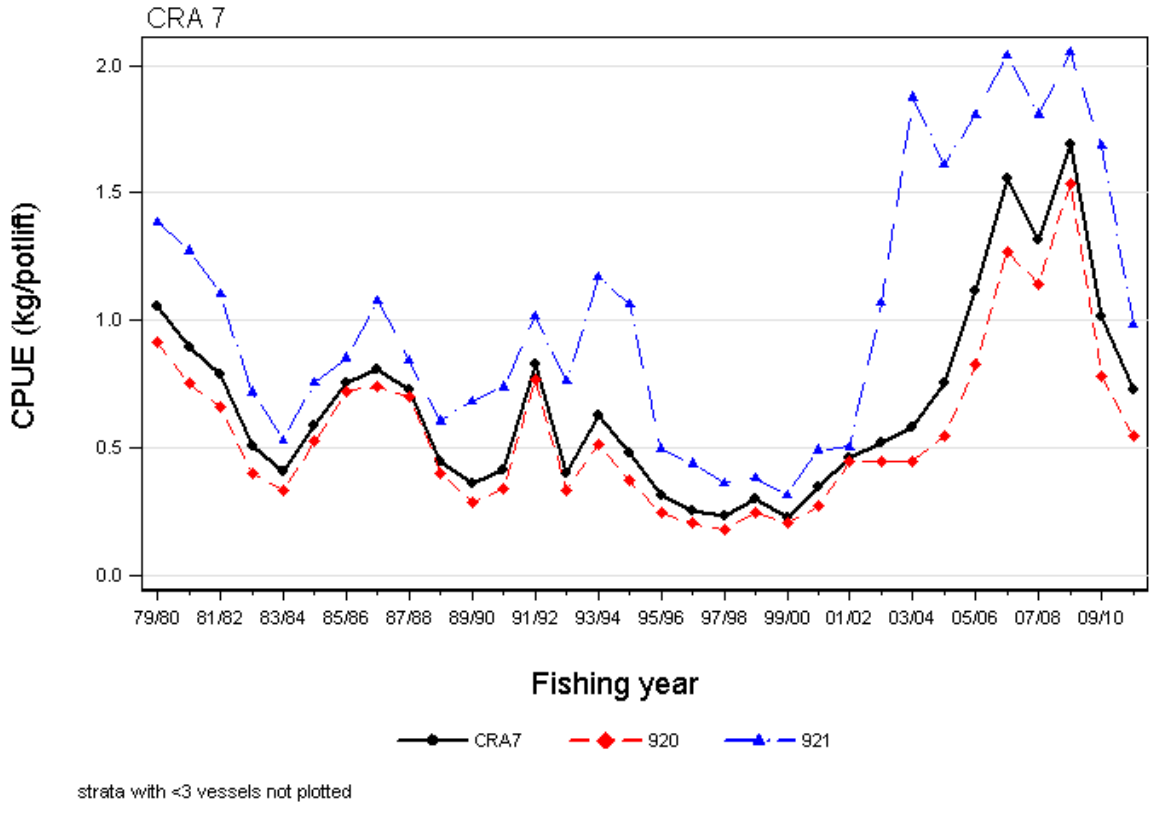

Figure 21: Arithmetic CPUE for CRA 7 by fishing year and statistical area from 1979–80 to 2010–11.

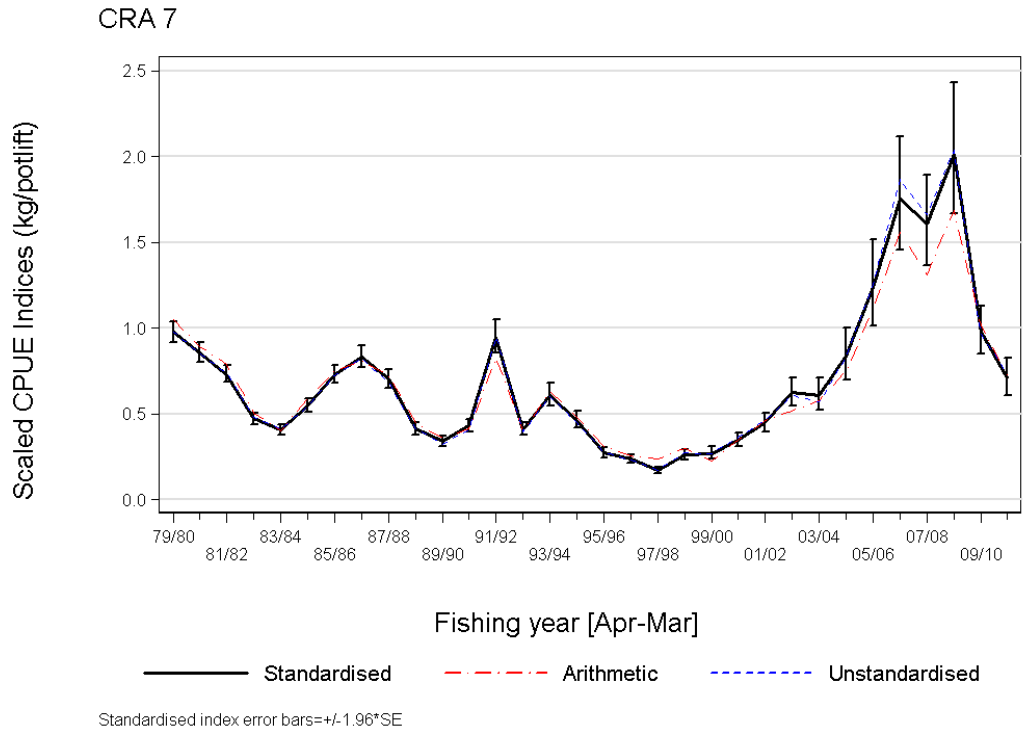

Figure 22: Annual CPUE indices for CRA 7: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 0.58 kg/potlift.

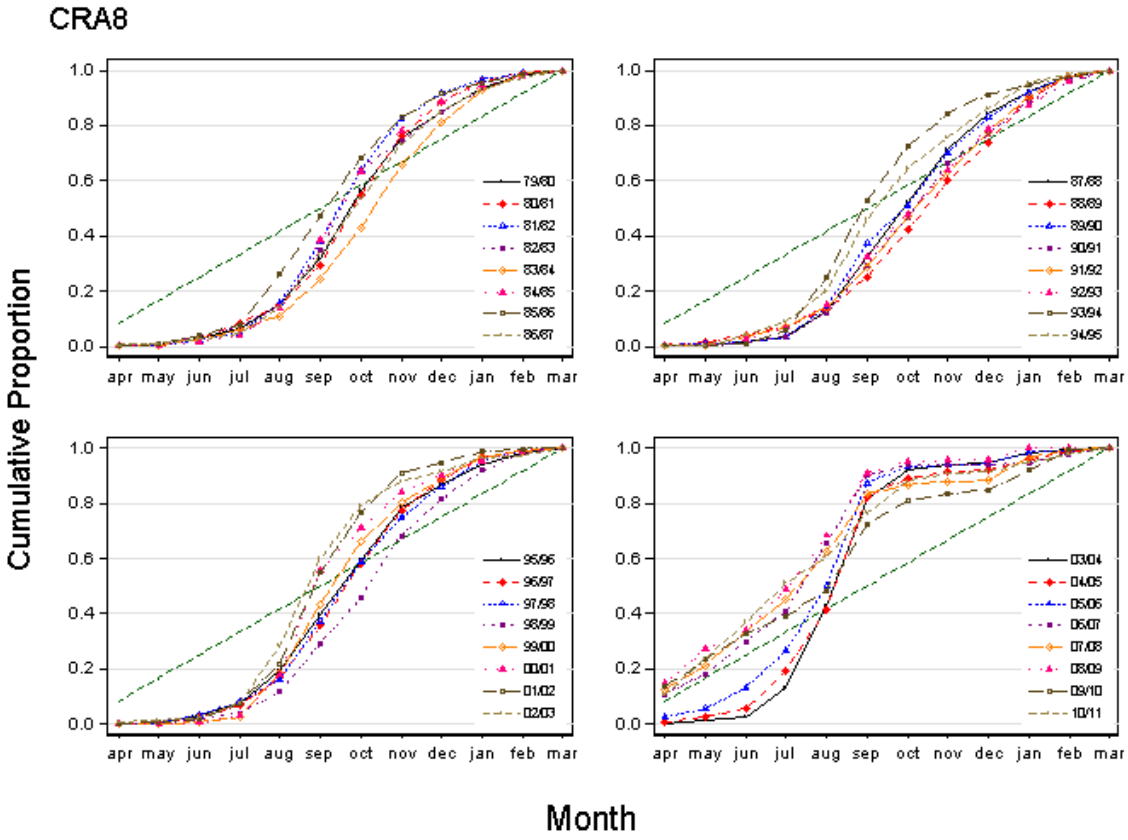

Figure 23: Cumulative catch percentages by fishing month for CRA 8, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

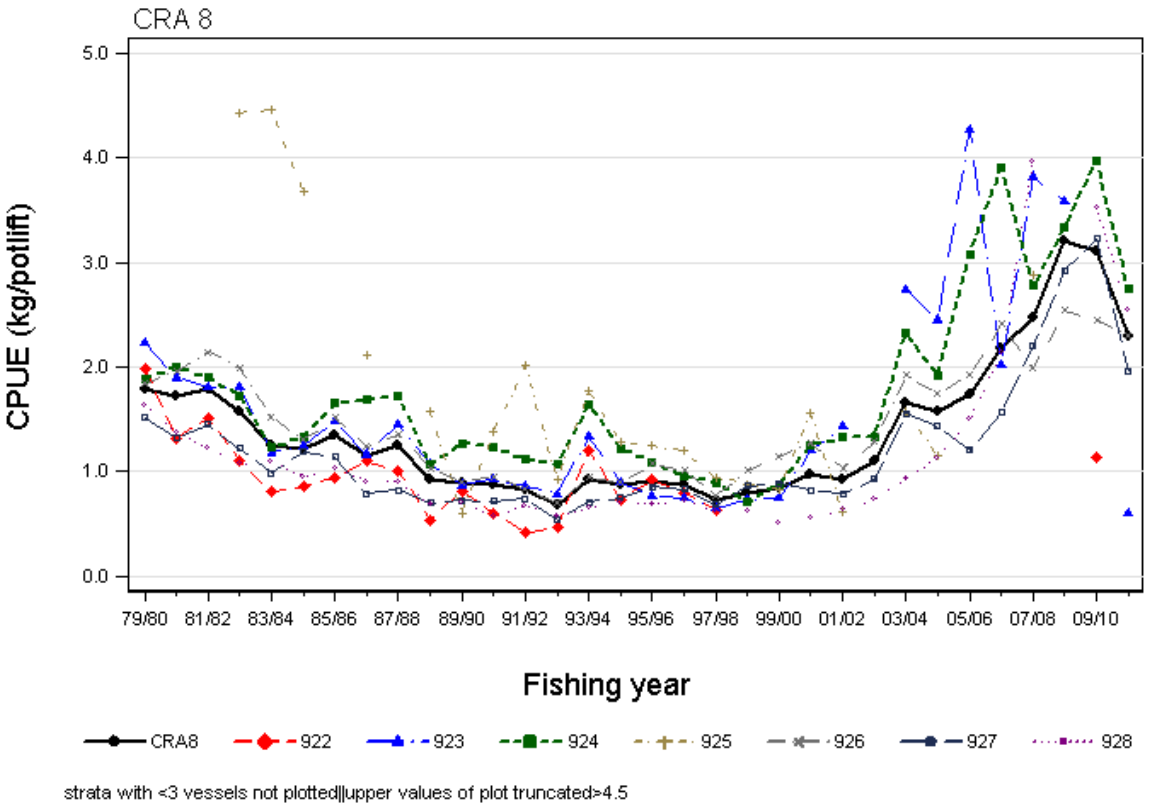

Figure 24: Arithmetic CPUE for CRA 8 by fishing year and statistical area from 1979–80 to 2010–11.

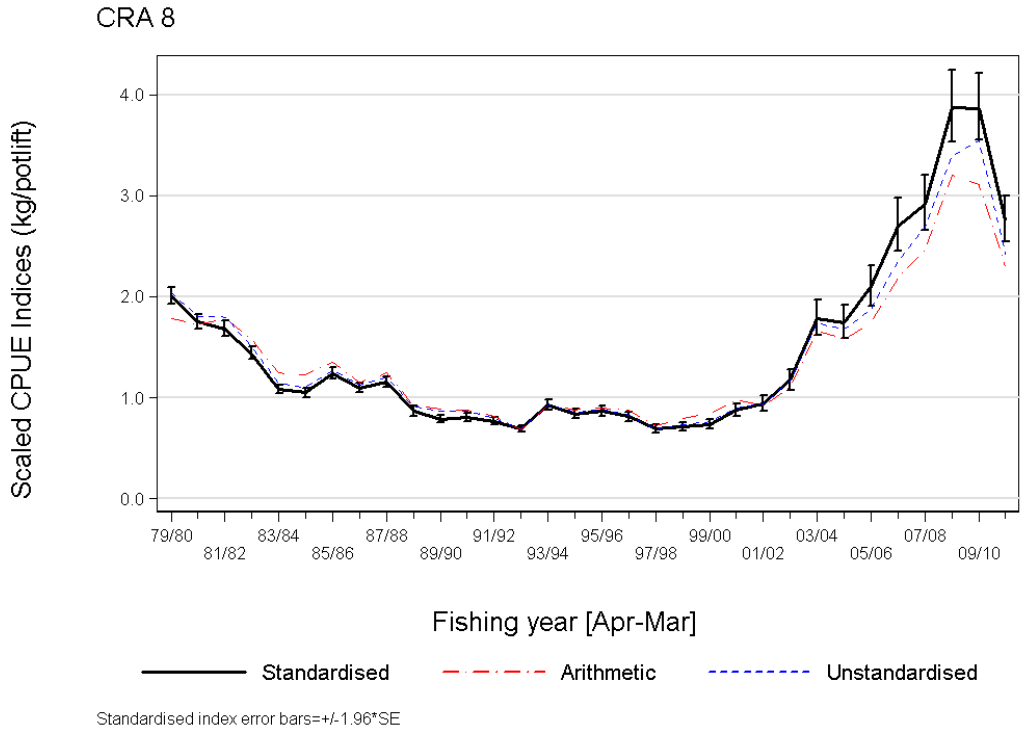

Figure 25: Annual CPUE indices for CRA 8: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. 1979–80 to 2010–11. The geometric mean for each series = 1.26 kg/potlift.

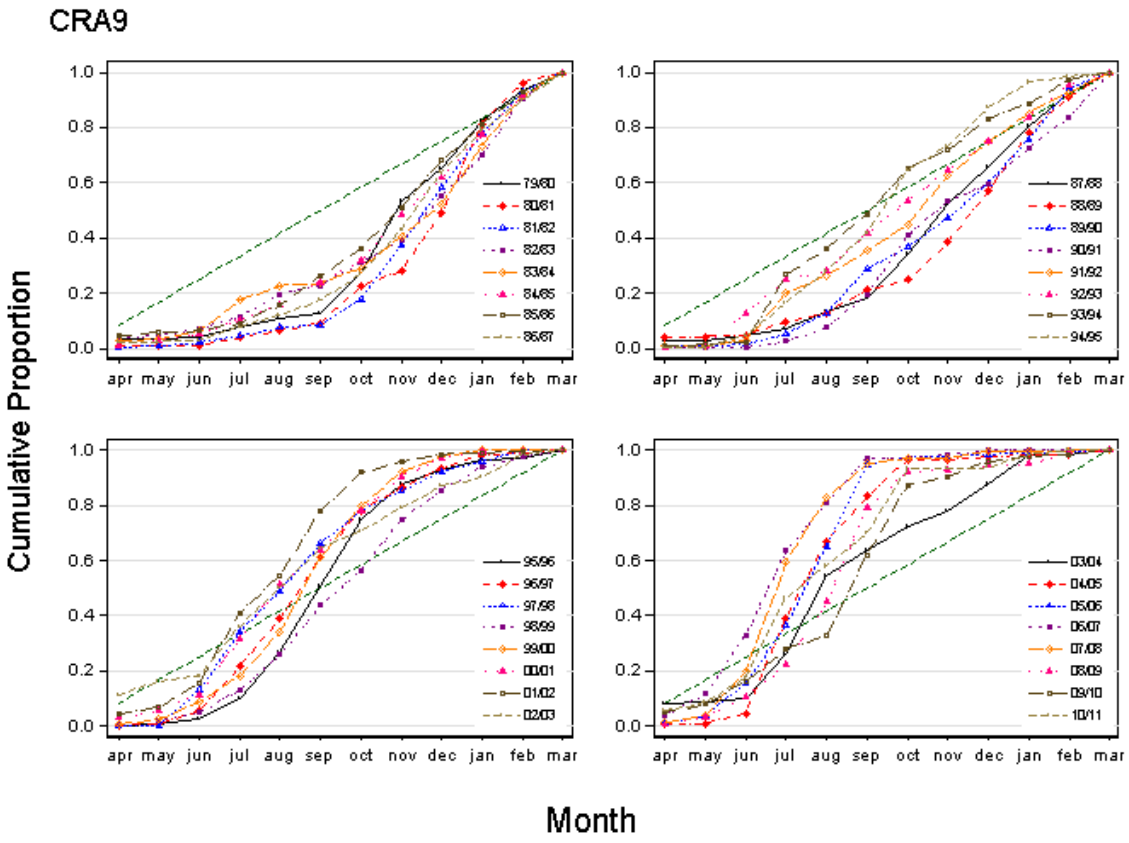

Figure 26: Cumulative catch percentages by fishing month for CRA 9, 1979–80 to 2010–11. Dotted line provides a reference equivalent to a uniform distribution of catch across all months.

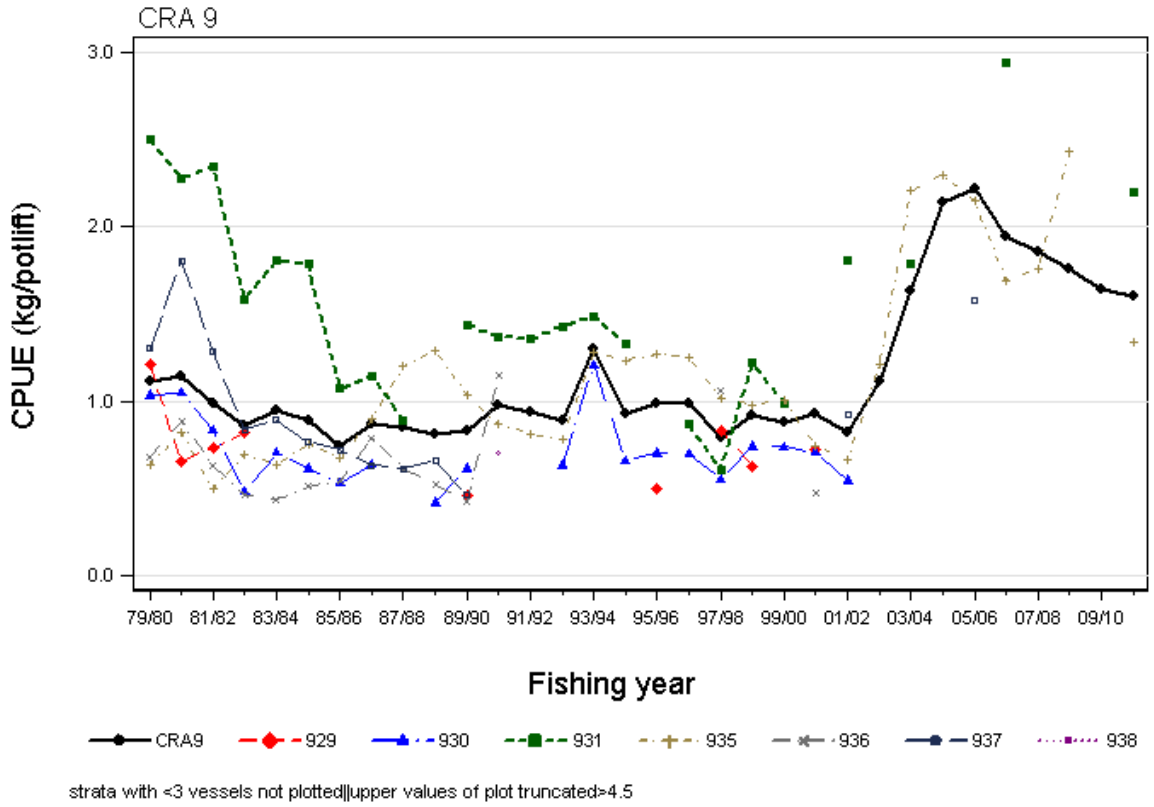

Figure 27: Arithmetic CPUE for CRA 9 by fishing year and statistical area from 1979–80 to 2010–11.

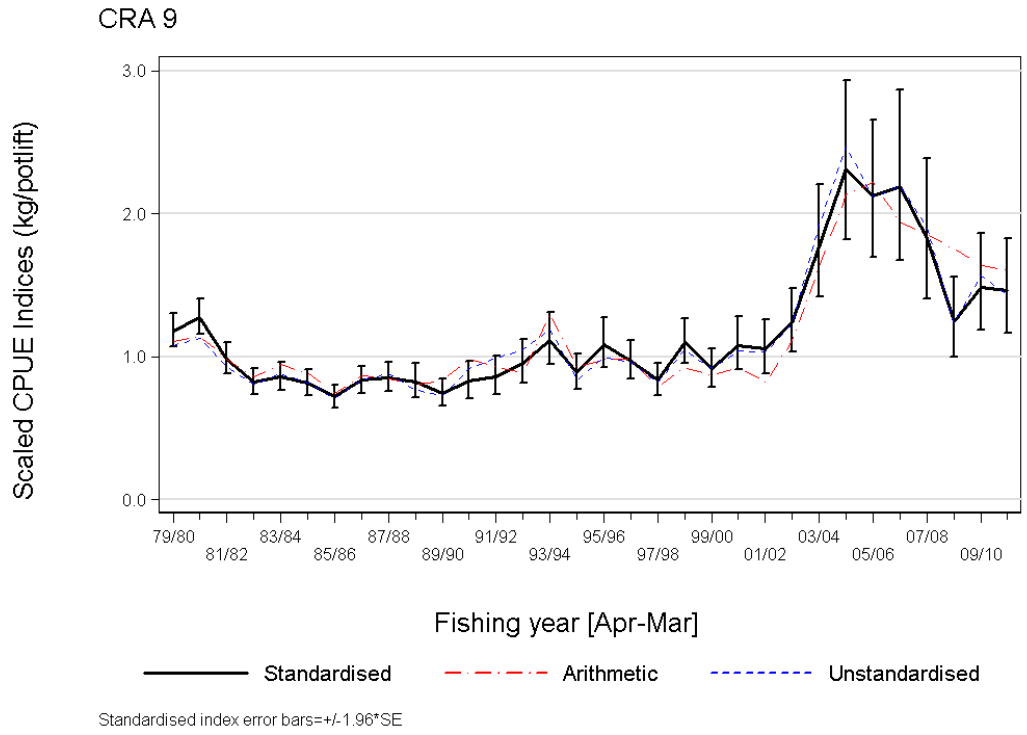

Figure 28: Annual CPUE indices for CRA 9: arithmetic (dashed line), unstandardised (dotted line), and standardised (bold line) ± 2 s.e. from 1979–80 to 2010–11. The geometric mean for each series = 1.10 kg/potlift.

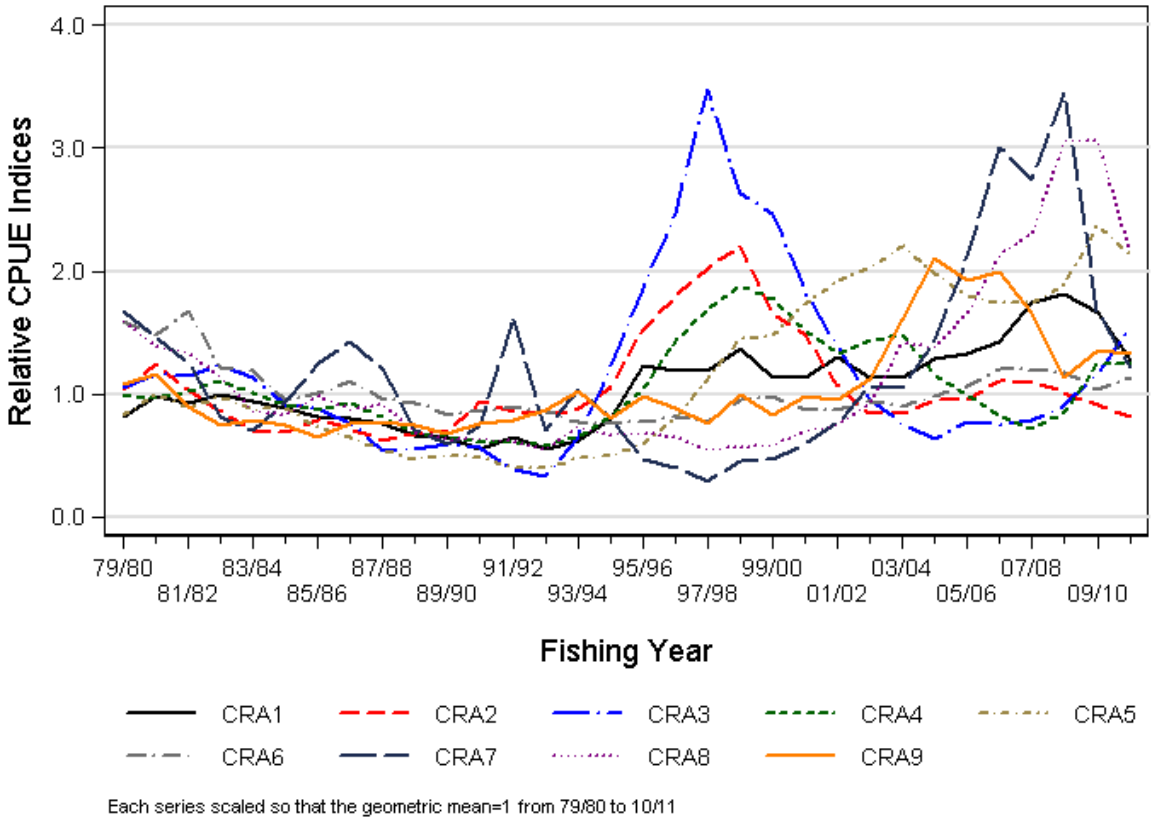

Figure 29: Standardised CPUE from all nine QMAs (see Figure 1) from 1979–80 to 2010–11.

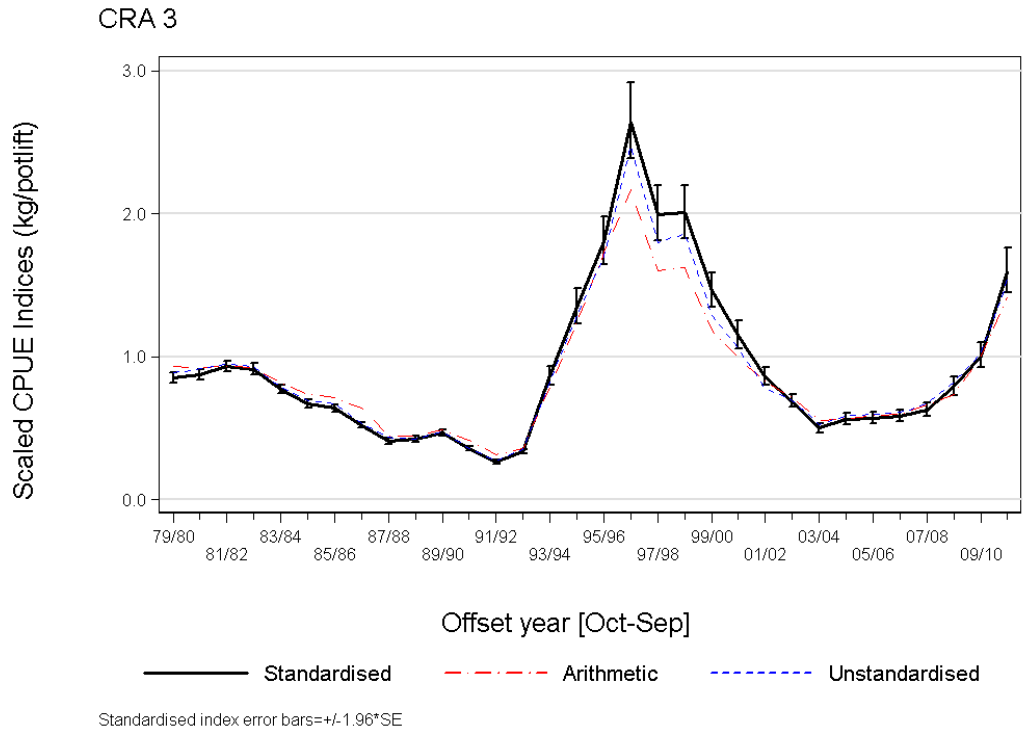

Figure 30: Standardised, unstandardised, and arithmetic offset year CPUE indices for CRA 3 from 1979–80 to 2010–11. Vertical bars are 95% confidence intervals. The geometric mean for all three series = 0.79 kg/potlift.

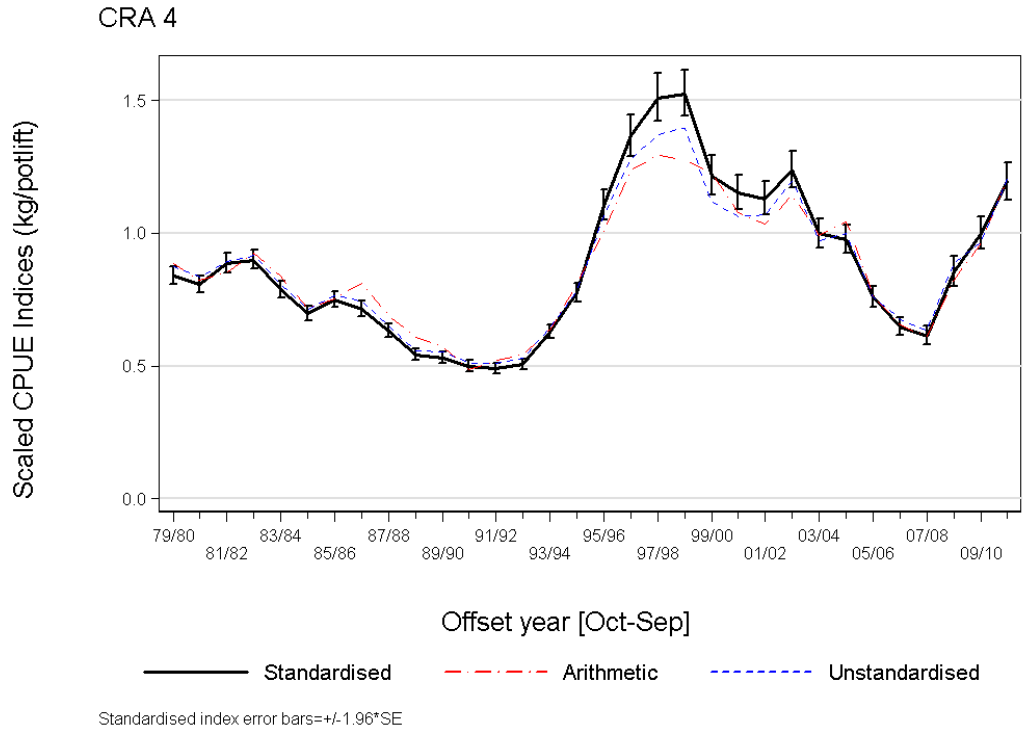

Figure 31: Standardised, unstandardised, and arithmetic offset year CPUE indices for CRA 4 from 1979–80 to 2010–11. Vertical bars are 95% confidence intervals. The geometric mean for all three series = 0.84 kg/potlift.

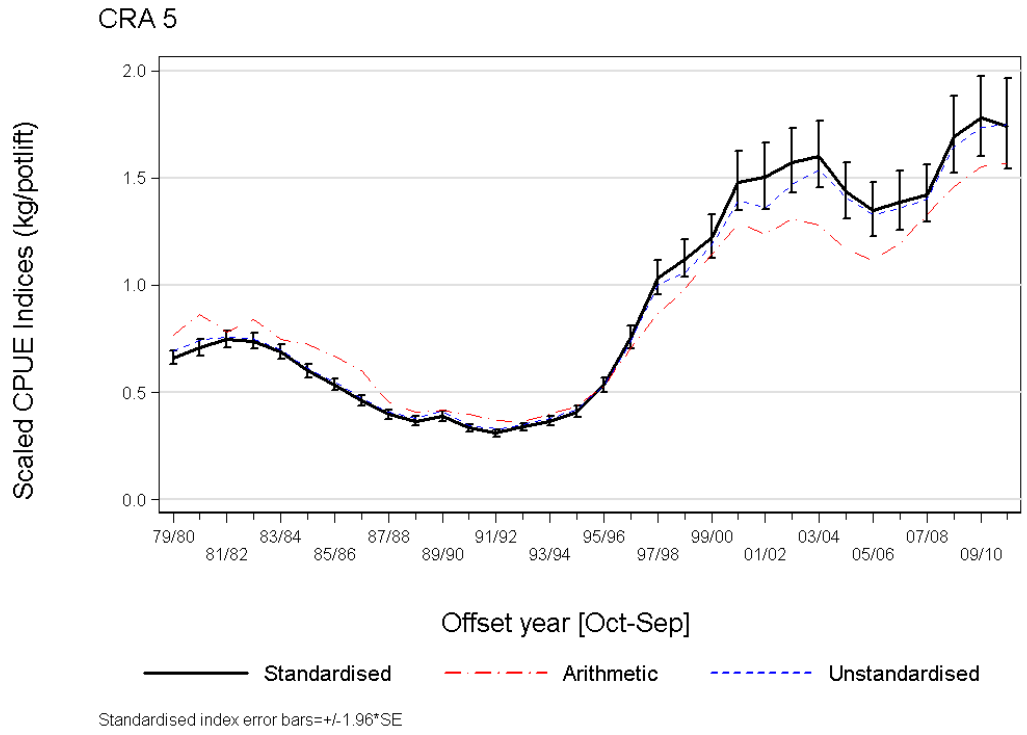

Figure 32: Standardised, unstandardised, and arithmetic offset year CPUE indices (kg/potlift) for CRA 5 from 1979–80 to 2010–11. Vertical bars are 95% confidence intervals. The geometric mean for all three series = 0.79 kg/potlift.

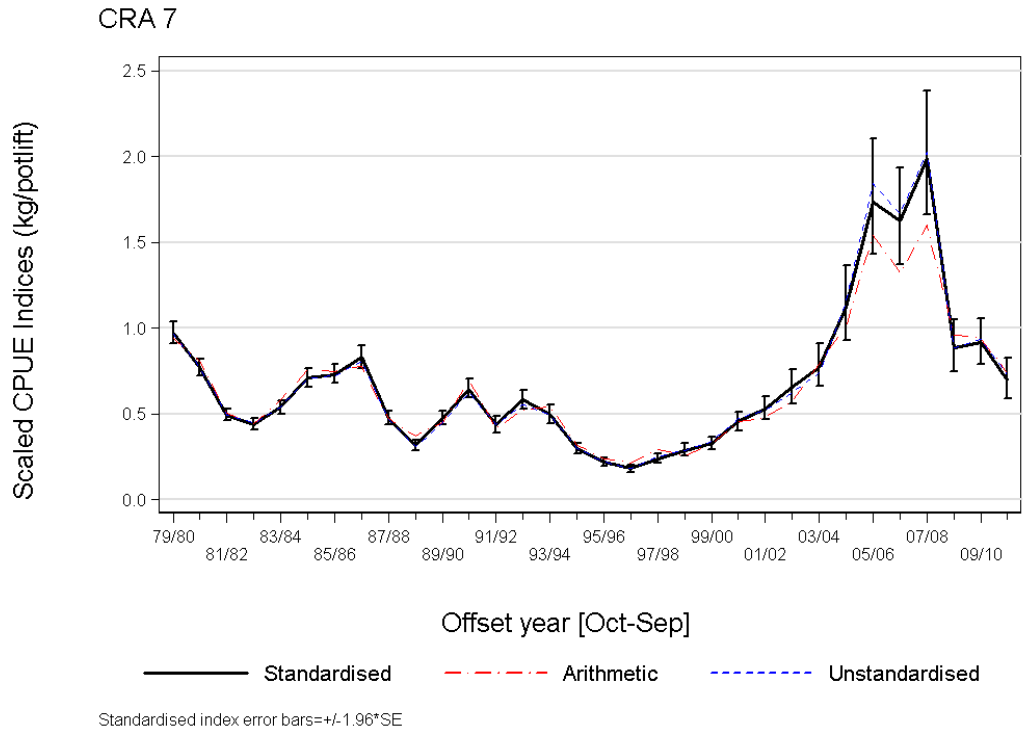

Figure 33: Standardised, unstandardised, and arithmetic offset year CPUE indices (kg/potlift) for CRA 7 from 1979–80 to 2010–11. Vertical bars are 95% confidence intervals. The geometric mean for all series = 0.58 kg/potlift.

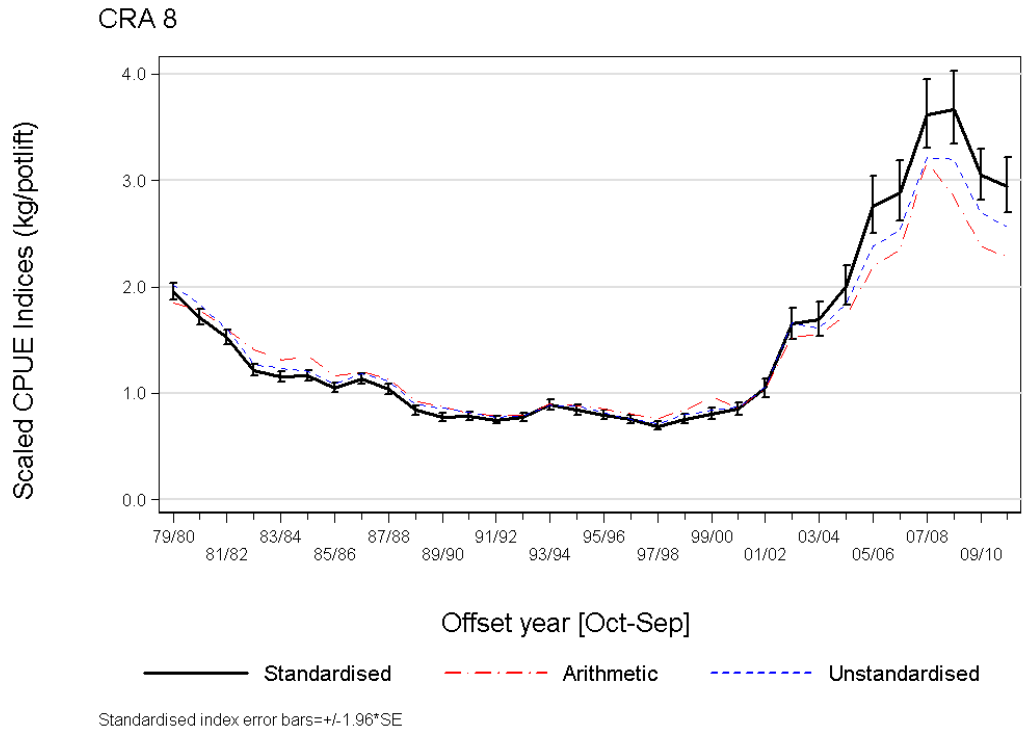

Figure 34: Standardised, unstandardised, and arithmetic offset year CPUE indices (kg/potlift) for CRA 8 from 1979–80 to 2010–11. Vertical bars are 95% confidence intervals. The geometric mean for all three series = 1.28 kg/potlift.

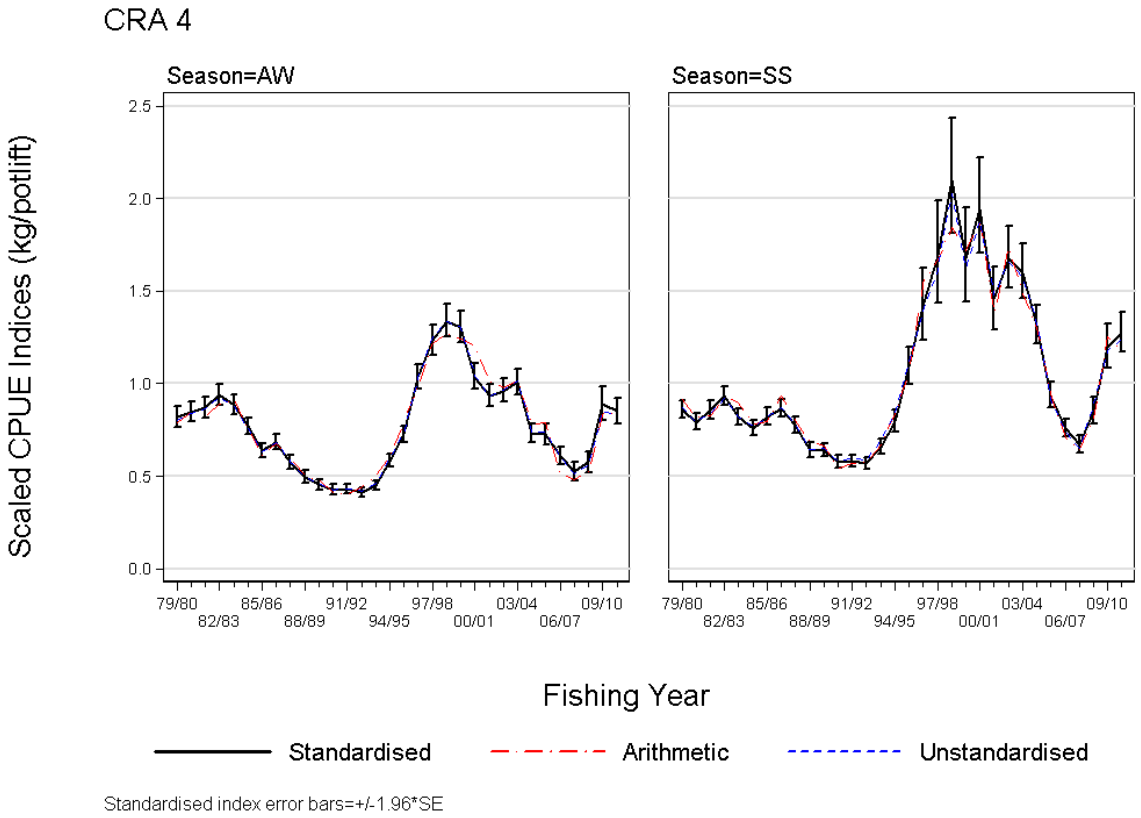

Figure 35: Standardised, unstandardised, and arithmetic CPUE indices (kg/potlift) by season and fishing year for CRA 4: 1979–80 to 2010–11 (final year for AW only). Vertical bars are 95% confidence intervals. The geometric mean for the AW series (left panel) = 0.73 kg/potlift and for the SS series (right panel) = 0.97 kg/potlift.

APPENDICES

A. DOCUMENTATION FOR THE "B4" ALGORITHM

Bentley et al. (2005) briefly described the "B4" algorithm, but did not provide a detailed description of the method. Steps 1 to 6 describe this algorithm, using Eq. A.1 to Eq. A.5 as required. This algorithm is performed on records where the error code is less than or equal to one (Bentley et al. 2005). There are seven active error fields in CRACE: three in the [`landings`] table and two each in the [`fishing_event`] and [`estimated_subcatch`] tables.

Step 1: aggregate all landings by vessel (*i*) and month (*m*) within a year (*y*):

Eq. A.1 $$L_{imy} = \sum_{g=1}^{n^l_{imy}} L_{giy}$$

where L_{giy} = landed weight in record *g* for vessel *i* in month *m* and year *y*; there are n^l_{imy} such records;

L_{giy} can be composed of "L" or "L+F+X" destination codes.

Step 2:

A. Create a list of vessels V_{my} that are active in month (*m*) within a year, based on the [`fishing_event`] table.

B. if $L_{V_{my}my} = 0$ then $L_{V_{(m+1)y}(m+1)y} = 0$

note that the pointer array V_{my} evaluates to a vessel subscript *i*.

Step 3: aggregate all estimated catch weight by vessel (*i*) and month (*m*) within a year (*y*):

Eq. A.2 $$C_{imy} = \sum_{h=1}^{n^c_{imy}} C_{hiy}$$

where C_{hiy} = estimated catch weight in record *h* for vessel *i* in month *m* and year *y*; there are n^c_{imy} such records;

Step 4: aggregate all estimated catch weight and potlifts by vessel (*i*), month (*m*) and statistical area (*a*) within a year (*y*):

Eq. A.3 $$C_{iamy} = \sum_{j=1}^{n^c_{iamy}} C_{jiy}$$

where C_{jiy} = estimated catch weight in record *j* for vessel *i* in month *m*, statistical area (*a*) and year *y*; there are n^c_{iamy} such records;

Eq. A.4 $$P_{iamy} = \sum_{j=1}^{n^c_{iamy}} P_{jiy}$$

where P_{jiy} = number potlifts in record *j* for vessel *i* in month *m*, statistical area (*a*) and year *y*; there are n^{c}_{iamy} such records;

Step 5: estimate landed catch weight by vessel (*i*), month (*m*) and statistical area (*a*) within a fishing year (*y*):

Eq. A.5 $$\hat{L}_{iamy} = \frac{C_{iamy}}{C_{imy}} L_{imy}$$

where $\hat{L}_{imay}$ = estimated landed weight in area *a* for vessel *i* in month *m* and year *y*;

note that $\hat{L}_{imay} = 0$ for the month/vessel strata identified in Step 2

Step 6: obtain the QMA $\left(Q^{c}_{iamy}\right)$ based on the statistical area in stratum *iamy* (use associations in Table A.1)

Table A.1. Assignment table for QMAs derived from rock lobster statistical areas

	1	2	3	4	5	6	7
CRA 1	901	902	903	904	939		
CRA 2	905[1]	906	907	908			
CRA 3	909[1]	910	911				
CRA 4	912	913	914	915	934		
CRA 5	916	917	918	919	932	933	
CRA 6	940	941	942	943			
CRA 7	920	921					
CRA 8	922[1]	923	924	925	926	927	928
CRA 9	929[1]	930	931	935	936	937	938

[1] straddling statistical area: the assignment rules in this table ignore this status

Note: nominal arithmetic CPUE $\left(I_{iamy}\right)$ in stratum *iamy* is (this is not part of the B4 algorithm):

Eq. A.6 $$I_{iamy} = \frac{\hat{L}_{iamy}}{P_{iamy}}$$

B. DIAGNOSTICS FOR CRA 3 OFFSET YEAR (1 OCTOBER–30 SEPTEMBER) STANDARDISED CPUE ANALYSIS

Table B.1. Number of vessel/statistical area/month records in the dataset used to calculate the offset year CRA 3 CPUE time series. '–': no data for indicated cell.

	CRA 3 Statistical Area			
Offset year	**909**	**910**	**911**	**Total**
1980	75	361	245	681
1981	90	352	267	709
1982	101	359	252	712
1983	121	392	245	758
1984	97	405	291	793
1985	116	380	287	783
1986	97	322	243	662
1987	89	359	244	692
1988	84	277	196	557
1989	64	289	179	532
1990	67	346	210	623
1991	67	276	243	586
1992	75	265	306	646
1993	57	210	275	542
1994	34	90	74	198
1995	17	61	55	133
1996	20	58	49	127
1997	19	54	38	111
1998	18	67	35	120
1999	23	68	41	132
2000	19	94	57	170
2001	21	85	57	163
2002	30	106	77	213
2003	24	125	126	275
2004	29	103	136	268
2005	26	82	114	222
2006	24	109	109	242
2007	22	109	109	240
2008	15	86	104	205
2009	24	65	71	160
2010	14	66	71	151
2011	13	55	52	120

Table B.2. Total deviance (R^2) explained by each variable in the CRA 3 standardised offset year CPUE analysis.

Variable	**1**	**2**	**3**
Offset Year	0.3521		
Month	0.0762	0.4402	
Statistical Area	0.0139	0.3696	0.4574
Additional deviance explained	0.0000	0.0880	0.0172

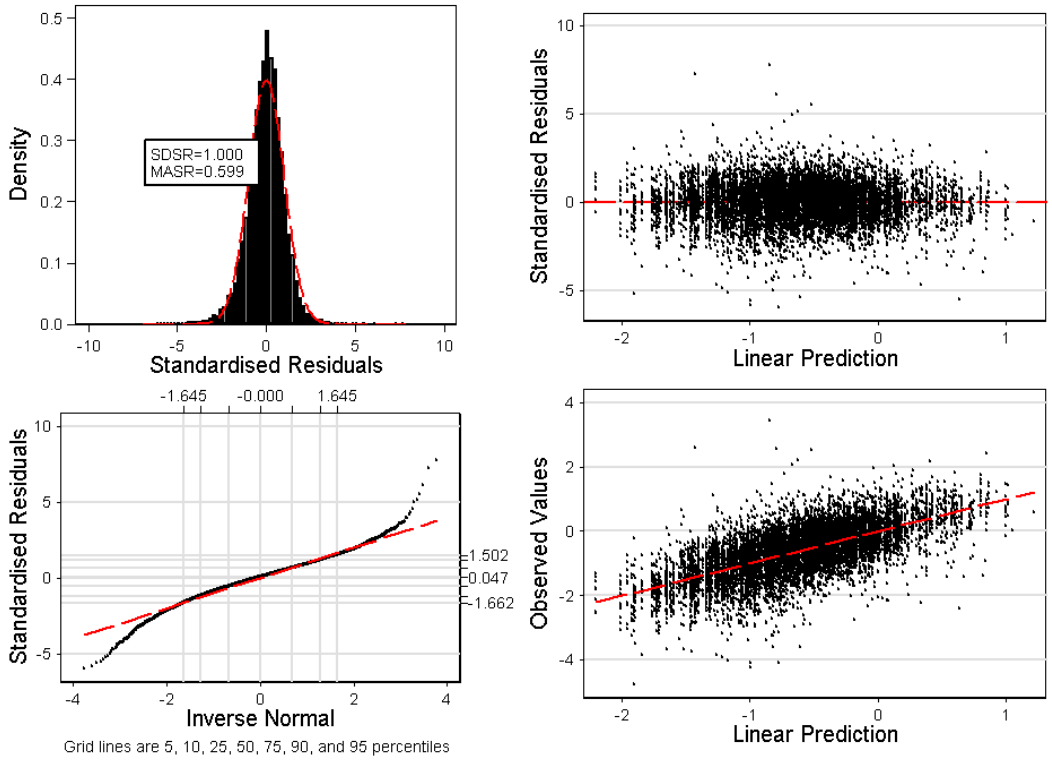

Figure B.1. Standardised residual plots for the CRA 3 standardised offset year CPUE analysis.

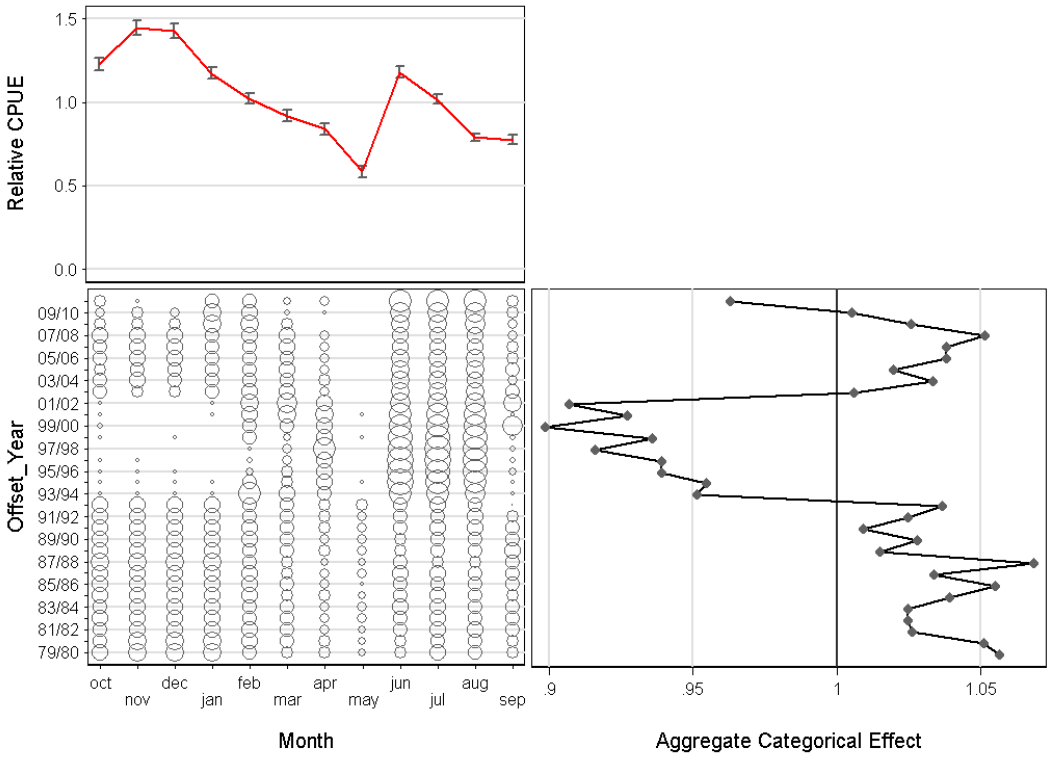

Figure B.2. The effect of the month categorical variable in the offset year CRA 3 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

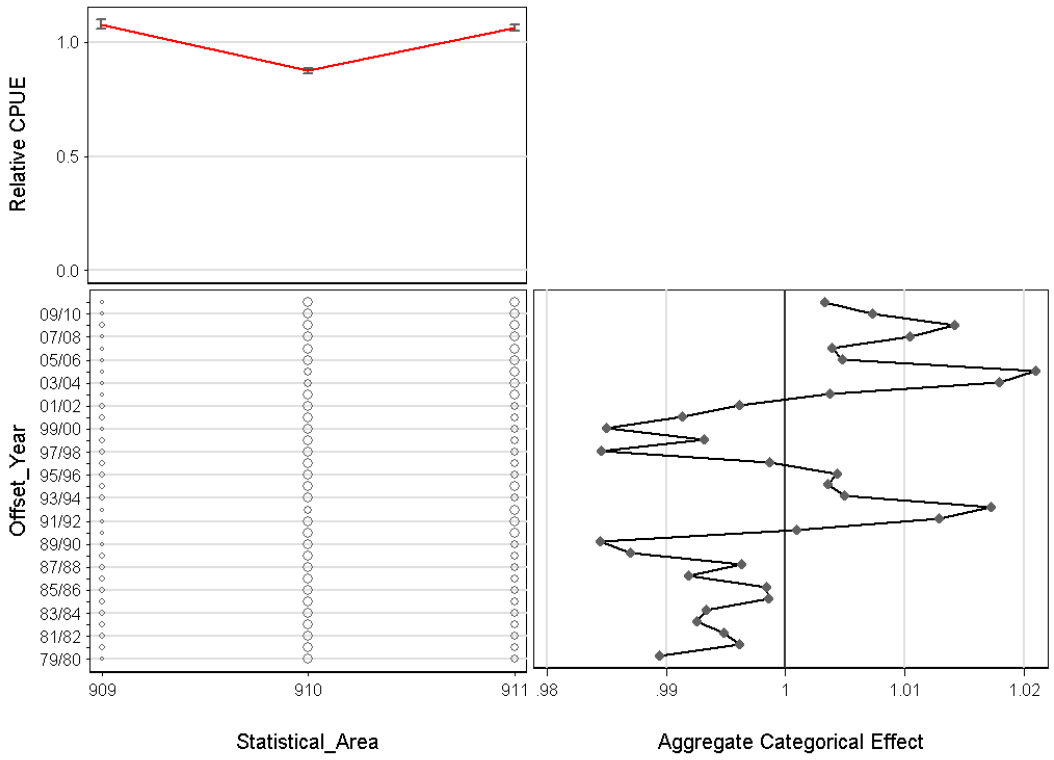

Figure B.3. The effect of the statistical area categorical variable in the offset year CRA 3 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

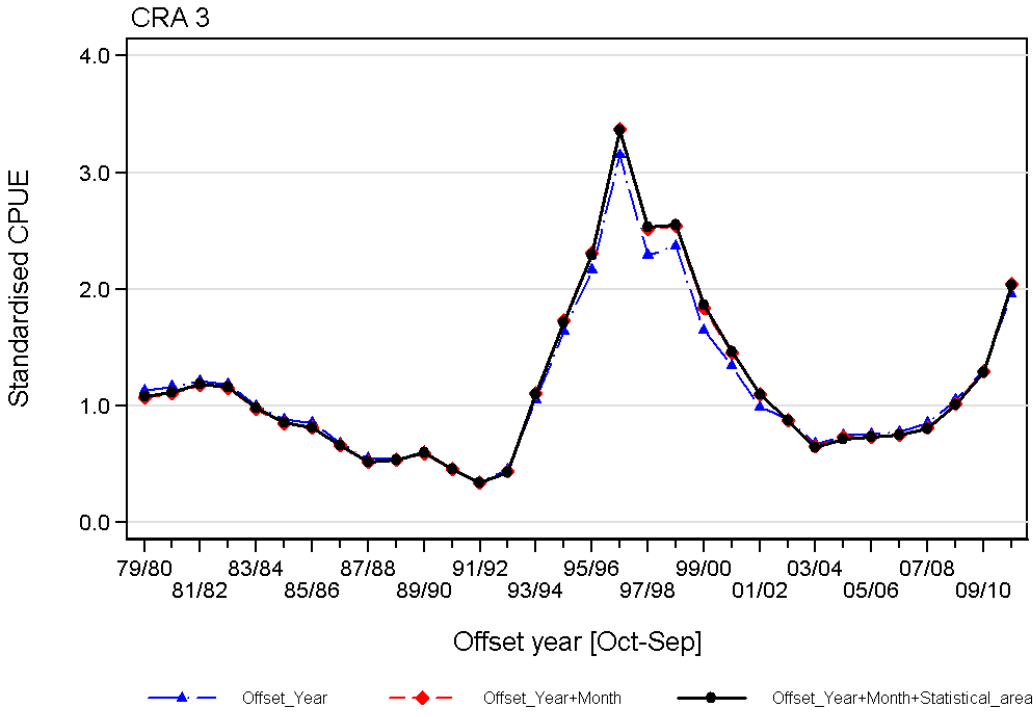

Figure B.4. Stepwise graph showing the effect on the year coefficients from the successive addition of each categorical variable to the offset year CRA 3 lognormal regression model. The final model is shown by a thick heavy line.

C. DIAGNOSTICS FOR CRA 4 OFFSET YEAR (1 OCTOBER–30 SEPTEMBER) STANDARDISED CPUE ANALYSIS

Table C.1. Number of vessel/statistical area/month records in the dataset used to calculate the offset year CRA 4 CPUE time series. '–': no data for indicated cell.

	CRA 4 Statistical Area					
Offset year	**912**	**913**	**914**	**915**	**934**	**Total**
1980	237	193	238	157	2	827
1981	258	162	238	165	7	830
1982	268	142	239	161	2	812
1983	256	182	278	182	5	903
1984	236	202	294	174	8	914
1985	230	173	283	162	6	854
1986	235	164	289	164	8	860
1987	225	183	277	138	6	829
1988	215	165	287	133	5	805
1989	204	185	275	113	2	779
1990	218	197	283	125	8	831
1991	232	201	297	126	6	862
1992	267	216	270	113	7	873
1993	282	221	258	119	14	894
1994	195	205	250	111	21	782
1995	135	170	224	85	24	638
1996	131	120	192	84	5	532
1997	114	67	165	54	–	400
1998	110	49	157	56	–	372
1999	112	67	157	66	4	406
2000	129	48	122	56	13	368
2001	123	76	131	71	15	416
2002	119	106	140	62	4	431
2003	102	107	158	65	–	432
2004	107	104	161	72	5	449
2005	113	100	161	65	9	448
2006	86	97	189	85	13	470
2007	93	95	196	96	27	507
2008	85	81	151	75	17	409
2009	76	77	107	51	5	316
2010	94	69	111	79	5	358
2011	90	75	149	69	4	387

Table C.2. Total deviance (R^2) explained by each variable in the CRA 4 standardised offset year CPUE analysis.

Variable	**1**	**2**	**3**
Offset Year	0.1607		
Month	0.0490	0.2337	
Statistical Area	0.0151	0.1793	0.2518
Additional deviance explained	0	0.0730	0.0181

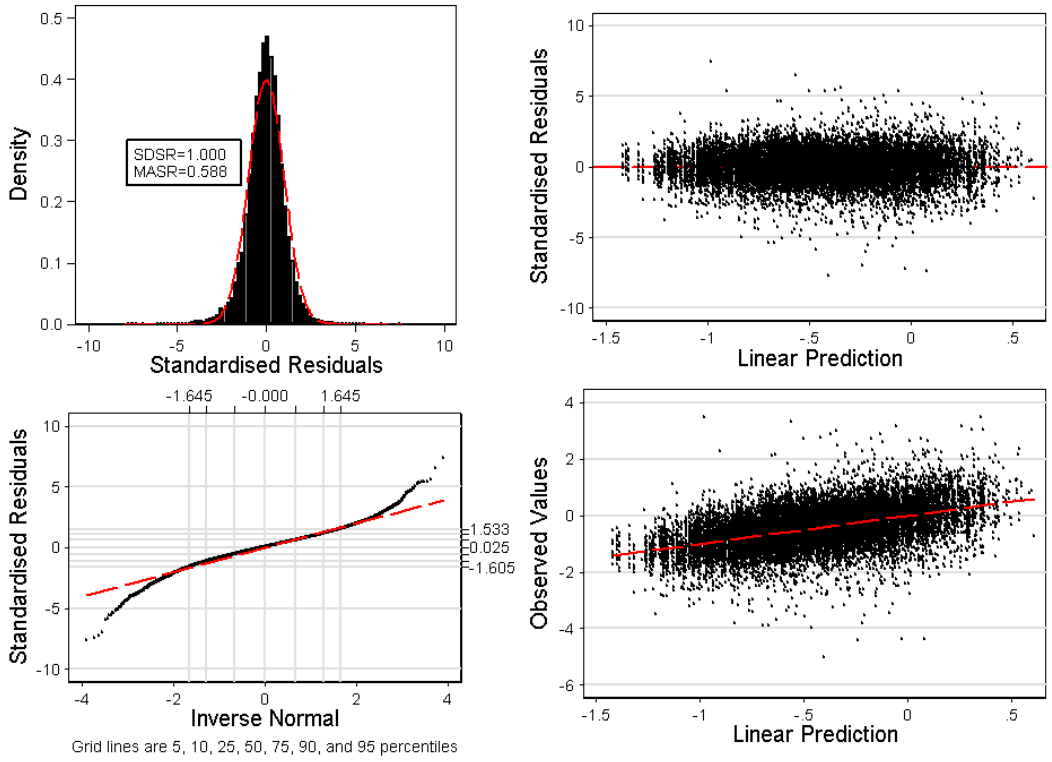

Figure C.1. Standardised residual plots for the CRA 4 standardised offset year CPUE analysis.

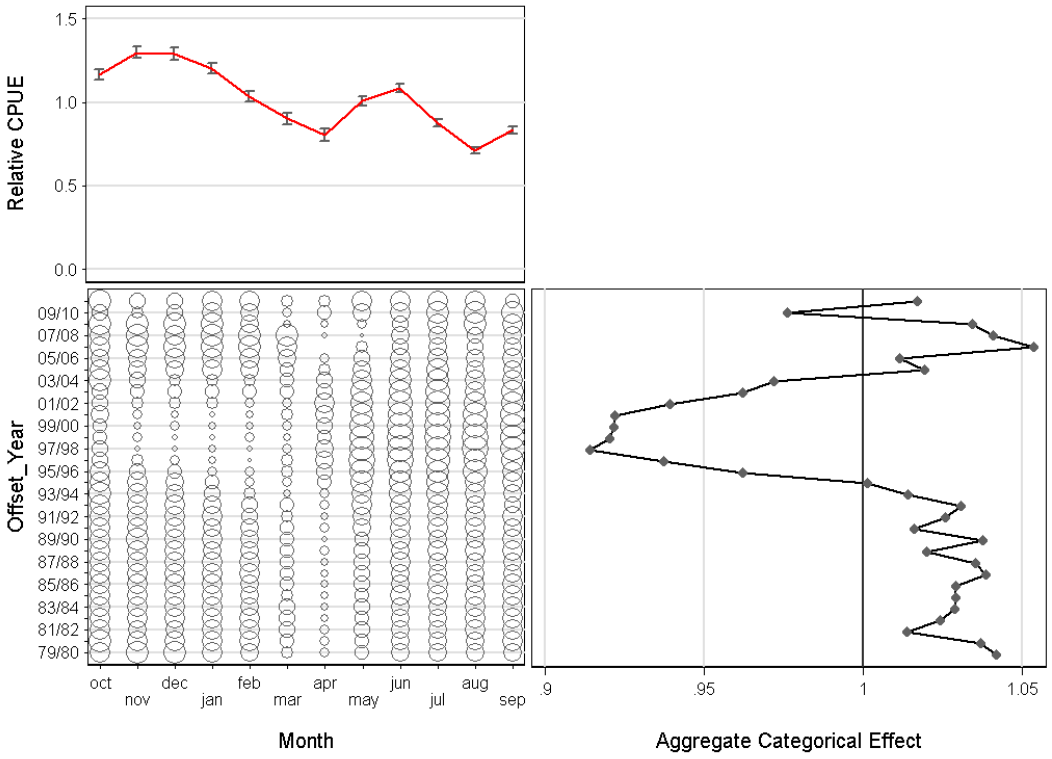

Figure C.2. The effect of the month categorical variable in the offset year CRA 4 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

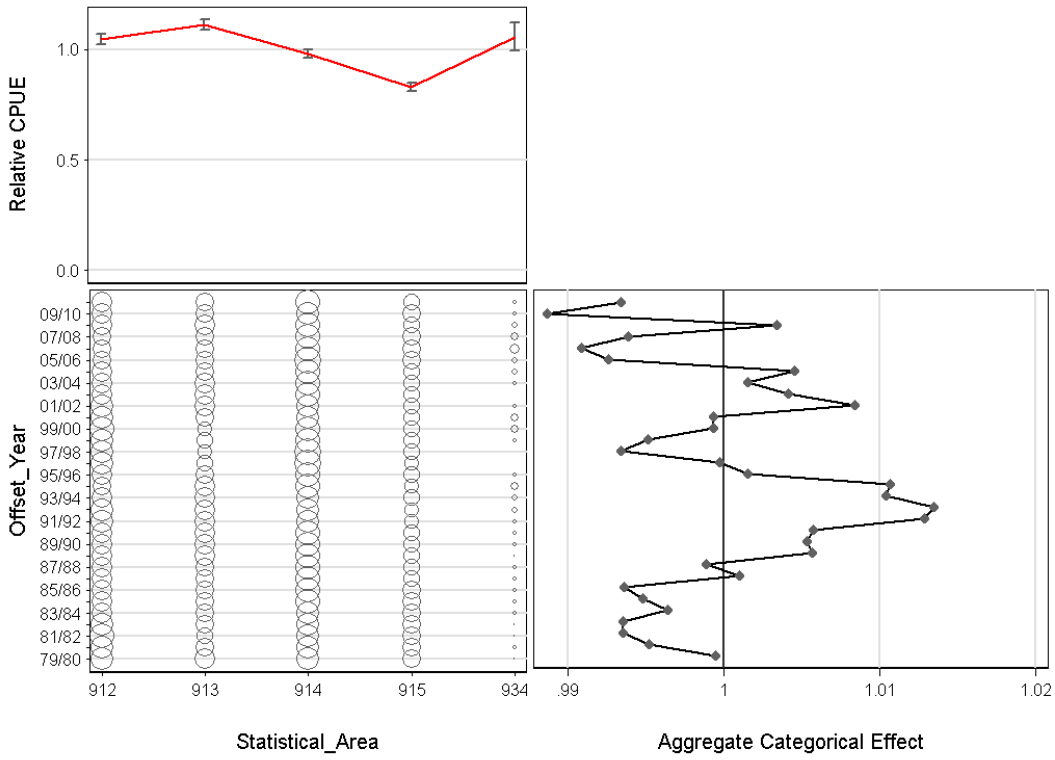

Figure C.3. The effect of the statistical area categorical variable in the offset year CRA 4 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

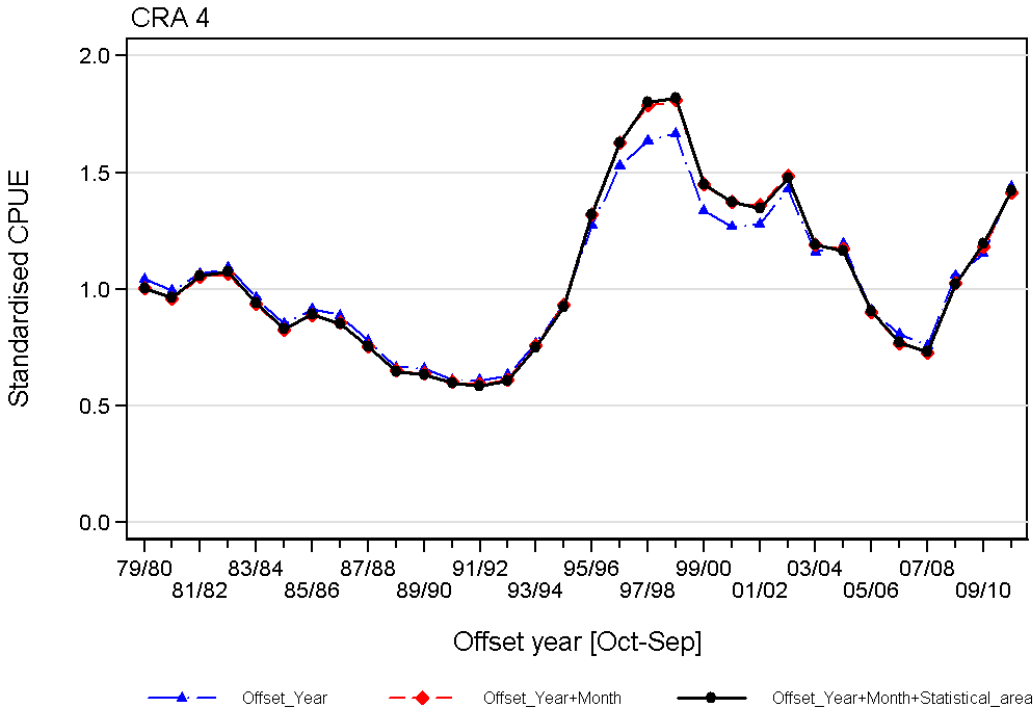

Figure C.4. Stepwise graph showing the effect on the year coefficients from the successive addition of each categorical variable to the offset year CRA 4 lognormal regression model. The final model is shown by a thick heavy line.

D. DIAGNOSTICS FOR CRA 5 OFFSET YEAR (1 OCTOBER–30 SEPTEMBER) STANDARDISED CPUE ANALYSIS

Table D.1. Number of vessel/statistical area/month records in the dataset used to calculate the offset year CRA 5 CPUE time series. '–': no data for indicated cell.

	CRA 5 Statistical Area						
Offset year	**916**	**917**	**918**	**919**	**932**	**933**	**Total**
1980	131	578	93	11	9	83	905
1981	115	422	75	2	3	89	706
1982	108	502	83	9	13	97	812
1983	99	506	83	21	4	122	835
1984	93	501	89	14	4	129	830
1985	98	470	78	15	11	123	795
1986	91	502	81	22	13	108	817
1987	96	457	74	16	17	95	755
1988	73	453	64	15	9	81	695
1989	52	365	63	9	5	65	559
1990	97	356	72	–	6	57	588
1991	99	392	91	1	7	98	688
1992	109	403	114	1	3	101	731
1993	101	367	91	2	1	107	669
1994	78	302	88	–	3	89	560
1995	78	268	61	–	3	79	489
1996	69	260	60	2	7	98	496
1997	45	203	44	2	8	82	384
1998	41	172	46	–	8	67	334
1999	35	166	43	–	8	61	313
2000	41	146	33	1	–	54	275
2001	51	120	16	–	–	42	229
2002	43	89	9	–	1	40	182
2003	62	91	7	–	–	52	212
2004	61	87	5	–	1	49	203
2005	61	119	5	–	2	47	234
2006	58	109	9	–	–	51	227
2007	49	102	2	–	1	48	202
2008	42	103	17	1	5	50	218
2009	36	79	10	–	–	47	172
2010	40	82	5	–	1	48	176
2011	28	59	8	–	–	36	131

Table D.2. Total deviance (R^2) explained by each variable in the CRA 5 standardised offset year CPUE analysis.

Variable	**1**	**2**	**3**
Offset Year	0.2760		
Month	0.0260	0.3246	
Statistical Area	0.0277	0.3001	0.3487
Additional deviance explained	0	0.0486	0.0241

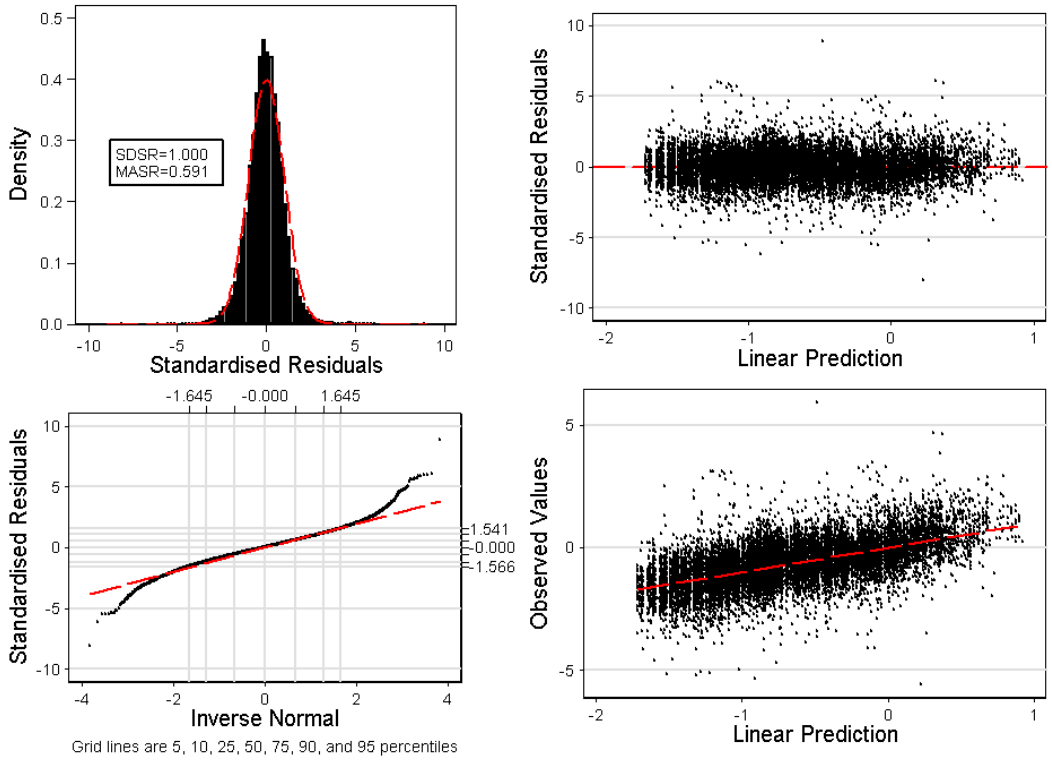

Figure D.1. Standardised residual plots for the CRA 5 standardised offset year CPUE analysis.

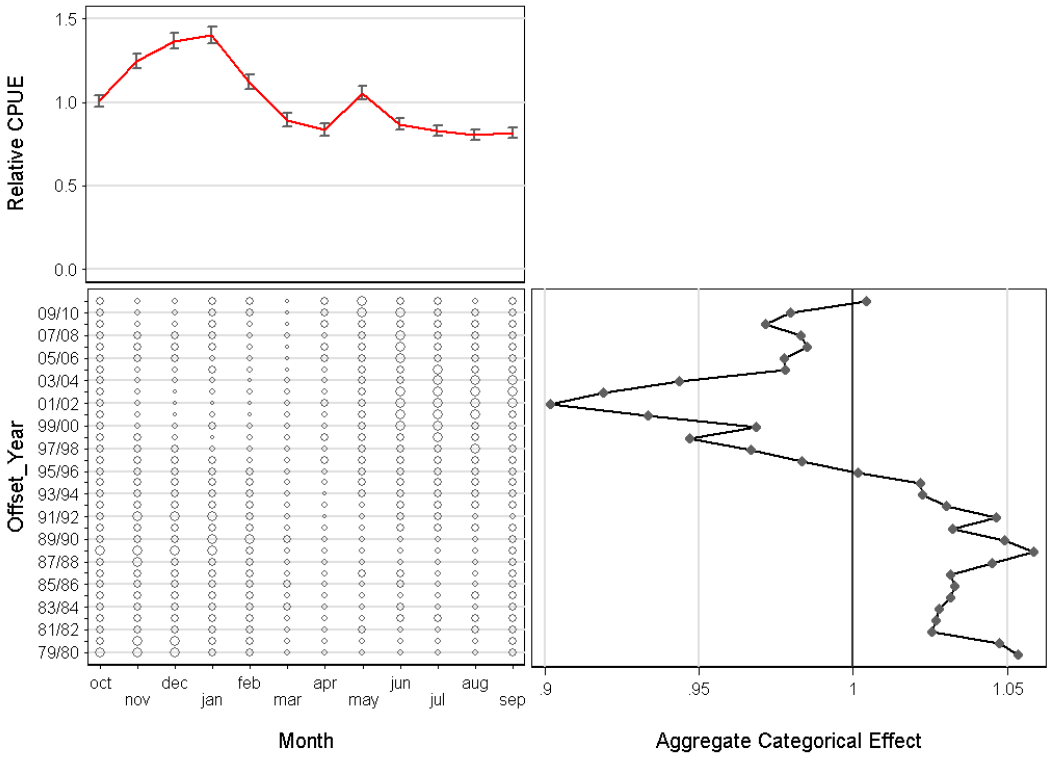

Figure D.2. The effect of the month categorical variable in the offset year CRA 5 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

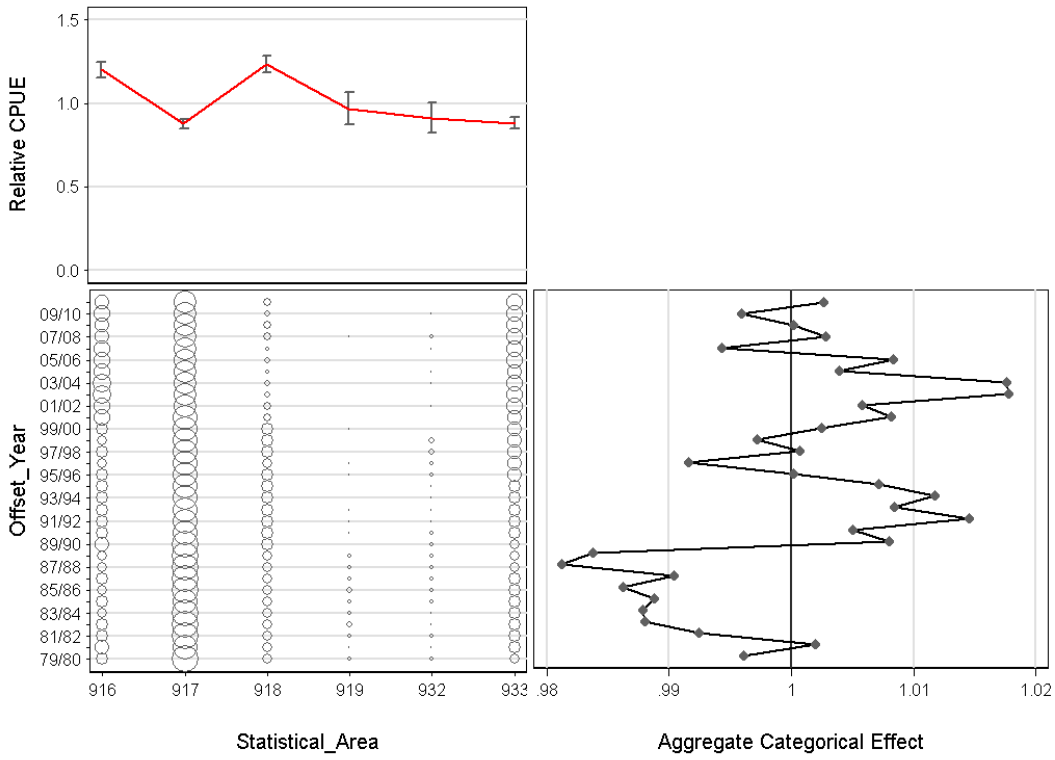

Figure D.3. The effect of the statistical area categorical variable in the offset year CRA 5 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

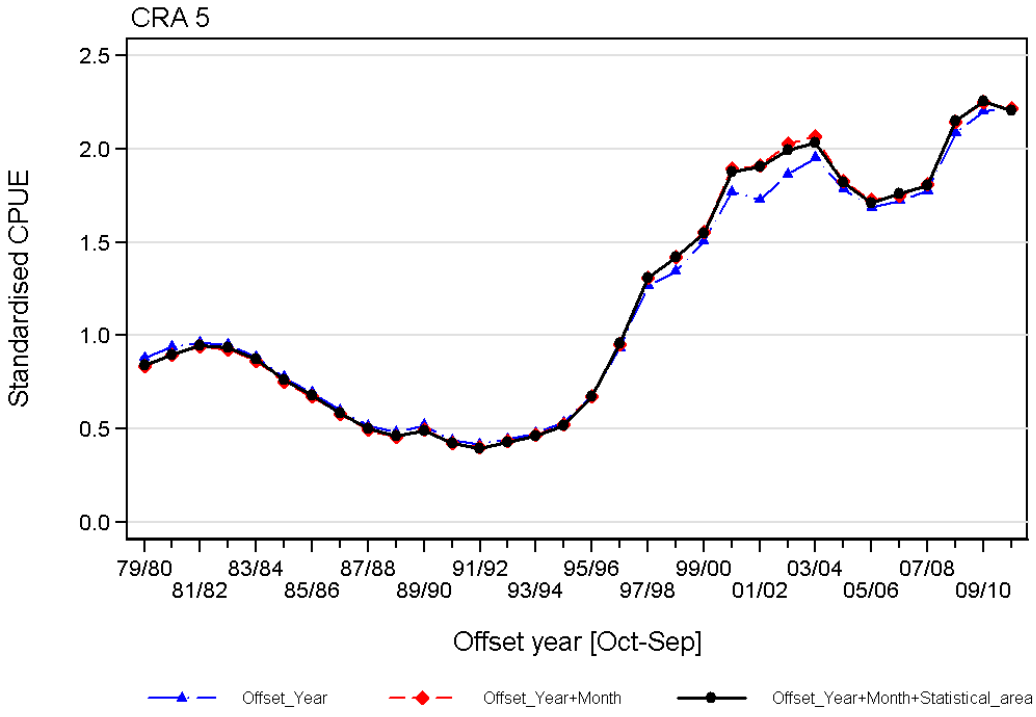

Figure D.4. Stepwise graph showing the effect on the year coefficients from the successive addition of each categorical variable to the offset year CRA 5 lognormal regression model. The final model is shown by a thick heavy line.

E. DIAGNOSTICS FOR CRA 7 OFFSET YEAR (1 OCTOBER–30 SEPTEMBER) STANDARDISED CPUE ANALYSIS

Table E.1. Number of vessel/statistical area/month records in the dataset used to calculate the offset year CRA 7 CPUE time series. '–': no data for indicated cell

	CRA 7 Statistical Area		
Offset year	**920**	**921**	**Total**
1980	405	213	618
1981	402	196	598
1982	330	157	487
1983	276	145	421
1984	299	142	441
1985	304	132	436
1986	299	131	430
1987	263	112	375
1988	229	112	341
1989	194	68	262
1990	276	72	348
1991	250	96	346
1992	150	49	199
1993	218	59	277
1994	145	42	187
1995	164	63	227
1996	142	51	193
1997	123	45	168
1998	95	60	155
1999	105	36	141
2000	108	57	165
2001	99	59	158
2002	107	35	142
2003	82	16	98
2004	70	17	87
2005	41	19	60
2006	37	23	60
2007	52	23	75
2008	48	21	69
2009	58	19	77
2010	69	37	106
2011	49	30	79

Table E.2. Total deviance (R^2) explained by each variable in the CRA 7 standardised offset year CPUE analysis.

Variable	**1**	**2**	**3**
Offset year	0.2356		
Statistical Area	0.0520	0.2827	
Month	0.0043	0.2437	0.2896
Additional deviance explained	0	0.0471	0.0069

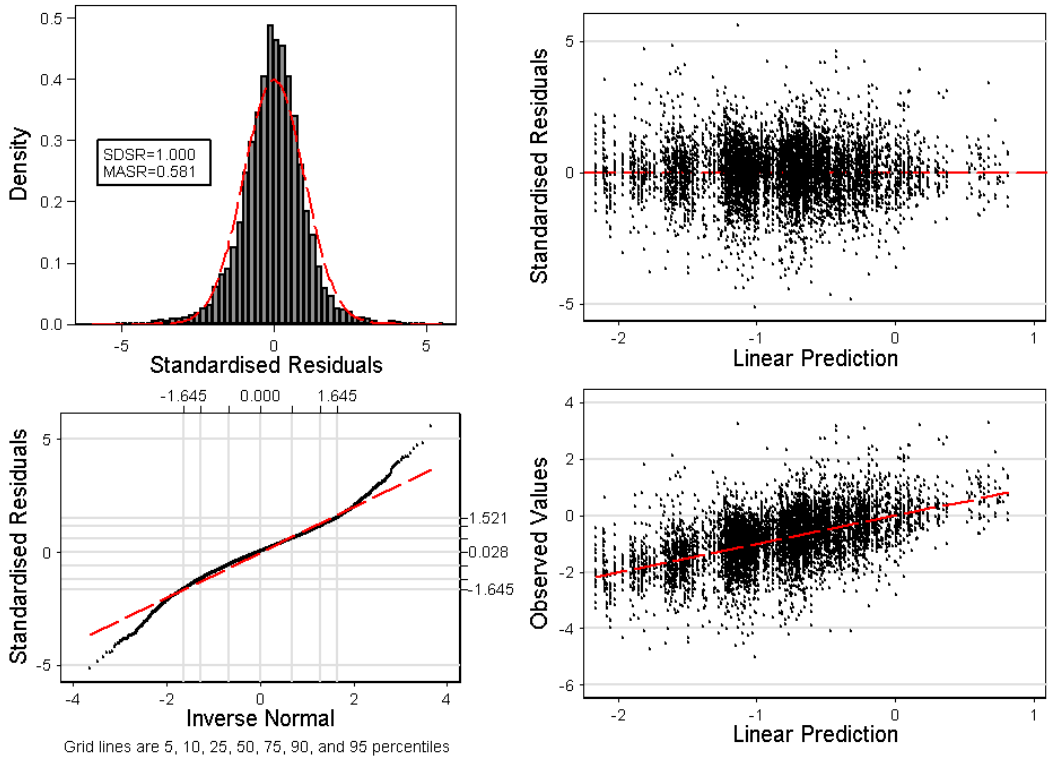

Figure E.1. Standardised residual plots for the CRA 7 standardised offset year CPUE analysis.

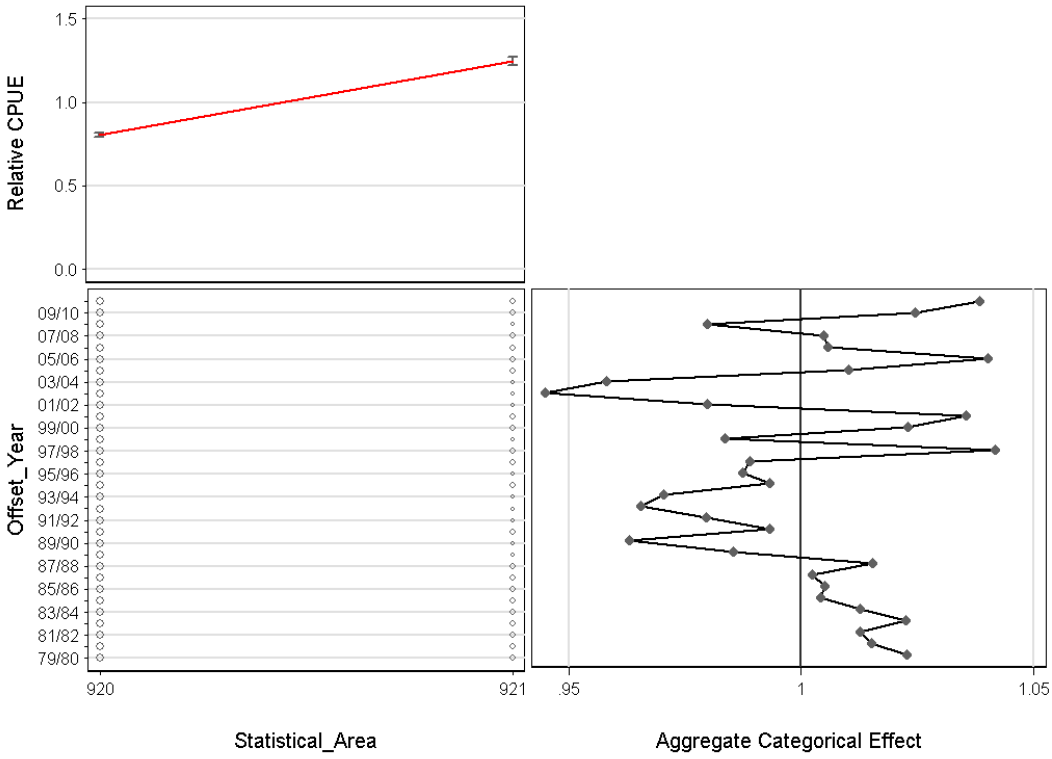

Figure E.2. The effect of the statistical area categorical variable in the offset year CRA 7 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

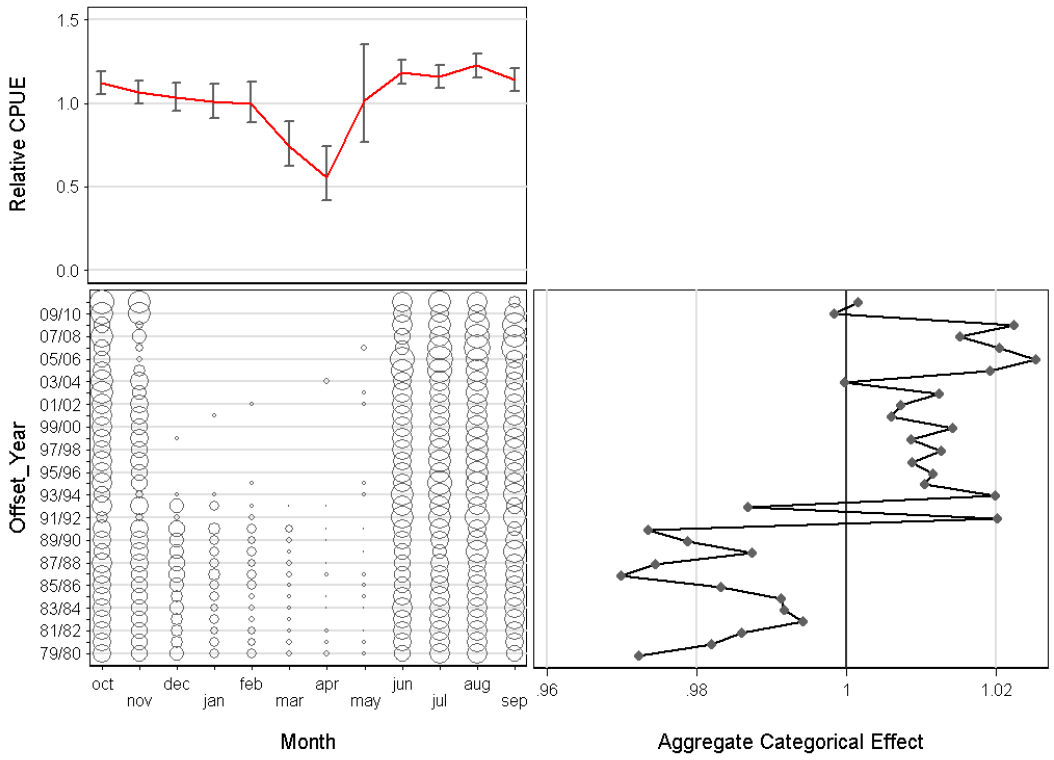

Figure E.3. The effect of the month categorical variable in the offset year CRA 7 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

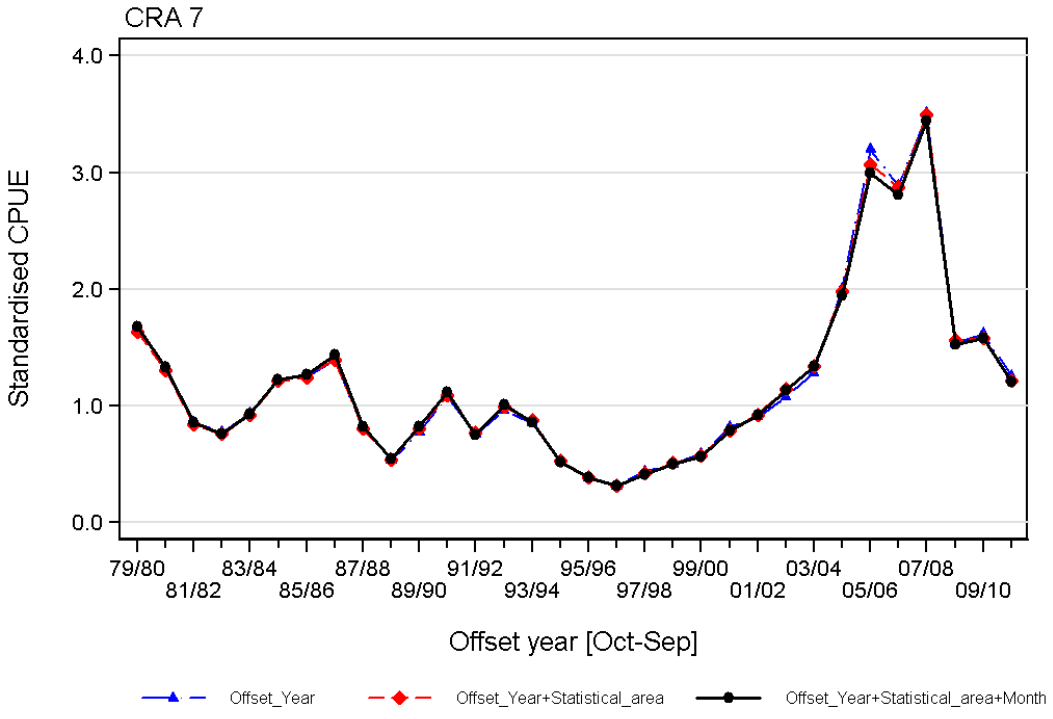

Figure E.4. Stepwise graph showing the effect on the year coefficients from the successive addition of each categorical variable to the offset year CRA 7 lognormal regression model. The final model is shown by a thick heavy line.

F. DIAGNOSTICS FOR CRA 8 OFFSET YEAR (1 OCTOBER–30 SEPTEMBER) STANDARDISED CPUE ANALYSIS

Table F.1. Number of vessel/statistical area/month records in the dataset used to calculate the offset year CRA 8 CPUE time series. '–': no data for indicated cell.

	CRA 8 Statistical Area							
Offset year	**922**	**923**	**924**	**925**	**926**	**927**	**928**	**Total**
1980	33	254	442	6	291	317	295	1 638
1981	42	222	422	9	293	234	247	1 469
1982	35	179	379	16	343	196	219	1 367
1983	40	170	338	15	381	281	217	1 442
1984	44	194	375	16	419	271	228	1 547
1985	19	175	334	22	405	347	249	1 551
1986	19	160	292	20	318	331	230	1 370
1987	30	173	307	5	329	262	215	1 321
1988	26	162	262	4	308	201	172	1 135
1989	29	159	238	14	256	145	130	971
1990	20	132	240	28	337	205	119	1 081
1991	27	110	224	21	348	218	171	1 119
1992	40	72	209	20	355	251	242	1 189
1993	29	78	190	28	325	231	273	1 154
1994	19	45	148	35	245	179	252	923
1995	18	53	135	51	205	165	225	852
1996	18	52	127	39	216	149	202	803
1997	18	55	130	23	235	166	226	853
1998	12	55	117	21	220	121	263	809
1999	10	59	116	29	212	120	229	775
2000	7	39	66	16	169	117	161	575
2001	5	20	61	11	165	114	133	509
2002	5	15	51	3	139	67	102	382
2003	2	11	43	5	132	43	83	319
2004	3	11	31	4	117	37	78	281
2005	3	18	33	7	117	50	66	294
2006	5	15	25	–	111	57	55	268
2007	7	11	30	2	114	48	49	261
2008	6	9	49	5	117	66	69	321
2009	7	6	39	–	100	45	90	287
2010	5	11	55	4	135	81	118	409
2011	2	2	45	–	126	63	93	331

Table F.2. Total deviance (R^2) explained by each variable in the CRA 8 standardised offset year CPUE analysis.

Variable	**1**	**2**	**3**
Offset Year	0.1620		
Month	0.0348	0.2134	
Statistical Area	0.0296	0.1909	0.2399
Additional deviance explained	0	0.0514	0.0265

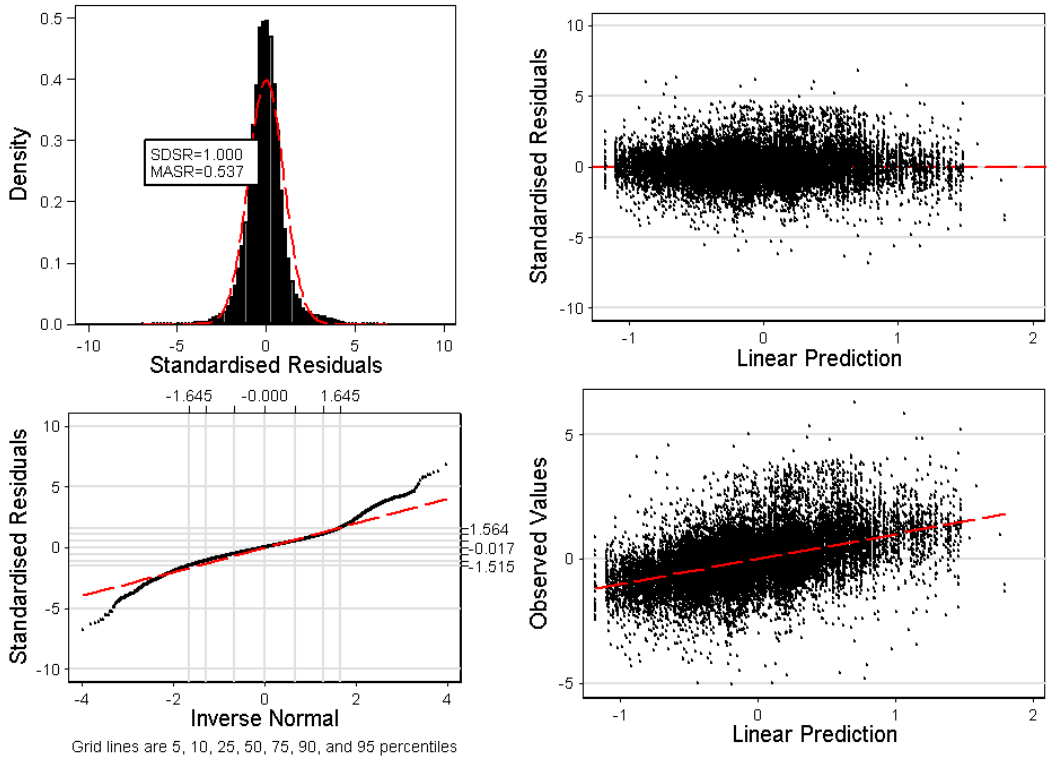

Figure F.1. Standardised residual plots for the CRA 8 standardised offset year CPUE analysis.

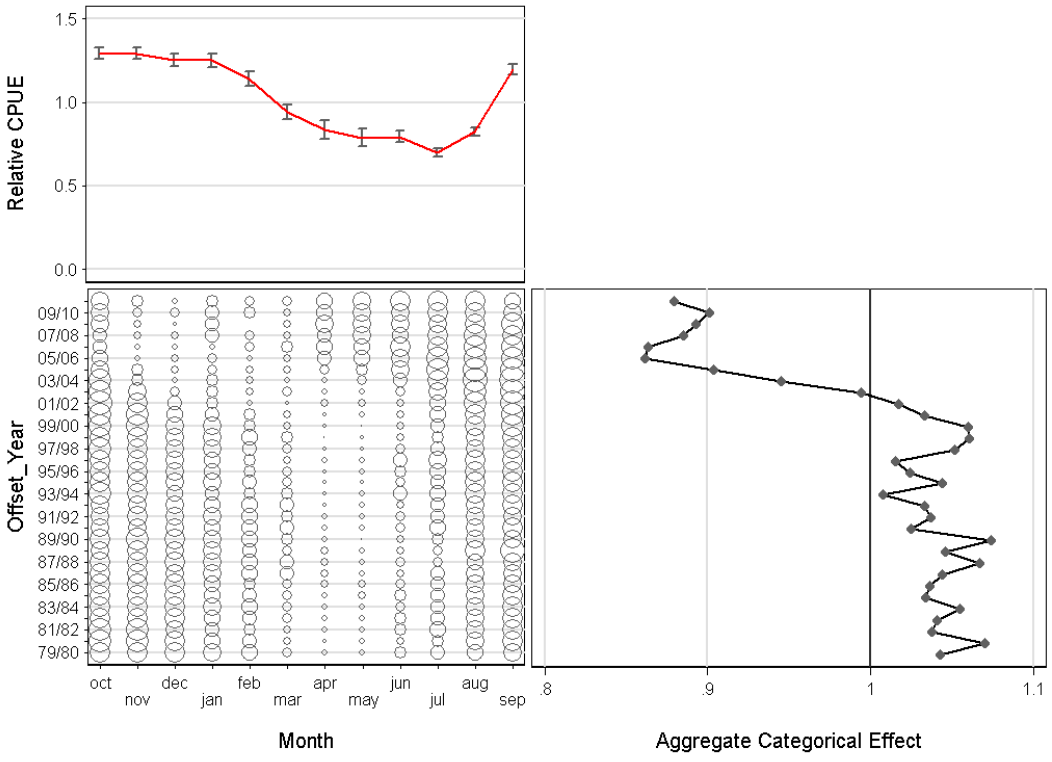

Figure F.2. The effect of the month categorical variable in the offset year CRA 8 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

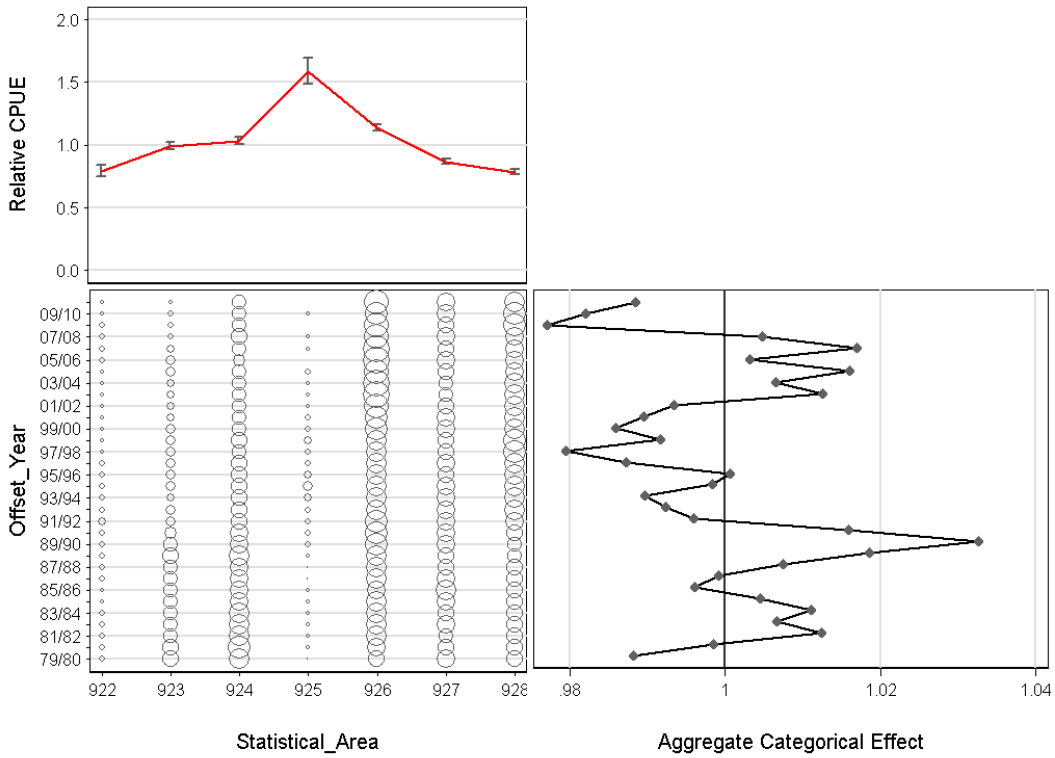

Figure F.3. The effect of the statistical area categorical variable in the offset year CRA 8 lognormal regression model: top left: effect by level of variable; bottom-left: distribution of variable by year; bottom-right: cumulative effect of variable by offset year.

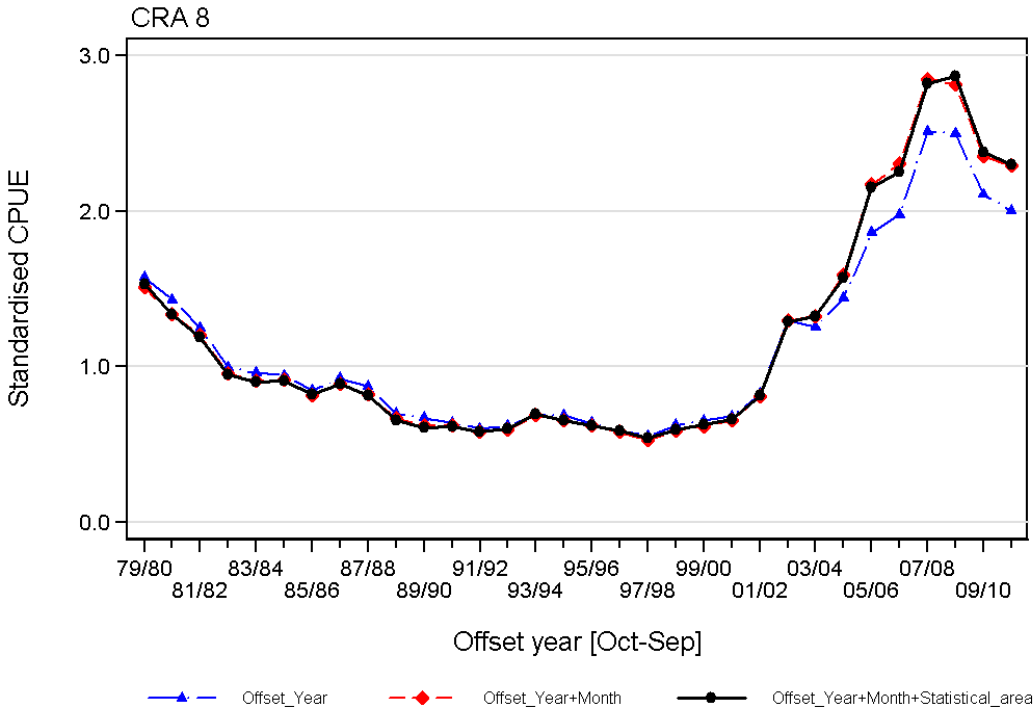

Figure F.4. Stepwise graph showing the effect on the year coefficients from the successive addition of each categorical variable to the offset year CRA 8 lognormal regression model. The final model is shown by a thick heavy line.

G. DIAGNOSTICS FOR CRA 4 SEASONAL (AW: 1 APRIL–30 SEPTEMBER; SS: 1 OCTOBER–31 MARCH) STANDARDISED CPUE ANALYSIS

Table G.1. Number of vessel/statistical area/month records in the dataset used to calculate the CRA 4 CPUE time series.

Fishing		CRA 4 Statistical Area							CRA 4 Statistical Area					
Year	Season	912	913	914	915	934	Total	Season	912	913	914	915	934	Total
1979	AW	89	80	92	50	1	312	SS	136	113	136	96	1	482
1980	AW	101	80	102	61	1	345	SS	149	90	135	110	7	491
1981	AW	109	72	103	55	0	339	SS	146	76	122	97	1	442
1982	AW	122	66	117	64	1	370	SS	147	98	157	108	3	513
1983	AW	109	84	121	74	2	390	SS	137	111	157	101	5	511
1984	AW	99	91	137	73	3	403	SS	118	96	149	91	5	459
1985	AW	112	77	134	71	1	395	SS	133	79	158	97	8	475
1986	AW	102	85	131	67	0	385	SS	127	103	152	85	6	473
1987	AW	98	80	125	53	0	356	SS	121	94	160	79	3	457
1988	AW	94	71	127	54	2	348	SS	105	92	149	66	0	412
1989	AW	99	93	126	47	2	367	SS	125	112	168	67	6	478
1990	AW	93	85	115	58	2	353	SS	114	98	147	76	3	438
1991	AW	118	103	150	50	3	424	SS	127	105	146	62	5	445
1992	AW	140	111	124	51	2	428	SS	145	119	120	59	7	450
1993	AW	137	102	138	60	7	444	SS	99	98	85	48	4	334
1994	AW	96	107	165	63	17	448	SS	54	81	58	39	12	244
1995	AW	81	89	166	46	12	394	SS	42	55	45	17	1	160
1996	AW	89	65	147	67	4	372	SS	29	12	19	11	0	71
1997	AW	85	55	146	43	0	329	SS	16	5	19	9	0	49
1998	AW	94	44	138	47	0	323	SS	22	9	17	13	0	61
1999	AW	90	58	140	53	4	345	SS	23	2	20	9	4	58
2000	AW	106	46	102	47	9	310	SS	31	9	19	14	2	75
2001	AW	92	67	112	57	13	341	SS	38	26	26	10	0	100
2002	AW	81	80	114	52	4	331	SS	41	27	48	21	0	137
2003	AW	61	80	110	44	0	295	SS	42	42	46	28	0	158
2004	AW	65	62	115	44	5	291	SS	64	51	73	30	4	222
2005	AW	49	49	88	35	5	226	SS	52	46	105	39	6	248
2006	AW	34	51	84	46	7	222	SS	67	67	131	63	17	345
2007	AW	26	28	65	33	10	162	SS	54	55	104	49	15	277
2008	AW	31	26	47	26	2	132	SS	44	46	63	26	2	181
2009	AW	32	31	44	25	3	135	SS	43	30	33	33	1	140
2010	AW	51	39	78	46	4	218	SS	52	27	69	44	2	194

Table G.2. Total deviance (R^2) explained by each variable in the CRA 4 standardised seasonal CPUE model.

Variable	1	2	3
Period	0.223		
Month	0.055	0.271	
Statistical Area	0.016	0.243	0.290
Additional deviance explained	0.000	0.047	0.019

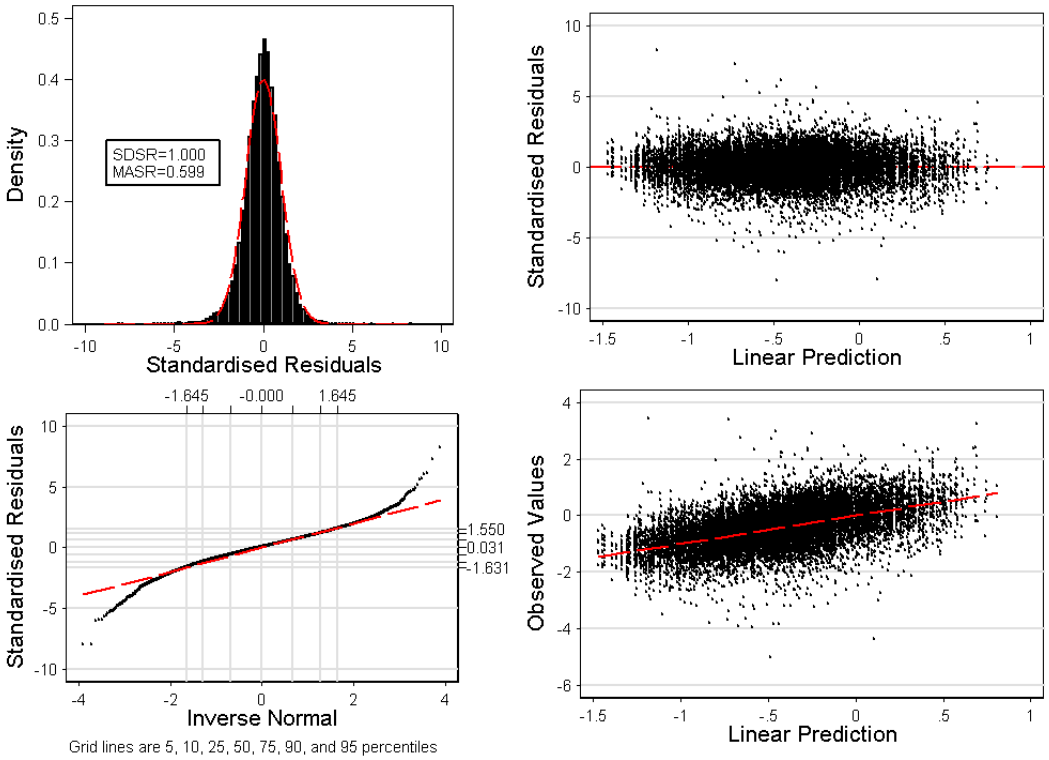

Figure G.1. Standardised residuals for the CRA 4 standardised seasonal CPUE analysis.

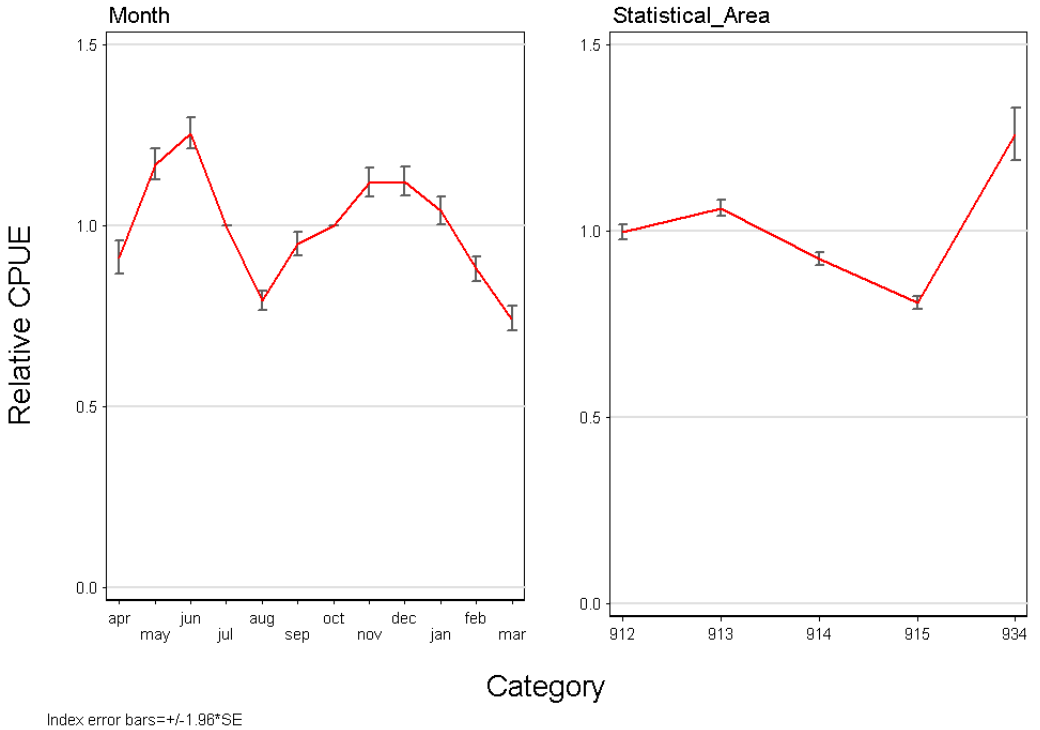

Figure G.2. Coefficients for month and statistical area from the CRA 4 seasonal CPUE standardisation. Month coefficients are not in canonical form, with each of the two reference months (July and October) set to 1.0 and the associated SE set to zero.