Gladfish

2012

Assessing Trends in Recreational Fishing in
Gladstone Harbour and Adjacent Waterways

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Gladstone Sportfishing Club Inc.

Gladstone Local Marine Advisory Committee

QGC
A BG Group business

Gladstone Recreational Fishing Project

Gladfish 2012

Assessing Trends in Recreational Fishing in Gladstone Harbour and Adjacent Waterways

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CONTENTS

FIGURES

TABLES

ACKNOWLEDGEMENTS

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Recreational fishing is an important social activity in the Gladstone area and the project was established as a 1 year project to determine indicators of trends in recreational fishing in the Gladstone Area.

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1. SUMMARY

This project has developed a number of indicators of trends in recreational fishing in the Gladstone area based on an assessment of catch and effort, Barramundi stocks (including stocked fish), Boyne Tannum Hookup, tagging and fishers' views of fishing.

Status and trends in recreational fishing can be summarised as:

Fishing effort has steadily increased -

- **Fishing effort has increased steadily over the past 6 years by around 25% and based on population projections is likely to continue to increase**
- **There were an estimated 23,700 fishing trips from key boat ramps in the Gladstone area in the year from Nov 2011-Oct 2012**

Catch rates have steadily declined over time -

- **Catch rates have declined steadily with Wanderers Fishing Club catch rates falling by 50-60% from 1985-2010 and by around 35% based on surveys in 1995-97 an the survey in 2011/12**
- **Seasonal catch rates from 2006-12 fluctuated from a low of 8.5 to a high of 24.9 fish/trip and for kept fish from a low of 0.02 to a high of 7.9 fish/trip**
- **There was an increase in catch rates from spring 2007-autumn 2009 and a decline since then**

Species composition of the catch has changed significantly with the influx of Barramundi from Awoonga -

- **The most caught species from 2006-12 was Bream (Yellowfin and Pikey) comprising 24.9% of the catch and 30.6% of the kept catch**
- **The influx of fish from Awoonga shows up in the catch from 2010-11 as from 2006-10 Barramundi was 3.1% of the catch and from 2010-12 was 28.4%**

Recreational fishers are mostly very satisfied or quite satisfied with the quality of fishing -

- **Recreational fishers (78%) were very satisfied or quite satisfied with the overall quality of fishing, however this is likely to have been influenced by the boost in Barramundi stocks from Awoonga**

Recapture rates of tagged fish are comparable to those for the whole state -

- **The overall recapture rate of tagged fish from 1985-2012 was 8.2% compared with the overall rate for the whole state of 7.4%**
- **The overall recapture rate of tagged fish released during the Boyne Tannum Hookup from 2000-12 was 5.3%**

Barramundi stocks are probably higher than at any point in modern history -

- **Gladstone Area Water Board estimated that 20,000 Barramundi left Lake Awoonga from Dec 2010-Jan 2011 with approximately 1,200 perishing, principally due to physical trauma during the early stages of the spill event**
- **The Barramundi recapture rate was 14.9% from 1985-2012 compared with 17.3% for the Fitzroy River and 7% for the whole state indicating the species is highly targeted**
- **The average indicative exploitation rate of 5% is likely to be an underestimate**

- **The average size of Barramundi measured increased significantly after the influx of Barramundi from Awoonga and ranged from 636-901mm from summer 2010-11 to spring 2012**
- **The average annual growth rates for Barramundi in the Boyne and Calliope Rivers were 71% and 26% lower respectively for fish 650mm or less compared with the Fitzroy River for 2011-12**
- **The average annual growth rates for Barramundi in the Boyne and Calliope Rivers were 74% and 39% lower respectively for fish over 650mm compared with the Fitzroy River for 2011-12**
- **Of tagged stocked fish in Lake Callemondah 91.9% were recaptured within 30km of the lake after going over the spillway**
- **Of tagged stocked fish in Lake Awoonga 61.1% were recaptured within 25km (Boyne River) of the lake after going over the spillway**
- **Barramundi recruitment in 2012 was poor and that was consistent with river flows and rainfall not being conducive to good recruitment**
- **The health of 232 Barramundi was assessed from Nov 2011-Oct 2012 on a scale of SK1(good)-SK5(bad) with 3.5% recorded as SK5 and 1 fish was recorded with cloudy eyes**

The status and trends are based on the following findings:

FISHING EFFORT

- Boat registrations in the Gladstone Regional Council area increased by 30% from 2000-12 to around 7,000
- In the Fitzroy region (including Gladstone and Rockhampton) 45,000 persons or 22% of the population went recreational fishing in 2010
- Fishing trips from the Auckland VMR boat ramp increased by approximately 25% from 2006-2012
- The estimated number of fishing trips from the Auckland VMR, Morgan Street, Gladstone Marina, Calliope Power Station, South Trees Inlet and Bray Park ramps from Sep 2011-Oct 2012 was 26,300 or an annual estimate of 23,700 from Nov 2011-Oct 2012

CATCH

- Catch rates for the Wanderers Fishing Club in Gladstone Harbour have declined by around 50-60% from 1985-2010
- Catch rates for kept fish were around 35% lower in 2011/12 compared with surveys in 1995/96 and 1996/97
- From autumn 2006-spring 2012 the catch rate fluctuated from a low of 8.5 fish/trip in summer 2006/07 to a high of 24.9 fish/trip in autumn 2008
- From autumn 2006-spring 2012 the catch rate for kept fish fluctuated from a low of 0.02 fish/trip in summer 2011/12 to a high of 7.9 fish/trip in autumn 2008
- From 2006-12 Bream (Yellowfin and Pikey) were 24.9% of the catch and 30.9% of the kept catch and Barramundi were 13.2% of the catch and 3.8% of the kept catch
- The influx of fish from Awoonga shows up in the catch from 2010-11 as from 2006-10 the Barramundi catch rate was 3.1% and from 2010-12 was 28.4%

BOYNE TANNUM HOOKUP

- Boyne Tannum Hookup fishing trips were mostly offshore in 2008 and 2009 while they were mostly estuary/inshore in 2011 and 2012
- Boyne Tannum Hookup catch rates for estuary/inshore trips ranged from around 4-12 fish caught and 0.5-2.5 fish kept from 2007-12

FISHERS' VIEWS OF RECREATIONAL FISHING

- Of 216 respondents to the survey of fishers' views most were male (95%), aged 31-50 (57%), rated recreational fishing as their most important outdoor activity (74%) and lived in the Gladstone area (89%)
- 78% of respondents were very satisfied or quite satisfied with the overall quality of fishing
- 80% of survey respondents were very concerned or moderately concerned about diseased fish in the area and 45% thought that diseased fish had a high impact on the fish population

FISH TAGGING

- A total of 23,196 fish were tagged from 1985-2012 with 1,899 (8.2%) recaptured with the top 5 species being Barramundi, Yellowfin Bream, Dusky Flathead, Pikey Bream and Mangrove Jack
- The overall recapture rate from 1985-2012 for the key species was 4.3% for Yellowfin Bream, 5.3% for Dusky Flathead, 5.3% for Pikey Bream and 7.3% for Mangrove Jack
- There were 322 Suntag map grids where fish were tagged with 4,101 fish tagged at the mouth of the Boyne River in grid BRG/N24 mostly during the Boyne Tannum Hookup
- There were 34 grids where 100 fish or more were tagged
- The recapture rate for fish tagged by the Gladstone Sportfishing Club during the Boyne Tannum Hookup from 2000-12 was 5.3%
- Of the fish recaptured from those tagged in the Boyne Tannum Hookup 75.9% were recaptured within 6 months
- Of the fish recaptured from those tagged in the Boyne Tannum Hookup 38.4% were recaptured within 1km and 94.7% were recaptured within 20km of where released

BARRAMUNDI

- Gladstone Area Water Board estimated that 20,000 Barramundi left Lake Awoonga from Dec 2010-Jan 2011 with approximately 1,200 perishing, principally due to physical trauma during the early stages of the spill event
- From autumn 2006-winter 2009 the catch rate for Barramundi ranged from 0-0.2 fish/trip while from spring 2009-spring 2012 the catch rate ranged from 0.6-3.7 fish/trip
- The percentage of Barramundi kept from autumn 2006-spring 2012 was 7.1%
- The commercial catch of Barramundi in 2011 was 215.6t with the previous highest catch being 16.8t in 2005
- The commercial CPUE of Barramundi in 2011 was 490.0kg/day with the previous highest being 64.5kg/day in 2006
- The commercial GVP of the Barramundi catch in 2011 was $1.98m with the previous highest being $0.15m in 2005

- There were 5,095 Barramundi tagged from 1985-2012 with 2,895 (56.8%) tagged in the last 2 years from 2010-12 compared with 2,200 (43.2%) over the previous 25 years
- The recapture rate for Barramundi from 1985-2012 was 14.9% which compares with 17.3% for the Fitzroy River and 7.0% for the overall Suntag rate
- The indicative exploitation rate for Barramundi from 2000-12 ranged from 0.7% in 2001 to 10.1% in 2009 with an average of 5.0% over all years however this is an underestimate
- There were 168 Suntag map grids where Barramundi were tagged with 814 tagged in the Pikes Crossing area in grid BRG/AA20 after they exited Lake Awoonga from late 2010
- From summer 2010-11, when fish from Awoonga entered the estuaries, to spring 2012 the average size ranged from 636-901mm
- Barramundi measured from Sep 2011-Oct 2012 were predominantly in 2 size ranges from 400-649mm and 800-1099mm in the Boyne River, Calliope River and Gladstone Harbour
- The average annual growth rate for the Boyne River for fish tagged at 650mm or less was 69.0±45.0mm, for the Calliope River it was 84.2±44.0mm and for the Fitzroy River it was 113.3±74.8mm
- The average annual growth rate for the Boyne River for fish tagged at over 650mm was 44.0±50.5mm, for the Calliope River it was 49.1±40.0mm and for the Fitzroy River it was 169.8mm±67.6mm
- Of the Barramundi tagged in Lake Callemondah 66.7% were recaptured after going over the spillway and 91.9% of these were recaptured within 30km
- Of the Barramundi stocked and tagged in Lake Awoonga 48 fish have been recaptured since Dec 2010 in the Boyne River, in adjacent waterways and as far south as the Burnett River at Bundaberg (180km)
- Of the Barramundi tagged in the Pikes Crossing area 139 fish have been recaptured since Dec 2010 in the Boyne River, in adjacent waterways, as far north as the Ross River at Townsville (760km) and as far south as the Burnett River at Bundaberg (180km)
- Recruitment in 2012 was poor with only 2 first year Barramundi recorded in Beecher Creek from 12 surveys at 7 sites from Jan-Apr
- River flows and rainfall were not conducive to good recruitment in 2012
- The health of 232 Barramundi was assessed from Nov 2011-Oct 2012 on a scale of SK1(good)-SK5(bad) with 3.5% recorded as SK5 and 1 fish was recorded with cloudy eyes

2. PROJECT RATIONALE

Resource industry growth in Gladstone, including the QGC LNG development, will lead to significant growth in the population over the next few years. Recreational fishing is an important social activity for the current population and is expected that participation will increase as a result of resource industry growth.

Gladstone Harbour, Narrows and adjacent waterways are finite and being increasingly impacted by industry and population growth. It is important that data are available on the quality of the fishing experience and trends that are likely to influence that experience. This will provide information that can be used to mitigate any decrease in the quality of the fishing experience and provide support for environmental protection. This will also support the community's capacity to assess the effects of resource industry growth and use this input to inform design/development of mitigation programs. Trends in recreational fishing will also assist in understanding the requirements for environmental protection relating to fish stocks.

3. OBJECTIVES

The objectives of the project are:

1. Develop a range of indicators on recreational fishing and the quality of the fishing experience in Gladstone Harbour, Narrows and adjacent waterways
2. Monitor recreational fishing in Gladstone Harbour, Narrows and adjacent waterways to obtain data for use in the indicators
3. Develop a range of information products on recreational fishing and fish in Gladstone Harbour, Narrows and adjacent waterways, promote best fishing practices and distribute fisheries information

This report addresses the first 2 objectives.

4. INDICATORS OF TRENDS IN RECREATIONAL FISHING

Trends in recreational fishing were assessed based on the following:

- Fishing effort through trailer counts at boat ramps over time
- Fishing effort through boat registrations and fisher participation survey
- Catch through comparing overall catch rates over time from boat ramp surveys and fishing trip details direct from fishers
- Catch rates from boat ramp surveys during the Boyne Tannum Hookup
- Catch rates of Wanderers Fishing Club historical records
- Barramundi as an indicator species
- Barramundi recruitment through identification of nursery areas, castnet surveys of juveniles and monitoring environmental cues that affect recruitment
- Barramundi stocking (Lake Callemondah and Lake Awoonga) through stocking records and tagging
- Barramundi stocks by examining size composition of the catch from boat ramp surveys, tagging records and measured fish
- Fish movement and growth through tagging
- Survey of fishers to understand perceptions of their fishing experience and compare that with actual catch rates to gauge the difference between perception and reality

Data previously collected was assessed to assist in the development of indicators by providing a historical context. Data were available from:

- CapReef boat ramp surveys from 2005-09
- Earlier boat ramp surveys - Platten Calliope 1996, GAWB Boyne Calliope 1996/97
- Boat registrations 2006-2012
- Suntag tagging 1985-2011
- Tagging and boat ramp surveys from Boyne Tannum Hookup 1999-2010
- Barramundi recruitment surveys 1999-2005
- Wanderers Fishing Club records 1985-2010
- Stocking and tagging records for Lake Awoonga and Lake Callemondah
- Statewide recreational fishing survey 2010

5. TRENDS IN FISHING EFFORT

Trends in fishing effort were assessed by examining:

- Boat registrations 2006-2012
- Fishing participation in 2000 and 2010
- Trailer counts at key boat ramps 2006-2012

A detailed assessment of current fishing effort during 2012 was made by examining:

- Trailer counts at key boat ramps
- Start and finish times of fishing trips
- Estimating fishing trips per day

BOAT REGISTRATIONS

Boat registrations are an indicator of trends in fishing effort as recreational fishing is the main use of smaller boats up to around 8m. Boat registrations were obtained for June each year from 2006-2012 for the Gladstone Regional Council area[1]. Boat registrations were assessed for motorboats (no sails) up to 8m. These were considered to be the vessels most likely to be used for recreational fishing. *Figure 1* shows the number of registrations at June each year. From 2006-2012 the number of boat registrations rose from 5,396 to 7,033 (30% increase) with a 1.3% increase in 2012 compared to the previous year.

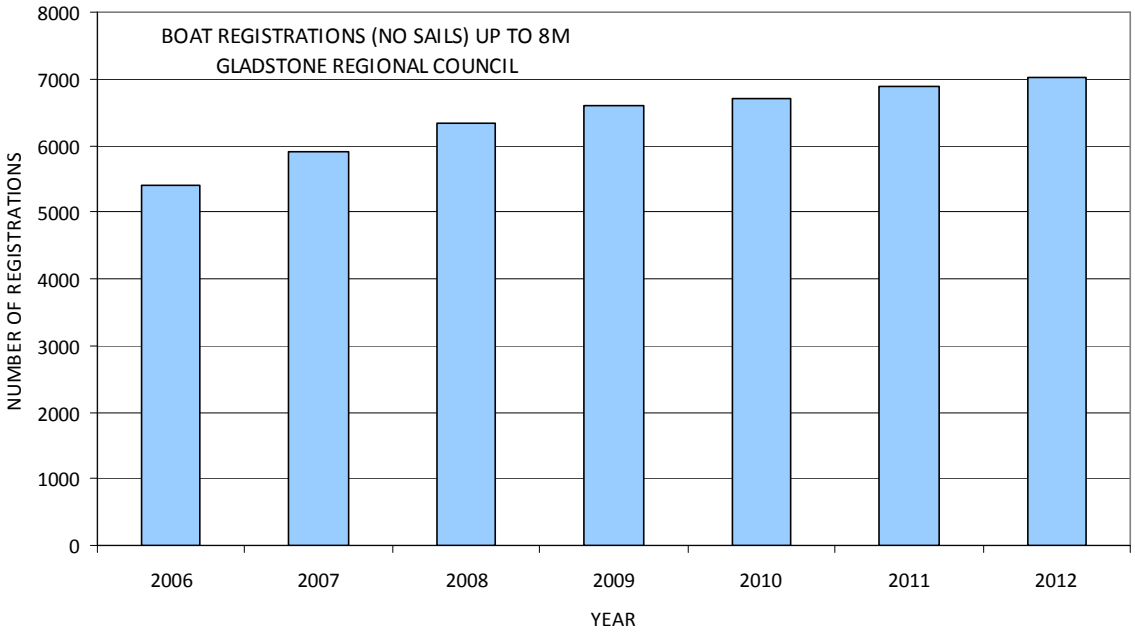

Figure 1: Number of motorboats (no sails) up to 8m in length registered in the Gladstone Regional Council area at June from 2006-2012

Boat registrations in the Gladstone Regional Council area increased by 30% from 2006-2012

[1] From Department of Transport and Main Roads

FISHING PARTICIPATION

Participation is an indicator of the number of people undertaking recreational fishing. Fisheries Queensland, part of the Department of Agriculture, Fisheries and Forestry, undertook a statewide telephone survey in 2010 to determine participation in recreational fishing in Queensland. Results were compared with a similar survey undertaken in 2000. The results of this survey were that around 700,000 Queenslanders, or around 17% of those 5 years and older went recreational fishing, crabbing and prawning. This number does not include fishers from other states or overseas.[2]

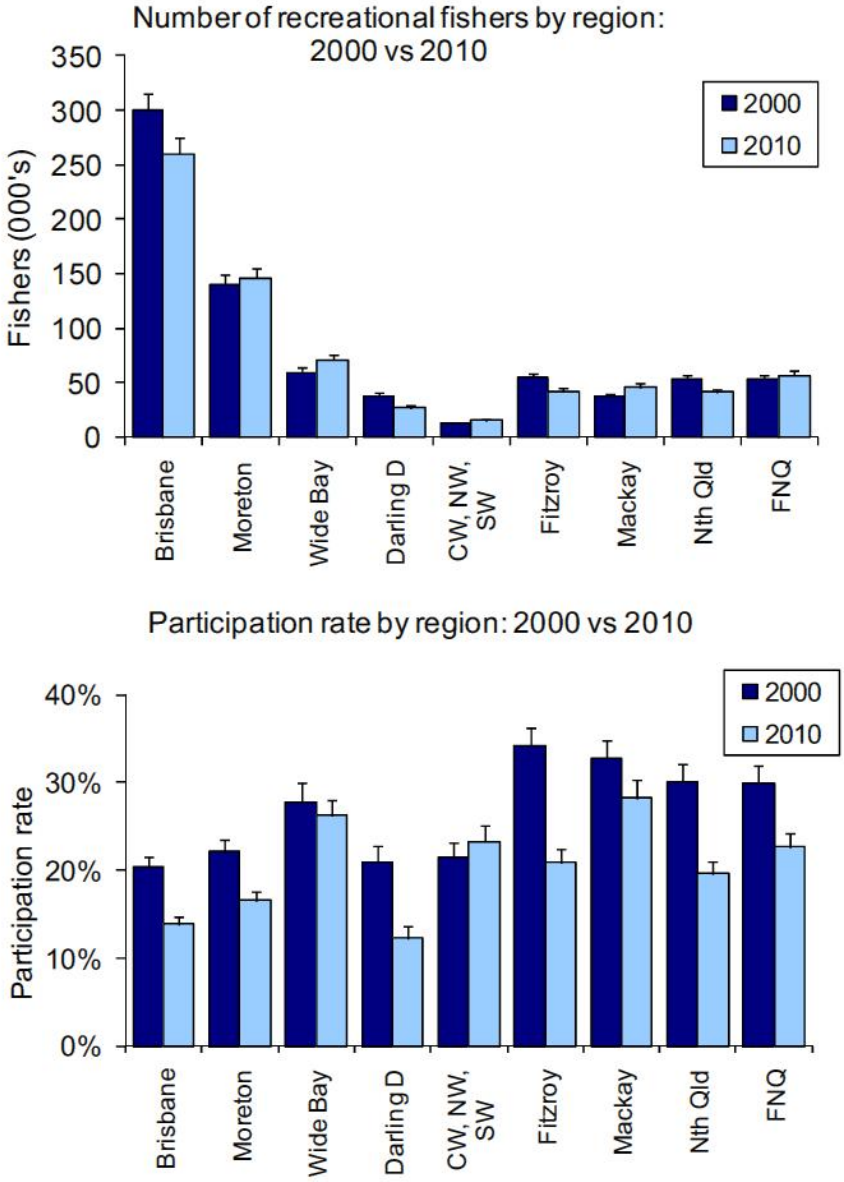

Figure 2: Numbers of recreational fishers and participation rates for each region in Queensland in 2000 and 2010

The data were available on a regional basis with Gladstone being in the Fitzroy region which includes Rockhampton. Within that region in 2010 there were 45,000 fishers that went fishing or 22% of the population 5 years and older which is higher than the Queensland average of 17%. There was a drop

[2] From http://www.daff.qld.gov.au/documents/Fisheries_RecreationalFishing/SWRFS-Phase-1-factsheet-May.pdf

of 15% in participation from 2000-2010. *Figure 2* shows the numbers participating and the participation rate for each region.

There was a decrease in the proportion of the population participating in recreational fishing in the Fitzroy region from 2000-2010. However the increase in the population over that time, the rise in boat registrations and numbers of fishing trips from CapReef surveys[3] suggest that fishing effort has increased.

> ***In the Fitzroy region (including Gladstone and Rockhampton) 45,000 persons or 22% of the population went recreational fishing in 2010***

> ***There was a 15% drop in the proportion of the population that went recreational fishing in 2010 compared with 2000***

FISHING EFFORT 2006-2012

Fishing effort refers to the number of fishing trips that are undertaken over time. Fishing trips can either be landbased or from a boat however the majority of fishing in the Gladstone area is from a boat. The CapReef project counted trailers at the Auckland Creek VMR boat ramp from 2005/06-2008/09 [4] and trailers were counted during 2011 and 2012 as part of this project. No counts were available for 2010.

Figure 3 shows the estimated number of trips from the ramp for those years. There was a rise of around 25% in the number of trips from 2006-2012 from the Auckland VMR ramp. This is consistent with the increase in boat registrations over the same period.

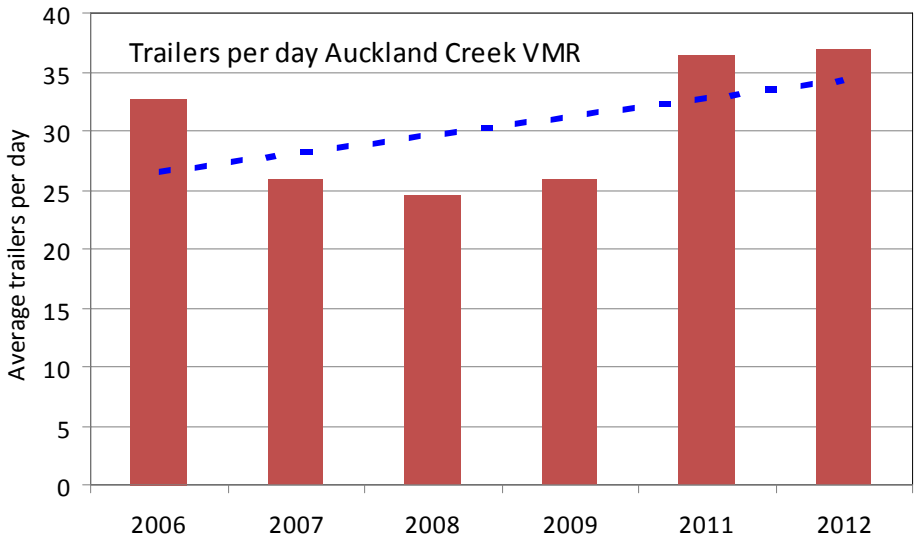

Figure 3: Average trailers per day at the Auckland VMR boat ramp from 2006-2012

> ***Fishing trips from the Auckland VMR boat ramp increased by approximately 25% from 2006-2012***

[3] CapReef Recreational Fishing and Fish Resources in Central Queensland 2005-09: Sawynok, Platten and Parsons (2009)
[4] CapReef Recreational Fishing and Fish Resources in Central Queensland 2005-09: Sawynok, Platten and Parsons (2009)

FISHING EFFORT 2011-12

Current fishing effort was measured by counting trailers at key boat ramps within the Gladstone area. *Table 1* shows the boat ramps that have been monitored and the number of days where trailer counts have been made. Counts of trailers commenced in Sep 2011.

Fishing effort at each ramp is influenced by different factors. Factors which can influence fishing effort include:

- Weekend or weekday
- Wind speed (for ramps used for offshore fishing)
- Tides
- Weather (rain)

	Days trailers counted				
Boat ramp	Spring 2011	Summer 2011-12	Autumn 2012	Winter 2012	Spring 2012
Auckland Creek (VMR)	46	84	90	72	89
Auckland Creek (Morgan Street)	46	84	90	72	89
Gladstone Marina	46	84	90	72	89
Calliope River (Power Station)	46	84	90	72	89
Calliope River (Historical Village)	0	0	0	0	0
Phillips Landing	0	0	1	0	0
South Trees Inlet	27	29	5	7	12
Boyne River (Bray Park)	27	27	2	9	11
Boyne River (Lions Park)	0	0	0	6	11
Boyne River (Tannum Sands)	0	0	0	0	0
Boyne River (Benaraby)	8	16	0	7	12
Boyne River (Pikes Crossing)	0	4	0	0	4
Narrows (Ramsay Crossing)	1	2	5	4	3
Total	247	414	374	321	409

Table 1: Number of days where trailer counts have been made in 2011-12

There were 381 days where trailer counts were made with 1,676 counts at all ramps.

Forecast wind speed was compared to the number of trailers at key boat ramps to determine the influence of wind speed on the numbers going fishing. The effect of wind speed was assessed for Auckland Creek (VMR), Boyne River (Bray Park) and Calliope River (Power Station).

The VMR and Bray Park ramps are used by fishers for both offshore and estuary fishing and the use of these ramps is significantly influenced by forecast wind speed. *Figures 4 and 5* show the forecast wind speed compared with the number of trailers counted at the VMR ramp (128 days) and Bray Park ramp (63 days). The Power Station ramp is mainly used for estuary fishing and its use is not significantly influenced by wind speed. *Figure 6* shows the forecast wind speed compared with the number of trailers counted at the Calliope Power Station ramp (120 days).

An assessment of tides and the number of trailers at the Calliope Power Station ramp was made and this indicated no significant correlation between ramp usage and the tides. As the number of days when it rained was low no analysis of the effects of rain has been made although it would be expected for days of heavy rain there would be some reduction in effort.

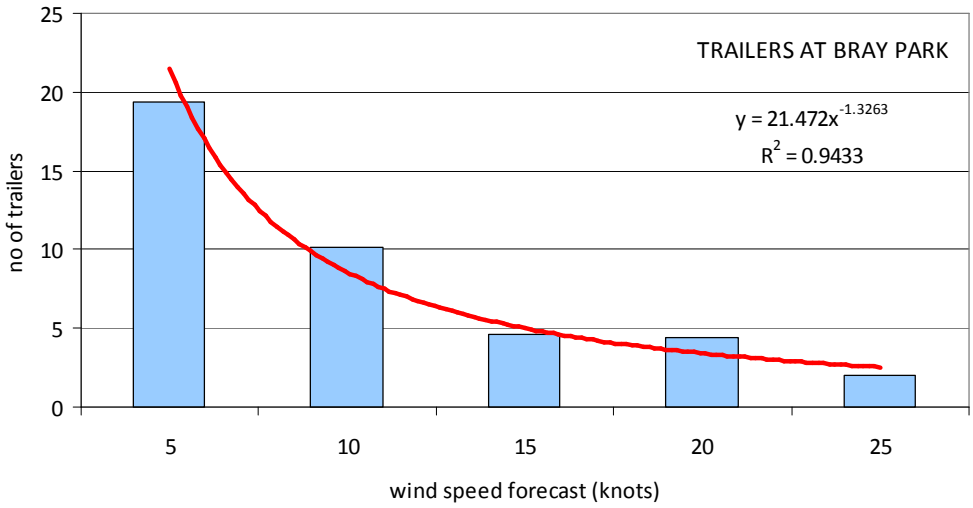

Figure 4: Forecast wind speed compared with number of trailers at Auckland VMR ramp

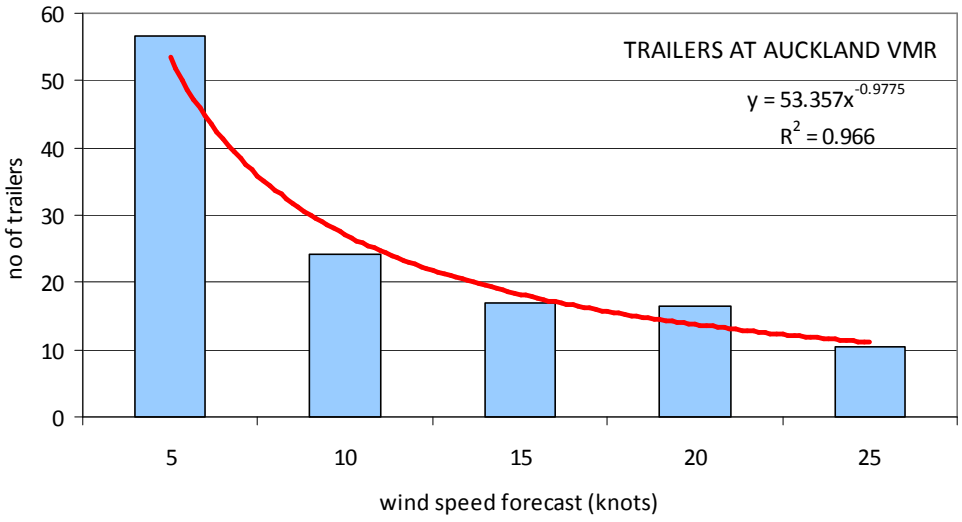

Figure 5: Forecast wind speed compared with number of trailers at Bray Park ramp

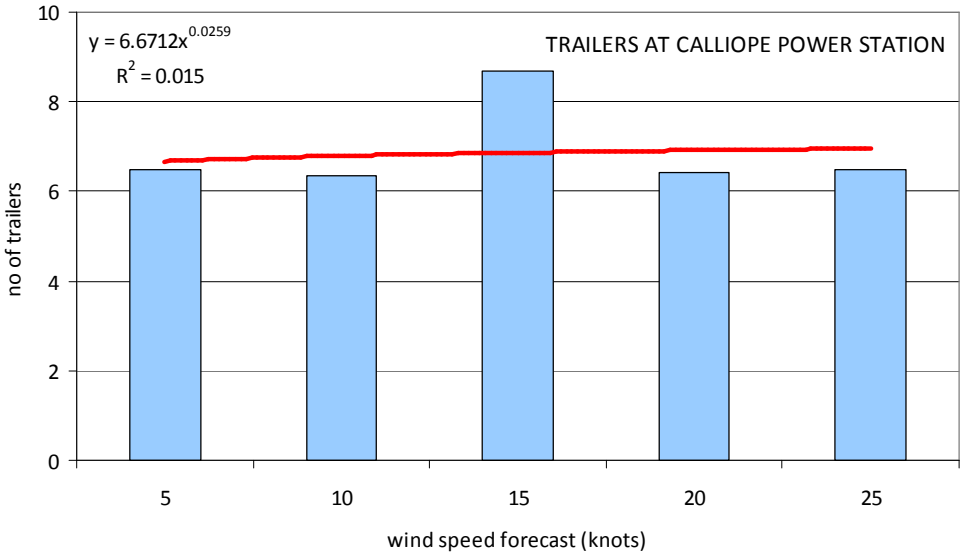

Figure 6: Forecast wind speed compared with number of trailers at Calliope Power Station ramp

Figure 7 shows the average number of trailers at Gladstone ramps and the Calliope Power Station ramp on weekdays and weekends. There was no significant difference in the number of trailers at the Calliope ramp while there was a significant difference for the Gladstone ramps.

The number of trailers at a boat ramp varies depending on the time of day and how many boats have gone out and how many boats have come back. Start and finish times for trips have been used to provide a profile of usage of ramps over a day. *Figure 8* shows the profile of boat ramp usage for all ramps (1,156 trips). This indicates that trips can start and finish at all hours with peaks of trips starting early morning and again late afternoon. Peaks of trips finishing occur mid-morning to lunch time and also around dark.

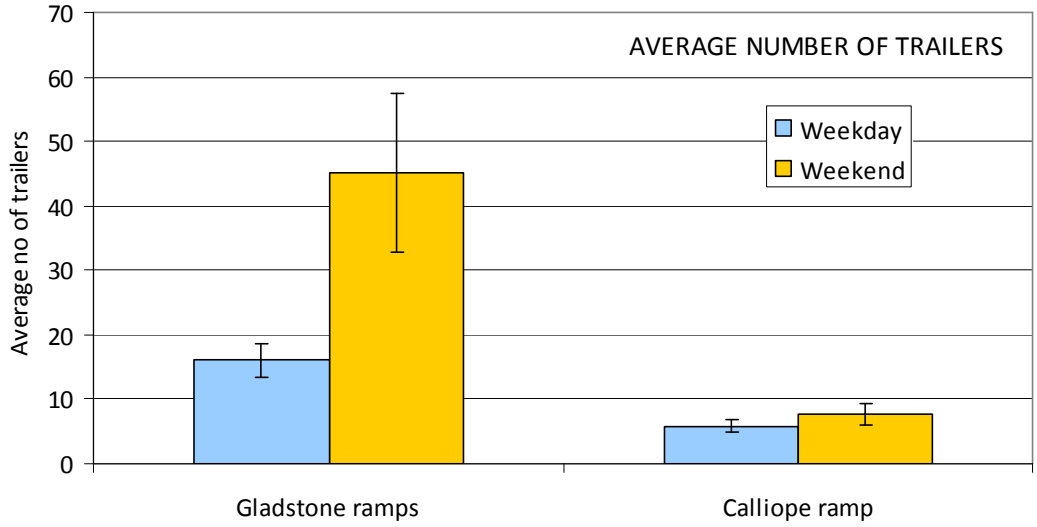

Figure 7: Comparison of trailers at ramps on weekdays and weekends at Gladstone and Calliope ramps

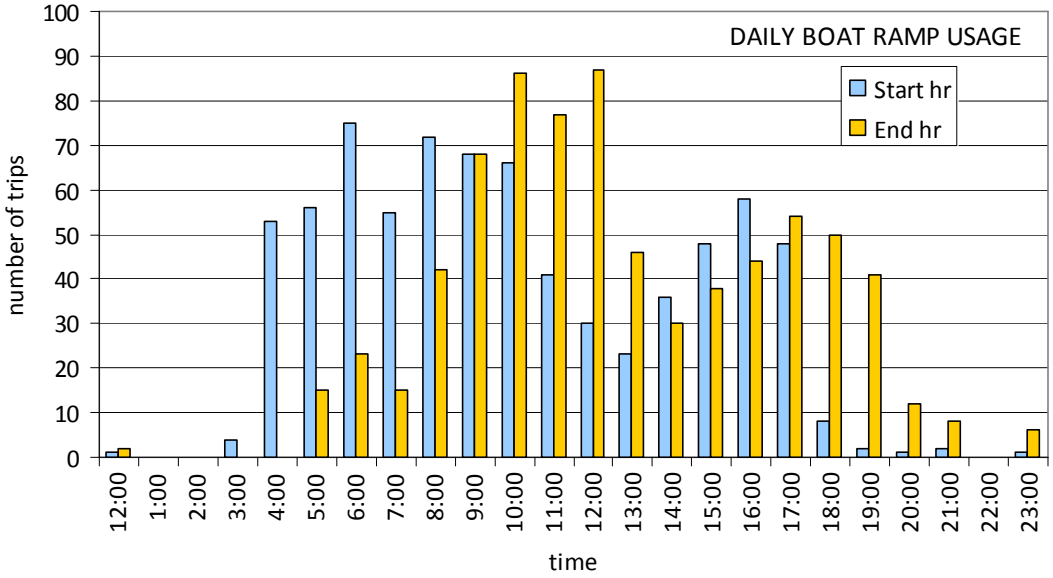

Figure 8: Profile of daily boat ramp usage

The number of persons on each fishing trips and the duration of the trip were used to calculate a typical fishing trip. From 1,156 trips an average fishing trip was calculated as 1.8 fishers fishing for 4.8 hours while the median trip was 2 fishers fishing for 2.75 hours.

Based on fishing times, *figure 9* shows the percentage of trips underway at various times of the day. There is a peak of boats on the water mid-morning and then again later in the afternoon, however there are trips underway at all hours of the day.

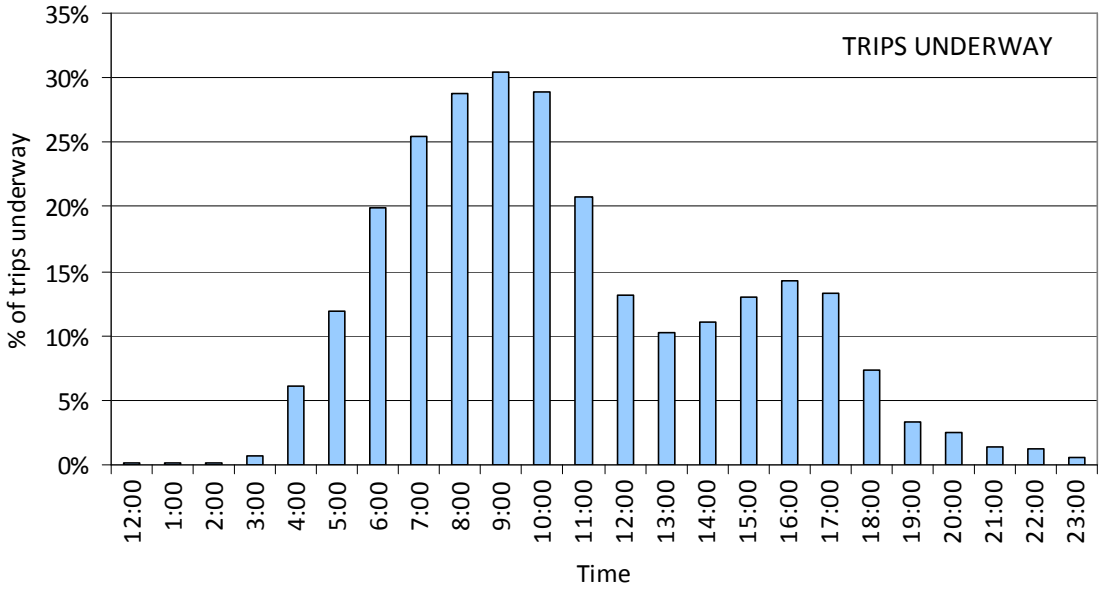

Figure 9: Percentage of trips underway at any time of the day

There were 62 days where trailer counts were made at the Gladstone ramp and at Bray Park. This allowed a relationship to be developed for ramp usage at Bray Park on days where there was no trailer count (*figure 10*).

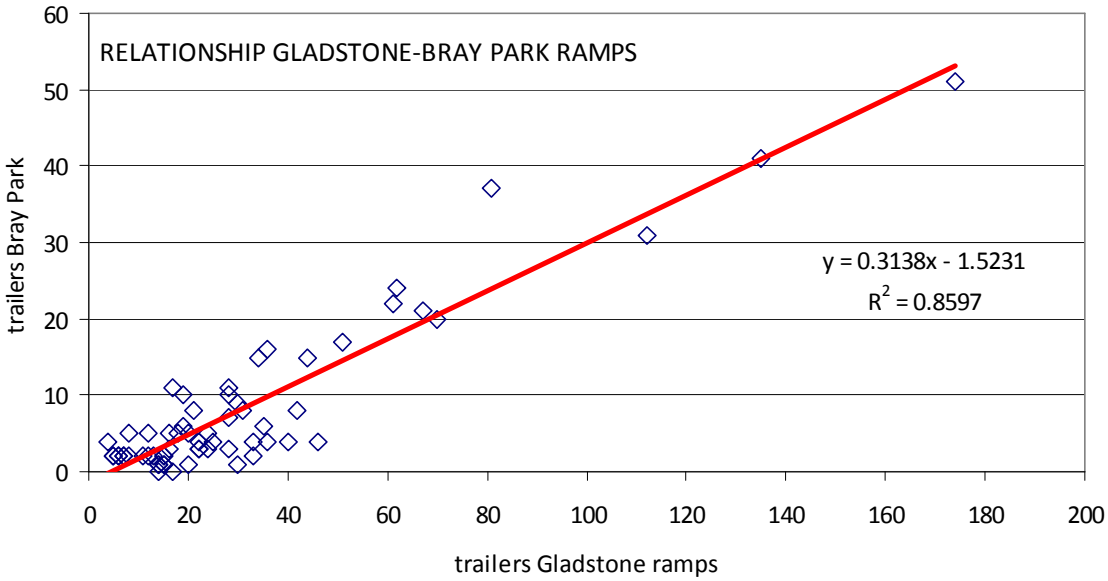

Figure 10: Relationship between the number of trailers at Gladstone and Bray Park ramps

An estimate of overall fishing effort from a number of key boat ramps was made. Boat ramps that have been included are Calliope Power Station, Gladstone Marina, Auckland Creek VMR, Morgan Street, South Trees Inlet (Toolooa Bend) and Bray Park. This estimate was based on the number of trailer counts at a particular time of day with a correction factor applied based on the expected number of trips underway at that time. Not all trips are associated with fishing and an estimate of non-fishing trips was made. It was estimated that 70% of trips from the Marina, Auckland VMR and

Bray Park were fishing trips while for Calliope Power Station and South Trees Inlet it was estimated that 90% were fishing trips. *Figure 11* shows the estimated number of trips from Sep 2011-Jul 2012. The total number of trips over that period for the included boat ramps was estimated at around 26,300 or 23,700 in the year from Nov 2011-Oct 2012.

This is an underestimate of the total number of trips as some minor ramps are not included however their usage is generally lower that the key ramps. Ramps not included were Calliope (Historical Village), Phillips Landing, Boyne River (Tannum Sands, Benaraby and Pikes Crossing) and Narrows (Ramsay Crossing).

There are also landbased fishing trips undertaken in the area. These trips were undertaken from the shore almost anywhere there is physical public access to the water. No attempt was made to estimate the number of landbased trips although fishers at the hot water outlet at the power station on the Calliope River were surveyed as part of the boat ramp surveys at the Calliope ramp.

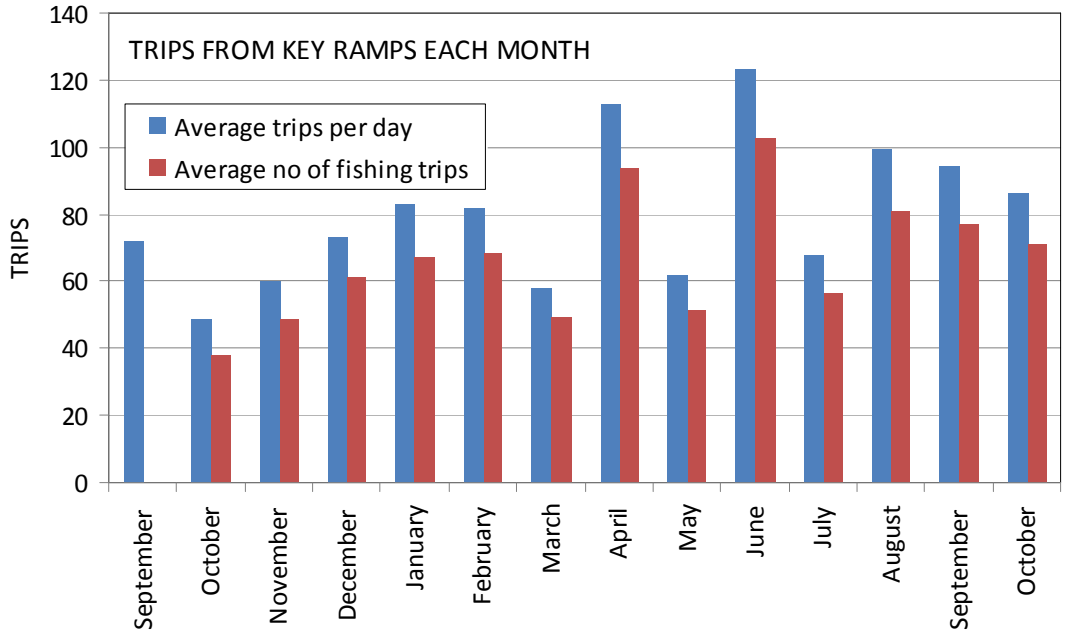

Figure 11: Estimated number of trips per day for key boat ramps in Gladstone Sep 2011-Jul 2012

The estimated number of fishing trips from the Auckland VMR, Morgan Street, Gladstone Marina, Calliope Power Station, South Trees Inlet and Bray Park boat ramps from Sept 2011-Oct 2012 was 26,300 or an annual estimate of 23,700 from Nov 2011-Oct 2012

6. TRENDS IN CATCH

Trends in catch were assessed by examining:

- Seasonal catch from boat ramp surveys for winter 2011-spring 2012
- Wanderers Fishing Club catch rates from 1985-2010
- CapReef seasonal catch from autumn 2006-winter 2009
- Gladstone Sportfishing Club members seasonal catch from spring 2011-autumn 2011
- Catch rates in Boyne Tannum Hookup 2007-2012
- Kept catch rates from surveys in 1996/97and 1997/98 compared with 2011/12 catch rates
- Species composition of the catch from 2006-2012

A detailed assessment of current catch during 2011/12 was made by examining:

- Catch rates from fishing trip catch details
- Species composition of the catch
- Fish kept and released

Seasons for the calculation of catch rates were adjusted so that the Barramundi closed season is included in a single season. Therefore seasons were:

- spring - Aug-Oct
- summer - Nov-Jan (Barramundi closed season)
- autumn - Feb-Apr
- winter - May-Jul

WANDERERS FISHING CLUB CATCH RATES 1985-2010

The Wanderers Fishing Club has conducted fishing trips in the Gladstone area for many years and recorded details of their catch on club outings. This provided a long term dataset that was examined for changes in catch rates over time. Catches were obtained from club fishing trips from 1985-2010 and the catch rate was calculated as the median of the number of fish/person/day.

Figure 12 shows the median catch rate for Gladstone Harbour for each 5 years from 1985-2010 while *figure 13* shows the catch rates for Gladstone Harbour, Turkey Beach and Cape Capricorn from 1991-2010. For Gladstone Harbour from 1985-1990 to 2001-2005 there was a steady decline from 14.5 to 4.6 fish/person/day with an increase to 9.4 fish/person/day in 2005-2010.

The catch rate of the club was highly variable from year to year but declined by around 50-60% since the mid 1980's. In part this was related to changes in fisheries regulations (bag and size limits) and club rules however not all the decline can be explained by these factors. The decline coincided with a significant increase in recreational fishing effort resulting in increased competition among fishers for the available stocks and reducing the take of individuals. Catch rates also declined at the other locations.

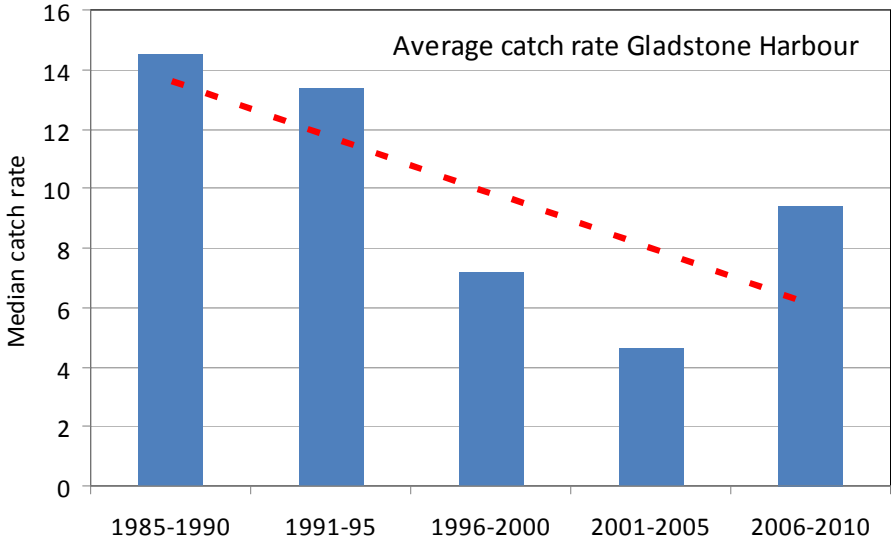

Figure 12: Median catch rate for the Wanderers Fishing Club fishing in Gladstone Harbour from 1985-2010

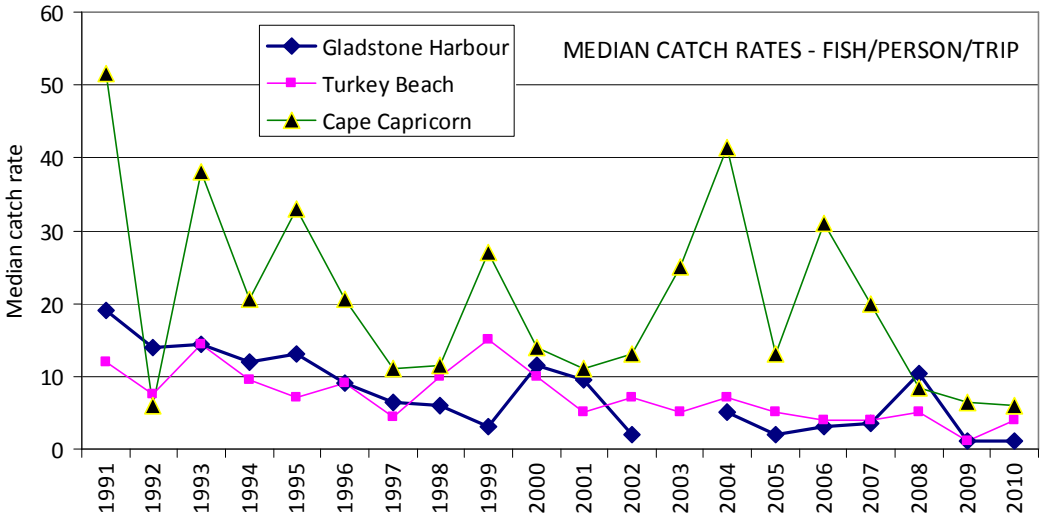

Figure 13: Median catch rate for the Wanderers Fishing Club fishing in Gladstone Harbour, Turkey Beach and Cape Capricorn from 1991-2010

Catch rates for the Wanderers Fishing Club in Gladstone Harbour declined by around 50-60% from 1985-2010

CATCH RATES 1996/97-2011/12

Seasonal catch rates were obtained from a survey in the Calliope River in 1996/97[5] and a survey in the Boyne River and South Trees Inlet in 1997/98[6]. Catch rates for kept fish were compared with catch rates in 2011/12. *Figure 14* shows the seasonal and yearly catch rates from each survey. The kept catch rate in 2011/12 was around 35% lower than the rates in the 1996/97 and 1997/98 surveys. As with the Wanderers Fishing Club this indicates that there has been a decline in catch rates.

[5] A survey of the recreational fishery in the Calliope River Gladstone - JR Platten
[6] Survey of the recreational fishery in the Boyne River and South Trees Inlet - JR Platten

As with the Wanderers Fishing Club the decline was influenced by changes in fisheries regulations (bag and size limits), increased fishing effort and a shift to limiting individual catches by voluntarily release of fish that were legal that could have been kept, this applied especially to Barramundi.

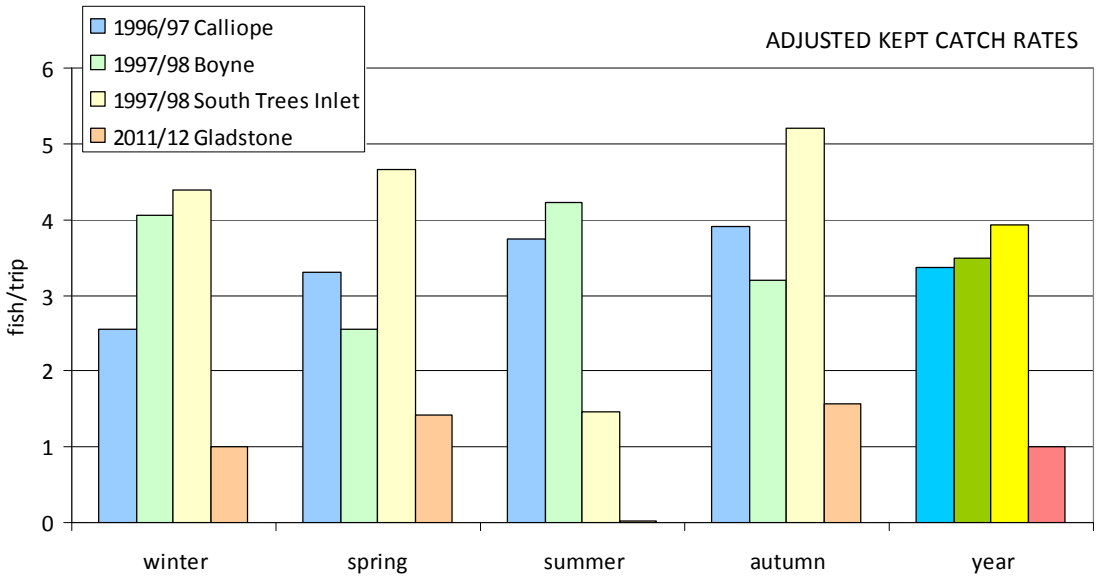

Figure 14: Comparison of season catch rates in 1996-97 and 2011-12

> ***Catch rates for kept fish were around 35% lower in 2011/12 compared with surveys in 1996/97 and 1997/98***

CATCH RATES 2006-2012

Catch details were obtained from CapReef boat ramp surveys and direct from fishers from autumn 2006-winter 2009. From spring 2009-autumn 2011 trip details were only obtained direct from fishers, mostly members of Gladstone Sportfishing Club and may not be representative of overall catch rates.

Catch rates are for trips to Gladstone Harbour, Facing Island, Boyne River, South Trees Inlet, Wild Cattle Creek, Calliope River and the Narrows south of Ramsay Crossing. Catch rates are based on a standard fishing trip which was based on 2 fishers fishing for 7.5 hours for boat fishing. This allowed a comparison with previous CapReef catch rates.

Figure 15 shows the total catch and kept catch rates each season from autumn 2006-winter 2012. The catch rate fluctuated from a low of 8.5 fish/trip in summer 2006/07 to a high of 24.9 fish/trip in autumn 2008. There was and increase in catch rates from autumn 2006-autumn 2009 with a decline since then. The kept catch rate fluctuated from a low of 0.02 fish/trip in summer 2011/12 to a high of 7.9 fish/trip in autumn 2008. The kept catch rate increased from autumn 2006-autumn 2008 with a decline since then.

Winter catch rates in each year, as shown in *figure 16*, include data from the Boyne Tannum Hookup so that winter catch rates can be considered as comparable. See *section 7* for details of catch rates during the Boyne Tannum Hookup. For 2006-09 there was an increase in both the caught and kept catch rates however there has been a decline since then.

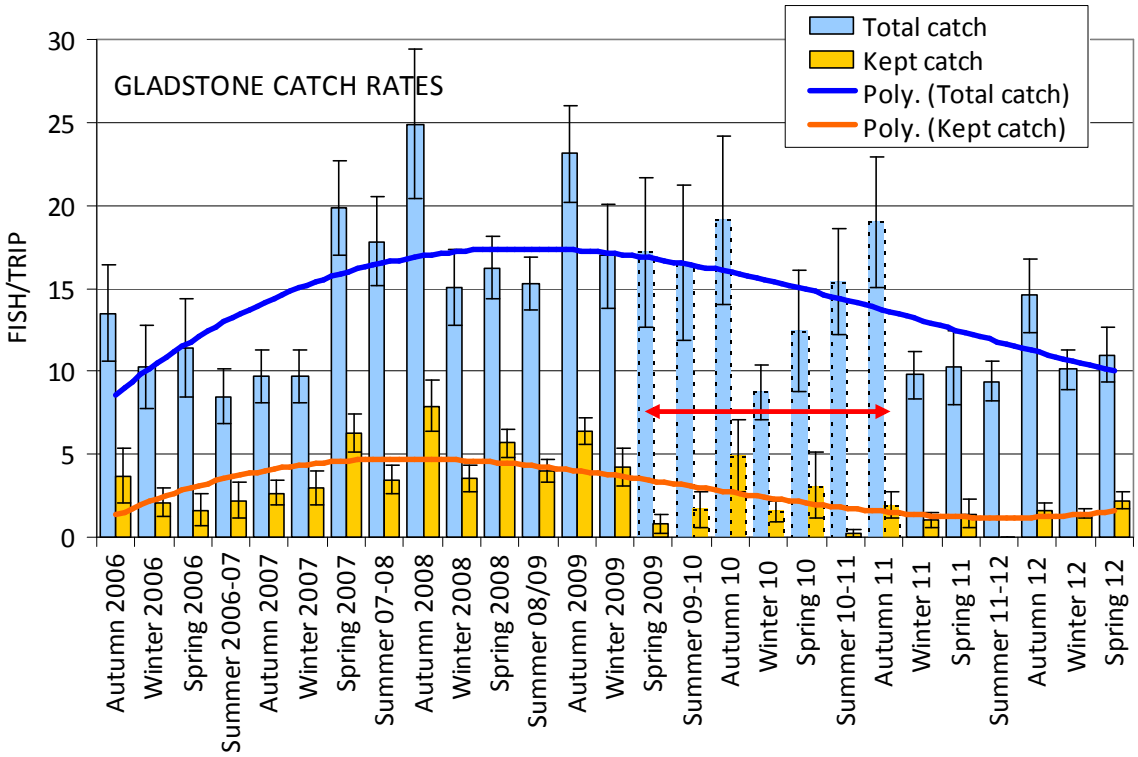

Figure 15: Seasonal catch rates for the Gladstone area from 2006-2012 (limited data from spring 2009-autumn 2011

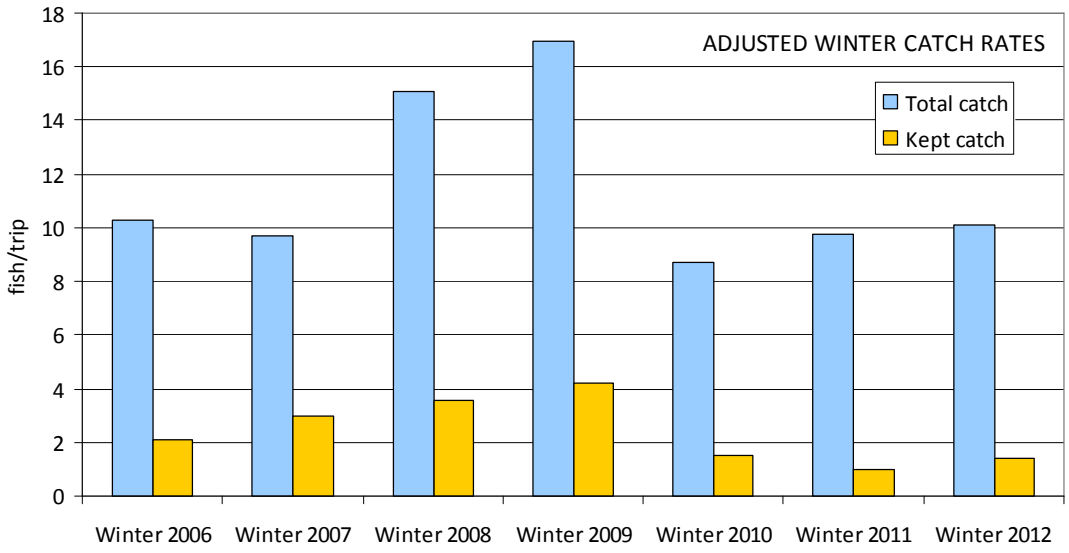

Figure 16: Winter catch rates from 2006-12

From autumn 2006-Spring 2012 the catch rate fluctuated from a low 8.5 fish/trip in summer 2006/07 to a high of 24.9 fish/trip in autumn 2008

From autumn 2006-Spring 2012 the catch rate for kept fish fluctuated from a low 0.02 fish/trip in summer 2011/12 to a high of 7.9 fish/trip in autumn 2008

SPECIES COMPOSITION

The numbers of each species caught and kept were recorded for each trip during boat ramp surveys and when trip details were obtained direct from fishers. From winter 2006-spring 2012 there were 5,280 trips recorded for 22,619 fish caught and 5,575 kept.

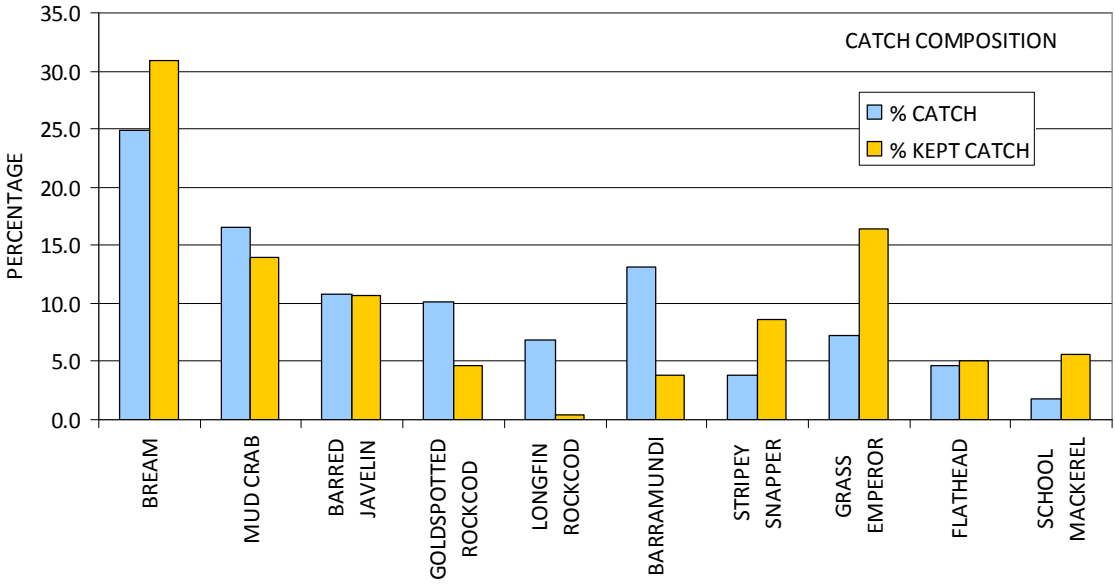

Figure 17: Summary of species caught and kept from 2006-12

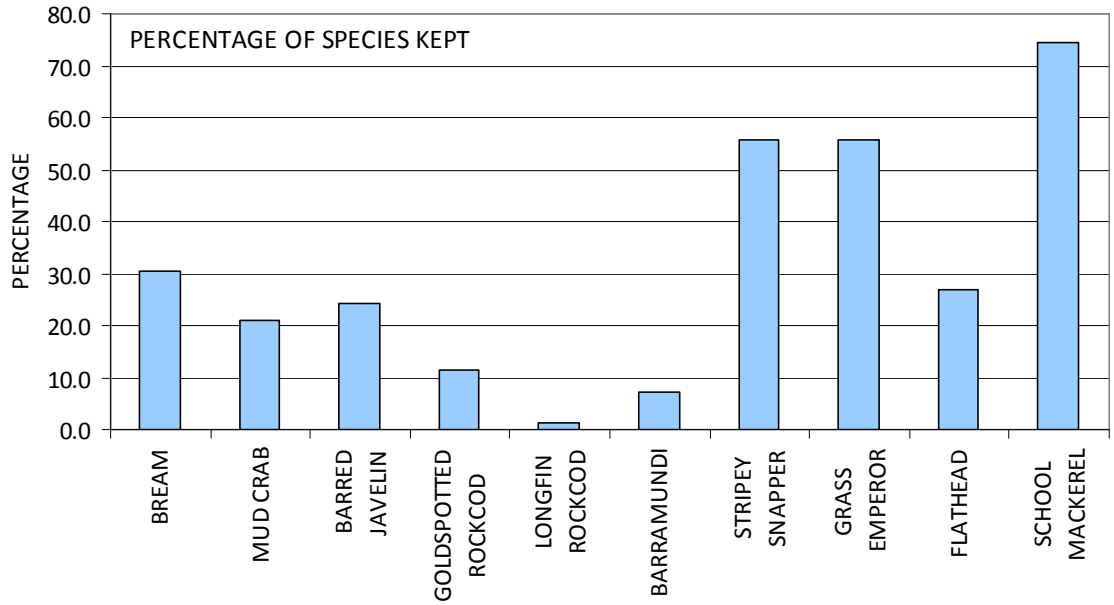

Figure 18: Percentage of species kept from 2006-2012

Figure 17 shows the percentage of the species in the catch and in the kept catch of the top 10 species. Bream includes Yellowfin and Pikey Bream and Flathead includes Dusky and Bartail Flathead. These species have been combined as they were not always accurately identified. Mud Crabs were not recorded in surveys until spring 2007. Bream were 24.9% of the total catch and 30.9% of the kept catch, Grass Emperor were 7.3% of the total catch and 16.4% of the kept catch. Barramundi were 13.2% of the total catch and 3.8% of the kept catch.

Figure 18 shows the percentage of each species caught that were kept. School Mackerel (74.3%), Stripey Snapper (55.7%) and Grass Emperor (55.6%) were the species that were most kept. Longfin Rockcod (1.3%) was the species where the least were kept. This is likely to be due to the legal length of the fish being 380mm while they only grow to around 400mm. The percentage of Barramundi (7.1%) kept was also low due to the legal length being 580-1200mm, fish being tagged and the voluntary release of legal size fish.

The percentage of species caught and kept each year is shown in *figures 19 and 20*. Each year covers winter-spring. Data from spring 2009 - autumn 2011 was from fishing tips only as no data from boat ramp surveys were available except from the Boyne Tannum Hookup. The influx of fish from Awoonga shows up in the in the catch from 2010-11 as the Barramundi from 2006-10 was 3.1% of the catch and from 2010-12 was 28.4%.

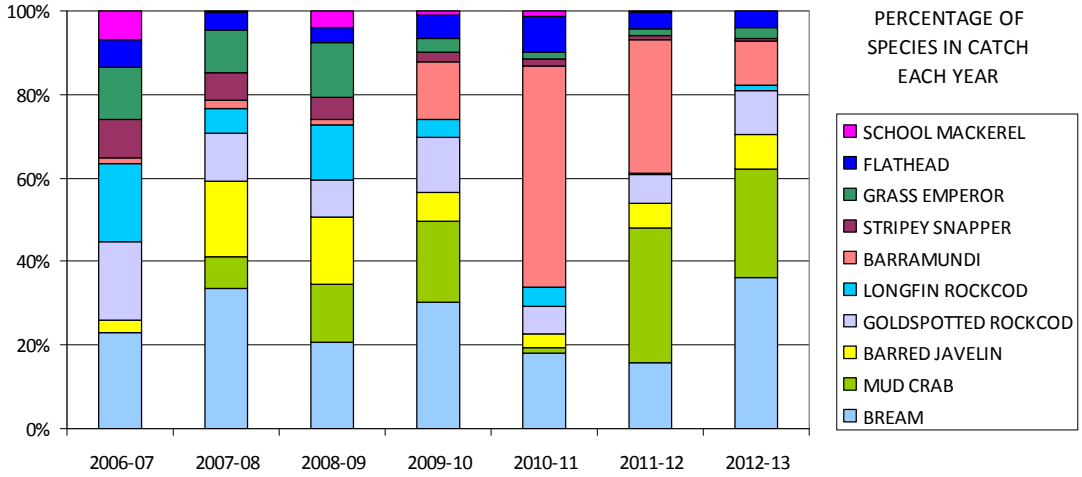

Figure 19: Numbers of key species caught each year

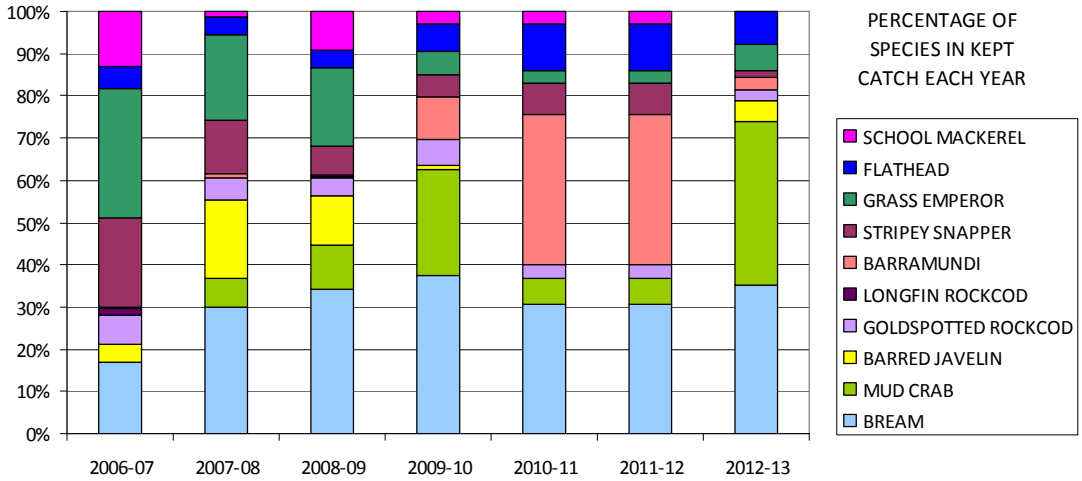

Figure 20: Numbers of key species kept each year

From 2006-12 Bream were 24.9% of the catch and 30.9% of the kept catch and Barramundi were 13.2% of the catch and 3.8% of the kept catch

The influx of fish from Awoonga shows up in the catch from 2010-11 as the Barramundi from 2006-10 was 3.1% of the catch and from 2010-12 was 28.4%

7. BOYNE TANNUM HOOKUP

Trends in the Boyne Tannum Hookup were assessed by examining:

- Effect of wind speed on fishing in the event 2005-2012
- Fishing locations 2005-2012
- Catch rates for the Outer Harbour and estuaries 2007-2012

The Boyne Tannum Hookup is an annual fishing competition that is held each year on the Queen's birthday weekend in June. It is one of the largest fishing competitions in Queensland often attracting in excess of 3,000 entrants. The competition is centred on Bray Park near the mouth of the Boyne River but there are no boundaries for where entrants can fish.

Data on catch and effort in the Boyne Tannum Hookup were collected each year since 2005. In 2005 and 2006 details were only obtained for offshore fishing trips while from 2007 details of trips in Gladstone Harbour and local estuaries were also obtained. Where people fish during the Hookup is strongly influenced by the wind conditions with offshore trips significantly reduced when winds exceed 15knots.

EFFECT OF WIND SPEED ON FISHING

Figure 21 shows the wind speed during each of the Hookups. In 2012 wind speeds exceeded 15knots at all readings and maximum wind speed exceeded 30knots on each day making it the windiest event in the 8 years data have been collected.

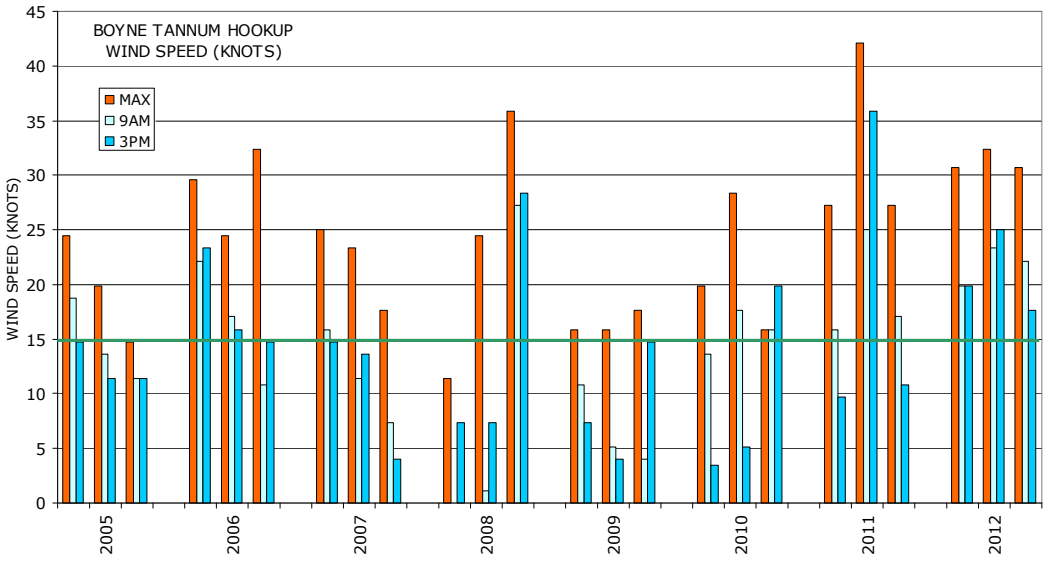

Figure 21 : Wind speed (knots) during the Boyne Tannum Hookup from 2005-2012

FISHING LOCATIONS

Fishing locations were categorised as:

- Offshore (islands, wide grounds, offshore reefs)
- Inshore (Outer harbour and Facing Island)

- Estuary (Gladstone Harbour, Boyne River, South Trees Inlet and Calliope River)

Figure 22 shows the percentage of fishing trips during the Hookup to offshore, inshore and estuary locations and *figure 23* shows the proportion of trips to estuary/inshore and offshore locations from 2007-2012. There was a high correlation between offshore trips and wind speed as shown in *figure 21*. In 2008 and 2009 when wind speeds were generally lighter (except on day 3 in 2008) there were many more trips offshore compared with 2011 and 2012 where strong wind persisted for most of the event confining trips to estuary/inshore locations.

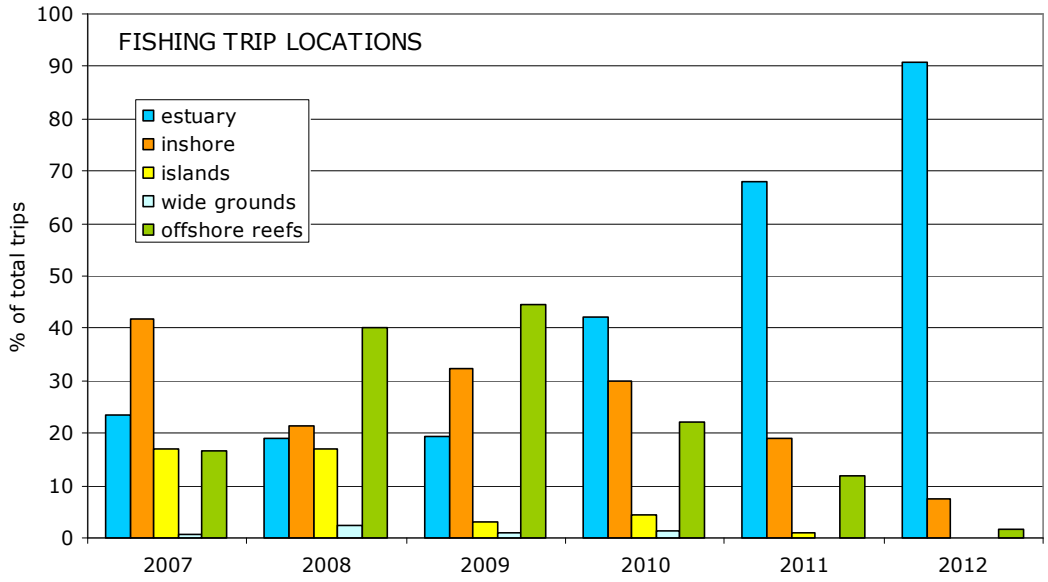

Figure 22: Location of estuary and inshore fishing trips during the Boyne Tannum Hookup from 2007-2012

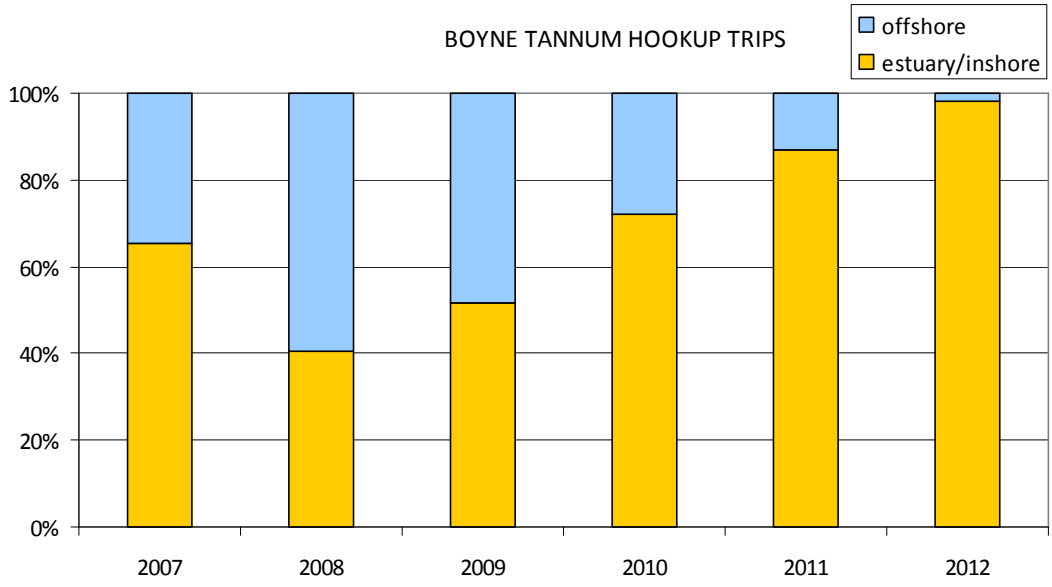

Figure 23: Percentage of trips in Boyne Tannum Hookup to estuary/inshore and offshore locations 2007-12

Boyne Tannum Hookup fishing trips were mostly offshore in 2008 and 2009 while they were mostly estuary/inshore in 2011 and 2012

BOYNE TANNUM HOOKUP CATCH RATES

Figure 24 shows the catch rates for inshore trips each year while *figure 25* shows the estuary catch rates. There was a decline in catch rates for inshore trips from 2007 to 2011 with an increase in 2012. The estuary catch rate fell from 2009 to 2011 however also increased in 2012. Catch rates for both estuary and inshore trips have fluctuated from around 4-12 caught and 0.5-2.5 fish kept.

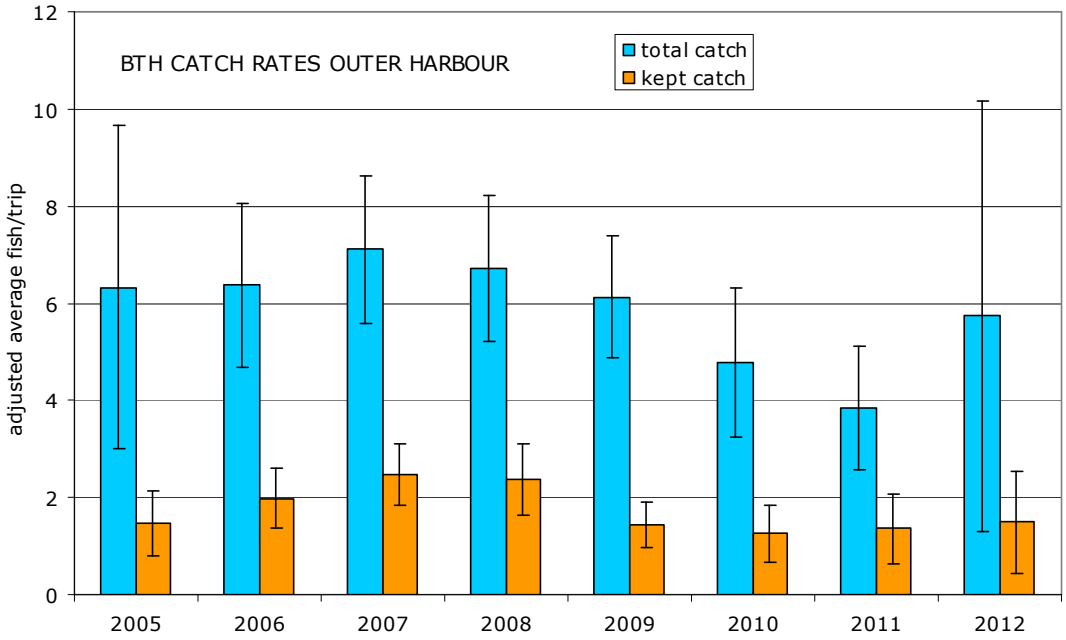

Figure 24: Catch rates for inshore areas during the Boyne Tannum Hookups from 2005-2012

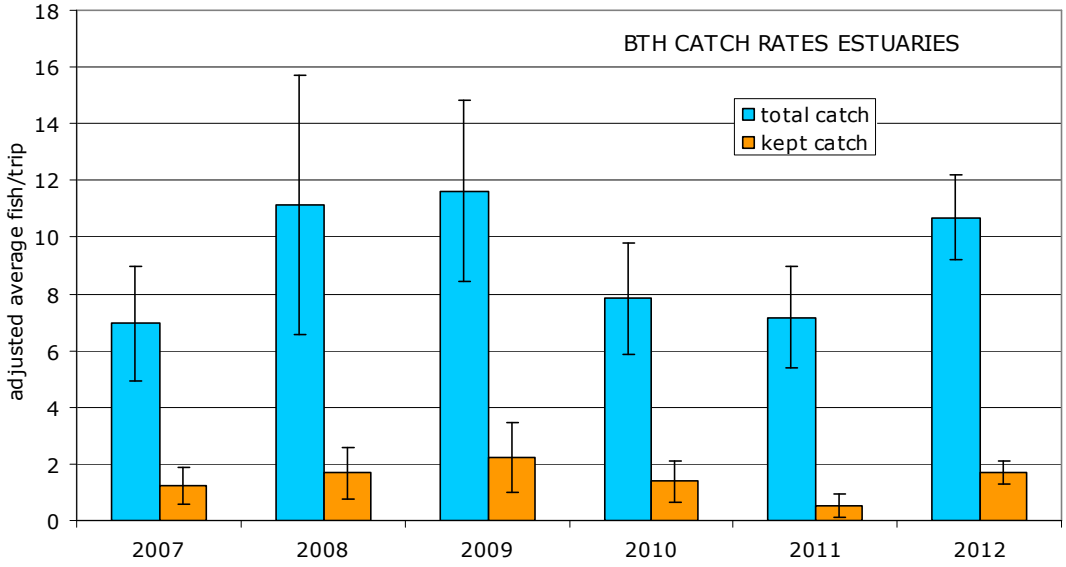

Figure 25: Catch rates for estuaries during the Boyne Tannum Hookups from 2007-2012

Boyne Tannum Hookup catch rates for estuary/inshore trips ranged from around 4-12 fish caught and 0.5-2.5 fish kept from 2007 -2012

8. FISHERS' VIEWS OF RECREATIONAL FISHING

The views of fisher on recreational fishing in the Gladstone area were assessed though:

- A manual survey of fishers at boat ramps, Ecofest and Boyne Tannum Hookup in 2012
- An online version of the survey at http://info-fish.net/survey
- An iPad version of the survey at Ecofest and Boyne Tannum Hookup

The survey to assess fisher's views of recreational fishing was delayed due to the fishing closure and fish health issues in the second half of 2011. Surveys were undertaken from Mar-Jun 2012 with 216 completed surveys.

There were 22 questions in the survey.[7] *Figure 26* shows that 77% of surveys were obtained at boat ramps or direct from fisher interviews while 23% were completed online.

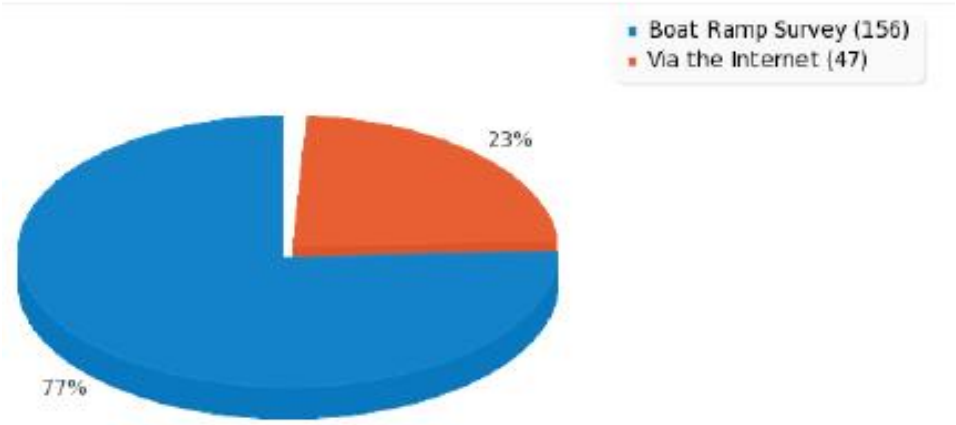

Figure 26: How responses to the fisher survey were received

The profile of respondents was:

- 95% were male - 5% were female
- 57% were aged 31-50
- 74% rated recreational fishing as their most important outdoor activity
- 89% lived in Gladstone or the surrounding area

Their responses on fishing:

- 61% fished in the area for 10 years or more
- 45% fished 20 days or more in the Gladstone area in the past 12 months
- 50% fished in Gladstone Harbour in past 12 months - 64% fished in Boyne River and South Trees Inlet - 63% fished in Calliope River
- 51% fished Boyne River, South Trees Inlet and Calliope River as their most fished location in last 12 months - 9% fished Gladstone Harbour most
- 77% targeted a particular species when they went fishing
- Barramundi 36% and Mud Crab 18% were the most targeted species

[7] For survey questionnaire and results see "Survey_26153_CapReef_Gladstone_Fisher_Survey.pdf"

- Barramundi 29%, Mud Crab 21% and Bream 20% were the most caught species in past 12 months
- 23% thought they caught more fish on a trip than other fishers - 15% thought they caught fewer fish
- 22% thought they caught more fish than other fishers in the past 12 months - 21% thought they caught fewer fish
- 78% were very satisfied or quite satisfied with the overall quality of fishing
- 60% were not affected by the fishing closure in Gladstone last year - 12% went fishing elsewhere
- 67% had not caught a diseased fish in the past 3-6 months
- 80% were very concerned or moderately concerned about diseased fish being caught in the area
- 45% thought that diseased fish had a high impact on the fish population
- 34% thought that recreational fishing had a high impact on the fish population
- 65% thought that commercial fishing had a high impact on the fish population
- 67% thought that coastal development had a high impact on the fish population

The survey indicated that 78% of those responding were very satisfied or quite satisfied with the overall quality of fishing. The survey was undertaken after months of media reports on the fish disease issues in Gladstone Harbour and suggests that the media reports were not representative of the views of recreational fishers. This result may also be influenced by 67% of respondents not having caught a diseased fish in the previous 3-6 months, however 80% were very concerned or moderately concerned about diseased fish being caught in the area and 45% thought that diseased fish had a high impact on the fish population.

Barramundi was indicated as the most targeted species by 36% of respondents while 29% reported that it was the most caught species. This result is likely to be attributable to the increase in Barramundi stocks from the Awoonga fish. It is unlikely that these figures would have been achieved had the survey been undertaken earlier. In the boat ramp survey in 1996/97 no Barramundi were recorded as being kept.[8] Tag records also show lower numbers of Barramundi tagged prior to 2010 (see *section 9*).

As there are no other surveys that have examined fishers' views no trend can be established. Based on the survey results it is considered that the perception of fishing by respondents was largely influenced by the boost in Barramundi stocks from Awoonga fish, given the high level of targeting of the species and the reported level of the catch. While there was a high level of concern about diseased fish this does not appear to have influenced their view on the overall quality of fishing.

> ***Of 216 respondents to the survey of fishers' views most were male (95%), aged 31-50 (57%), rated recreational fishing as their most important outdoor activity (74%) and lived in the Gladstone area (89%)***

> ***78% of survey respondents were very satisfied or quite satisfied with the overall quality of fishing***

> ***80% of survey respondents were very concerned or moderately concerned about diseased fish in the area and 45% thought that diseased fish had a high impact on the fish population***

[8] A survey of the recreational fishery in the Calliope River Gladstone - JR Platten

9. FISH TAGGING

Species, tag locations, recapture rates and movement were assessed by examining:

- Tag data and recapture data from 1985-2012
- Boyne Tannum Hookup tagging 2000-12

TAGGING 1985-2012

Tagging commenced in the Gladstone area around 1985 and has continued since that time. Locations where fish were tagged were recorded on Suntag grid maps.[9] Grid maps covering the Gladstone area are:

- Gladstone Harbour - GLD
- Calliope River - CR02
- Boyne River - BRG
- Curtis Island - CIS
- Lake Awoonga - GLA

Grids on these maps are 1km^2. Locations where fish were tagged were recorded as map/grid eg BRG/M24 is the mouth of the Boyne River. *Figure 27* shows maps BRG, CR02 and GLD that were used in the analysis of tagging data.

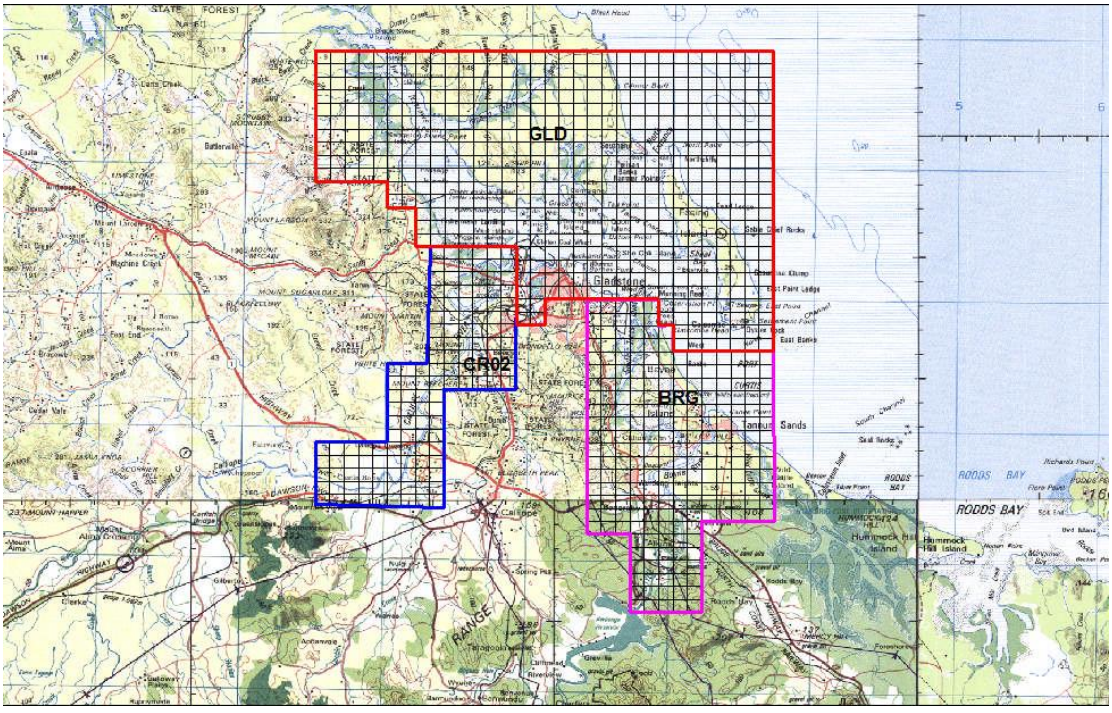

Figure 27: Suntag grid maps used to record tagging locations

[9] Suntag grid maps available from www.info-fish.net/suntag

Tagging included around 35 species with *table 2* showing the numbers of the top 10 species tagged over that time. From Jul 1985-Oct 2012 there were 23,196 fish tagged and 1,899 (8.2%) recaptured. *Figure 28* shows the numbers of fish tagged each 5 years in Suntag maps BRG, CR02 and GLD. Note that the data for 2010-12 only covers 2 years.

Species	Tagged	Species	Tagged
BARRAMUNDI	5,095	MANGROVE JACK	1,505
YELLOWFIN BREAM	3,397	BLACKSPOTTED ROCKCOD	997
GOLDSPOTTED ROCKCOD	3,102	BARRED JAVELIN	764
DUSKY FLATHEAD	2,796	GIANT TREVALLY	581
PIKEY BREAM	2,433	BLUE THREADFIN	492

Table 2: Numbers of top 10 species tagged from 1985-2012

Details of Barramundi tagging are in *section 10*. Apart from Barramundi the most tagged species were Yellowfin Bream, Goldspotted Rockcod, Dusky Flathead, Pikey Bream and Mangrove Jack.

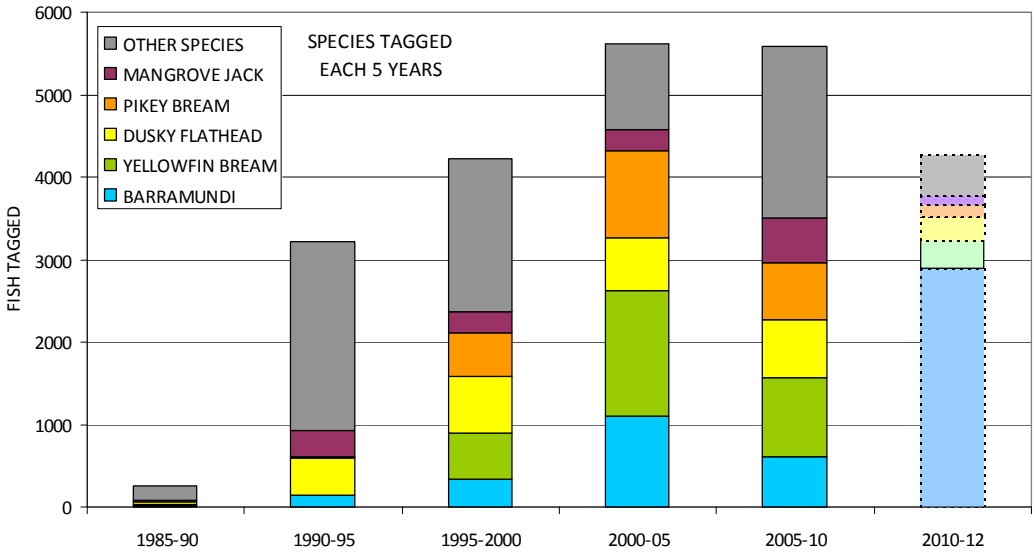

Figure 28: Numbers of key species tagged each 5 years from 1985-2012

> ***A total of 23,196 fish were tagged from 1985-2012 with 1,899 (8.2%) recaptured with the top 5 species being Barramundi, Yellowfin Bream, Dusky Flathead, Pikey Bream and Mangrove Jack***

RECAPTURE RATES

Figure 29 shows the percentage of key species recaptured each 5 years in Suntag maps BRG, CR02 and GLD. The period 2010-12 is only a partial period. The overall recapture rate rose steadily over the period from 6.9% in 1985-90 to 10.3% in 2010-12. The recapture rate is related to fishing effort[10] and the trend is that it has increased over time.

Recapture rates are shown for key species other than Barramundi. Recapture rates for Yellowfin Bream steadily rose from 0% in 1985-90 to 6.0% in 2010-12. For Dusky Flathead it has fallen from

[10] Suntag Research Report 2011/12 Sawynok 2012

11.5% in 1985-90 to 2.4% in 2010-12. For Pikey Bream it has ranged from 0% in 1990-95 to 4.1% in 2010-12 although it reached a high of 6.6% in 2005-10. For Mangrove Jack it has ranged from 0% in 1995/90 to 7.2% in 2010-12 although it reached a high of 9.3% in 2005-10. The recapture rate for 2010-12 only represents the rate over 2 years and will change over time. The drop in the rate for some species is likely to have resulted from a shift in focus to Barramundi.

The overall recapture rate from 1985-2012 for the key species was 4.3% for Yellowfin Bream, 5.3% for Dusky Flathead, 5.3% for Pikey Bream and 7.3% for Mangrove Jack. The overall recapture rate for fish in the Suntag program from 1985-2012 was 7.4%, for Yellowfin Bream was 4.0%, for Dusky Flathead was 8.7%, for Pikey Bream was 4.6% and for Mangrove Jack was 6.3%.[11] This indicates that the recaptures rates for the Gladstone area are not significantly different to the rates in the overall Suntag program for these key species.

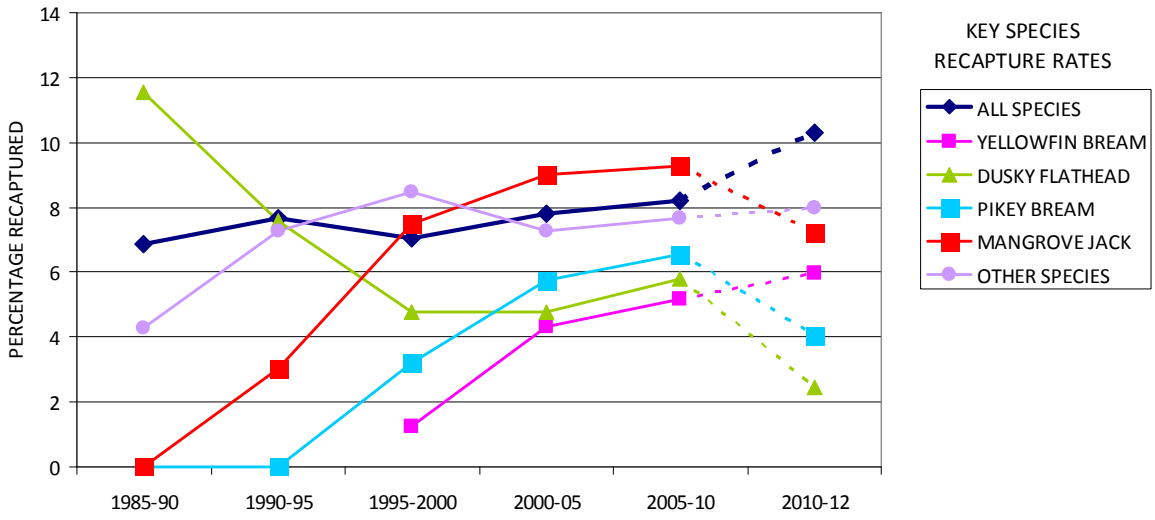

Figure 29: Recapture rates for key species tagged for each 5 years from 1985-2012

> ***The overall recapture rate from 1985-2012 for all species was 8.2% compared with the overall Suntag rate of 7.4%***

> ***The overall recapture rate from 1985-2012 for the key species was 4.3% for Yellowfin Bream, 5.3% for Dusky Flathead, 5.3% for Pikey Bream and 7.3% for Mangrove Jack***

TAG LOCATIONS

Figure 30 shows the grids where fish were tagged from 1985-2012. There were 322 grids where fish were tagged. The largest numbers tagged were 4,101 in BRG/N24 with most of these tagged and released during the Boyne Tannum Hookup. There were 34 grids where 100 or more fish were tagged (shown in red in *figure 30*).

[11] Suntag Research Report 2011/12 Sawynok 2012

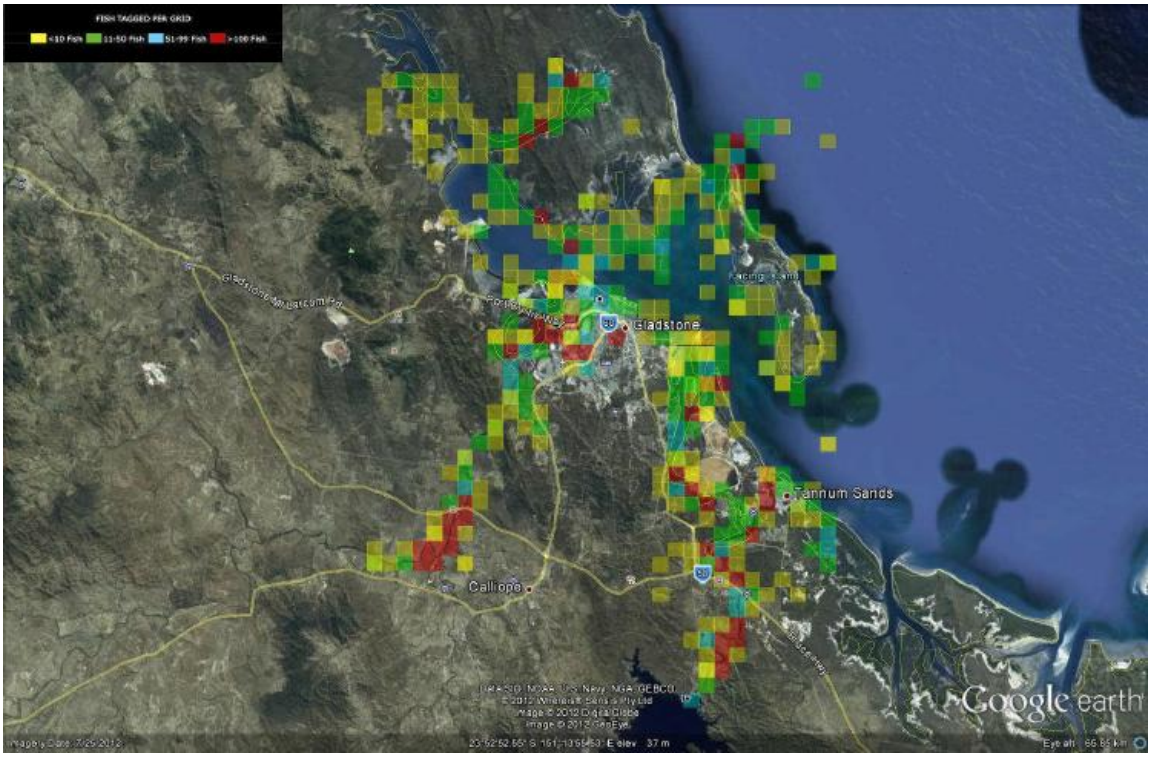

Figure 30: Locations where fish were tagged from 1985-2012

> ***There were 322 grids where fish were tagged with 4,101 fish tagged at the mouth of the Boyne River in grid BRG/N24, mostly during the Boyne Tannum Hookup***

> ***There were 34 grids where 100 fish or more were tagged***

BOYNE TANNUM HOOKUP TAGGING

From 2000 the Gladstone Sportfishing Club tagged fish brought to the live weigh-in section of the Boyne Tannum Hookup at Bray Park near the mouth of the Boyne River. Fish that were presented live (circled yellow in *figure 31*) in good condition were tagged, kept in a large live display tank (circled red in *figure 31*) and then released progressively over the duration of the competition. All fish were released at the Bray Park boat ramp at BRG/N24. Key species tagged were:

- Dusky Flathead
- Yellowfin Bream
- Pikey Bream
- Barred Javelin
- Mangrove Jack

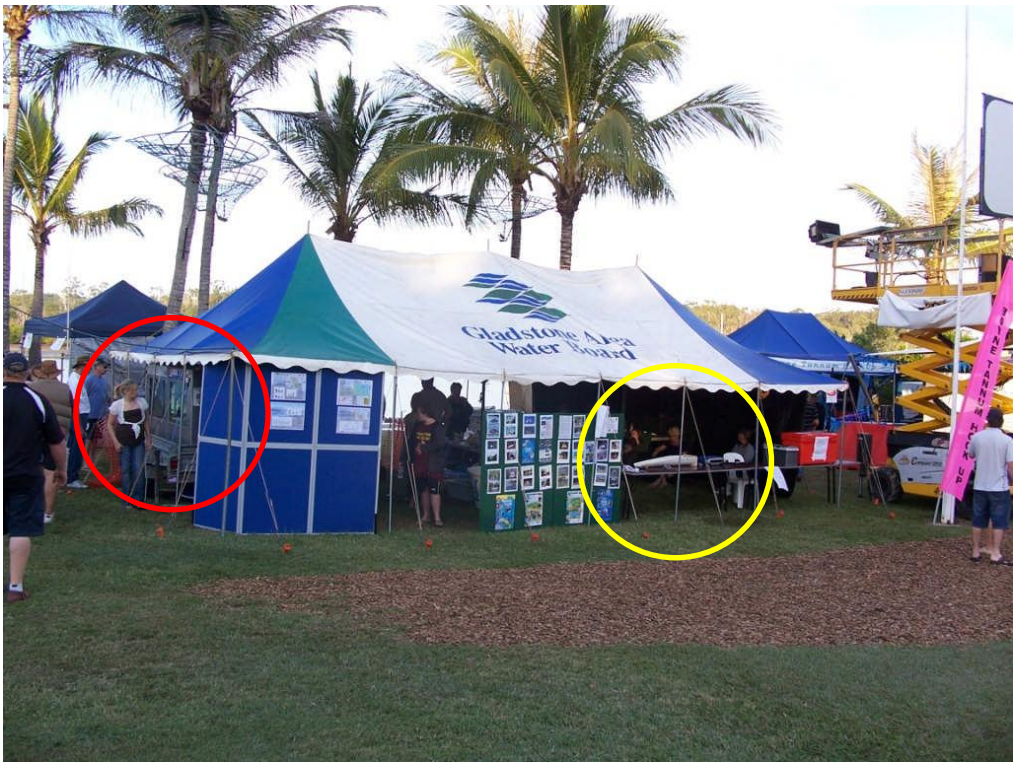

Figure 31: Gladstone Sportfishing Club marquee with live weigh-in (yellow) and fish display tank (red) at the 2008 Boyne Tannum Hookup

Figure 32 shows the numbers of fish tagged in each Hookup and the recapture rate for fish tagged each year. From 2000-12 there were 3,656 fish tagged with 195 (5.3%) recaptures. The recapture rate is less than the overall rate for the area of 8.2%. *Figure 33* shows the number of key species tagged in all Hookups and their recapture rates.

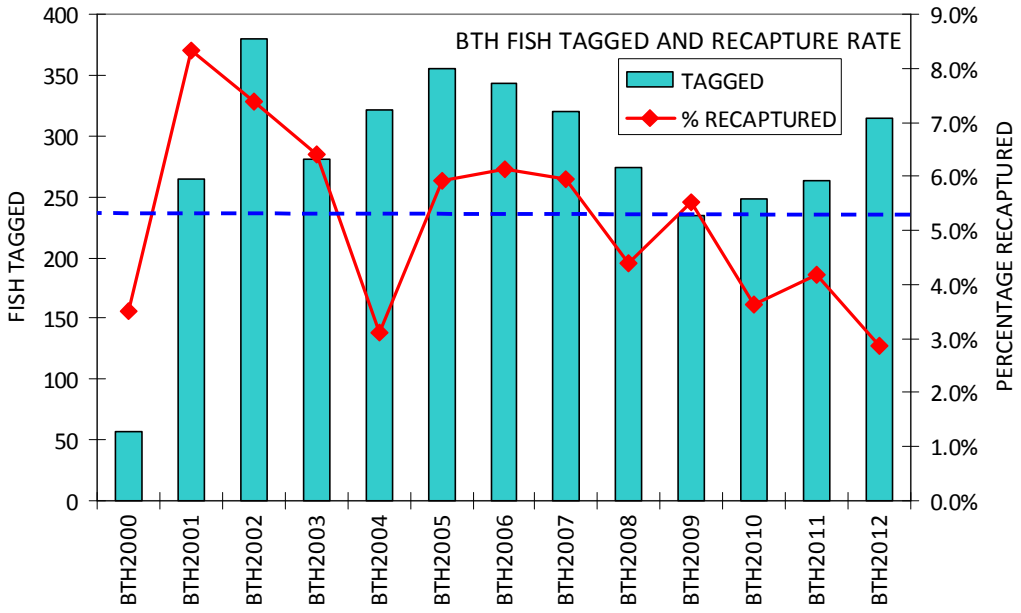

Figure 32: Fish tagged and recapture rates from Boyne Tannum Hookup 2000-12

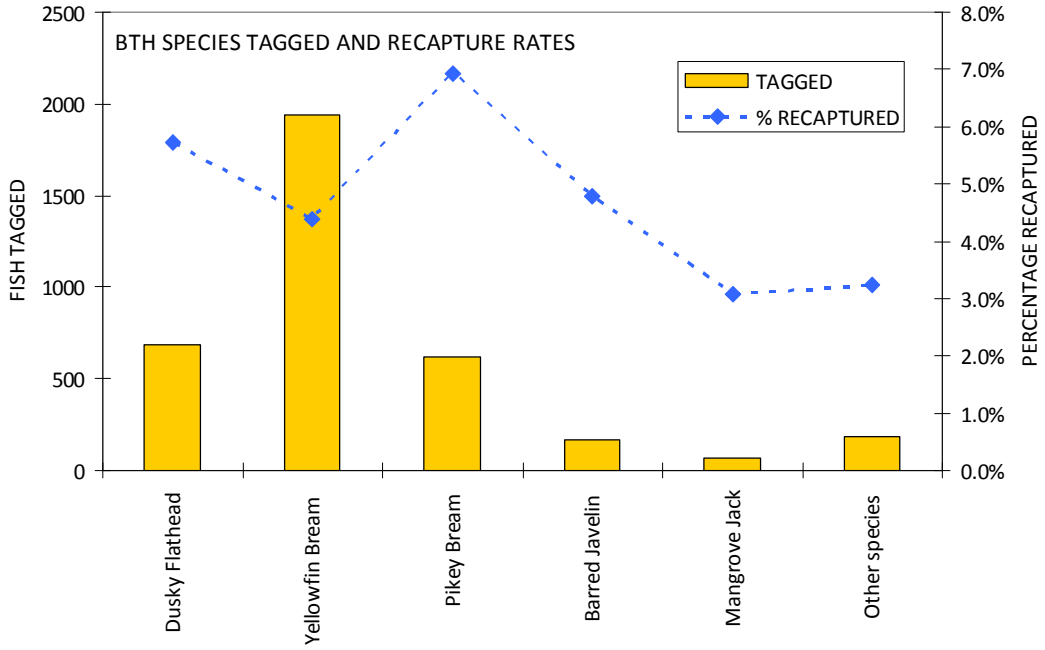

Figure 33: Recapture rate of key species tagged in Boyne Tannum Hookup 2000-12

Of the fish recaptured 148 (75.9%) were recaptured within 6 months of release. Of the 195 recaptures there were 190 that had sufficient data to determine movement. All fish were released at the Bray Park boat ramp (BRG/N24) with 10 (5.3%) recaptured 20km or more from where they were released. A total of 73 (38.4%) were caught in the same area as tagged (moved less than 1km). The furthest distance a fish was recaptured from the release site was a Dusky Flathead caught in the Elliott River at Bundaberg 175km south after being at liberty for just 129 days (just over 4 months) after the 2005 Hookup. *Figure 34* shows the distance fish moved compared to the days out.

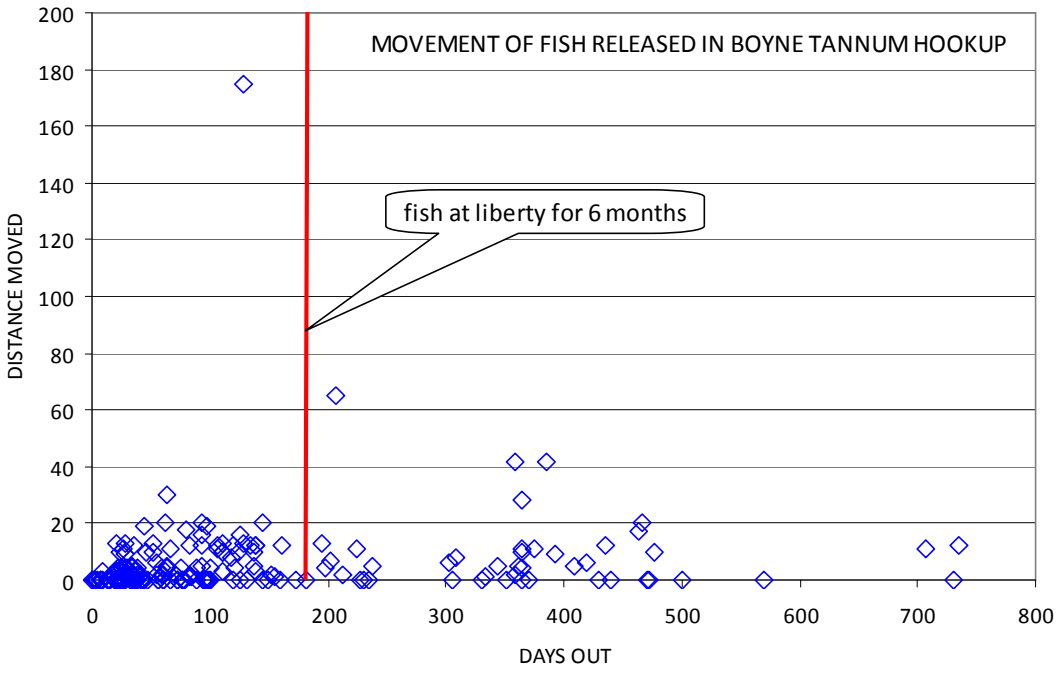

Figure 34: Movement of tagged fish released in Boyne Tannum Hookup 2000-12

The recapture rate for fish tagged by the Gladstone Sportfishing Club during the Boyne Tannum Hookup from 2000-12 was 5.3%

Of the fish recaptured from those tagged in the Boyne Tannum Hookup 75.9% were recaptured within 6 month

Of the fish recaptured from those tagged during the Boyne Tannum Hookup 38.4% were recaptured within 1km and 94.7% were recaptured within 20km of where released

10.BARRAMUNDI

Trends in Barramundi were assessed by examining:

- Catch data from 2006-12
- Tag and recapture data from 2000-12
- Locations where Barramundi were tagged 1985-2012
- Barramundi movement and growth
- Barramundi recruitment surveys 1999-2011
- Stocked fish in Lake Awoonga and Lake Callemondah
- Commercial catch of Barramundi 2000-11

A detailed assessment of the status of Barramundi in 2012 was made by examining:

- Effect of stocked fish exiting Lake Awoonga and Lake Callemondah
- Catch rates
- Size composition of stock and growth rates
- Tag recapture rates
- Exploitation rates
- Fish health issues

Barramundi is an iconic species that is highly sought after throughout its entire range across tropical Australia including the Gladstone area, especially by the more avid and experienced fishers. Barramundi was selected as an indicator species for more detailed assessment.

Barramundi took on a greater level of importance when very large numbers of fish exited Lake Awoonga when it spilled in late Dec 2010. This was the first time the dam had spilled since the dam wall was raised in 2002 and flows over the spillway continued until Jun 2011. Barramundi were observed going over the spillway (*figure 35*) within days and over the following weeks large numbers of Barramundi continued to go over the spillway.

Figure 35: Barramundi on the Awoonga spillway Jan 2011

The Gladstone Area Water Board estimated that 20,000 mature-sized Barramundi exited Lake Awoonga. Approximately 1,200 fish perished, principally due to physical trauma during the initial stages of the spill event.[12] Some of these fish moved down the Boyne River, with reports of fish from "Awoonga" in many areas of the Gladstone Harbour, Calliope River and elsewhere up and down the coast. This was an unprecedented event which resulted in more Barramundi, especially large fish, in the Gladstone area than in any time in modern history. This lead to a bonanza for local and visiting fishers but was overshadowed by significant fish health issues that emerged in mid 2011.

The dam spilled again from Mar-Jun 2012 with more stocked fish leaving the dam however the size range of these fish was generally smaller around 500-600mm. No estimate of the number of fish that left Awoonga over that time was available however was considered to be less that the numbers in 2010-11.

> ***Gladstone Area Water Board estimated that 20,000 Barramundi left Lake Awoonga from Dec 2010-Jan 2011 with approximately 1,200 perishing, principally due to physical trauma during the early stages of the spill event***

RECREATIONAL BARRAMUNDI CATCH

Catch rates for Barramundi were obtained from fishing trips details obtained from boat ramp surveys and direct from fishers (see *section 6*). Seasonal catch rates were calculated for each season from autumn 2006-spring 2012.

Figure 36 shows the number of Barramundi caught/trip each season with an increase in the fish caught after Lake Awoonga overtopped the spillway in summer 2010-11 and allowed Barramundi to move into the Boyne River and beyond. From autumn 2006-winter 2009 the catch rate for Barramundi ranged from 0-0.2 fish/trip while from spring 2009-spring 2012 it ranged from 0.6-3.7 fish/trip, excluding winters when few Barramundi are caught due to low water temperatures. The percentage of Barramundi kept from autumn 2006-spring 2012 was 7.1%.

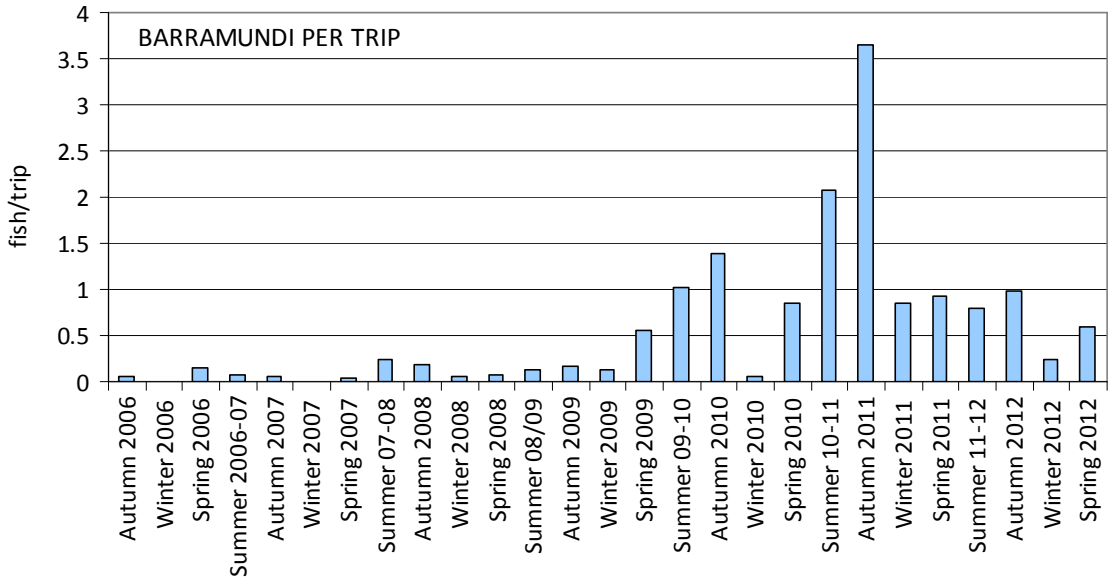

Figure 36: Catch rate of Barramundi each season from 2006-2012

[12] Gladstone Area Water Board website www.gawb.qld.gov.au "Summary of GAWB Report to the Gladstone Fish Health Scientific Advisory Panel"

From autumn 2006-winter 2009 the catch rate for Barramundi ranged from 0-0.2 fish/trip while from spring 2009-spring 2012 the catch rate ranged from 0.6-3.7 fish/trip

The percentage of Barramundi kept from autumn 2006-spring 2012 was 7.1%

COMMERCIAL CATCH OF BARRAMUNDI 2000-11

The commercial catch of Barramundi was obtained from logbook data 2000-2011.[13] Data for 2012 are not available as Fisheries Queensland is not yet confident in that data. Data were for grid S30 which covers the Gladstone Harbour as shown in *figure 37.*

Figure 37: Commercial catch grids for Central Queensland with Gladstone grid S30

Commercial catch per year (tonnes) and catch per unit effort (CPUE) for grid S30 for each year are provided in *figure 38.* There is a closed season from Nov-Jan each year so the catch data is for the 9 months from Feb-Oct.

From 2000-10 the commercial catch ranged from a low of 4.0t in 2009 to a high of 16.8t in 2005. In 2011 it rose to a high of 215.6t, an increase of over 1,600% over the previous year. The significant increase in the catch in 2011 is attributed in part to the large number of "Awoonga" Barramundi that entered the fishery in early 2011. From 2000-2010 the commercial catch per unit effort (CPUE) ranged from a low of 30.8kg/day in 2001 to a high of 64.5kg/day in 2006. In 2011 it rose to 490.0kg/day, which was an increase of 796% over the previous year.

Figure 39 shows the Gross Value of Production (GVP) of the commercial Barramundi catch in Gladstone grid S30 from 2000-2011. From 2000-2010 the GVP ranged from $0.06m in 2001 to $0.15m in 2005. In 2011 it rose to a high of $1.98m, an increase of 1,606%.

[13] Commercial logbook data supplied by Fisheries Queensland

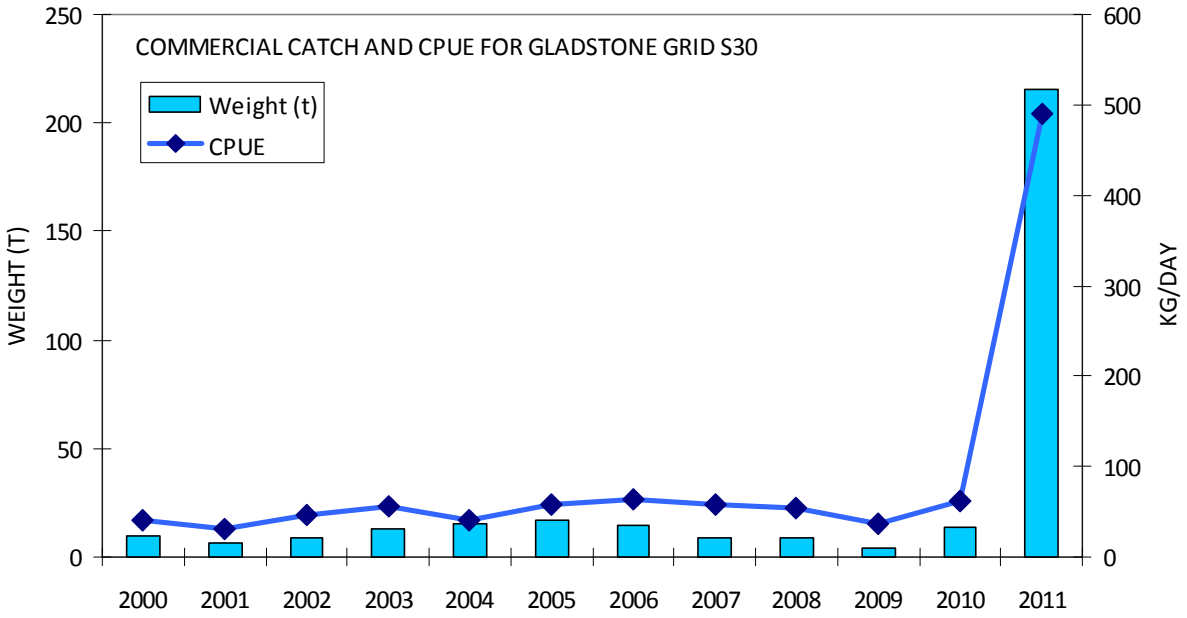

Figure 38: Commercial catch (tonnes) of Barramundi and CPUE for Gladstone grid S30 from 2000-11

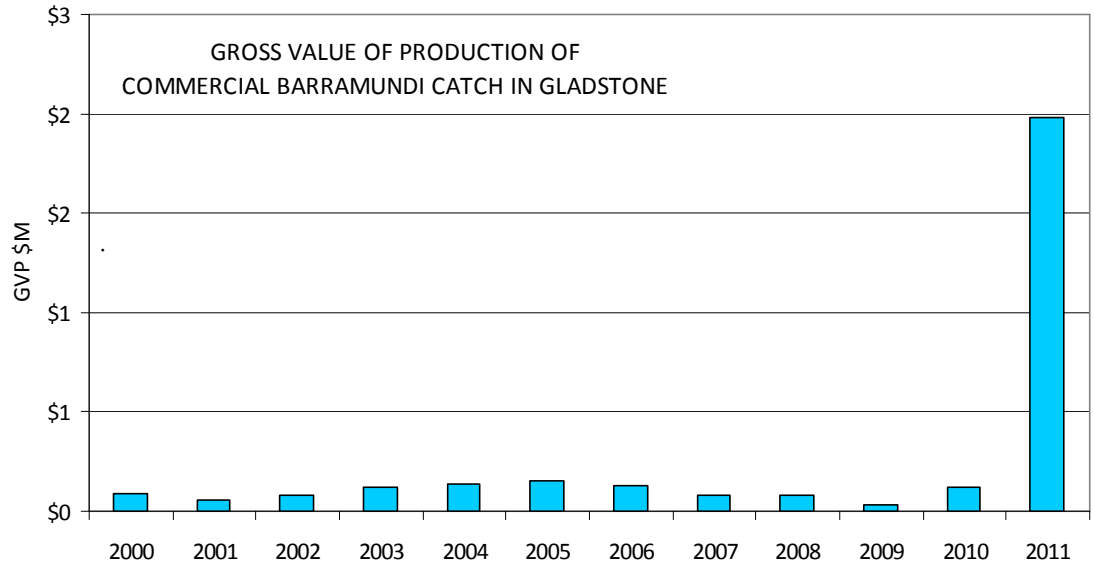

Figure 39: GVP of the commercial catch of Barramundi in Gladstone grid S30 from 2000-11

The commercial catch of Barramundi in 2011 was 215.6t with the previous highest catch being 16.8t in 2005

The commercial CPUE of Barramundi in 2011 was 490.0kg/day with the previous highest being 64.5kg/day in 2006

The commercial GVP of the Barramundi catch in 2011 was $1.98m with the previous highest being $0.15m in 2005

BARRAMUNDI TAGGING

From 1985-2012 there were 5,095 Barramundi tagged (see *section 9*). *Figure 40* shows the number of fish tagged each 5 years since 1985 in Suntag maps BRG, CR02 and GLD. Note that the data for 2010-12 only covers 2 years. From 1985-2010 there were 2,200 Barramundi tagged while in the 2 years since then there have been 2,895 (58.6% of total) tagged which is more than in the previous 25 years. This is mostly due to the increase in stocks from Awoonga fish and good recruitment from 2008-10. *Figure 41* shows a typical large Barramundi tagged in the Pikes Crossing area in early 2011.

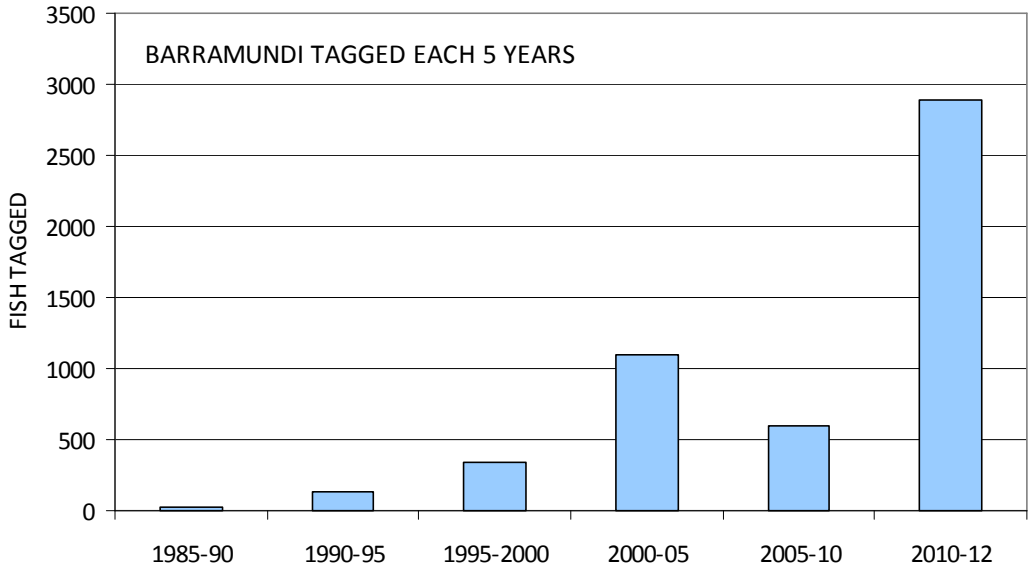

Figure 40: Numbers of Barramundi tagged each 5 years from 1985-2012

Figure 41: Typical large Barramundi tagged in the Pikes Crossing area in early 2011

There were 5,095 Barramundi tagged from 1985-2012 with 2,895 (56.8%) tagged in the last 2 years from 2010-2012 compared with 2,200 (43.2%) over the previous 25 years

RECAPTURE RATES

Figure 42 shows the recapture rate for Barramundi and all species for each 5 years from 1985-2012. The recapture rate ranged from a high of 29.2% in 1985-90 to 12.4% in 2010-12. Recapture rates for 1985-90 and 1990-95 need to be treated with caution due to the low numbers of fish tagged over those years. The overall recapture rate from 1985-2012 was 14.9% while the overall recapture rate for Barramundi under Suntag was 7.0% and for the Fitzroy River was 17.3%.[14]

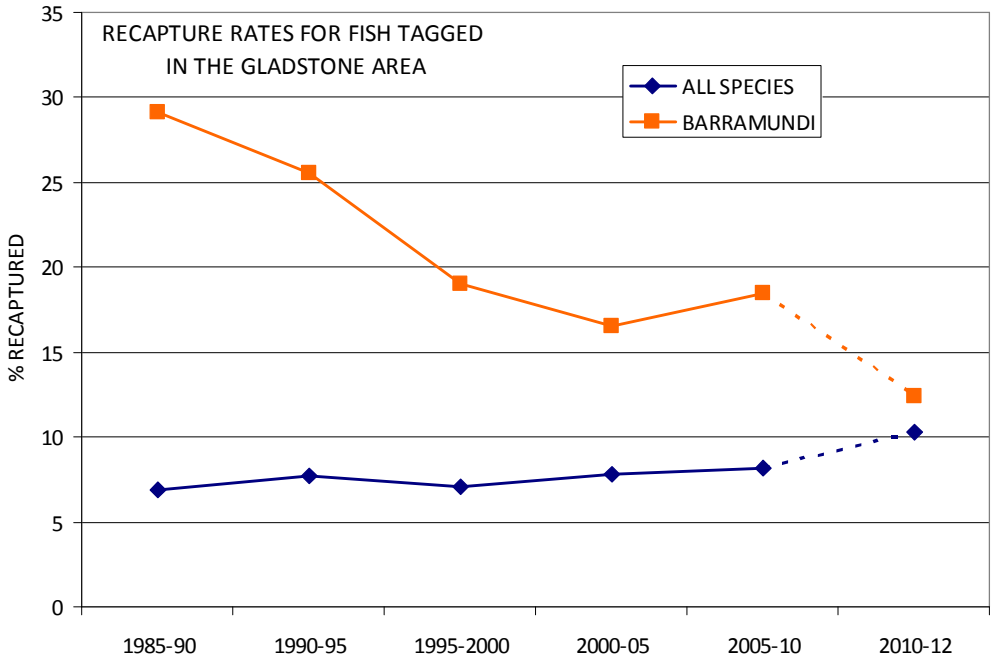

Figure 42: Recapture rate for Barramundi and all species for each 5 years from 1985-2012

The recapture rate for Barramundi from 1985-2012 was 14.9% which compares with 17.3% for the Fitzroy River and 7.0% for the overall Suntag rate

EXPLOITATION RATES

The exploitation rate was calculated as the ratio of recaptures where the fish was kept compared with the number of fish tagged over time. This provided an estimate of the proportion of the population harvested. Not all recaptures are reported so that this is an underestimate of the exploitation rate. From anecdotal information there was underreporting of recaptures by both recreational and commercial fishers. The exploitation rate needs to be treated as indicative only due to the low numbers of fish tagged in some years and the underreporting of recaptures.

The exploitation of the recreational catch was calculated as the number of Barramundi kept compared with the total number caught as obtained from boat ramp surveys. This provided an estimate of the proportion of the recreational catch harvested.

Table 3 shows the exploitation rates for each year from 2000-12 based on the number of fish tagged and the number of recaptures kept. A survival rate of 90% has been assumed for fish released. The

[14] Suntag Research Report 2011/12 Sawynok 2012

exploitation rate ranged from 0.7% in 2001 to 10.1% in 2009. The average exploitation rate over all years was 5.0%. *Figure 43* shows a comparison of the exploitation rate for Gladstone and the Fitzroy River.

Tag year	Tagged	90% survival	Recaptured from current years tagging		Recaptures from previous years tagging year		Recaptures from current and previous year		Recaptured from tags released > 1 year ago		Total recaps	Exploitation rate
			Recap	Kept	Recap	Kept	Recap	Kept	Recap	Kept		
2000	317	285.3	5	3	5	3	34	0	5	2	44	7.6%
2001	256	230.4	8	2	42	2	4	0	4	3	16	0.7%
2002	249	224.1	15	4	19	4	4	3	8	3	27	1.7%
2003	132	118.8	18	10	22	13	6	2	32	21	56	5.8%
2004	107	96.3	10	6	16	8	4	2	19	14	33	6.7%
2005	190	171	5	3	9	5	2	1	19	13	26	5.2%
2006	107	96.3	13	9	15	10	2	0	4	4	19	5.8%
2007	72	64.8	7	3	9	3	1	0	22	18	30	3.1%
2008	55	49.5	2	1	3	1	1	1	18	9	21	1.5%
2009	141	126.9	6	4	7	5	4	2	9	8	19	10.1%
2010	209	188.1	9	4	13	6	12	7	6	4	27	4.7%
2011	2052	1846.8	22	10	34	17	130	19	41	11	193	9.0%
2012	809	728.1	139	32	269	51	44	14	29	8	212	2.8%

Table 3: Exploitation rates for Barramundi in the Gladstone area based on tagging and recaptures

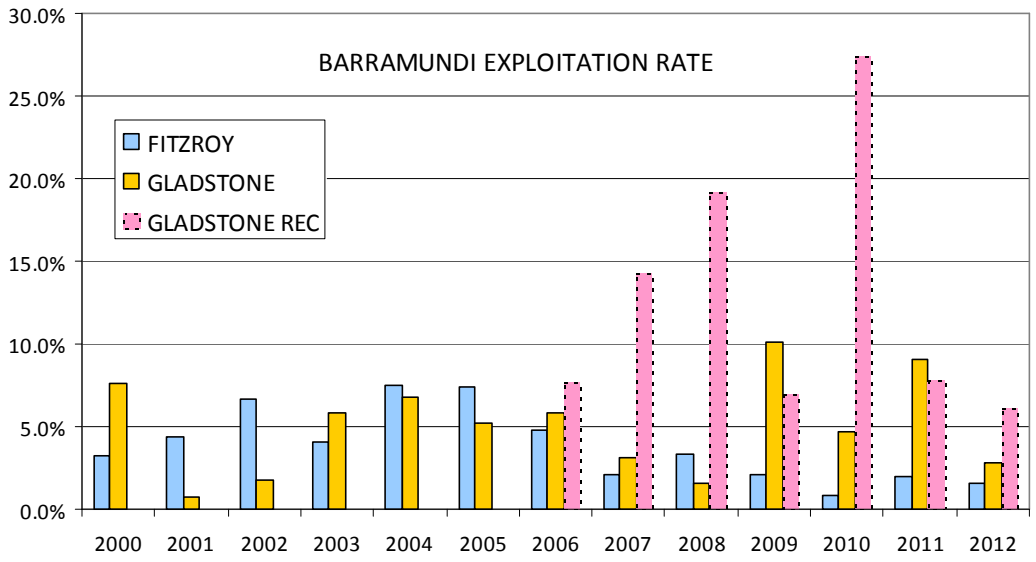

Figure 43: Comparison of exploitation rates in Gladstone (total and recreational) and the Fitzroy River

The indicative exploitation rate for Barramundi for 2000-12 ranged from 0.7% in 2001 to 10.1% in 2009 with an average of 5.0% over all years however this is an underestimate

TAG LOCATIONS

Details of recording of tag locations are in section 9. *Figure 44* shows the locations were Barramundi were tagged from 1985-2012. There were 168 grids where Barramundi were tagged with the largest number being 814 in BRG/AA40, which is in the Pikes Crossing area. All these fish were tagged after the fish left the dam in late 2010. There were 12 grids where 100 of more Barramundi were tagged (shown in red on *figure 41*).

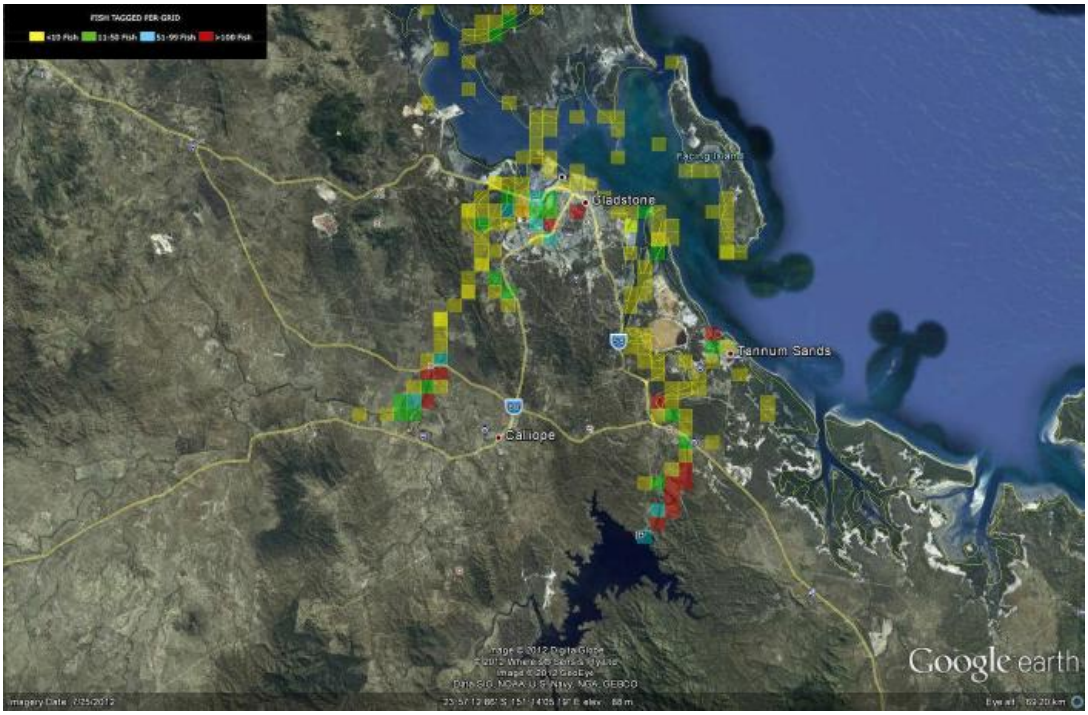

Figure 44: Locations where Barramundi were tagged from 1985-2012

> ***There were 168 grids where Barramundi were tagged with 814 tagged in the Pikes Crossing area in grid BRG/AA20 after they exited Lake Awoonga from late 2010 and 12 grids where over 100 fish were tagged***

BARRAMUNDI SIZES

Barramundi were measured during boat ramp surveys and by taggers when tagging fish. This allowed an average size and the size range of fish for fish each season to be calculated. *Figure 45* shows a typical Barramundi being measure after being tagged.

Figure 46 shows the average size of Barramundi caught each season from 2008-2012. The average size increased from summer 10-11 when the fish from Awoonga began being caught. From summer 2010-11, when fish from Awoonga entered the estuaries, to spring 2012 the average size ranged from 636-901mm.

Figure 47 shows the lengths of 1,985 Barramundi measured from Sep 2011-Oct 2012. There were 2 different groups of fish. Fish from 400-649mm were a mix of fish from Awoonga and natural recruits from 2008-10. Fish from 800-1099mm were predominantly Awoonga fish.

Figure 45: Barramundi being measured after tagging

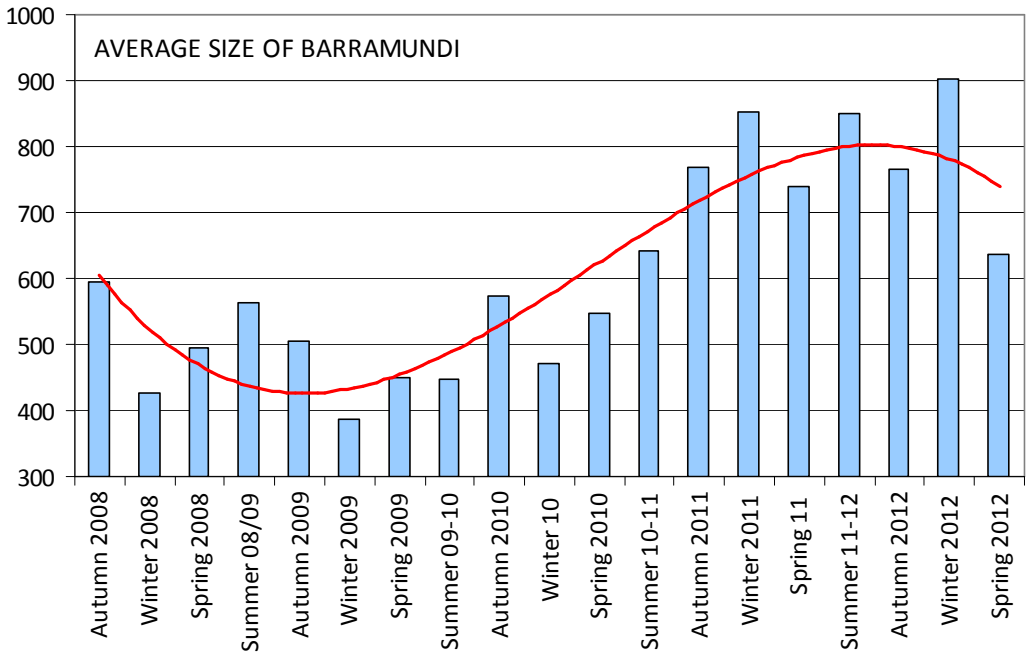

Figure 46: Average size of Barramundi caught each season from 2008-2012

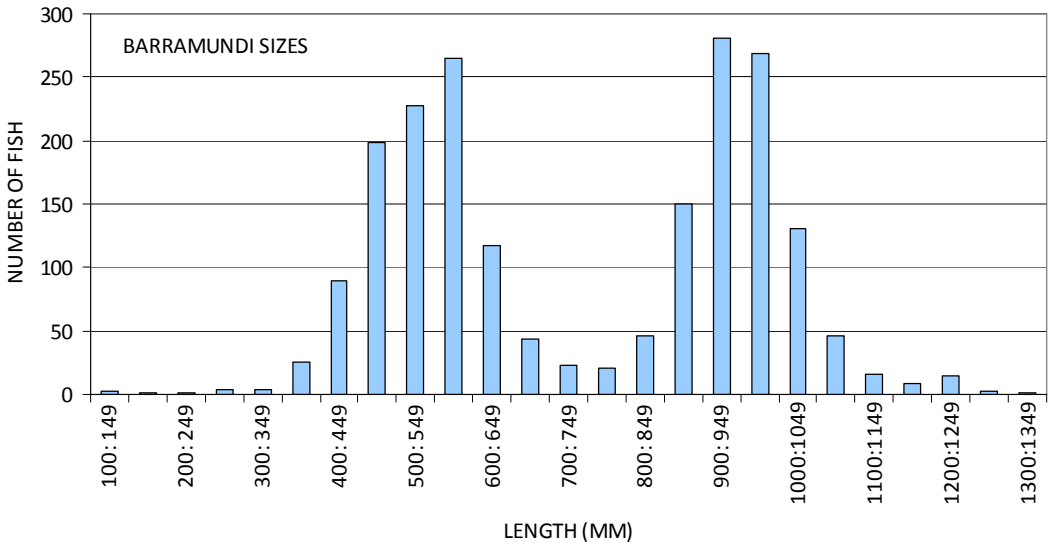

Figure 47: Lengths of Barramundi measured from Sep 2011- Oct 2012

Tagging data were used to provide a timeline of Barramundi measured in the Boyne River, Gladstone Harbour and the Calliope River. *Figure 48* show the number and size of fish tagged/measured in the Boyne (map BRG) and *figure 49* for the Calliope River (map CR02) from 2000-2012. This shows the influx of fish from Lake Awoonga following the spilling of the dam in Dec 2010 and the 2 distinct sizes ranges as shown in *figure 47*.

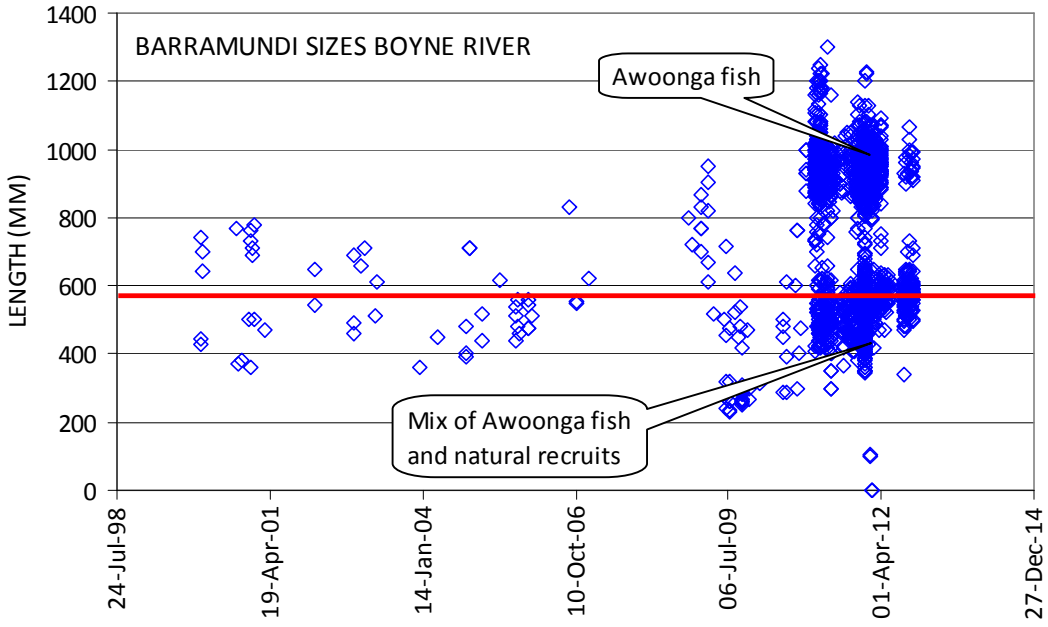

Figure 48: Number and size of Barramundi tagged in the Boyne River from 2000-2012

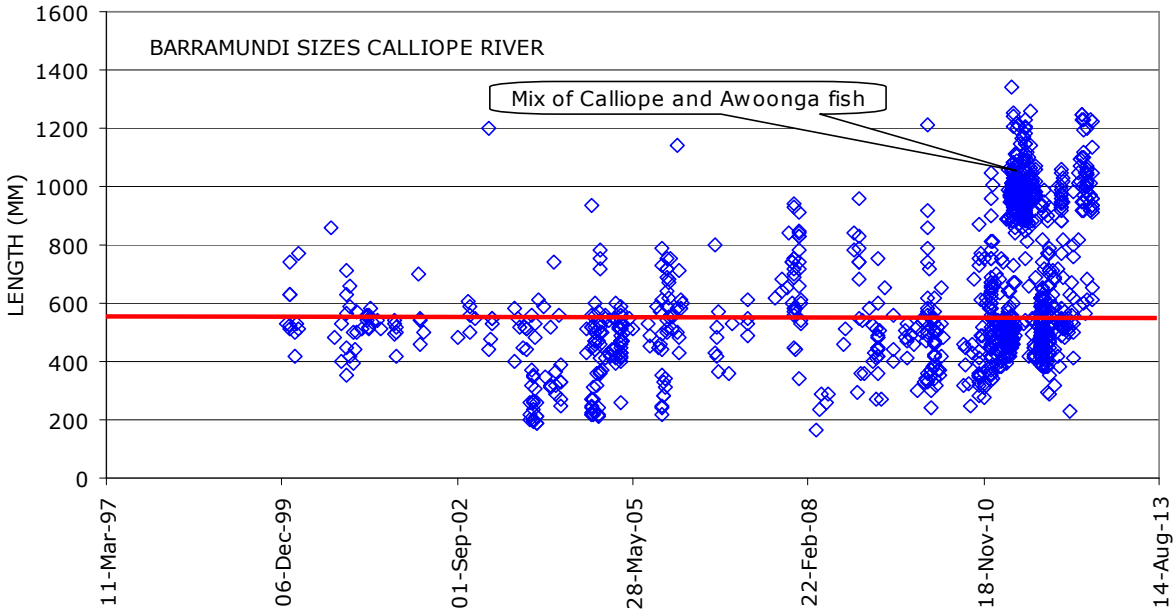

Figure 49: Number and size of Barramundi tagged in the Calliope River from 2000-2012

Figure 50 shows the number and size of fish tagged in Gladstone Harbour (map GLD). Fish stocked in Lake Callemondah and the Duck Ponds have been separately identified to indicate the contribution of stocked fish to the harbour area. The reduction in the numbers of fish tagged in the harbour is likely to reflect a reduction in fishing effort.

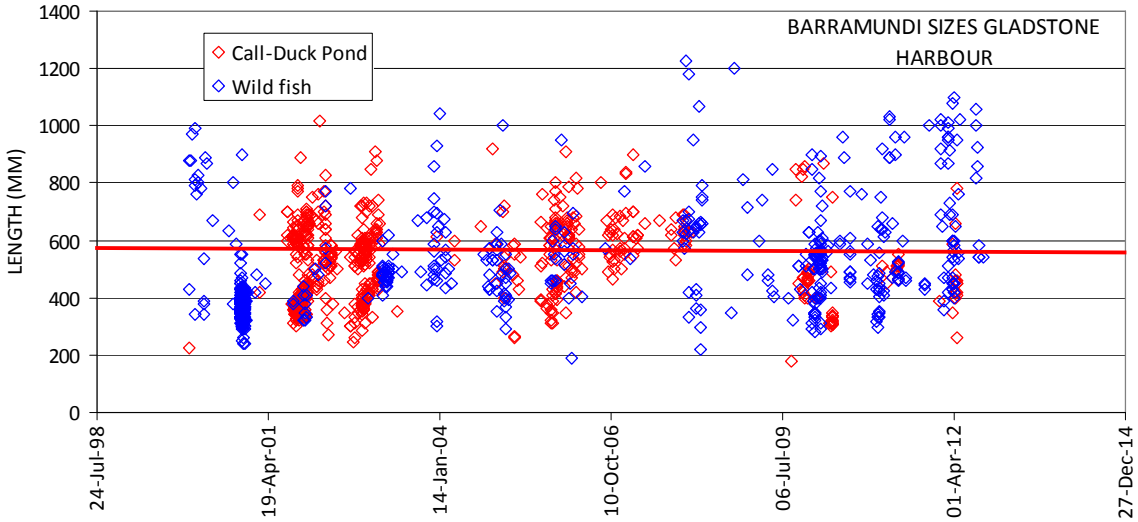

Figure 50: Number and size of Barramundi tagged in Gladstone Harbour from 2000-2012

From summer 2010-11, when fish from Awoonga entered the estuaries, to spring 2012 the average size ranged from 636-901mm

Barramundi measured from Sep 2011-Oct 2012 were predominantly in two size ranges from 400-649mm and 800-1099mm in the Boyne River, Calliope River and Gladstone Harbour

BARRAMUNDI GROWTH

Barramundi growth was assessed based on the length of the fish when tagged and recaptured. Fish that were out for less than 90 days and had negative growth were excluded. Growth was assessed for fish 650mm or less and 650mm and above in both the Boyne and Calliope Rivers that were tagged from Jan 2011-Oct 2012. This corresponds with the time fish exited Lake Awoonga and the 2 size ranges of fish that were found in the rivers. Annual growth was also compared with the adjacent Fitzroy River.

There were 92 recaptures in the Boyne River, 47 for fish tagged 650mm or less and 45 for fish tagged over 650mm. There were fewer recaptures of Calliope River fish with a total of 34, 16 for fish tagged 650mm or less and 18 for fish tagged over 650mm. For the Fitzroy River there were 149 recaptures, 139 for fish tagged 650mm or less and 10 for fish tagged over 650mm.

Figure 51 shows the growth of fish compared with the days out for fish 650mm or less when tagged in the Boyne and Calliope Rivers from Jan 2011-Oct 2012. This indicates that the growth of fish 650mm or less was higher in the Calliope River than in the Boyne River.

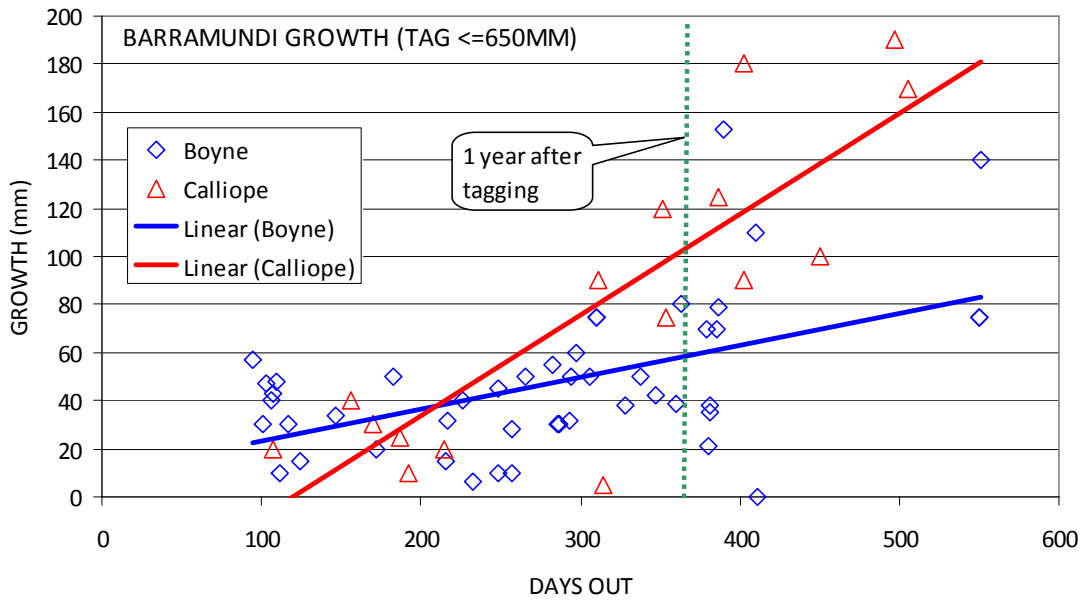

Figure 51: Growth of Barramundi tagged at 650mm or less in the Boyne and Calliope from Jan 2011-Ovct 2012

Figure 52 shows the growth of fish compared with the days out for fish over 650mm when tagged in the Boyne and Calliope Rivers from Jan 2011-Oct 2012. This indicates that the growth of fish over 650mm was also higher in the Calliope River than in the Boyne River.

Figure 53 shows the average annual growth (and standard deviation) of Barramundi tagged in the Boyne, Calliope and Fitzroy Rivers and then recaptured. The average annual growth rate for the Boyne River for fish tagged at 650mm or less was 69.0±45.0mm and for fish over 650mm was 44.0±50.5mm. For the Calliope River for fish tagged at 650mm or less the growth rate was 84.2±44.0mm and for fish over 650mm was 49.1±40.0mm per year. For the Fitzroy River the growth rate for fish tagged at 650mm or less was 113.3±74.8mm and for fish over 650mm it was 169.8mm±67.6mm per year.

The growth rate for the Fitzroy River is higher for both groups of fish however the growth rate for fish tagged at over 650mm in the Fitzroy River should be treated with caution as the number of fish in that size range was low. The lower growth rates for the Calliope and Boyne River could be the result of increased competition for food following the increase in fish in those rivers from Awoonga.

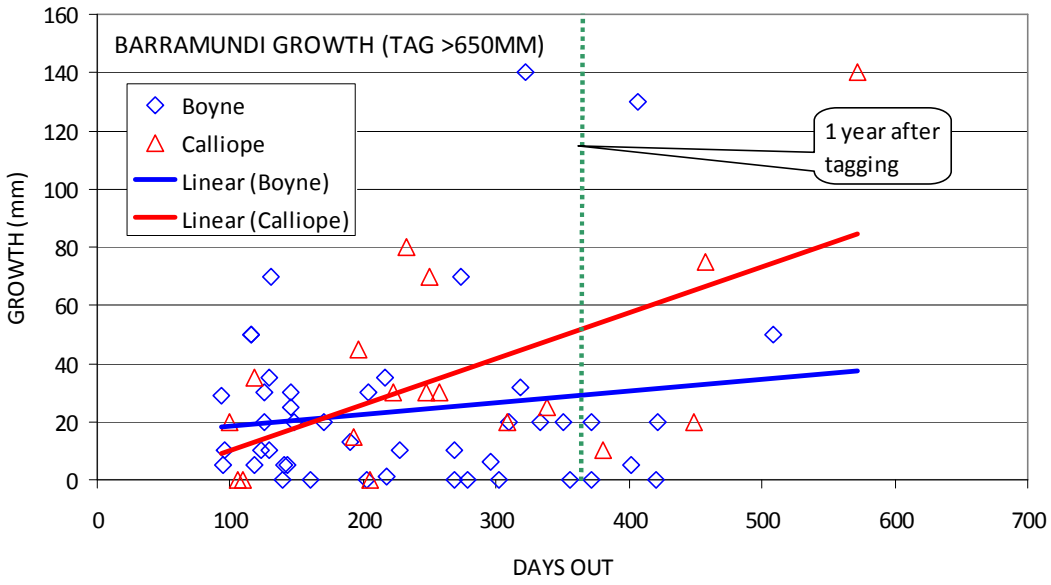

Figure 52: Growth of Barramundi tagged at over 650mm in the Boyne and Calliope from Jan 2011-Ovct 2012

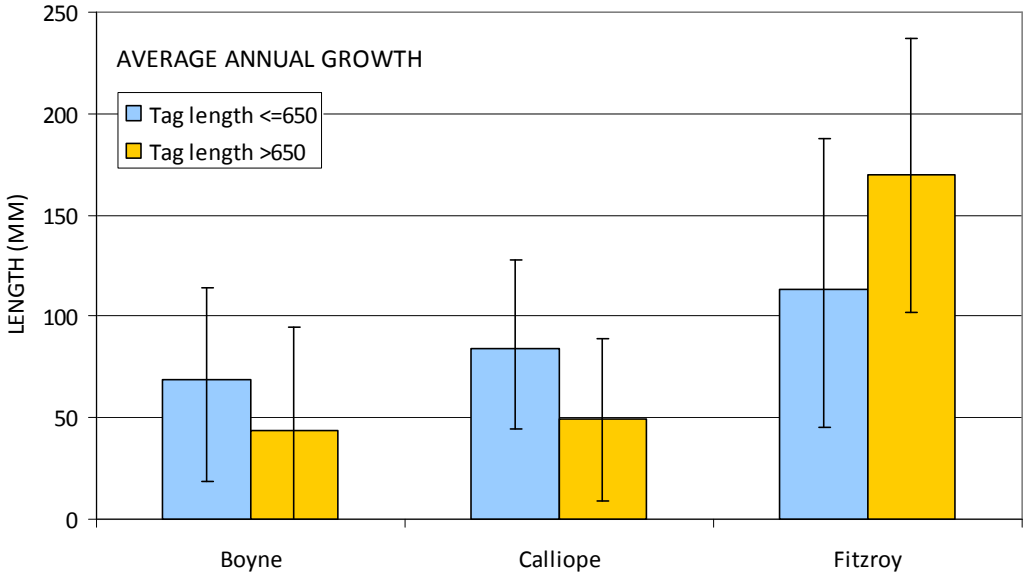

Figure 53: Average annual growth of Barramundi in the Boyne, Calliope and Fitzroy Rivers tagged from Jan 2011-Oct 2012

The average annual growth rate of Barramundi in the Boyne River for fish 650mm or less was 69.0±45.0mm, for the Calliope River it was 84.2±44.0mm and for the Fitzroy River it was 113.3±74.8mm

The average annual growth rate of Barramundi in the Boyne River for fish over 650mm was 44.0±50.5mm, for the Calliope River it was 49.1±40.0mm and for the Fitzroy River it was 169.8±67.6mm

BARRAMUNDI STOCKED IN LAKE CALLEMONDAH

Barramundi have been stocked in all years since 1999, except 2009 in batches of around 3,000+ fish per year in Lake Callemondah.[15] Since then a total of 617 fish have been tagged in the lake by members of the Gladstone Sportfishing Club. Of these there have been 111 recaptures (18.0%) with 9 fish being recaptured twice. Of these recaptures there were 74 (66.7%) where fish have gone over the spillway and been recaptured elsewhere. Of those recaptures 68 (91.9%) were caught within 30km of the spillway. Most recaptures were in Gladstone Harbour, Calliope River, Boyne River, South Trees Inlet and the Narrows however there was one fish recaptured in the Burnett River 185km to the south. *Figure 54* shows the location of recaptures of Barramundi tagged in Lake Callemondah and recaptured elsewhere after going over the spillway.

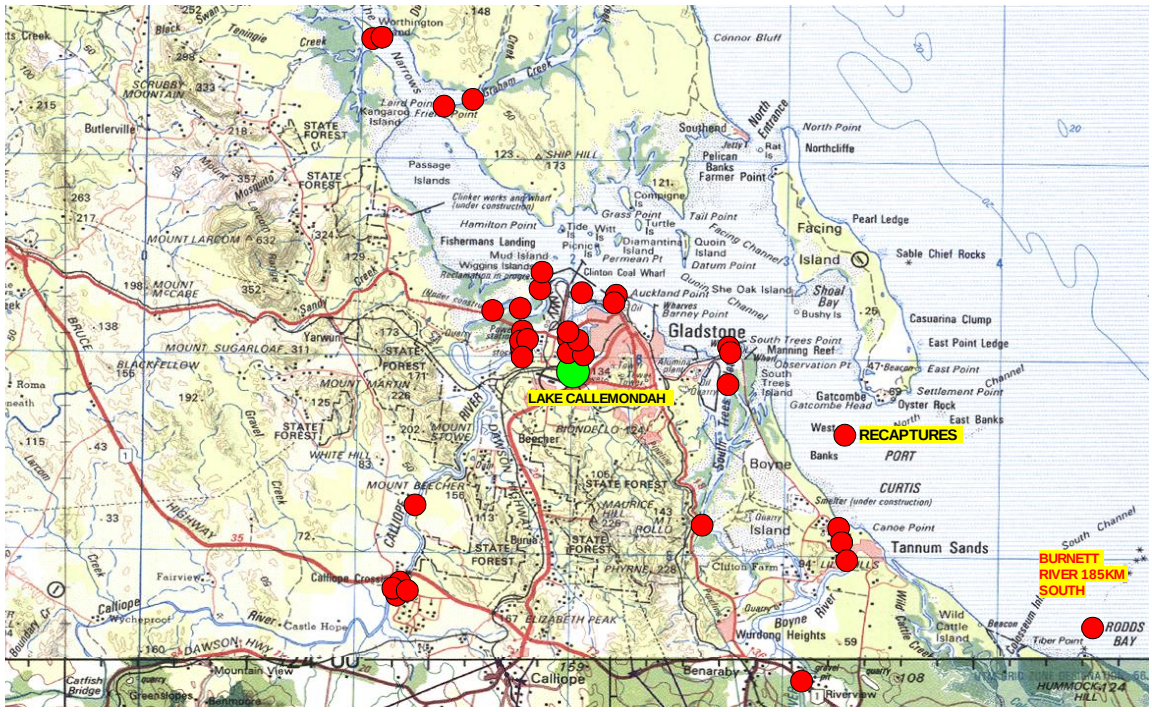

Figure 54: Locations where Barramundi tagged in Lake Callemondah were recaptured

> ***Of the Barramundi tagged in Lake Callemondah 66.7% were recaptured after going over the spillway and 91.9% of these were recaptured within 30km***

BARRAMUNDI STOCKED IN LAKE AWOONGA

Barramundi and other species had been stocked in Lake Awoonga since the 1980s with over 2.4 million Barramundi stocked from 1996-2007.[16] From 2007-12 a further 1.3 million Barramundi were stocked in the lake.[17] Some Barramundi were stocked at a size where they were tagged using GAWB tags. From 2000-2007 there were 14,599 Barramundi tagged by GAWB then released. More stocked fish have been tagged since then but details are not yet available. Also there were 358 larger fish tagged by Suntag taggers up to the end of 2010.

[15] From "Summary of Tagging of Stocked Fish in Impoundments and Waterways of Queensland" Sawynok 2009 and advice from Port Curtis Fish Stocking Group

[16] From "Summary of Tagging of Stocked Fish in Impoundments and Waterways of Queensland" Sawynok 2009

[17] Stocking numbers from Gladstone Area Water Board 2013

In Dec 2010 Lake Awoonga spilled for the first time since the dam wall was raised in 2002 and kept spilling until Jun 2012. Barramundi were observed going over the spillway in large numbers. Since then 48 fish tagged in the lake have been recaptured below the dam and elsewhere. Of the recaptures 11 were caught below the dam in the area of Pikes Crossing and 23 (47.9%) recaptured within 25km (downstream in the Boyne River). The remaining fish were recaptured in the Gladstone Harbour, Calliope River, Narrows and elsewhere with 4 (8.3%) recaptured around 200km south in the Burnett River. This was the furthest south fish from Lake Awoonga have been recaptured.

Fish that went over the spillway were also tagged below the dam. Tagging of these fish occurred from Jan 2011. This included tagging by Fisheries Queensland of 480 fish during an electrofishing survey in Dec 2011. This survey was undertaken to obtain data on the health of fish in the upper Boyne River.

A total of 1,220 Barramundi were tagged below the Awoonga spillway in the Pikes Crossing area from Jan 2011-Oct 2012. These were fish that were tagged in map BRG grids AB19, AA20, Z20, Z21 and Y21. Of these fish there were 139 recaptures (11.4%).

Of the fish tagged in the dam and in the Pikes Crossing area there have been 60 recaptures downstream from Pikes Crossing. *Figure 55* shows where fish tagged in the lake and in the Pikes Crossing area have been recaptured. One fish was recaptured as far north as the Ross River at Townsville (760km) to the north and 6 fish have been caught to the south in the Burnett River at Bundaberg (180km).

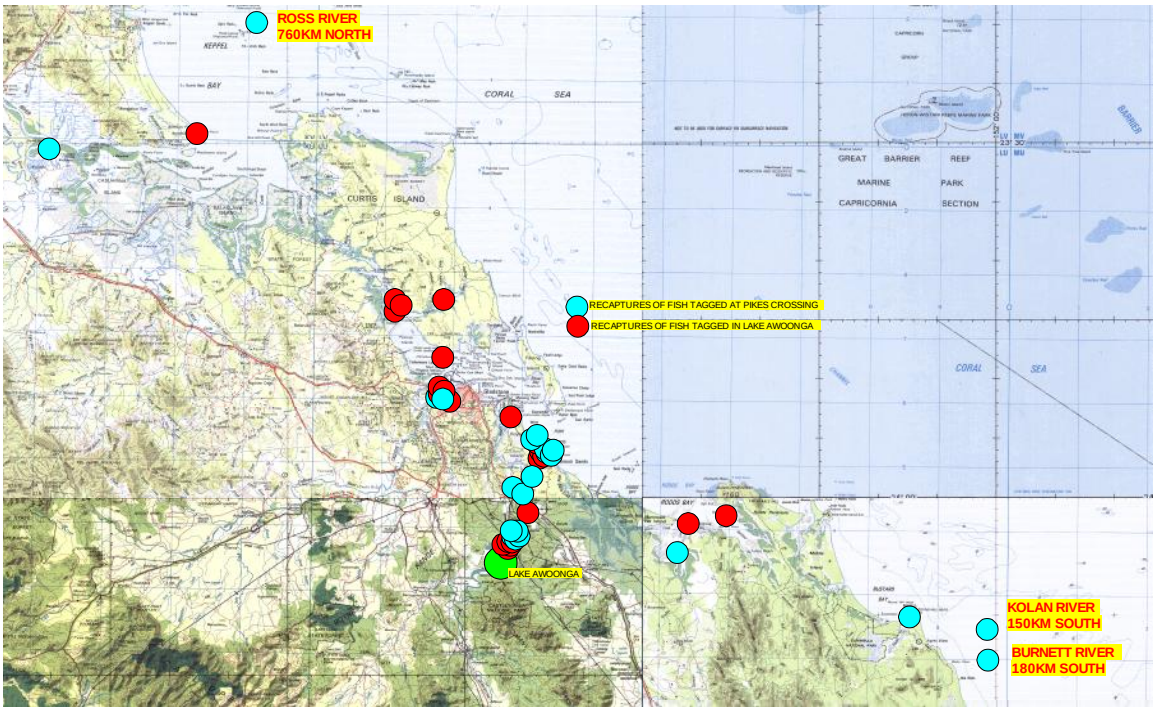

Figure 55: Locations where Barramundi tagged in Lake Awoonga and at Pikes Crossing were recaptured

> ***Of the Barramundi stocked and tagged in Lake Awoonga 48 fish have been recaptured since Dec 2010 in the Boyne River, in adjacent waterways and as far south as the Burnett River at Bundaberg (180km)***

> ***Of the Barramundi tagged in the Pikes Crossing area 139 fish have been recaptured in the Boyne River, in adjacent waterways, as far north as the Ross River in Townsville (760km) and as far south as the Burnett River at Bundaberg (180km)***

BARRAMUNDI RECRUITMENT

Barramundi recruitment surveys were undertaken in the Central Queensland area from 1999-2011 in locations considered to be nursery areas used by Barramundi in their first year. The surveys were aimed at obtained data on the level of recruitment each year. There were 2 sites in the Gladstone area that were surveyed regularly from 1999-2010. These were Munduran Creek (1999-2010) near Ramsay Crossing in the Narrows and Beecher Creek (2000-2005).

One-off surveys were undertaken in 2000-01 in Black Swan Creek, Middle Creek, Boyne River and Calliope River however no Barramundi were recorded.

Surveys were undertaken using a standardised castnet method with a fixed number of casts at each site. Based on the site size and characteristics this involved 5, 10 or 20 casts. The numbers of fish of each species caught in each cast were recorded to allow a catch rate of fish/cast to be calculated for each survey. All Barramundi recorded were measured and fish over 150mm were tagged. Barramundi spawning generally occurs from Oct-Jan each year and recruits enter nursery areas from Jan-Apr. Recruitment surveys were undertaken from Jan-May when new recruits were expected to be in the nursery areas.

There were 25 surveys undertaken at Beecher Creek from 2000-2005 and 38 surveys at Munduran Creek from 1999-2010. There were 4 reports produced of recruitment surveys from 1999-2005.[18]

In 2012 there were 12 surveys undertaken at 7 sites from Jan-Apr using the standardised survey method. *Figure 56* shows the sites surveyed in 2012 and other sites surveyed in 2001 and not surveyed in 2012. There were 723 fish recorded of 33 species including 2 Barramundi. Other species where recruits were recorded were Yellowfin Bream (75 fish mostly 70-115mm), Barred Javelin (13 fish mostly 60-80mm) and Mangrove Jack (9 fish mostly 150-220mm).

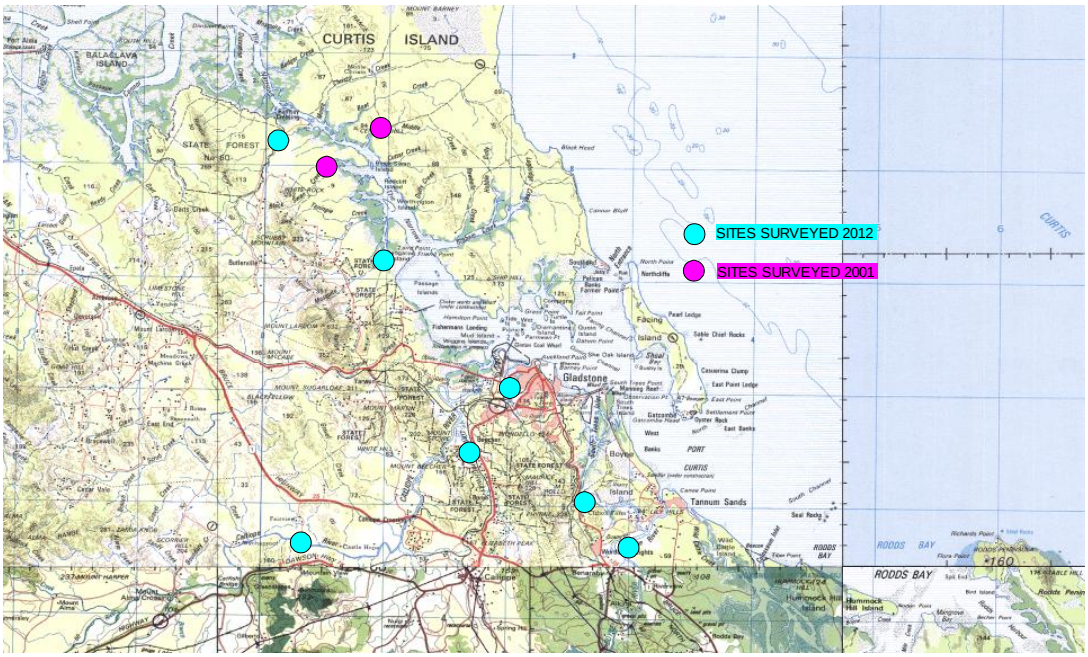

Figure 56: Sites of Barramundi recruitment surveys in the Gladstone area

[18] "Barramundi Nursery Areas in Central Queensland" Sawynok (2002): " Barramundi Nursery Areas in Central Queensland 2002/03" Sawynok (2003): " Barramundi Nursery Areas in Central Queensland 2003/04" Sawynok (2004): " Barramundi Nursery Areas in Central Queensland 2004/05" Sawynok and Platten (2005)

In the surveys in Beecher Creek from 2000-05 there were 1,093 fish of 29 species recorded with no Barramundi. However from 2003-2008 there were 33 Barramundi less than 300mm that were tagged in the area of the survey site as shown in *figure 57*. In 2012 there were 2 surveys in Beecher Creek with 121 fish of 13 species recorded including 2 Barramundi as shown in figure *54*.

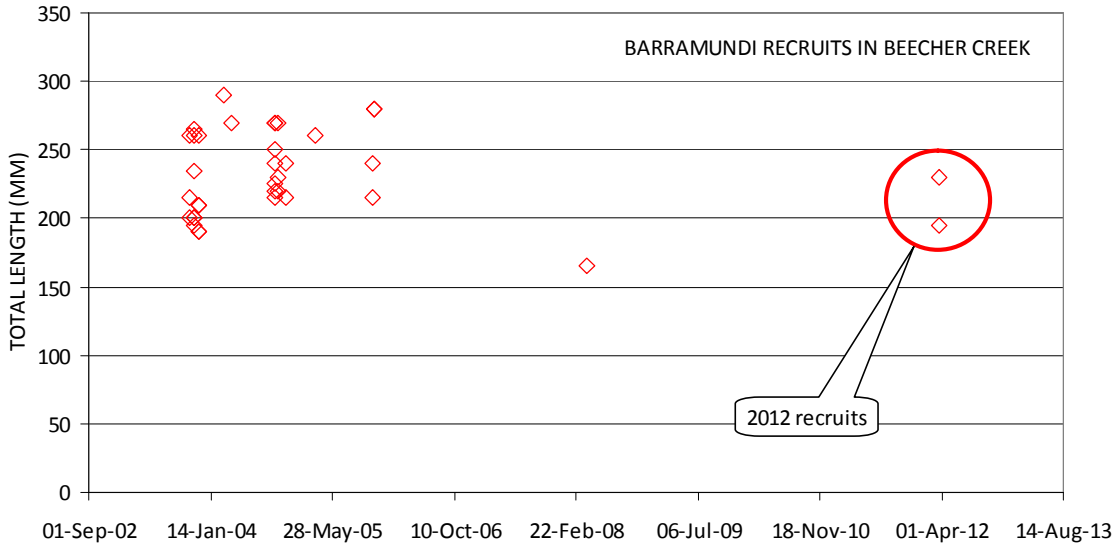

Figure 57: Barramundi recruits recorded in Beecher Creek 2000-2008

In the surveys in Munduran Creek from 1999-2010 there were 1,263 fish from 30 species recorded including 5 Barramundi. A further 8 Barramundi less than 300mm were recorded from 2002-2009 as shown in *figure 58*. In 2012 there were 3 surveys in Munduran Creek with 222 of 11 species recorded and no Barramundi.

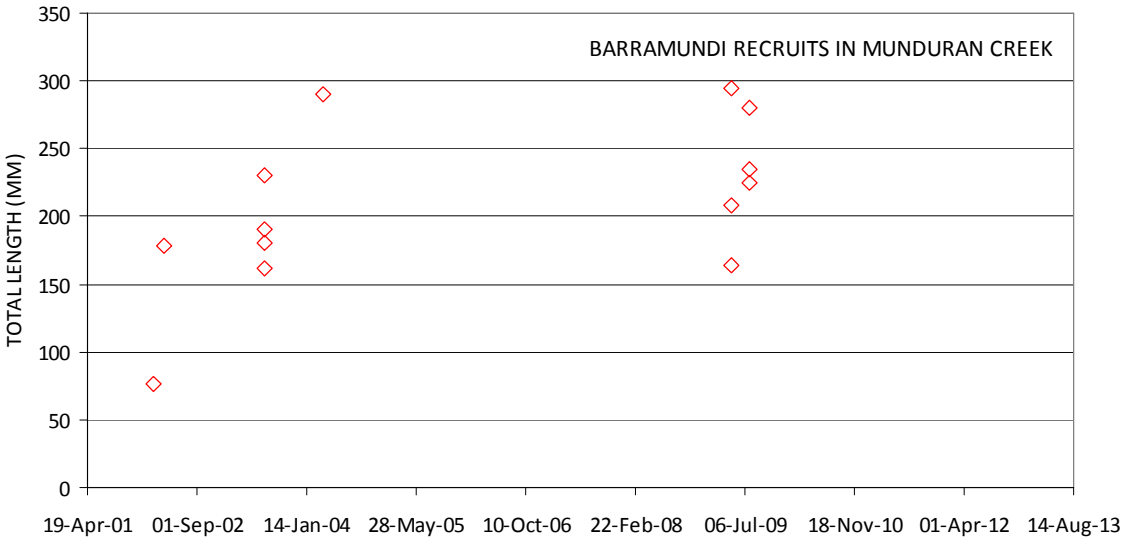

Figure 58: Barramundi recruits recorded in Munduran Creek from 1999-2010

Recruitment in 2012 was poor with only 2 first year Barramundi recorded in Beecher Creek from 12 surveys at 7 sites from Jan-Apr

River flows and rainfall were not conducive to good recruitment in 2012

ASSESSMENT OF FISH HEALTH

While this project commenced in Sep 2011 fish health issues emerged earlier in the year. In late Dec 2010 the Awoonga dam overtopped the spillway. Shortly after came reports of Barramundi going over the dam spillway with the first reports of dead fish coming in around Christmas. *Figure 59* shows dead fish below the spillway on 26 Dec 2010.

The first report of a "blind" Barramundi was received on 11 Aug 2011 from the hot water outlet in the Calliope River. The fish is shown in *figure 60.* Another sick fish that was tagged in Lake Awoonga was caught on 21 Aug 2011 in Graham Creek. This fish was found swimming just below the surface and died shortly after. Reports of sick fish in the Boyne River were received in late Aug with one-third of fish caught by commercial fishers reported as having diseased eyes. Reports of diseased fish escalated in the coming weeks and included species other than Barramundi. The Government announced a fishing closure in Gladstone Harbour that went from 16 Sep-7 Oct 2011.

Figure 59: Dead Barramundi below the Awoonga dam spillway in late Dec 2010

Figure 60: First "blind" Barramundi report was received in Aug 2011

In Nov 2011 DAFFQ requested that taggers assess the health of Barramundi tagged, based on a scale provided by DAFFQ and to take photos of the fish they tag. The scale was:

- E1 - cloudy eye
- E2 - cloudy eye, swollen, redness or haemorrhage
- E3 - ruptured eyeball
- SK1 - no redness or red pin point marks
- SK2 - red pin point marks – no general redness
- SK3 - pin point areas skin/fins
- SK4 - Redness of a larger patch of skin as a 'rash', may involve the fins and fin bases
- SK5 - ulceration through the skin with scale loss, muscle damage, or bleeding - include cuts and wounds

As well as recording skin and eye condition taggers assess the condition of a fish on release on a scale of 1-5. The scale was:

- RC1 - excellent - no obvious damage from capture and handling, minimal time out of water, swam away strongly
- RC2 - good - slight hook or handling damage, short time out of water, swam away well
- RC3 - fair - moderate damage from hooking or handling, moderate scale loss, slow to swim away
- RC4 - poor - long time out of water, major scale loss, long time to recover, fish turned upside down
- RC5 - dead - no sign of recovery on release, floated away on surface, taken by predator

There were 140 photos of fish stored in the database and the health code recorded for 232 fish since Nov 2011. For the 232 fish the health condition (examples in *figure 61*) was recorded as:

- SK1 - 203
- SK2 - 15
- SK3 - 5
- SK4 - 0
- SK5 - 8
- E1 - 1
- E2 - 0
- E3 - 0

Of the fish where the health code was recorded, 87.5% were recorded as SK1 while 3.5% were recorded as SK5. Fish that were in very poor condition may have been less likely to be caught on line and those with SK4/5 may be underrepresented.

There were 1,579 Barramundi that were tagged since Sep 2011 where the release condition was recorded.

- RC1 - 1,508
- RC2 - 55
- RC3 - 11
- RC4 - 2
- RC5 - 3

All 232 fish that had a skin condition recorded also had a release condition recorded. Of the 8 fish reported with skin condition SK5, 5 were fish tagged on 4 Apr 2012, not long after the dam overflowed. These were recorded as "having big sores on them, maybe from going over the wall" and were also reported having a release condition of RC1. This would be consistent with fish having recently gone over the dam wall.

In late May 2012 around 25 Barramundi, including 4 tagged fish, were reported as dead in the shallow pools below the dam spillway. The tagged fish were all tagged in the Boyne River, 3 in the Pikes Crossing area (Dec 2011-Feb 2012) and the other 22km downstream in the Boyne (Apr 2011) and no health issues were reported when tagged. The fish reportedly perished in the pools along with other fish such as Catfish from a lack of dissolved oxygen as waters receded leaving isolated pools.

R71468 - SK1

R71466 - SK1

R71473 - SK1

U60748 - SK5

U86489 - SK2

U86529 - SK3

Figure 61: Sample photos of fish health condition of tagged fish as stored in the database

> ***The health of 232 Barramundi caught by taggers from Nov 2011-Oct 2012 had their skin condition assessed on a scale of SK1(good)-SK5(bad) with 3.5% recorded as SK5 and 1 fish was recorded with cloudy eyes***

11. CONCLUSIONS

This project has developed a number of indicators of trends in recreational fishing in the Gladstone area based on an assessment of catch and effort, Barramundi stocks (including stocked fish), Boyne Tannum Hookup, tagging and fishers' views of fishing.

Status and trends in recreational fishing can be summarised as:

Fishing effort has steadily increased -

- Fishing effort has increased steadily over the past 6 years by 25% and based on population projections is likely to continue to increase
- There were an estimated 23,700 fishing trips from key boat ramps in the Gladstone area in the year from Nov 2011-Oct 2012

Catch rates have steadily declined over time -

- Catch rates have declined steadily with Wanderers Fishing Club catch rates falling by 50-60% from 1985-2010 and by around 35% based on surveys in 1995-97 an the survey in 2011/12
- Seasonal catch rates from 2006-12 have fluctuated from a low of 8.5 to a high of 24.9 fish/trip and for kept fish from a low of 0.02 to a high of 7.9%
- There was an increase in catch rates from spring 2007-autumn 2009 and a decline since then

Species composition of the catch has changed significantly with the influx of Barramundi from Awoonga -

- The most caught species from 2006-12 was Bream (Yellowfin and Pikey) comprising 24.9% of the catch and 30.6% of the kept catch
- The influx of fish from Awoonga shows up in the catch from 2010-11 as Barramundi from 2006-10 was 3.1% of the catch and from 2010-12 was 28.4%

Recreational fishers were mostly very satisfied or quite satisfied with the quality of fishing -

- Recreational fishers (78%) were very satisfied or quite satisfied with the overall quality of fishing, however this is likely to be influenced by the boost in Barramundi stocks from Awoonga

Recapture rates of tagged fish are comparable to those for the whole state -

- The overall recapture rate of tagged fish from 1985-2012 was 8.2% compared with the overall rate for the whole state of 7.4%
- The overall recapture rate of tagged fish released during the Boyne Tannum Hookup from 2000-12 was 5.3%

Barramundi stocks are probably higher than at any point in modern history -

- Gladstone Area Water Board estimated that 20,000 Barramundi left Lake Awoonga from Dec 2010-Jan 2011 with approximately 1,200 perishing, principally due to physical trauma during the early stages of the spill event
- The Barramundi recapture rate was 14.9% from 1985-2012 compared with 17.3% for the Fitzroy River and 7% for the whole state indicating the species is highly targeted
- The average indicative exploitation rate of 5% is likely to be an underestimate
- The average size of Barramundi measured increased significantly after the influx of Barramundi from Awoonga and ranged from 636-901mm from summer 2010-11 to spring 2012

- The average annual growth rates for Barramundi in the Boyne and Calliope Rivers were 71% and 26% lower respectively for fish 650mm or less compared with the Fitzroy River for 2011-12
- The average annual growth rates for Barramundi in the Boyne and Calliope Rivers were 74% and 39% lower respectively for fish over 650mm compared with the Fitzroy River for 2011-12
- Of tagged stocked fish in Lake Callemondah 91.9% were recaptured within 30km of the lake after going over the spillway
- Of tagged stocked fish in Lake Awoonga 61.1% were recaptured within 30km of the lake after going over the spillway
- Barramundi recruitment in 2012 was poor and that was consistent with river flows and rainfall not being conducive to good recruitment
- The health of Barramundi caught by recreational fishers from Nov 2011-Oct 2012 was assessed with 3.5% of fish caught being assessed as being in very poor condition

The status and trends in recreational fishing shows a long term trend of increasing fishing effort and decreasing catch rates. The influx of Barramundi from Lake Awoonga provided a significant boost to Barramundi stocks which, in turn, resulted in a shift in the species composition with a significant increase in Barramundi in the recreational catch. The increase in Barramundi in the catch was likely to have influenced the views of fishers that were mostly very satisfied or quite satisfied with the quality of recreational fishing. It was considered that the perception of fishers matched closely the status of fish stocks.

While fish health issues dominated the media in 2011 and 2012 the incidence of fish in poor condition was low in the recreational catch. However fishers were mostly very concerned or moderately concerned about diseased fish and thought that they had a high impact on the fish population.