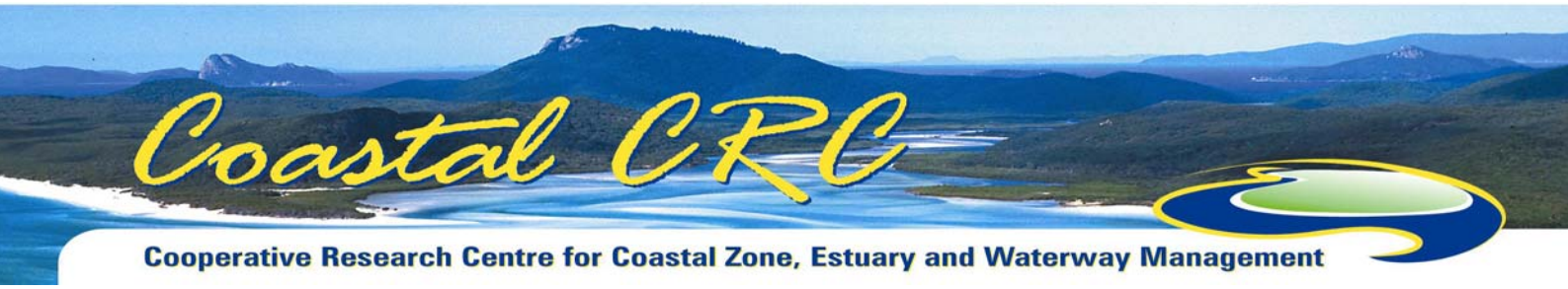

Historical trends in recreational fishing catches in the Gladstone region

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Abstract
The state of recreational fisheries is seen by many as an indicator of environmental health and ecological productivity. This paper considers two data sets from the Curtis Coast region: the catches of the Yaralla fishing club from offshore waters and the catch rates of the Wanderers fishing club from locations near and within Port Curtis.

The catches of the Wanderers Fishing Club provide useful, comparable and controlled data at two locations (Port Curtis and Cape Capricorn). Catch rates (median fish per person per trip) were lower in Port Curtis than at the Cape Capricorn site. Both sites show a significant decline in catch over time, but this trend is not as evident in the last ten years at Cape Capricorn. A continued decline was noted within Port Curtis in this ten year period. Results from similar clubs in Moreton Bay do not show similar trends.

There was no significant trend established for offshore catches from the Yaralla fishing club. Variability from year to year was far more significant than trends over time.

Introduction

Trends in the catches of amateur fishers are regarded as indicators of both ecologically sustainable development (see EPA, NSW 1995) and the degree of exploitation of fish (Gartside *et al*. 1999).

Recreational fishing is one of the highest participation activities in Queensland and its contribution to the Queensland economy is significant. As a result of this participation rate, the catches of anglers can influence government policy. When anglers are increasingly dissatisfied they have a large political influence for change. Therefore quantitative knowledge of catch trends is very important in informing debate.

The data can also be useful as a monitoring tool. Data from a group of fishers going to the same place, on comparable tides and fishing in the same way for a set time period can be a very cost effective manner of examining ecological productivity trends over time and may be almost as useful as some scientifically designed sampling programs performed at large cost. At least it is worth comparing with trends obtained in other ways.

In some cases fishers have been fishing in comparable ways at particular sites over significant time periods and have maintained careful records of their catches (see Pollock and Williams, 1993). This provides useful trend data provided that the characteristics of the fishery are well understood (Gartside *et al*. 1999). In many cases recreational catch data can be the only reliable long-term data available that may show change over time.

This study aims to consider trends over time in two data sets related to the records of line-fishing clubs. One based on an inshore fishery in the estuaries near and in Port Curtis and the second in offshore waters. Both sets provide a point of comparison to other data and studies elsewhere in Queensland.

It is not the aim of this paper to consider the reasons for any of the trends in catches. This is a separate and highly complex task that requires much further study. Caution must be applied in postulating as to the causes of trends, as the factors that impact on recreational fisher success are many and varied. It must be observed however, that many of these factors equally apply to other forms of monitoring so that there is merit in examining trends at least to identify if there is cause for concern.

Care should also be taken in comparing the data from the two clubs. The characteristics of the offshore fishery are fundamentally different to that of the inshore fishery. The data from the Yaralla club are based on large predatory fish in a reef environment, the Wanderers club on inshore estuarine species. The two sets are provided to demonstrate separate trends in different habitats, not for direct comparison.

Data sets examined

Wanderers Fishing Club

These fishers conduct monthly competitions in estuaries from Bustard Head to Cape Capricorn and hold reliable data from 1982/83, 1987/88 and from 1990/91 to the present. Each club trip is held over five hours in conjunction with a spring tide. They fish in similar

locations each year. Hence there are data available in each year from catches taken from the shores of Facing Island within Gladstone Harbour, and from the beaches close to Cape Capricorn (Fig. 1).

Fishing has always been conducted using rod and reel techniques; usually natural baits of yabbies (*Carassiops* spp.) are utilised. All competitors fish the same locality and for the same length of time (five hours).

The data contains a degree of control in that the fishers fished:

- in set comparable locations;
- over set time periods;
- on days with similar tides
- using similar methods and
- seeking similar species.

Some factors are not controlled. The skill level of competitors will vary and the group fishing from year to year does not remain the same, however a core group of fishers have remained active throughout much of the study period. There are controls on the type of gear that can be used but increasingly efficient gear (or experience in using it) could influence results.

Yaralla Fishing Club

The Gladstone based Yaralla Fishing Club provided data for the period 1977 to 2000 based on catches from the Capricorn/Bunker group (Fig. 1). Each trip consists of a 2-day weekend excursion with anglers fishing for approximately 10 hours per trip. Fishing is carried out in daylight from vessels from 10m to 17m in length. In almost all cases fishing occurred from boats drifting across patch reefs in depths between 12 and 25m. Fishing is carried out with nylon handlines (rods and reels are banned from competition) using baits of fish, squid or cuttlefish.

Data characteristics

The data are from experienced anglers fishing in known successful locations, so that their catch rates are not indicative of those of most anglers. They are however, useful to indicate trends in catch rates over time. The fishers are competitive, hence there is a motivation to be as productive as possible and to record catches accurately.

Both clubs record the number of fish caught and their total weight for each angler. Wanderers club has always recorded the types of fish taken but Yaralla has only recorded fish type since 1997.

Methods of analysis

Data were analysed to indicate the median number of fish caught per angler per trip for each financial year (July to June) at each locality. The median was chosen to reduce any bias of unusually low or high individual catches and variations in skill between anglers (see Mapstone *et al*. 1996). Trends in species composition of catch were examined by totalling the number of each species taken in each year.

Trends in catch rate over time were estimated by examining the correlation between median catch and the time in years since the first year data were available, that is attempting to examine the degree to which time can explain trends in median catch.

Results

Catch composition
The catch of Wanderers fishing club is dominated (81% in Gladstone Harbour, 85% at Cape Capricorn) by whiting (largely *Sillago ciliata*) (Fig. 2), the catch from the Yaralla club is based around three main species (red throat emperor, *Lethrinus miniatus*., venus tusk fish, *Choerodon venustus* and coral trout, *Plectropomus* spp.) although a large number of other species are taken (Fig. 3).

Catch trends

Wanderers fishing club
Highest catch rates were consistently recorded from the Cape Capricorn area (Fig. 5, Table 1).

Catch rates were variable, but show a significant declining trend across the full time period examined at both the Cape Capricorn and Gladstone Harbour sites (Table 1). During the time period 1991 – 2001, this trend was less obvious at Cape Capricorn, but catch rate continued to decline within Port Curtis (Table 1).

Yaralla fishing club
There was no significant trend established for offshore catches from the Yaralla fishing club (Fig. 4; r^2=0.1188). Variability from year to year is far more significant than trends over time and the probable best interpretation is that catch rates have not significantly declined over time.

Discussion

The data provide a useful opportunity to examine trends in fish catches at a number of sites within the vicinity of the Curtis coast. They represent one of the few long-term data sets available to consider possible trends in ecological productivity.

As stated in the Introduction, this paper does not consider any causative relationship behind catch trends and no inferences in this regard should be drawn from this study. However, it is notable that habitat modification has been historically much greater within Gladstone

Harbour than at Cape Capricorn or within the Capricorn Bunker Group. This is a subject worthy of much further investigation.

Care must also be expressed in considering catch trends over time. Some trends established in this study were clearly significant but there is no guarantee that catch rate trends may not change over a longer time period. This is why it is important to consider catch rates over as long a time period as possible.

Declining trends were common to all inshore sites over the time that data was available, although the trend was much less significant in the catch rates from Cape Capricorn over the last ten years. There was however, evidence of a continuing decline within Gladstone Harbour. This trend warrants further investigation and perhaps fishery independent monitoring.

Of further interest is that there is no clear trend in catches from the reef areas of the Capricorn Bunker group, variability from year to year was more significant than any trend over time. This suggests that declining catch rates are not universal amongst all local recreational fisheries.

The study of Thwaites and Williams (1994) of southern Queensland fishing club data provide a comparison in relation to the results of the Wanderers Club. This study examines the fishing club results from several clubs using similar techniques, catching similar species and operating under similar competition rules within Moreton Bay in southern Queensland. Their study shows no declining trend at four of five sites (all have remained stable or increased slightly). One site (Bribie Island) showed a decline in catch rates, however the significance of the decline was lower than that noted in this study from Gladstone Harbour. This suggests that the trends observed in this study are not evident in other locations of the state.

Higgs (1993), studied trends in the data of fishing clubs fishing Great Barrier Reef waters offshore from Townsville. These anglers fished in a similar manner to the Yaralla Club and their catch was based around similar species. He records a complex but declining trend in catch. The trend in catch rate from the Capricorn Bunkers was nowhere near as obvious. A slight decline was detected but variation from year to year was such that catch could not be considered to have declined significantly.

Acknowledgements

The Wanderers Fishing Club and Yarralla Fishing Club provided the catch data used in this study. I would like to thank these clubs for access to the data and compliment them on their high standards of data storage and management.

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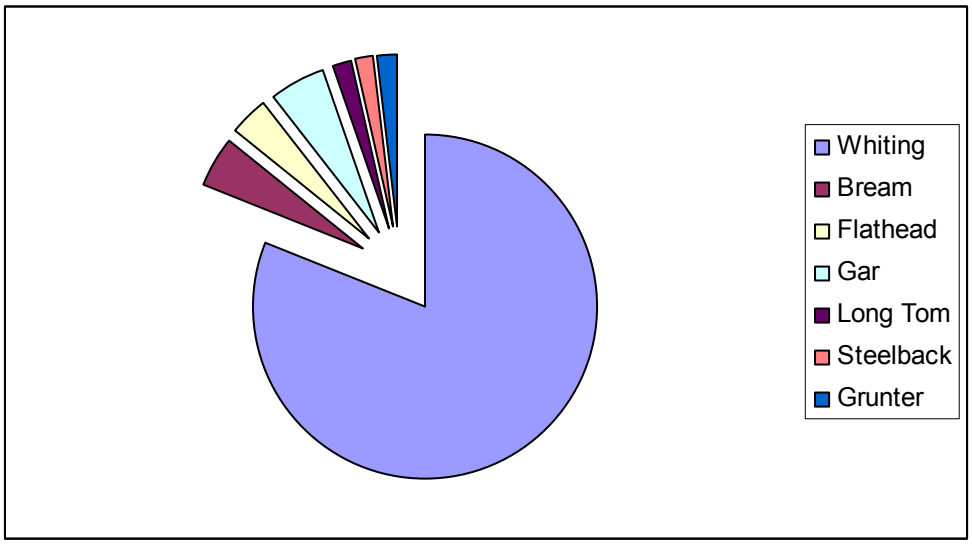

Fig. 2 Catch composition of the Wanderers fishing club from Curtis Coast area 1997 –2000.

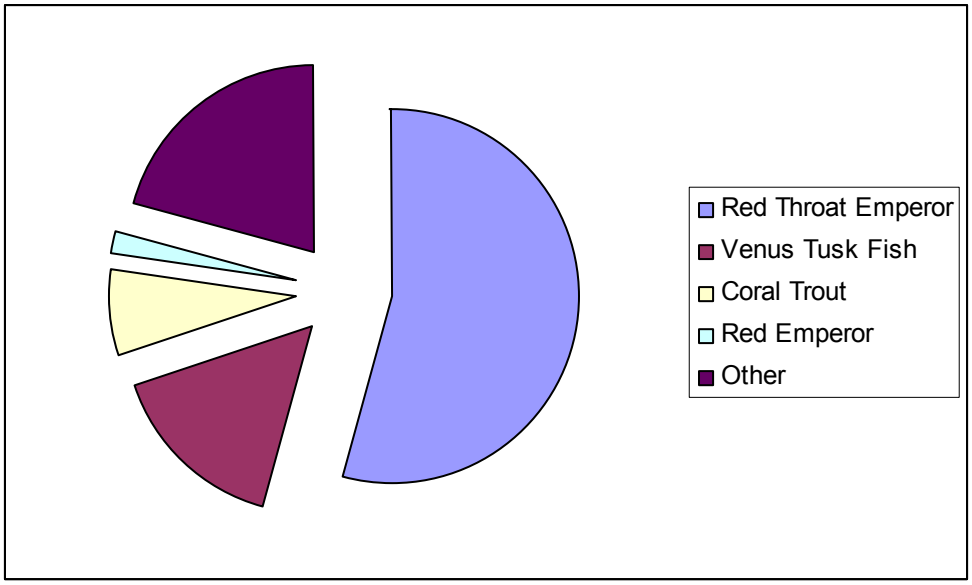

Fig. 3 Catch composition of the Yaralla fishing club from the Capricorn Bunker group 1997 – 2000.

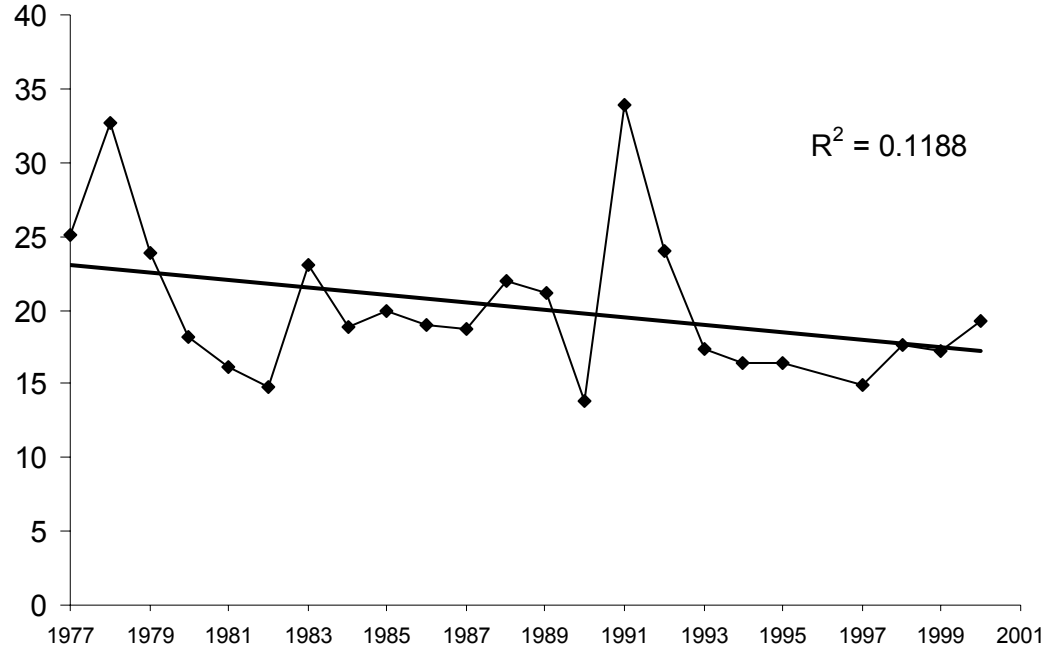

Fig. 4 Catch rates (median catch per person per trip) of the Yaralla fishing club for offshore locations within the Capricorn/Bunker group for the period 1977-2000.

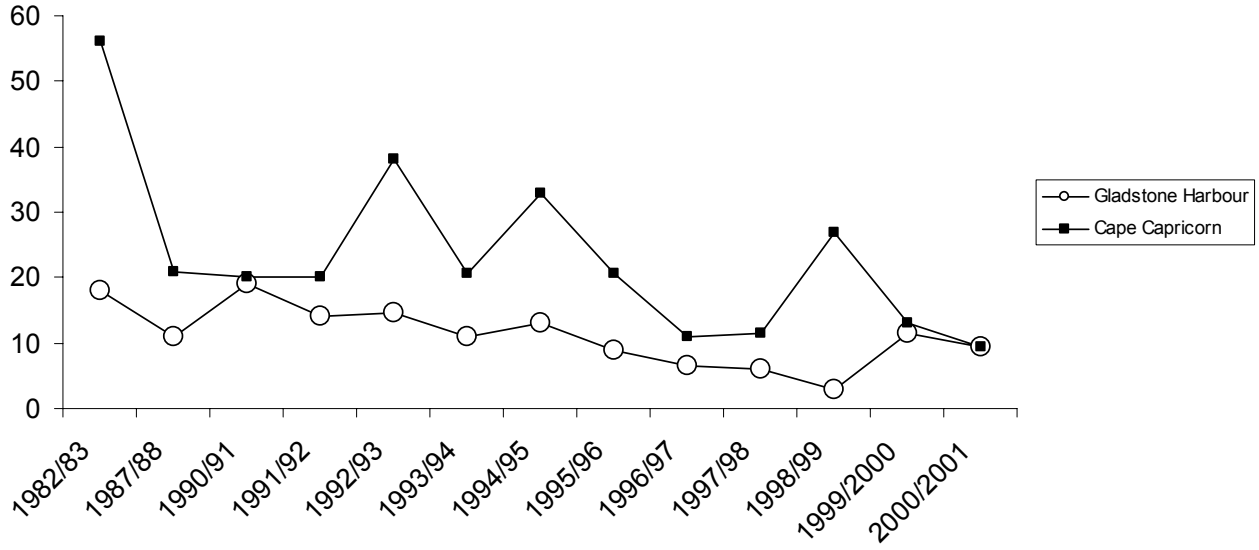

Fig. 5 Catch rates by the Wanderers fishing Club (median catch per person per trip) from Gladstone Harbour and Cape Capricorn for the period 1982-2001.

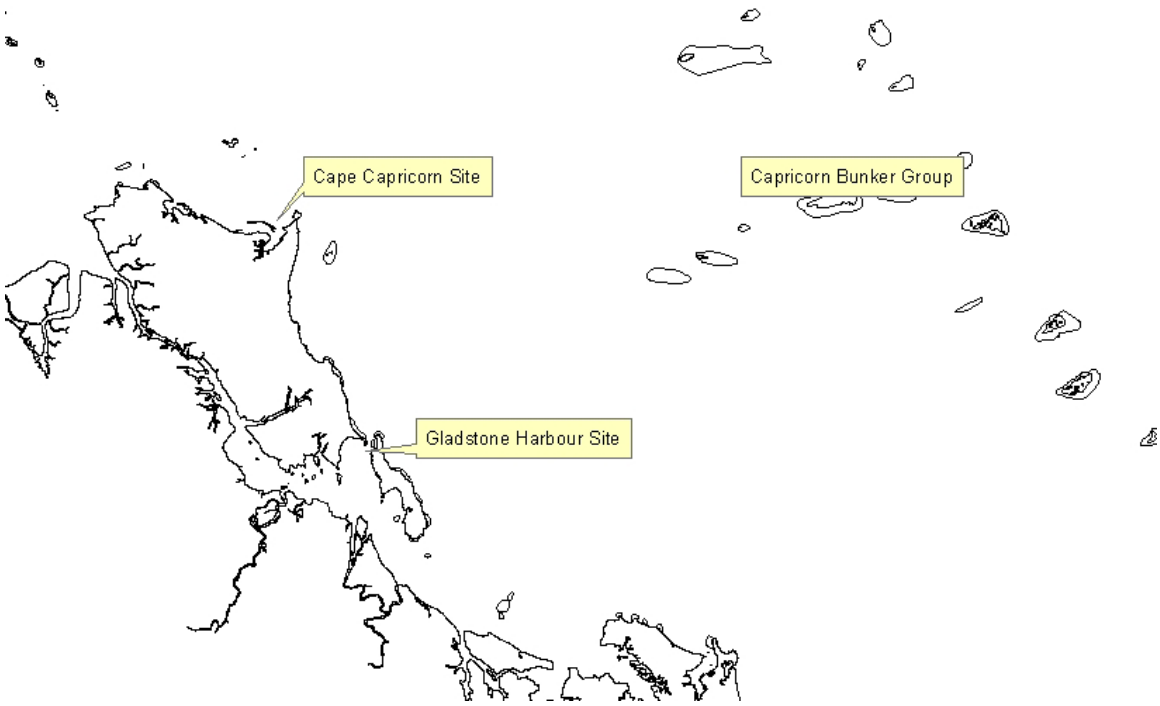

Fig. 1 Locations fished by the fishing clubs.

Table 1
Catch rates (median catch per person per trip) of the Wanderers fishing club for the two principal locations (Cape Capricorn and Port Curtis) for the period 1982/83-2000/2001. Trends over time (whole of time period and last ten years) were examined by calculating the correlation between time and catch rate.

	Port Curtis	Cape Capricorn
1982/83	18	56
1987/88	11	21
1990/91	19	20
1991/92	14	20
1992/93	14.5	38
1993/94	11	20.5
1994/95	13	33
1995/96	9	20.5
1996/97	6.5	11
1997/98	6	11.5
1998/99	3	27
1999/2000	11.5	13
2000/2001	9.5	11.5
Trend over time period	-0.70	-0.71
Trend 1991-2001	-0.73	-0.32