

# THE CHARTER BOAT FISHERY OFF THE GOLD COAST, QUEENSLAND



Courtesy of Good Go Fishing Charters

Data Summary 1994 - 1999

By

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## ABSTRACT

This report provides a summary of data collected from the charter boat fleet off the Gold Coast, Queensland between 1994 and 1999. The dominant species in the catch was Snapper (*Pagrus auratus*). Other important catch components were Teraglin (*Atractoscion aequidens*), Pearl Perch (*Glaucosmoa scapulare*), Jobfish (*Pristipomoides filamentosus*, *Pristipomoides sieboldi*) and Yellowtail Kingfish (*Seriola lalandi*).

Catch rates of Amberjack (*Seriola dumerili*), Samson (*Seriola hippos*) and Cobia (*Rachycentron canadus*) appeared to demonstrate seasonal catch trends. Catch rates of Dolphin Fish (*Coryphaena hippurus*) were related to the location and presence of FADs. Charter boat catches of pearl perch have declined since 1994 as have catches of Snapper. The latter showed a recovery in 1999. There was a trend towards the increasing importance of minor species. During the last two years there has been an increase in the discard rate of snapper and a decline in the mean size of snapper retained.

## INTRODUCTION

By definition: (Australian Marinelife Institute Inc.)

The Charter Fishing industry is a service industry providing local, interstate and international recreational anglers with the opportunity to undertake a fishing excursion.

The Gold Coast Charter industry caters for a wider range of recreational anglers with special requirements needed to meet the demands of the expanding interstate, international and corporate market.

## HISTORY OF THE GOLD COAST CHARTER BOAT FISHERY

Prior to 1986 recreational anglers often fished offshore from either professional fishing boats or their own vessels. The opening of the Southport Seaway in 1986 allowed a transformation of charter boat fishing off the Gold Coast. In 1986 only four charter operators fished off the Gold Coast. The period 1994 to 1997 saw a significant increase, not only in the number of operators, but also in the fleet size. From 1996 larger vessels with increased numbers of passengers began to take their place in the fleet and 1998 saw the inevitable over supply in carrying capacity. This increase in carrying capacity coupled with a drop in catches of the more popular fish species such as snapper has seen a number of operators either selling vessels or leaving the fishery. This adjustment in fleet size represents a 30% reduction in the permanent operational fleet for 1999 with further reductions in fleet size predicted.

## THE GOLD COAST FISHERY

The sampling area that represents the Gold Coast fishery for the purpose of this report is bounded by Latitudes 28°12' and 27°30' and Longitudes 153°27' and 153° 48'. This represents an area of some 480 sq. nautical miles. The fishing area has been divided into fishing zones, using the Southport Seaway as the reference point.

These fishing zones are represented by:

- Zone 1 ( South East) Latitude 28° 05' to 28° 12'
- Zone 2 ( East South East) Latitude 28° 00' to 28° 05'
- Zone 3 ( East) Latitude 27° 52' to 28°00'
- Zone 4 ( East North East) Latitude 27° 47' to 27° 52'
- Zone 5 ( North East) Latitude 27° 30' to 27° 47'

The fishery operates in three depth zones corresponding to offshore rocky reefs along the 24, 36 and 50 fathom lines running parallel with the coastline. More defined reef structures are found at the southern end of the fishery (Zone 1), with "lifts" of up to eight metres in some areas. This zone is an extension of the reef complex out from Cook Island. Zones 2,3 and 4 do not have the reef protrusions of zone 1. Zone 5 forms the lower end of the reef formations linking with the Point Lookout region and whilst having more exposed reef, does not have the lift heights found in zone 1. More pronounced depth variations are noted closer to shore at the southern and northern ends of the fishery with a more extended slope existing in the central area of the fishery. In the southern region fishing is concentrated around ridges inside a prominent submerged seamount area. Extensive wire weed areas are located on the rocky reef slopes in zones 2,3 and 4 and along the outer slopes from 80m.

Demersal or bottom fishing activities within the Gold Coast fishery are usually carried out in waters between 36 and 50 fathoms. The demersal stocks of fishes that inhabit the deeper outer slopes have in general been under-exploited or only lightly exploited by the charter fleet due to distance offshore and the generally strong current found in these areas.

Ecologically, this demersal fishery is integrated with such other fisheries as the pelagic fishery since pelagic species are sometimes targeted, or are incidentally caught, by the charter fleet.

Most of the charter fishing is carried out on vessels ranging in length from 8 to 18m. These vessels, surveyed to carry between 8 and 25 persons, are company owned and maned by qualified skippers or in some cases owner operated. All fishing is undertaken using rod and reel with suitable fishing areas generally located using GPS. Echo-sounders are generally used to identify fish and bait schools on the fishing grounds. In all but a few cases fishing is conducted by drifting across the target area. With some dual engine vessels, engines are used to hold position over the fishing site against the current. Total length of fishing trips average 9 hours for the fleet with mean fishing time of 5.5 hours.

A combination of cut and live bait is used with pilchards the preferred cut bait. Live bait consists mainly of yellowtail (*Trachurus declivis*) and slimy mackerel (*Scomber australasicus*). Weather conditions influence the number of trips undertaken with many cancellations due to strong wind warnings and unfishable conditions.

To meet international "limited stay" and interstate tourism requirements, there has been a trend towards half day or short duration tours. This has caused an increase in trip numbers undertaken by some operators thereby increasing the number of fishers participating in the fishery. To meet the larger group bookings often associated with international groups, larger surveyed vessels have been introduced to the fishery. Vessels carrying these larger groups not only have the potential for increasing impact on the fishery but also tend to fish the closer reef areas where smaller fish, in particular juvenile snapper and teraglin, are found.

There has also been a significant increase in the number of night trips undertaken. Up until 1997 night fishing was normally only carried out around the period of the full moon. Commencing in 1997, and increasing in frequency in 1998, night fishing has become a popular activity particularly for the tourist market. These short duration night charters provide interstate and international tourists with the opportunity of experiencing offshore fishing whilst also allowing them to undertake other daytime tourist activities. The short duration of night time fishing excursions often restricts the fishing activity to the close inshore reef areas where juvenile fishes are abundant. The catching of these small fish provide recreational activity for the fishers who in many cases do not wish to retain their catch, but the recreational value has to be measured with possible mortality of the released fish. Teraglin, a species that has a high mortality after release, is one of the species mostly caught on these close in reefs. Because these fish school by size, with smaller fish found in shallower waters, very few specimens found in these areas are of legal length (45cm).

In the last few years, there have been anecdotal reports of a decrease in the size range of snapper retained by the Gold Coast charter fleet, and increases in discard numbers. Many operators highlighted this as one of the most important issues facing the Gold Coast Charter industry. We recognised that despite a great deal of information on the landed catch of snapper (data have been collected since 1993), there existed no extensive data set on snapper recruitment stock that would either confirm or deny this anecdotal information. In 1998 we began to identify and quantify the size structure of the discarded snapper catch as well as the retained catch. This was done to provide information to allow for better management of the snapper resource given concerns about the level and fate of discards in many of our fisheries.

The main objectives of this work were to describe monthly variation in the ratios of retained snapper to discarded snapper and to provide a basis for monitoring long term changes in the size structure of the total catch (both retained and discarded) of snapper. This report provides a basic data summary of the information collected from the Gold Coast Charter fleet between 1994 and 1999. It also presents information on a pilot program beginning in 1998 to assess the relative abundance of undersize fish.

## DATA COLLECTION & ANALYSIS

Data collection remains difficult owing to diverse user groups, broad geographical areas, and the many points where fish are landed. Fishing pressure has increased with growing human populations, greater demands for fishery products, and technological improvements such as electronic fish finders and navigational aids.

The fishery records for each trip are summarised on standard forms (Appendix 1 & 2) and records made of the catch, effort, depth and weather conditions. Catch is recorded in numbers of each target species (Snapper, etc.) for the survey with non-target species grouped into one category as "others". Species within this latter group include dolphin fish (*Coryphaena*

*hippurus*), amberjack (*Seriola dumerillii*), and samson (*Seriola hippos*). These fish are seasonally present in the fishery and have been recorded separately. Snapper catch and by-catch of 14 Gold Coast Charter boats were recorded both at sea and onshore upon their return to port.

Hourly catch rates per angler were calculated for all fishing days based on a relationship established through our research work that showed that about 70% of anglers were actually fishing. The remaining 30% were either seasick or did not fish for other reasons. Fleet catch to by-catch ratios were calculated for the total fishery and subsets of the data based on depth distribution.

CATCH COMPOSITION

Species targeted by charter boats within the Gold Coast fishery include, snapper (*Pagrus auratus*), pearl perch (*Glaucosoma scapulare*), teraglin (*Atractoscion aequidens*), jobfish (*Pristipomoides filamentosus* and *Pristipomoides sieboldi*), yellowtail kingfish (*Seriola lalandi*), amberjack (*Seriola dumerilii*), samson fish (*Seroila hippos*), cobia (*Rachycentron canadus*) and dolphin fish (*Coryphaena hippurus*). These species, with the exception of amberjack, samson, dolphin fish and cobia have been separated in the following catch statistics and included with minor species such as sweep (*Scorpius lineolatus*), theodore butterflyfish (*Nemipterus theodorei*), venus tuskfish (*Choerodon venustus*), black-spot pigfish (*Bodianus vulpinus*) and tailor (*Pomatomus saltatrix*) under the category for other species.

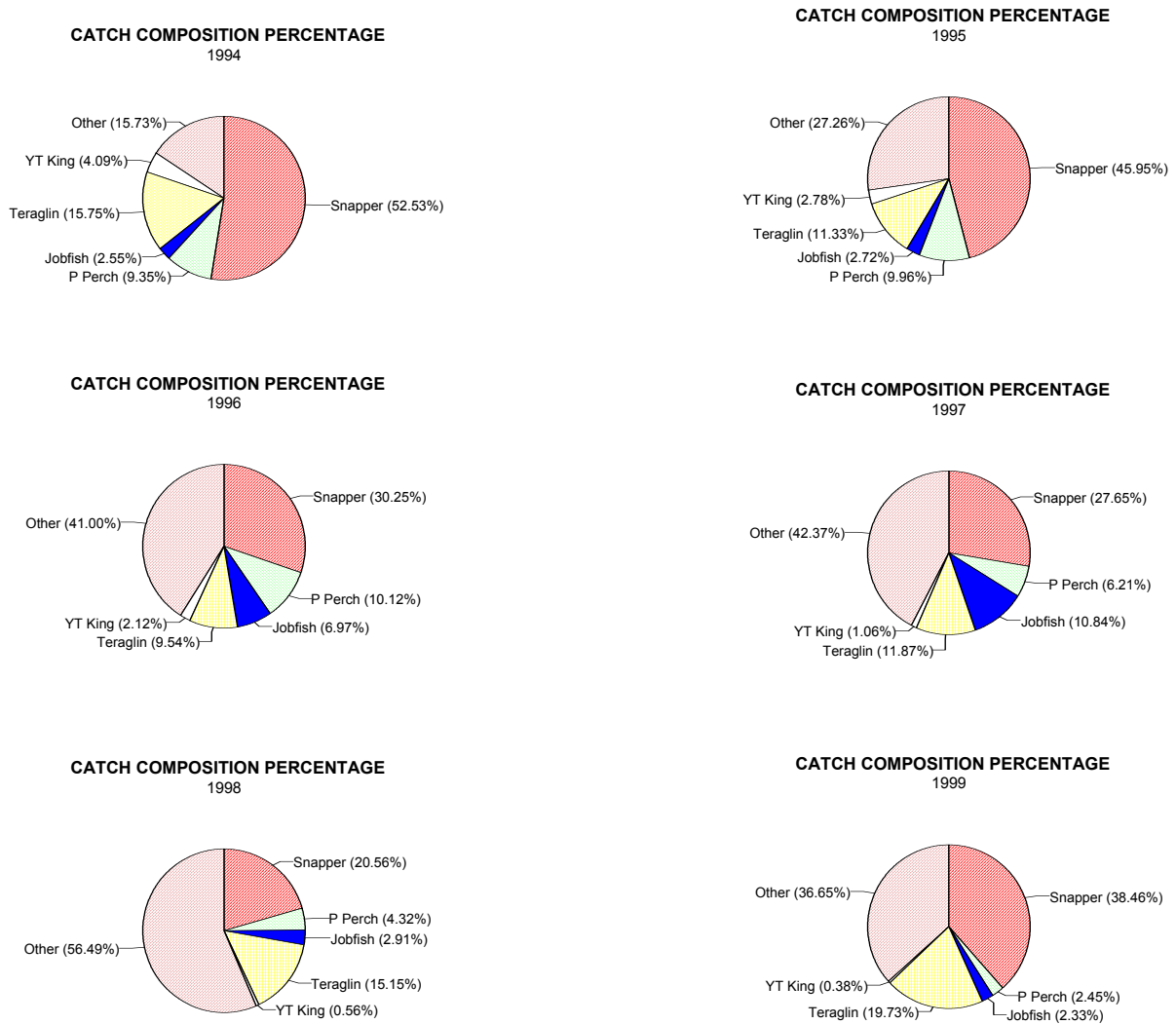
Table 1. Details of charter boat fishing effort off the Gold Coast for the period 1994 to 1999.

Year	Data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1993	Count of Day						7.00	30.00	23.00	31.00	30.00	17.00	43.00	181.00
	Average of No Anglers						7.71	7.64	6.50	7.10	8.20	7.24	7.74	7.48
	Average of Net Anglers						5.40	5.35	4.55	4.97	5.74	5.06	5.42	5.24
	Average of Fish Time						5.36	5.44	6.46	6.13	5.78	6.07	5.49	5.81
1994	Count of Day	63.00	52.00	25.00	68.00	74.00	95.00	102.00	127.00	128.00	111.00	108.00	90.00	1043.00
	Average of No Anglers	7.16	6.54	7.04	7.07	7.62	7.30	7.17	7.55	7.78	7.17	7.48	7.63	7.37
	Average of Net Anglers	5.01	4.58	4.93	4.95	5.33	5.11	5.02	5.28	5.45	5.02	5.23	5.34	5.16
	Average of Fish Time	5.36	5.21	4.95	5.67	5.69	5.60	5.32	5.46	5.48	4.74	5.03	5.59	5.35
1995	Count of Day	91.00	47.00	53.00	89.00	68.00	73.00	120.00	95.00	124.00	85.00	73.00	97.00	1015.00
	Average of No Anglers	7.42	7.21	7.14	7.50	7.96	7.40	8.09	7.81	7.66	7.69	7.86	7.73	7.67
	Average of Net Anglers	5.19	5.05	5.00	5.25	5.57	5.18	5.67	5.47	5.36	5.39	5.50	5.41	5.37
	Average of Fish Time	5.52	5.45	5.28	5.59	5.48	5.10	5.37	5.51	5.50	5.40	5.45	5.28	5.42
1996	Count of Day	70.00	52.00	49.00	76.00	35.00	86.00	98.00	132.00	105.00	117.00	88.00	124.00	1032.00
	Average of No Anglers	7.46	7.72	7.82	7.55	8.00	8.03	8.49	8.45	8.52	8.22	8.12	8.02	8.11
	Average of Net Anglers	5.22	5.41	5.47	5.28	5.60	5.62	5.94	5.92	5.96	5.75	5.68	5.62	5.67
	Average of Fish Time	5.68	5.77	6.09	5.37	5.70	5.82	6.05	5.73	5.71	5.49	5.60	5.60	5.70
1997	Count of Day	60.00	61.00	84.00	85.00	64.00	112.00	119.00	138.00	103.00	105.00	86.00	97.00	1114.00
	Average of No Anglers	8.00	7.79	8.14	7.61	8.01	8.09	8.17	8.03	8.17	7.99	8.02	7.75	7.99
	Average of Net Anglers	5.60	5.46	5.70	5.33	5.61	5.66	5.72	5.62	5.72	5.59	5.62	5.43	5.60
	Average of Fish Time	4.98	5.48	5.51	5.14	5.46	5.45	5.70	5.78	5.61	5.78	5.40	5.38	5.51
1998	Count of Day	94.00	73.00	71.00	67.00	99.00	100.00	97.00	93.00	107.00	99.00	57.00	103.00	1060.00
	Average of No Anglers	8.11	8.01	7.93	7.43	7.91	8.21	8.11	7.94	8.66	8.35	8.82	8.79	8.20
	Average of Net Anglers	5.68	5.61	5.55	5.20	5.54	5.75	5.68	5.56	6.06	5.84	6.18	6.16	5.74
	Average of Fish Time	5.21	5.13	5.70	5.37	5.53	5.62	5.71	5.42	5.38	5.32	5.41	5.28	5.43
1999	Count of Day	115.00	44.00	81.00	88.00	56.00	85.00	117.00	91.00	96.00	132.00	84.00	96.00	1085.00
	Average of No Anglers	9.37	8.24	8.27	9.18	9.15	8.68	9.13	9.60	10.07	9.41	9.43	8.72	9.17
	Average of Net Anglers	6.56	5.76	5.79	6.43	6.41	6.07	6.39	6.72	7.05	6.59	6.60	6.10	6.42
	Average of Fish Time	5.15	5.45	5.22	5.64	5.18	5.36	5.13	5.60	5.33	5.51	5.63	5.84	5.41
Total Count of Day		493.00	329.00	363.00	473.00	396.00	558.00	683.00	699.00	694.00	679.00	513.00	650.00	6530.00
Total Average of No Anglers		8.08	7.62	7.86	7.76	8.06	7.97	8.20	8.13	8.36	8.20	8.19	8.09	8.08
Total Average of Net Anglers		5.65	5.33	5.50	5.43	5.64	5.58	5.74	5.69	5.85	5.74	5.73	5.66	5.65
Total Average of Fish Time		5.31	5.40	5.49	5.46	5.51	5.50	5.52	5.63	5.53	5.39	5.42	5.49	5.48

- Count of Day = Number of charter boat days
- Average of No. Anglers = Average number of anglers per boat
- Average of Net Anglers = Average number of anglers actually fishing per boat
- Average of Fish Time = Average number of hours spent fishing per trip

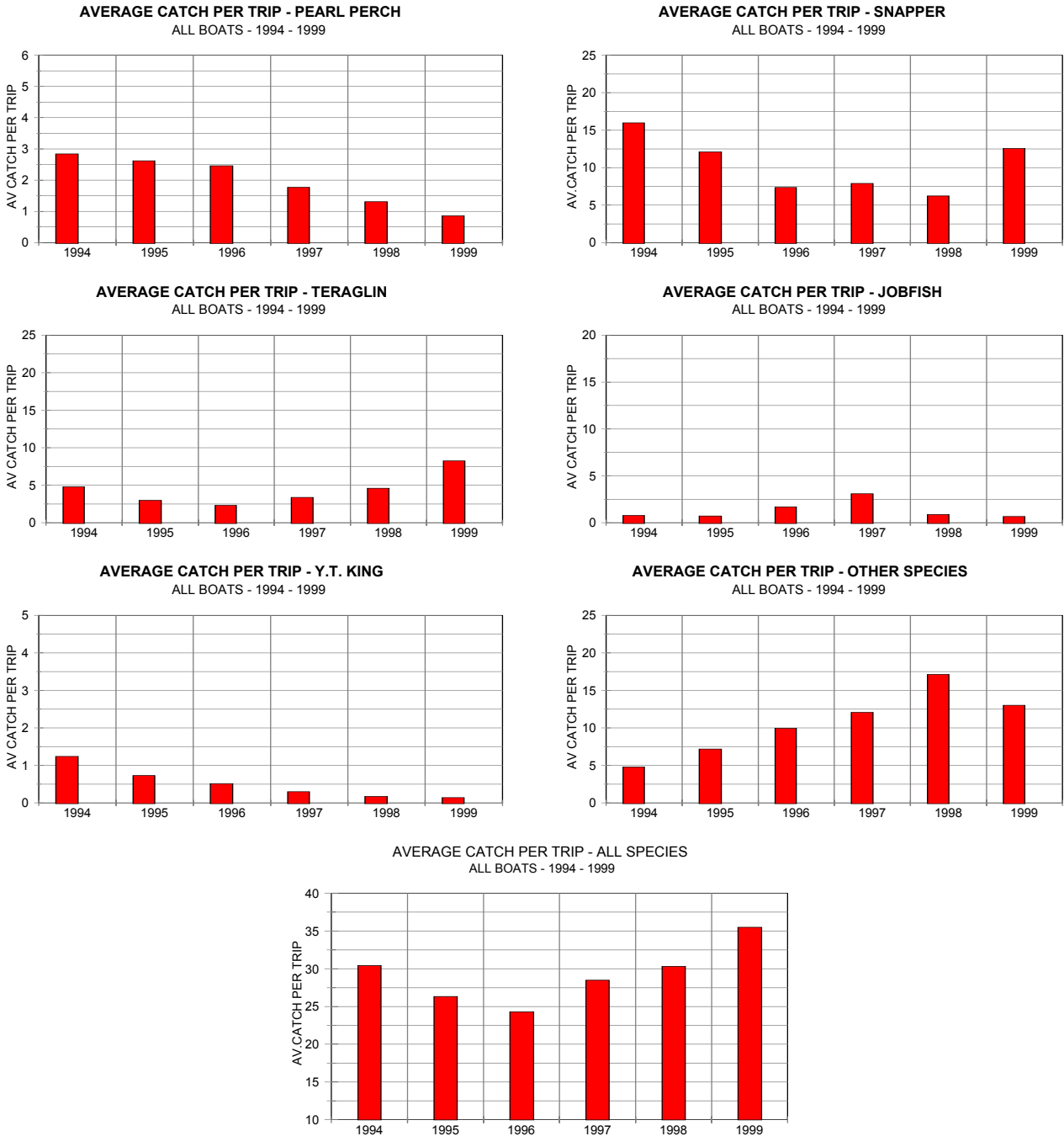
Figure 1

Catch composition of Gold Coast Charter fleet 1994 - 1999. Percentage of total annual catch (number) represented by various species.



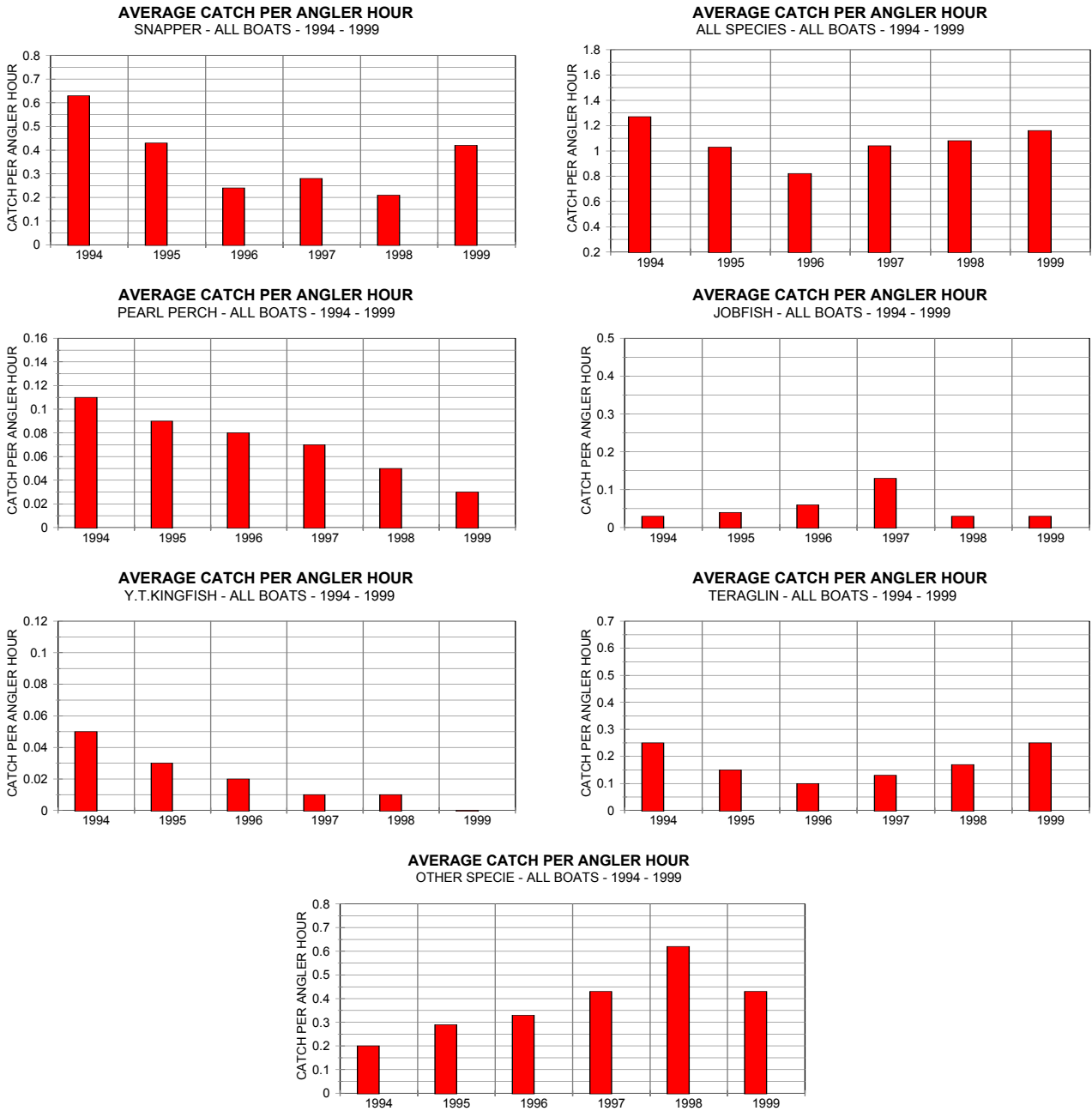
- Snapper catch percentage ranged from 20% to 50%. There was a decline in the catch percentage from 52.5% in 1994 to 20.6% in 1998 with an increase in 1999 up to 36.5%
- There has been a substantial decrease in the percentage of pearl perch over the past three years.
- The high catches of Jobfish in 1996 and 1997 were dominated by *P.sieboldi*. *P.filamentosus* dominated catches results in 1994, 1995, 1998 and 1999. With the exception of 1996 and 1997 the appearance of *P.filamentosus* corresponded with increased snapper catches.
- The percentage of teraglin in the catch remained consistent from 1994 to 1998 which was dominated by night fishing. 1999 saw the establishment of a day fishery that accounts for most of the catch in that year.
- The importance of yellowtail kingfish catches has declined over the survey period.
- The importance of other species increased in 1996 and peaked in 1998. This coincided with the incursion of samson fish (*Seroila hippos*) in 1996, cobia (*Rachycentron canadus*) 1997 and dolphin fish (*Coiyphaena hippusus*) in 1998.

Figure 2 Average catch per trip of various species caught by the Gold Coast charter fleet 1994 – 1999



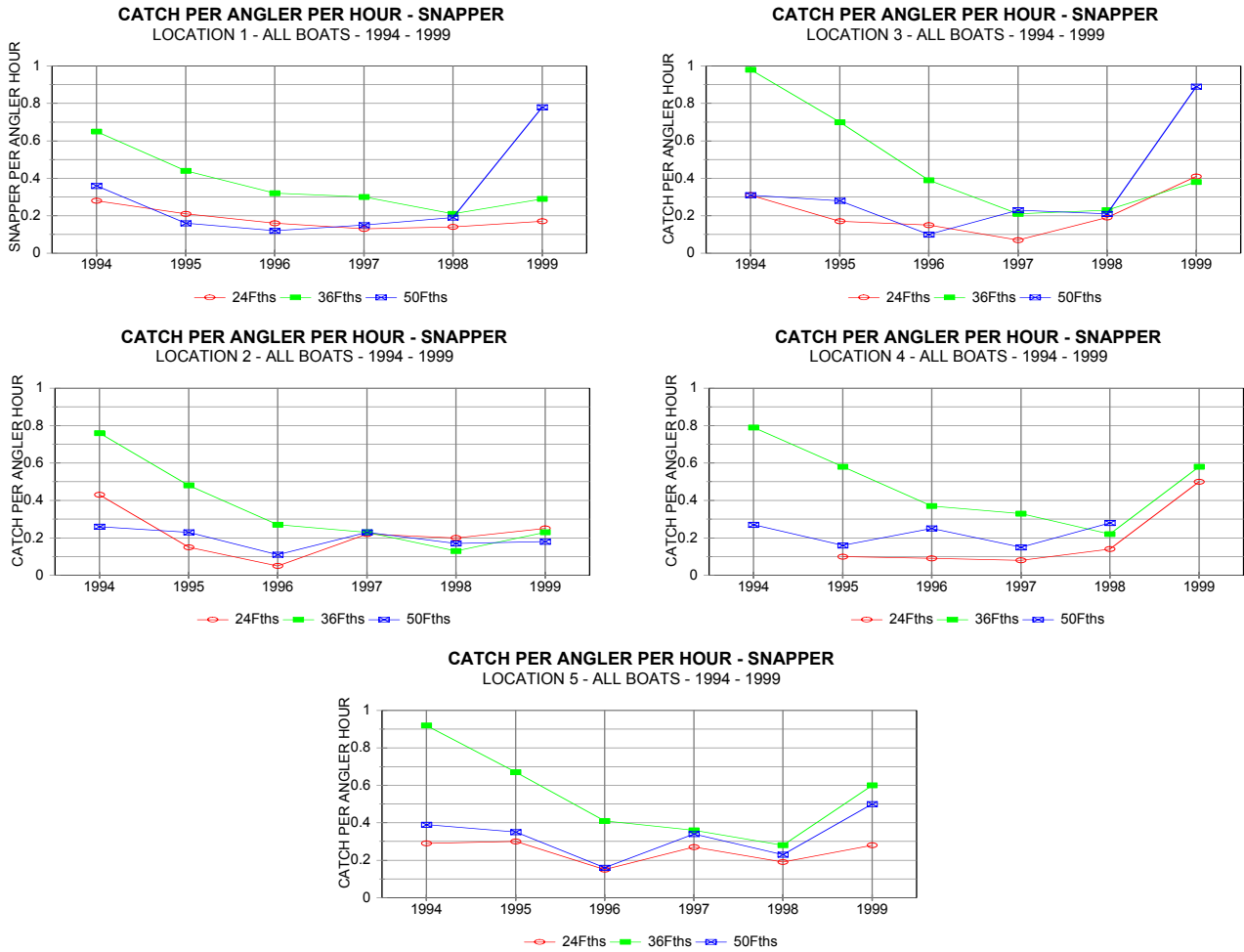
- Snapper catches declined from 1994 to 1998 with an indication of a recovery in 1999.
- Pearl perch catch peaked in 1996. A steady downward trend was recorded through to 1999.
- A peak in jobfish catch in 1997 was the result of an increase in numbers of *P.sieboldi*. This species dominated the catch in years 1996 and 1997. In 1998 *P. filamentosus* represented a larger proportion of the catch.
- Teraglin fleet catch trends reflected a change in fishing activity over the same period (See previous graphs).
- Catch trends for other species reflected the steady increase in the numbers of other species kept, because of the corresponding downturn in snapper catches. Secondly there was significant targeting of dolphin fish, amberjack and samson in 1997 and 1998 which reflected a change to a multi species fishery, rather than predominantly a snapper fishery.

Figure 3 -Average catch (number of fish retained) per angler hour of principal species groups.



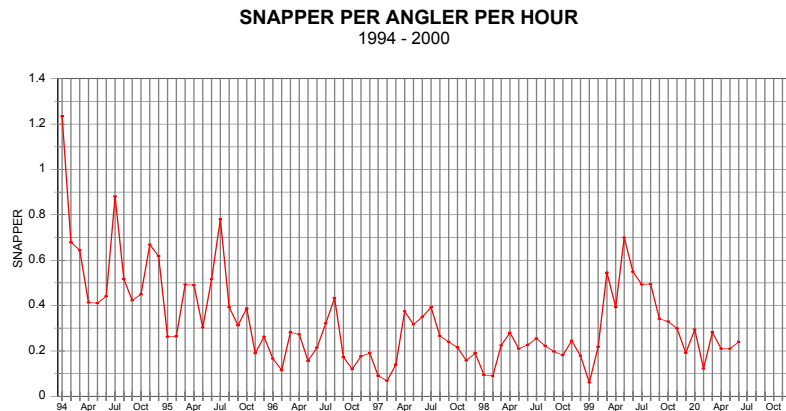
- Trends in catch per angler/ hour are similar to total catch trends for all species.

Figure 4 - Snapper catch per angler hour for five fishing zones off the Gold Coast.



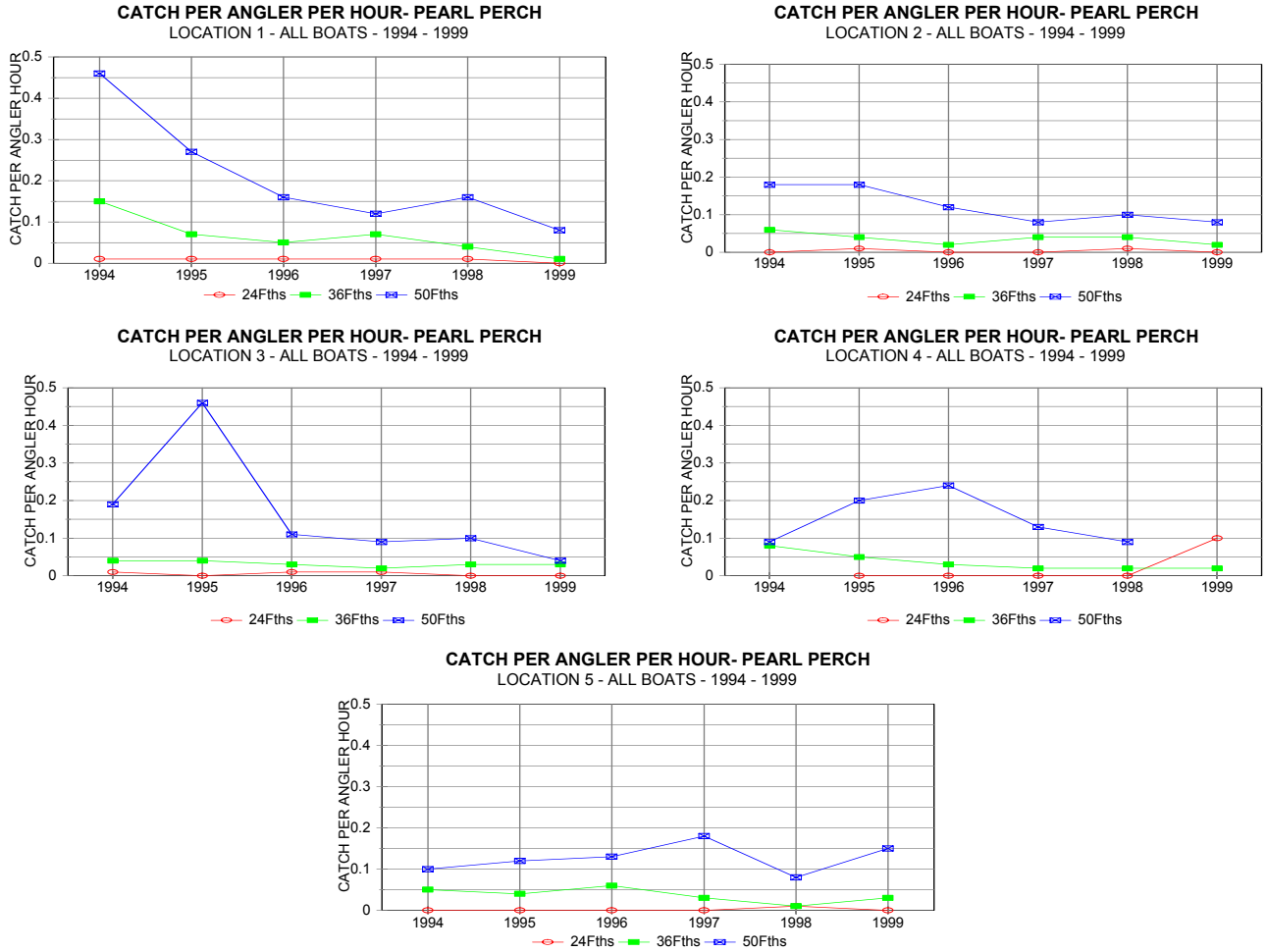
- Catch rates were highest in the 36 fathom zone
- All zones showed similar catch rate patterns with a decline most noticeable in 50 fathoms
- All zones (except zone 2) showed increased CPUE in 1999

Figure 5. Monthly variation in snapper CPUE (catch/angler/hour) for Gold Coast Charter fleet



- Recruitment introduction in January 1999 appears to contribute to the increased CPUE for March 1999.
- 30 to 31 cm fish represent 48% of the catch in March 1999, 56% in April 1999 and 79% in May 1999.
- 30 to 32cm represent 79% of the catch in April 1999 and 71% in May 1999.

Figure 6 Pearl perch catch per angler hour for five fishing zones off the Gold Coast.

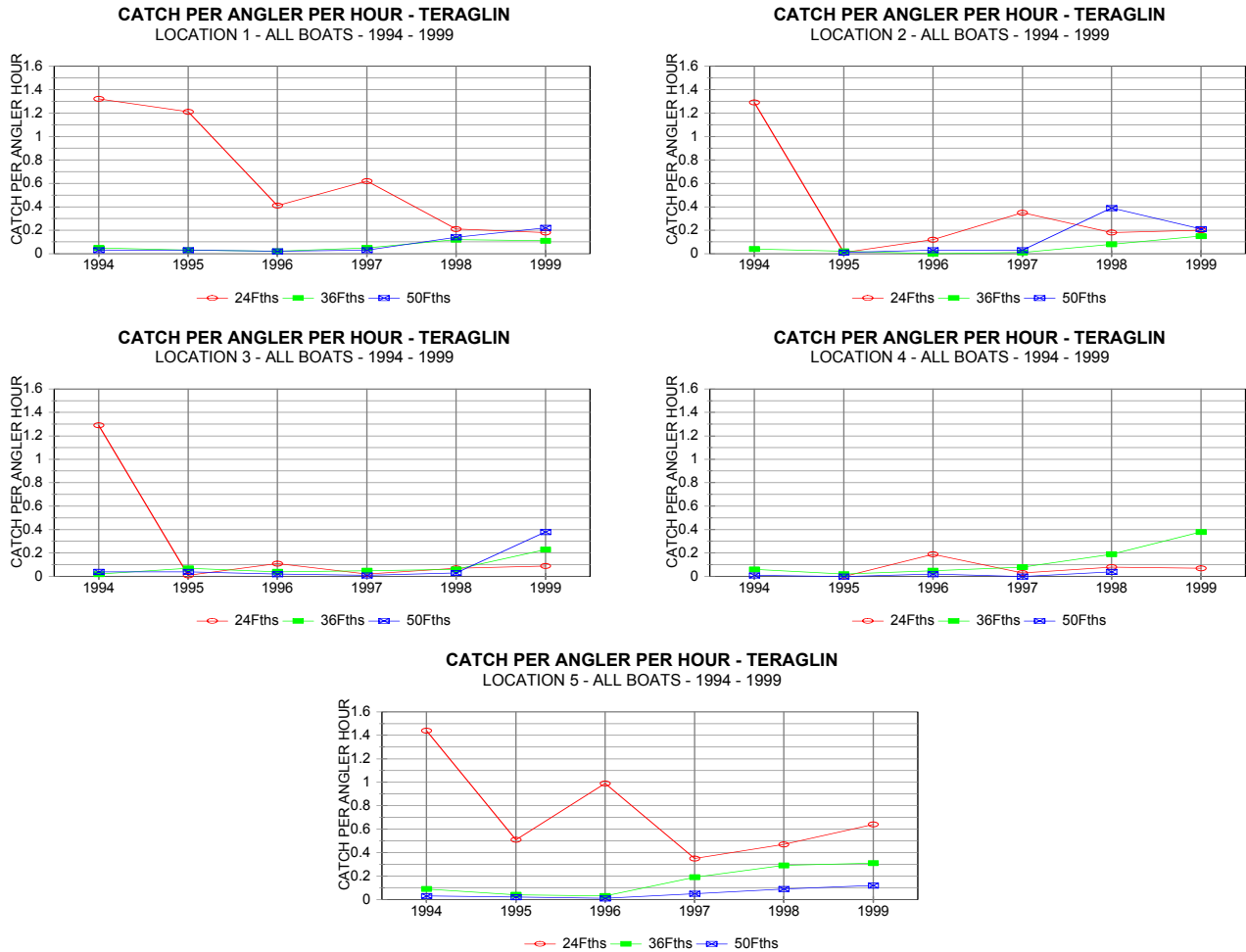


- Catch rates were highest in the 50 fathom zone.
- Location and catch rates show considerable annual variation



Sample catch of Pearl Perch in 1996

Figure 7 Teraglin catch per angler hour for five fishing zones off the Gold Coast.



- Catch rates were highest in 24 fathom zone
- Highest catch rates in Zones 1 and 5 reflecting the number of night trips undertaken in these areas
- Recent increases in 1999 reflected a move to a daytime fishery

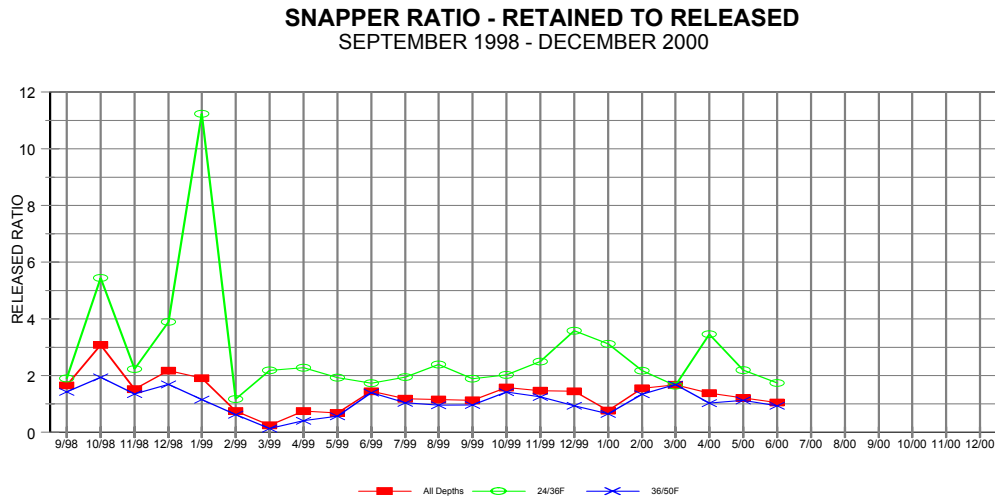
DISCARDED VS RETAINED SNAPPER

Table 2. Snapper catch (numbers of retained and released fish) for a sub-sample of the Gold Coast Charter Fleet from 1998 to 2000.

Month	1998		1999		2000	
	Retained	Released	Retained	Released	Retained	Released
January			173	330	873	669
February			204	153	269	418
March			847	211	514	858
April			635	480	321	443
May			559	381	467	567
June			901	1305	676	713
July			979	1157		
August			982	434		
September	344	567	672	755		
October	258	794	863	1364		
November	415	630	548	799		
December	468	1018	505	733		
Trip Nos.		210		553		341

Examination of established catch ratio data for the period September 1998 to June 2000 indicates a mean ratio of snapper released to snapper retained at 1.5:1 (Table 2)

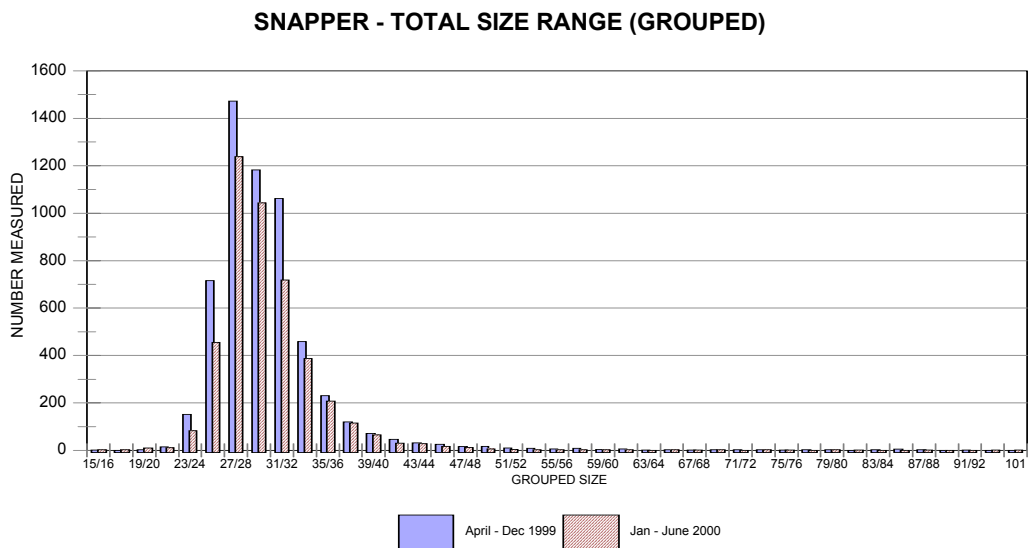
Figure 8. Ratio of released to retained catch in two major reef depth zones, (24 to 36 fathoms and 36 to 50 fathoms) from September 1998 to December 2000.



- Highest ratios of released to retained found in 24/35 fathoms
- Released/ Retained ratio peaked in 24 to 36 fathoms in January 1999 (11:1)

Of particular interest is the catch peak in the 24 to 36 fathoms region in January 1999 indicating a ratio of 11.2:1. It was noted that the largest catch rates were identified coming from the fishing zones south of the Southport Seaway (which were also the shallower fishing areas). These results confirm that greater numbers of recruitment fish were found in the shallow depths. However, the margins between the two established fishing depths are not significant indicating that these smaller fish could be dominating the total fishery. At times there is a distinct convergence of released ratios within the fishery at all depths.

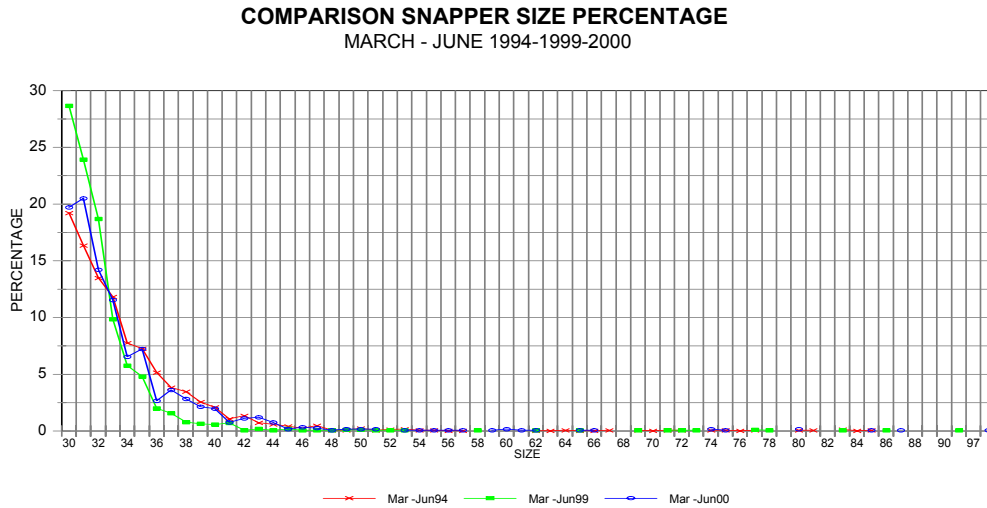
Figure 9. Size structure for snapper caught for the periods April to December 1999 and January to June 2000 (Sizes have been grouped into 2cm size classes).



- Size structures were similar for both sampling periods with 65.3% of snapper between 27 and 32 cm in 1999 compared with 66.2 % in 2000.

## MONTHLY SIZE STRUCTURE COMPARISONS

Figure 10. Size frequency of retained snapper catch by the Gold Coast fishery during 1994, 1999 and 2000



- Greater number of snapper in the 27cm to 30 cm were caught for the period February to June 2000 than were caught for the same period in 1999.
- There was an increase in the snapper catch in size range 37cm to 60cm in 2000..
- In 1994 a smaller percentage of snapper in the 30cm to 33cm range were caught when compared with years 1999 and 2000. In 1999 a much larger percentage of 30cm and 31cm snapper were captured and this could have been related to the large number recruitment snapper recorded in January 1999.

## DISCUSSION

In the last five years a noticeable change has taken place in the targeting of various species of fish. The information gathered over six years sets a benchmark within the Gold Coast fishery. When this project commenced the bulk of fishing activity concentrated on snapper and pearl perch. Teraglin were regarded as a full moon, night time fishery with only a small number of charter vessels involved in these charters. At certain times of the year several boats made above average catches of yellowtail kingfish and jobfish.

Snapper represented significant catches during 1994 and 1995. The availability of snapper declined in 1996 where catch statistics reflected a lower catch per angler. Average catch per angler for all species for the five-year period 1994 - 1998 was 5 - 6 fish with a fleet CPUE of 1.1 (Figure 3). Further unchecked expansion of fishing effort may lead to severe declines of the rocky reef fish stocks particularly based on the forecast for residential population expansion within the fishing region. Even sustained fishing may be sufficient to reduce reef fish populations on substrate structures such as those found within the Gold Coast fishery.

When catch rates for the total catch of all species are considered, they appear less variable than for some specific species. Species such as snapper, pearl perch, jobfish and yellowtail kingfish demonstrate large annual variability in catch rate when considered over a lengthy time span, however the total catch is much more consistent. Differences in catch composition between zones are also evident in the CPUE data with different areas supporting different species. Further, there appears to be a positive correlation between snapper and rosy jobfish (*P. filamentosus*) catches. However this result, whilst interesting, must be interpreted with caution.

CPUE data suggest that catch rates will be maximised by fishing between 60 and 70m. Beyond 70m the CPUE in terms of numbers of fish declines with depth mainly due to the effects of current. No CPUE data on weight verses depth is maintained but one would suspect that catch rates by weight would be maximized by fishing outside the 90 m region where larger fish are generally found.

Teraglin, once targeted mainly at night are now proving to be a significant daytime fishery. The sustainability of this fishery is still to be determined, as these fish appear to be site specific and could easily be vulnerable to localised over fishing.

The stimulus to develop alternative fisheries has been brought about by the apparent decline in the availability of some species. Analysis of catch and effort data suggests that total overall catch rates have remained constant, however, the catch composition of the fishery changes over time, with a decline in the relative proportion of snapper (*Pagrus auratus*). Other changes in catch composition have been brought about by change in social factors with increasing numbers of tourists undertaking short duration excursions.

There is also evidence of changing fishing strategies to target seasonal availability of certain species. For example, when dolphin fish (*Coryphaena hippurus*) were present in the fishery for long periods during late 1997 up until October 1998 fishing pressure switched from demersal stocks to dolphin fish which congregated around Fish Attraction Devices (FAD's). With the introduction of FAD's in 1997 and 1998 large catches of dolphin fish (*Coryphaena hippurus*) were recorded. These catches were maintained well into the winter months. Fishing effort adjustments for dolphin fish have been made to achieve a net demersal fishing time to ensure a correct CPUE for demersal fishes.

An example of the effect changing target species preferences can be seen in (Table 2.) Which shows that the years 1994 and 1995 snapper appeared in numbers resulting in a domination of catch results. In 1996 to 1998 snapper catches appeared to be down causing many operators to change their fishing techniques. For several months in 1996 Cobia (*Rachycentron canadus*) dominated the catch results for many of the boats fishing the southern zone (Zone 1.). In 1999 an upturn in snapper catch was recorded. This upturn reflected an increase in the numbers of snapper within the fishery especially, in the early part of the year outside of what is regarded as the “normal snapper fishing” period.

The catch rates and sizing data derived from our observer programs illustrate the utility of these data in describing possible trends in snapper catches within the Gold Coast Charter fishery. The length- frequency data gathered during this project has provided us with preliminary estimates of possible size trends. For example, if the trends continue over the coming months, possible sizing problems revealed within this fishery will warrant closer examination. At the very least the generally small size of snapper landed by the charter fleet confirms continued growth overfishing of the stock.

Another initial piece of information that our observer program provided was the identification of a very large population of recruitment fish in January 1999. (Figure 8) Unfortunately this event took place before the size measurement of released catch commenced; therefore we have no way of identifying a dominant size range for these recruitment fish. The question has to be asked, where did these small fish come from and where did they go? When we look at the CPUE for snapper, the second part of the question maybe easier to answer. The apparent large snapper recruitment to the fishery in January 1999 may have contributed to the substantial increase in the CPUE for the period March to August 1999. (Figure 5)

With continued collection of such recruitment catch data a size profile could be developed to track possible stock trends within the fishery. The question to be considered is whether these estimates of size structure and CPUE of released fish could be used to predict increases or decreases in catch rates.

Table 3: Total numbers of snapper and “other species” landed by a subset of the Gold Coast Charter fleet from 1994 to 1999.

Year	Snapper	Other Species
1994	17873	5316
1995	12725	7576
1996	7704	10900
1997	8614	13348
1998	6772	18304
1999	13881	13944

The stimulus to develop alternative fisheries is dependant on changing the entrenched thinking of fishers that snapper is the only species worth fishing. The Gold Coast fishery has a resource of different species with limited developed activity. Without changes to harvest thinking, enthusiasm for continued fishing does not appear to be sustainable at present levels. There are indicators that the charter fishery are already moving to fish alternative species. This strategy has been accepted by fishers and in time should reduce the impact on the demersal fishery.

In 1998 a pilot program was introduced to measure and accurately assess the number of undersized fish returned to the habitat. Most work has been centred on snapper where sampling is undertaken by a number of different boats ranging over wide areas of the Gold Coast fishery. Small snapper (25 - 28 cm) have been found in all depths out to 50 fathoms, with very small fish not necessarily only captured in the shallow depths.

In 1999 a total monitoring of snapper sizes has been maintained to assess the total size distribution within the fishery. This work will be extended to recreational fishers fishing from small runabouts. These fishers, who frequently fish the inshore waters will provide a wider cross section from the fishery. This information will assist assessments related to proposed changes in management of the snapper fishery.

The percentage of undersized fish returned to the habitat indicates that terminal tackle size could be increased. Nowadays few fish less than 25cm (the old minimum legal size) are caught by the charter fleet. The increase in tackle size which many charter operators instigated after the earlier increase in MLS appeared to be effective in lowering catches of smaller fish during that period. However the number of fish captured under 30cm would indicate that hook sizes still need to be increased.

The concerning feature of this project is the lack of snapper numbers caught above 32cm. This pattern is consistent with our sampling since 1996 and tends to demonstrate growth overfishing.

## CONCLUSION

The population levels of the targeted species within the Gold Coast fishery are either unknown or out of date, hence there is no up-to-date assessment of stock condition for all species with the possible exception of snapper which has been determined as being in need of rehabilitation (Ferrell,D and Sumpton,W, 1997. *Assessment of the fishery for Snapper (Pagrus auratus) in Queensland and New South Wales.*). Basic biological data (beyond catch information) for many popular species are also lacking or grossly inadequate. This limits determination of the current condition of the stocks. The measurement of recruitment stock basically goes unreported.

Therefore the general aim of this survey was to establish an accurate database of catch information of the charter boat fishery operating out of the Gold Coast. The central objective has been to understand charter boat catch trends and their harvesting effects. The survey has been able to develop a data set that indicates catch composition and catch trends, showing the dominance of snapper that make up a large proportion of the fish captured. Whilst the total catch for all species may not show a downward trend, there is a question as to the sustainability of snapper, pearl perch and teraglin. The apparent reduction in the average size of snapper is also an indicator for further concern.

The fishery targets a wide variety of species and the fishery appears to switch preference in order to take advantage of the local abundance of particular species. To maintain a sustainable off shore fishery to meet the needs in steady growth of residential population and the large potential of the tourist and corporate market drawing people to undertake fishing excursions, it is important to develop the right management characteristics to maintain a sustainable rocky reef fishery. Most importantly local conservation initiatives have to be considered. Despite uncertainties, it would be unwise not to explore ways to measure the potential effects of by-catch. The recommendation from this report would be to expand our observational programs into other fisheries using the established model. However this will depend on the degree of financing available. Continuation and expansion of this project could provide important information to fish managers on behalf of the charter fleet industry.