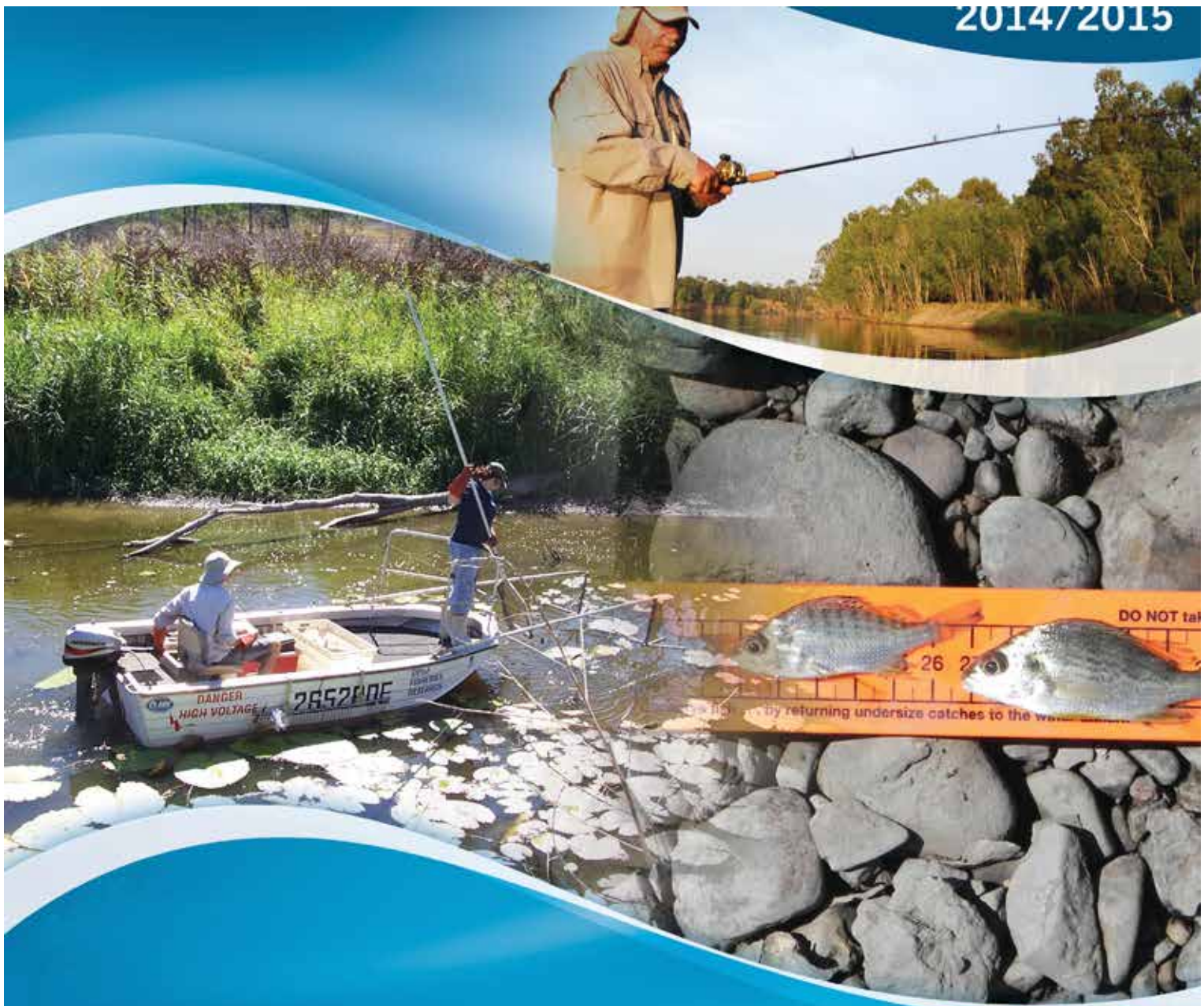


2014/2015



# INFOFISH

## CITIZEN SCIENCE & SUNTAG REPORT

infofish



# Infofish Citizen Science and Suntag Report 2014/15

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Information in this publication is provided as general advice only. For application to specific circumstances, professional advice should be sought.

Infofish Australia have taken all steps to ensure the information contained in this publication is accurate at the time of publication. Readers should ensure that they make the appropriate enquiries to determine whether new information is available on a particular subject matter.

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Covers designed by Ella Anastasia from Dedicated-IT.

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## Acronyms Used in the Report

AFTA: Australian Fishing Trade Association  
AIMS: Australian Institute of Marine Science  
ANSA: Australian National Sportfishing Association  
ANSAQ: Australian National Sportfishing Association Qld Inc  
Austag: ANSA Research Program  
CSIRO: Commonwealth Scientific and Industrial Research Organisation  
DAFF: Department of Agriculture, Fisheries and Forestry  
DAFQ: Department of Agriculture and Fisheries Queensland  
DNRM: Department of Natural Resources and Mines  
FQ: Fisheries Queensland  
FRDC: Fisheries Research and Development Corporation  
GAWB: Gladstone Area Water Board  
GBRMP: Great Barrier Reef Marine Park  
GBRMPA: Great Barrier Reef Marine Park Authority  
JCU: James Cook University  
PIRSA: Primary Industries and Resources South Australia  
RBB: Rocky Barra Bounty  
RUF: Recreational Use Fee  
SEQwater: South East Queensland Water  
Suntag: Citizen Science and Research Program  
TAA: Tagging Achievement Award  
TEA: Tagging Excellence Award

## Acknowledgements

The running of a citizen science program to collect data on our fish species, and involvement in many research projects, is a major undertaking. The program would not be possible without the support of a wide range of organisations and individuals that have contributed either funding, in kind support and voluntary effort. The voluntary effort of all taggers is also acknowledged.

### Suntag Gold Sponsors (over \$20,000)

Infofish Australia

Department of Agriculture and Fisheries



Queensland Government

### Suntag Silver Sponsors (\$5,000-\$20,000)

QGC (part of larger project)  
One Pixel

ANSAQ



### Suntag Bronze Sponsors (up to \$5,000)

Gladstone Sportfishing Club  
XXXX Gold

Burnett LMAC

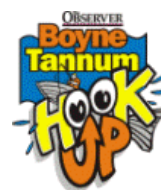


## Suntag Funding for tags

The following organisations contributed funding for the purchase of tags for their projects.

Bundaberg Sportfishing Club  
Fitzroy River Fish Stocking Group  
Burdekin Fish Restocking Association  
Cairns Area Fish Stocking Group  
Emerald Fish Stocking Group  
Mackenzie River Fish Stocking Association

Holloways Beach Environment Education Centre  
Rocky Barra Bounty  
Boyne Tannum Hookup  
Captag



The following individuals contributed funding for the purchase of tags for their own use or made a donation to Suntag.

Michael Dohnt  
Billy Stringer  
David Lindsay

Duncan Faichney  
Steve Salmond  
Tony Vesel

## Projects partnering with Suntag

The following projects are undertaken in conjunction with Suntag.

Gladfish (Gladstone Qld)  
Crystal Bowl (Predicting Barramundi stocks)  
McArthur Monitoring (King Ash Bay Fishing Club)  
Lake Awoonga (Gladstone Area Water Board tagging)  
Gladstone Healthy Harbour Partnership

Fitzroy Partnership for River Health Catchment Solutions  
XXXX Island tagging (XXXX Gold)  
Westag (Tagging Western Australia)  
Newtag (Tagging NSW)





## Supporters of Suntag

The following organisations have provided support for Suntag or activities undertaken under Suntag.

Department of Natural Resources and Mines

Department of Defence

James Cook University

Fitzroy Basin Association

Hallprint Pty Ltd

Platypus Fishing Lines

BarraDave Sportfishing Services

Glenlyon Dam Tourist Park (D&B Dare)

Freshwater Fish Stocking Association of Queensland

Sunfish Queensland

Andrew Phipps (Phippsy) - Radio Zinc

Graham Cumming





## Businesses participating in Suntag

The following businesses participated in Suntag this year.

Queensland Fishing Monthly  
Stones Corner Marine  
Cast e-mag  
Lively Lures  
Tackleland (Sandgate)

Shads Lures  
Infish-Lures  
Andy's Fishing  
Brisbane River Fishing  
CQ Fishing Adventures



## ANSAQ clubs participating in Suntag

The following clubs and fish stocking groups have taken part in Suntag this year.

Suntagers  
Moretag  
Redcliffe Peninsula Game and Sportfishing Club  
Kingaroy Sportfishing Club  
Bundaberg Sportfishing Club  
Gladstone Sportfishing Club  
Captag  
Keppel Bay Sportfishing Club  
Southern Brisbane Sportfishing Club  
Townsville Sportfishing Club  
Burdekin Recreational Sportfishing Club  
Townsville Saltwater Sportsman's Club  
Cardwell Sportfishing Club  
Cairns Sportfishing Club  
Mossman Sportfishing Club

Bribie Island Sportfishing Club  
Ipswich United Sportfishing Club  
Weipa Sportfishing Club  
King Ash Bay Fishing Club  
Sunshine Coast Sportfishing Club  
Endeavour Sportfishing Club  
Hinchinbrook Sportfishing Club  
Lavarack Sportfishing Club

## Fish Stocking Groups participating in Suntag

The following fish stocking groups have taken part in Suntag this year.

Gladstone Area Water Board  
 Mount Isa Fish Stocking Group  
 Gulf Barramundi Stocking Association  
 Richmond Fish Stocking Group  
 Cairns Area Fish Stocking Association  
 Burdekin Fish Restocking Association  
 Tablelands Fish Stocking Society  
 Twin Cities Fishing Stocking Society  
 Faust Dam Fish Stocking Association  
 Mackay Area Fish Stocking Association  
 Fitzroy River Fish Stocking Group  
 Callide Valley Native Fish Stocking Association

Emerald Fish Stocking Group  
 Mackenzie River Fish Stocking Association  
 Baralaba Recreation and Fish Stocking Group  
 Borumba Fishing Club  
 Bundaberg Sportfishing Club Fish Stocking  
 Brisbane Valley Anglers Fish Stocking Assoc  
 Logan-Albert Fish Management Association  
 Cungulla Recreational Fishing and Social Club

## Fishing Competitions supported by Suntag

Suntag works with and supports the following fishing competitions by managing data on fish tagged during these events.

Rocky Barra Bounty  
 Boyne Tannum Hookup  
 Bundaberg VMR fishing Competition  
 Noosa River to Reef Family Fishing Classic

Lake Moondarra Fishing Classic  
 Mulloway Marathon  
 Tag-a-Toga



## The Infish Team

Infish Australia manages Suntag in partnership with ANSAQ and manages data collection for a number of other organisations and clients. Suntag Queensland is a registered business name of Infish Australia. The Infish team all contribute to the delivery of Suntag and associated projects.



Bill Sawynok is the Manager of Infish Australia which is based in Rockhampton. It was established in 1995 as Infish Services and the name was changed in 2010. Through Infish, Bill has managed Suntag since 1987 and has played a number of roles in fisheries research. He was manager of Recfishing Research 2005-2012, a past director of the Fisheries Research and Development Corporation and past board member of the Reef Cooperative Research Centre.



Stefan Sawynok joined Infish Australia in 2012 however has provided the technology support for Suntag for many years through his One Pixel business. Stefan moved to Brisbane in late 2012 to take up a more active role in Infish Australia. He developed the current Infish 2012 database, Suntag Online and linked the database to Google Earth to improve information delivery.



Shirley Sawynok is the Finance Manager and joined Infish Australia in 2005. Prior to that time she spent 10 years working for WIN television. Shirley manages Suntaggers which allows individual members to take part in Suntag. She also manages tag purchases and distribution, the Infish shop and the Rocky Barra Bounty.



Wendi Parsons is based in Rockhampton and joined Infish Australia in 2005. Wendi has an Aquatic Marine Management degree and is responsible for field data collection including water quality sampling, recruitment surveys and boat ramp surveys. She is also responsible for data entry and has worked on all Infish projects including the McArthur River Monitoring project in the Northern Territory. Wendi is a keen recreational fisher and particularly enjoys fishing for Barramundi.

## What the Fishing Industry gets from Investment in Suntag

Suntag has been providing a service to the fishing industry for almost 30 years since 1986/87. With over 1,130,000 fish records in the database it is now the largest fisheries database in Qld outside government and research institutions and the largest volunteer fisheries citizen science database in the world. Over its lifetime it is estimated that there has been \$15-20m invested or provided in kind by government, other funders, researchers, taggers and stocking groups in the data stored in the database.

This year Infish Australia contributed \$74,200 to the running of Suntag. The Suntag grant from Fisheries Queensland was \$40,000. Total investment in cash and in kind contributions was \$707,200 or \$16.70 for every grant dollar. Infish Australia and ANSAQ believe that there are few other examples of such a multiplier on investment within the Queensland fishing industry. The return on investment in improved knowledge of fish stocks is also substantial although not quantified, however with over 20,000 downloads of Suntag reports and a total reach of 300,000 through Facebook posts on Suntag and Crystal Bowl the knowledge spread has been substantial.

Where Suntag is at has been achieved by providing a high quality service using the latest technology that is responsive to industry needs. The focus of Suntag and its various associated projects has shifted towards being able to predict fish stocks into the future, through a Crystal Bowl approach, in a way that provides information to the industry that can be used to determine the level of future investment in a particular fishery. This commenced with Barramundi in the Fitzroy River in 2011 and extended to Gladstone in 2014. It was extended to King and Blue Threadfin in the Fitzroy River and Mulloway in Moreton Bay in 2015. The aim is to develop the Crystal Bowl at as low a cost as possible, otherwise it will not be sustainable. To achieve this there has been an increased emphasis on collecting data on recruitment of key species.

Having a world-class data collection and storage system ensures that quality data are available however that data needs to be available in a variety of formats to the fishing industry and government to assist in dealing with real world issues that affect the industry and our fisheries. Websites, Facebook pages, Google Earth, video clips and podcasts extend the suite of information formats now used to share information.

A new more integrated approach to information sharing was introduced last year. Facebook pages for Suntag, Crystal Bowl, Gladfish and King Ash Bay became the media for reporting interesting recaptures in near real time. Suntag Mini-reports, videos and interactive views of the data using Google Earth were introduced to the Suntag and Crystal Bowl websites and feature species, locations, timescales, issues or all of those to tell some of the interesting stories from the database. The websites were expanded to provide tagging groups with a page on their own tagging efforts direct from the database in real time. The Suntag News bulletin was revamped to an online news format to promote the mini-reports and other interesting information.

Bill Sawynok  
Infish Australia



## Highlights in 2014/15

The Suntag database now represents one of the largest long term investments in fisheries data collection in Queensland outside of the Queensland Government. At the end of the year the total number of fish records in the database has increased to 1,132,800 with 41,700 added in 2014/15. The database contains details of:

- ✦ 738,700 tagged fish
- ✦ 58,500 recaptures
- ✦ 43,300 fishing trips with catch and effort
- ✦ 288,200 other fish from catch records
- ✦ 690 recruitment surveys
- ✦ 47,300 fish from recruitment surveys
- ✦ 3,000 photographs of tagged and recaptured fish

Suntag shared its information with the fishing and broader community through:

- ✦ 25 Suntag mini-reports and Crystal Bowl reports with 20,000 downloads of reports
- ✦ 2,600 likes of Suntag Facebook page and 480 likes of Crystal Bowl Facebook page
- ✦ 300,000 total reaches through Suntag and Crystal Bowl Facebook posts
- ✦ 272 maps available through Google Earth
- ✦ 7 Suntag enews bulletins to 800 subscribers
- ✦ 365 users registered for Suntag Online
- ✦ 17 website pages with live data from database for clubs and business tagging groups

Other highlights:

- ✦ Recruitment surveys were added to the database with 690 surveys and 47,300 fish added to the database
- ✦ The first recapture of a fish out for over 20 years was a Barramundi tagged in Lake Tinaroo in Oct 1994 at 550mm and recaptured in Nov 2014 at 1,230mm
- ✦ 106 Frequent taggers account for 293,00 (39%) of the total number of fish tagged while the remaining 9,500 taggers account for 302,400 (40.9%) of the fish tagged
- ✦ Fish stocking groups account for 101,300 (13.7%) of the fish tagged and researchers 42,000 (5.7%)
- ✦ Fishing trips with catch and effort details now total 44,200 (3,200 this year)
- ✦ A total of over 9,600 taggers (640 this year) have now participated in Suntag and 17,300 fishers (750 this year) have reported the recapture of a tagged fish
- ✦ A total of over 1,470 fishers contributed data to Suntag this year through tagging fish, reporting recaptures and catch
- ✦ Barramundi was the most tagged species with over 247,100 tagged and 18,100 recaptured (over 21,800 including multiple recaptures)
- ✦ The overall recapture rate for fish, excluding crabs was 6.6% with 6.6% recapture rate for 2010-15 being 6.6% or the same as the long term average
- ✦ The release rate of recaptured fish for the past 10 years was over 60% and over 70% from 2007/08 to 2009/11 and over 70% in 2014/15
- ✦ Mick Dohnt remains the top tagger overall having tagged a total of over 23,800 fish
- ✦ A total of over 91,000 fish have the location where the hook was lodged in the fish recorded with 10.6% of fish caught on bait deep hooked (throat or gut) and 2.1% of fish caught on lures

## Infotish Citizen Science Activities

In recent years the scope of Infotish projects has extended well beyond fish tagging. It is now extensively involved in a range of activities focused on monitoring that comes under the broad term "citizen science". This involves collecting data on fishing activities and working collaboratively with government agencies, research bodies, corporate funders, fishing organisations and community groups. There are now 12 broad areas that Infotish is involved in:

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| ✦ Fish tagging                    | ✦ Support for research projects |
| ✦ Community monitoring            | ✦ Catch and effort              |
| ✦ Predicting fish stocks          | ✦ Monitoring fish health        |
| ✦ Monitoring fish recruitment     | ✦ Released fish survival        |
| ✦ Monitoring stocked fish         | ✦ Historical tagging records    |
| ✦ Monitoring fishing competitions | ✦ Support for overseas tagging  |

Infotish provides the framework, standards and a common database structure for the management and operation of separate programs/projects throughout Australia and eventually overseas. The program structure allows for the collection of a wide range of fisheries data, not only tagging data. Infotish programs in Australia are shown in *figure 1*. These are:

- |                                 |                               |
|---------------------------------|-------------------------------|
| ✦ Suntag (Queensland)           | ✦ Westtag (Western Australia) |
| ✦ Crystal Bowl (Central Qld)    | ✦ Newtag (NSW)                |
| ✦ Gladfish (Gladstone)          |                               |
| ✦ McArthur Monitoring (NT Gulf) |                               |



Figure 1: Infotish programs around Australia

## Framework for Infotish Citizen Science and Suntag

The framework for Infotish Citizen Science and Suntag includes data from tag and recapture, catch and effort, recruitment surveys, additional scientific data on fish, photographs and video and environmental data. Information delivery includes websites, Facebook pages, videos, Google Earth maps, reports and scientific publications as shown in *figure 2*.

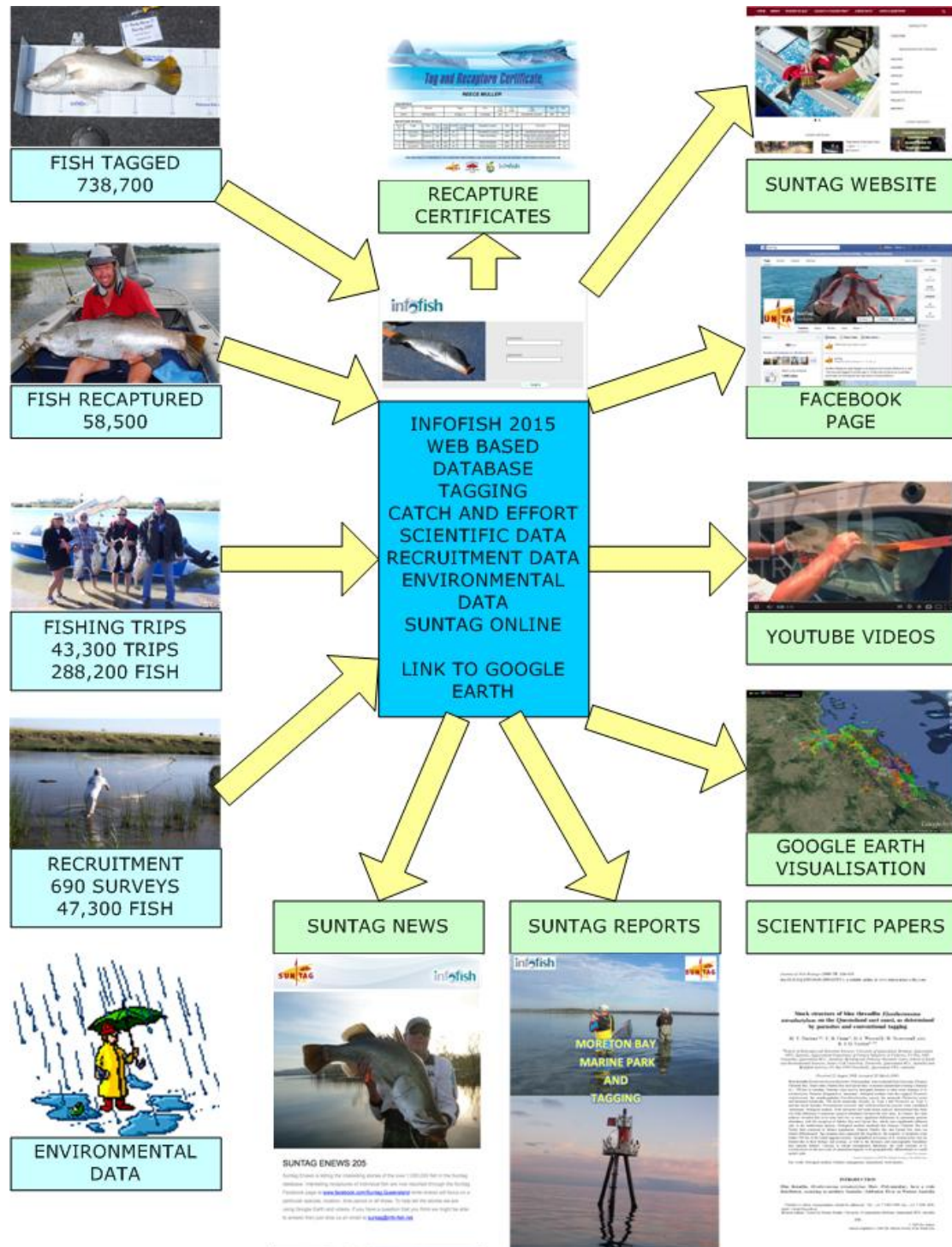


Figure 2: Diagram showing Infotish data flows from data collection to information products

## Suntag 2015 Collecting and Storing Data

### Suntag 2015 Database

The Infofish 2015 online database is the central hub for the collection and storage of a range of fisheries data through Suntag and Citizen Science projects. The database is located at <http://qld.info-fish.net/infofish> and requires a secure login for access. *Figure 3* shows the login page for the database. Some of the features of the database are:

- ✦ Built using industrial strength database tools
- ✦ Uses data standards where available (eg standard fish names)
- ✦ Tagging Manual to Quality Assurance documentation standards available from website
- ✦ Online access from anywhere in the world with data contributors (taggers/researchers) able to securely access their own data online (read only)
- ✦ Database linked to Google Earth to allow easy and near real time visualisation of data
- ✦ Photographs and video stored along with text data
- ✦ Recaptures can be lodged online through the Suntag website with instant feedback on the fish direct from the database
- ✦ Recapture certificates sent electronically or by mail to the person that recaptured the fish and the tagger with customised certificates available for some projects
- ✦ Tagging and other data can be lodged online or via email with over 95% of data now lodged electronically
- ✦ Tagging awards automated providing certificates to recipients
- ✦ Incorporation of recruitment survey data in 2015 including site details and photographs

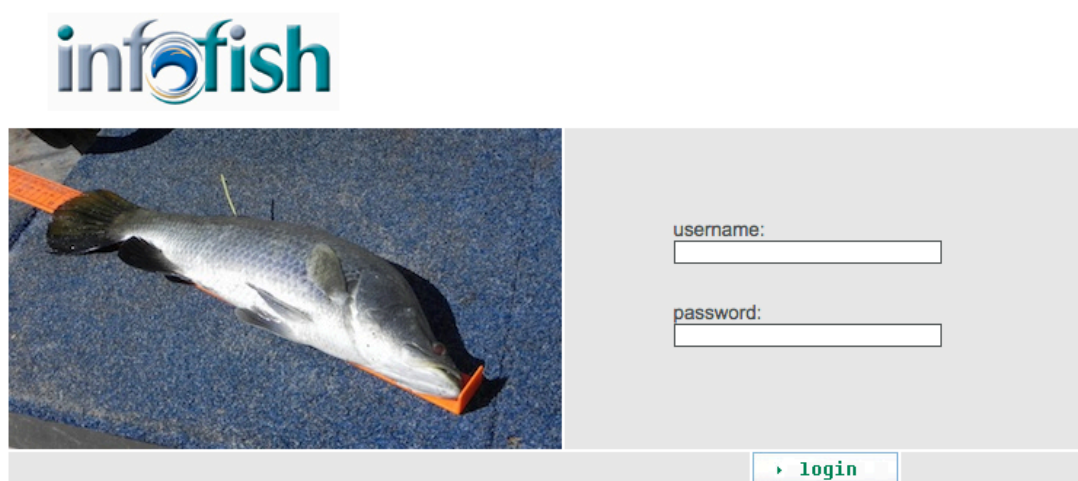


Figure 3: Suntag 2015 login page



## Suntag Online

Suntag Online was introduced in 2012 to allow taggers to access their own data (read only), monitor progress towards tagging awards and upload trip details to the database. Taggers access Suntag Online through a secure login. When they login they are automatically provided with an update of the top 10 taggers in the current month, the top 20 taggers for the year, top species tagged for the year and recaptures for the month as shown in *figure 4*. This is automatically updated each time they log in and allows them to keep track of their own and the program's progress.

There are now 365 registered users of Suntag Online and there were over 500 trips lodged through Suntag Online in 2014/15.

Administration	New Email	Admin	Flags	Logout	Remember	Log Off				
Home	TOP TEN TAGGERS THIS MONTH									
User Groups	Fisher	Total Caught	Total Length (m)							
User Details	BAKER S	8	2.4							
Tag Series	ARNOLD C	7	2.3							
Tag Series	ARNOLD P	6	2.2							
Tag Series	THOMAS R	6	1.8							
Tag Series	FUTHER	5	2.3							
Tag Series	POWELL D	4	1.7							
Tag Series	DOHRT M	4	1.5							
Tag Series	COBB R	3	0.9							
Tag Series	SAWYER W	1	0.3							
Tag Series	BAKER L	1	0.2							
Research	TOP TWENTY TAGGERS THIS YEAR									
Competition	Fisher	Total Caught	Total Length (m)							
Competition	OPSG	911	225.5							
Competition	TFSG	532	140.5							
Competition	THOMPSON E	448	218							
Competition	OXFORD B	380	142.2							
Competition	MBISA	341	94.7							
Competition	POWELL D	292	127.4							
Competition	HANSEN T	280	152.1							
Competition	FRANZ D	278	111.5							
Competition	VESELT	231	88.4							
Competition	LATIMER E	222	117.3							
Competition	POWELL E	200	87.7							
Competition	KENNEL A	194	69.6							
Competition	STRATFORD H	188	57.8							
Competition	GREGORY S	177	34.3							
Competition	HUGHES S	167	87.7							
Competition	HARTYSON S	155	34.7							
Competition	MORGAN S	132	26.5							
Competition	HURRY PT	132	52.2							
Competition	STEWART A	140	52.7							
Competition	BOYLE A	145	43.8							
TOP SPECIES THIS YEAR										
Species	Total Caught	Total Length (m)								
BROADWING	405	1757.4								
AUSTRALIAN RACE	1504	537.4								
DURRY PLATHAD	737	315.8								
KING THREAFEN	477	345.2								
PIKEY BREAM	417	37.6								
SNAPPER	412	141.3								
YELLOWFIN BREAM	402	185.4								
BARRED MULLET	397	134.2								
MANGROVE JACK	333	112								
BLACK SPOTTED ROCKCOD	308	105.5								
BLUE THREAFEN	252	118.5								
RED TROUT (EMPEROR)	190	72.9								
GOLDEN PERCH	185	81.3								
MULLOWAY	171	118.9								
GOLDEN SNAPPER	144	59.3								
RED EMPEROR	140	53.6								
GIANT TROUBLE	115	45.8								
BLACK SPOTTED ROCKCOD	110	34.5								
GRASS EMPEROR	102	12.5								
MUD CRAB	70	50.1								
RECAPTURES THIS MONTH										
TAG	FISHER	Series	Date	TS	Recapture	Series	Location	Tag	Tag	Distance
11442	BAKFOR S	RED SNAPPER	1/1/2015	300	RECAPTURED SAME AREA	0	RED SNAPPER	11442	218	0
11442	BAKFOR S	RED SNAPPER	1/1/2015	340	RECAPTURED SAME AREA	0	RED SNAPPER	11442	218	0
11442	BAKFOR S	AUSTRALIAN RACE	1/1/2015	380	UP LINE	10	LINE SNAPPER	11442	218	0
11442	BAKFOR S	AUSTRALIAN RACE	1/1/2015	380	UP LINE	20	LINE SNAPPER	11442	218	0
11442	BAKFOR S	AUSTRALIAN RACE	1/1/2015	380	UP LINE	30	LINE SNAPPER	11442	218	0
11442	BAKFOR S	RED SNAPPER	1/1/2015	340	RECAPTURED SAME AREA	10	RED SNAPPER	11442	218	0

Figure 4: Initial screen when logged onto Suntag 2015

## Recruitment Survey Data

Infofish started collecting data on fish recruitment (primarily Barramundi) in Central Queensland in 1999. With the development of the Crystal Bowl to predict fish stocks and the development of report cards on the health of waterways understanding recruitment has become more important.

Previously recruitment survey data were stored in a separate offline Access database but this resulted in some duplicated data and made analysis more complex than it needed to be. This year the recruitment survey data were incorporated into Infofish 2015 making it available online.

The screenshot displays the Infofish 2015 database interface. On the left is a navigation menu with categories: Administration, Research, and Reports. The 'Site' section is active, showing a form for '12 MILE CREEK'. The form includes fields for Name, Location, Map, Grid, UTM, and UTM Zone. A description field contains text about the site's location relative to the 12 Mile Creek. Below the form are three image upload sections labeled 'Image', 'Second Image', and 'Third Image', each with a corresponding photo of the site. On the right side of the interface, there is a table with columns for 'Location', 'Text', and 'Spatial Location'. The table contains three rows of data, each representing a different location within the site.

Location	Text	Spatial Location
12 Mile Creek	12 Mile Creek	12 Mile Creek
12 Mile Creek	12 Mile Creek	12 Mile Creek
12 Mile Creek	12 Mile Creek	12 Mile Creek

Figure 5: Data stored on recruitment sites is now stored in the Infofish 2015 database



Figure 6: Barramundi recruits recorded in the Fitzroy River in 2015

Fish recorded during recruitment surveys are stored in the tag table allowing easier analysis along with other data. Data on the survey sites is also stored in a new table and includes photos of the site and a site map so that all details of the site are stored in one location. *Figure 5* shows site details of 12 Mile Creek in Central Queensland that is used as a reference site for Barramundi recruitment while *figure 6* shows Barramundi recruits recorded during the 2015 recruitment season.



## Storing Images

Storing of Images of tagged and recaptured fish was added in 2011. This year the storing of photos was enhanced to include storing of a second image of a tagged fish. The visual library is growing steadily with 3,058 images in the database. Of these there were 2,842 images of tagged fish and 216 of recaptured fish. The images complement the textual data. *Figure 7* shows stored images of a tagged fish in the database.

Images in the database have been used to monitor fish health issues in the Gladstone area as well as allowing checks to be made on the lengths of fish where the photos include the measuring device.

### Tracking

Competition:   
Location:   
Latitude Act:   
Longitude Act:   
Latitude Summary:   
Longitude Summary:   
Description:

Image:   
Image:  
Second Image:   
Image:  
Video:

Latitude Act: Number Latitude Act for location where fish caught with south latitude being negative eg -23.23.567  
Longitude Act: Number Longitude Act for location where fish caught with east longitude being positive eg 153.24.456  
Latitude Summary: Number Latitude Summary for location where fish caught with south latitude being negative eg -23.23.567  
Longitude Summary: Number Longitude Summary for location where fish caught with east longitude being positive eg 153.24.456  
Description: Description Tag description on competition  
Video: URL Link to video source eg http://www.youtube.com/

Figure 7: Images of individual tagged or recaptured fish in the database

## Fish Identification

To assist with fish identification of species that are recorded in the database images have been made available by Graham Cumming. These images have been included in the database and are also available on the Suntag website. *Figure 8* shows some of the images in the database and *figure 9* shows the images on the website.

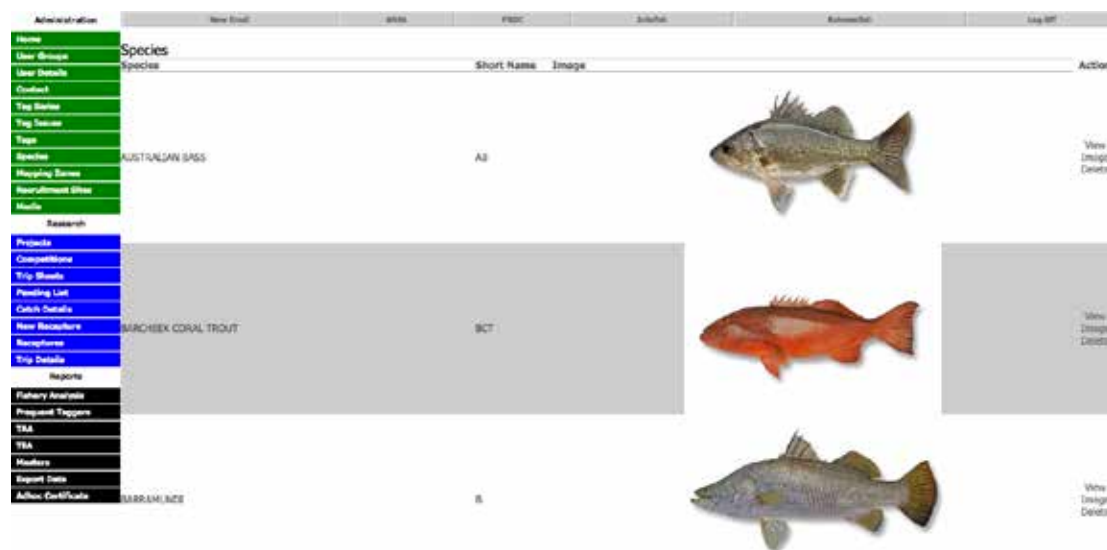


Figure 8: Species images in the Infofish 2015 database

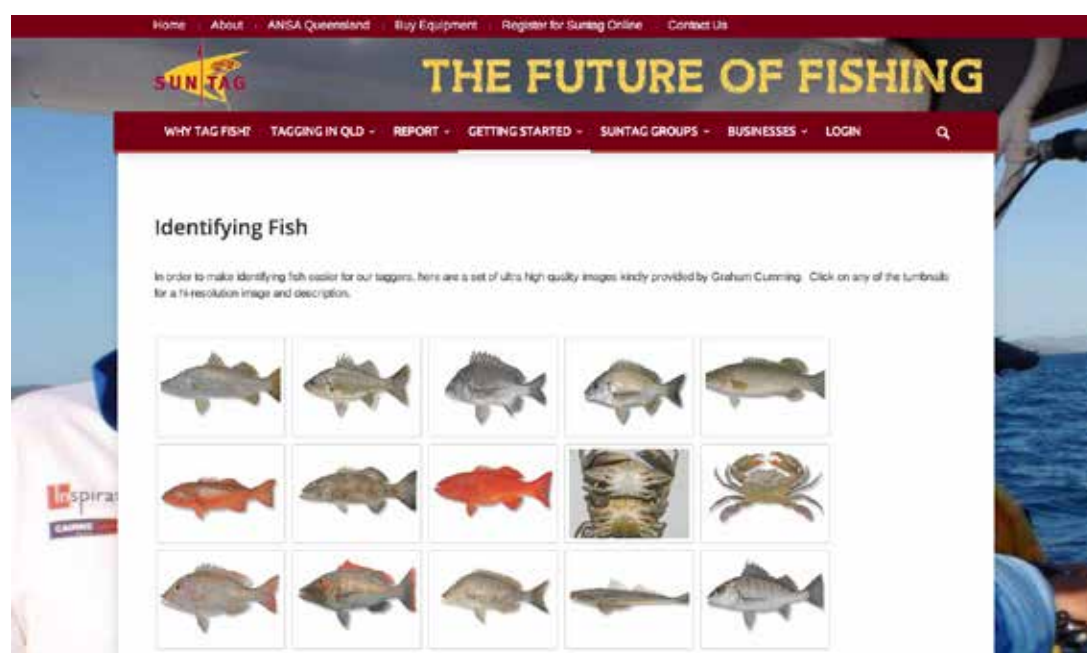


Figure 9: Species images on the Suntag website



## Recording Locations

Recording of locations is important in the visualization of data stored in the database. Suntag uses a series of grid maps to assist with the recording of locations. Grids are mostly  $1\text{km}^2$  however there are some maps that use  $2\text{km}^2$  grids. Maps are available from the Suntag website as a pdf (*figure 10*) or as a Google Earth file (*figure 11*). Locations can also be recorded as GPS coordinates.

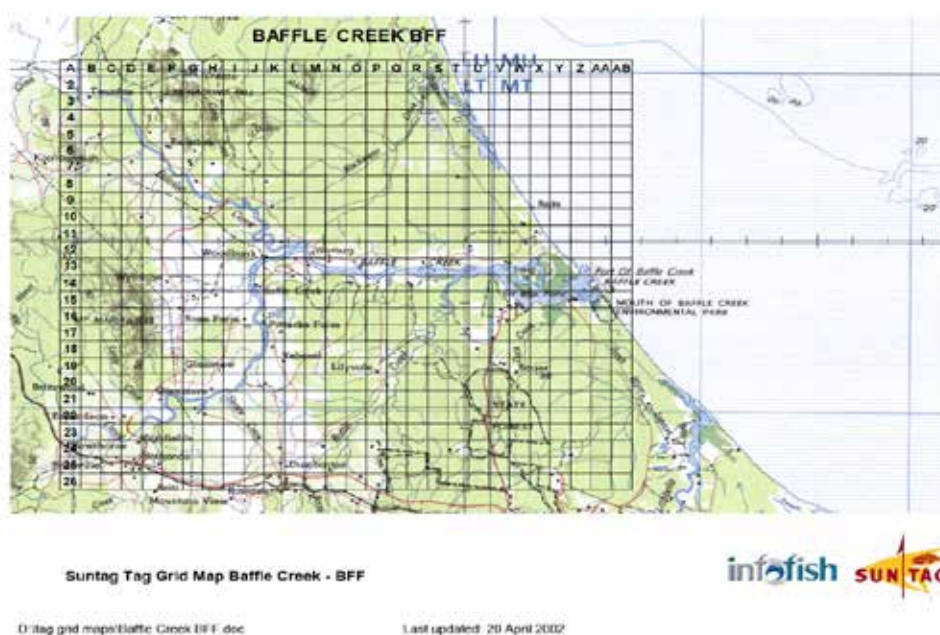


Figure 10: Baffle Creek grid map for recording locations

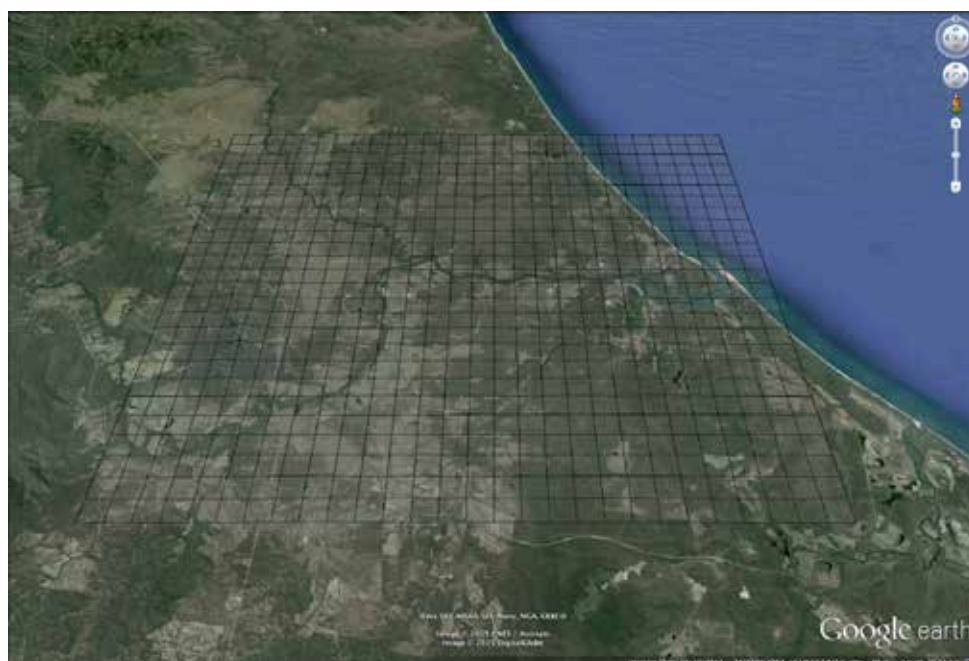


Figure 11: Baffle Creek grid map in Google Earth

## Sharing Infotish and Suntag Information

### Sharing Suntag Information

An important aspect of Suntag has been the development of a range of ways of sharing information with taggers as they have largely provided the data accumulated in the database. Individual taggers can access their own data through Suntag Online but that only provides access to their own data.

Suntaggers was established in 2011/12 to allow individuals to take part in Suntag. Suntaggers includes individuals and any tagger from an ANSA club becomes a Suntagger automatically when they tag fish under Suntag. In 2014/15 there were 116 individual Suntaggers and 626 members in total.

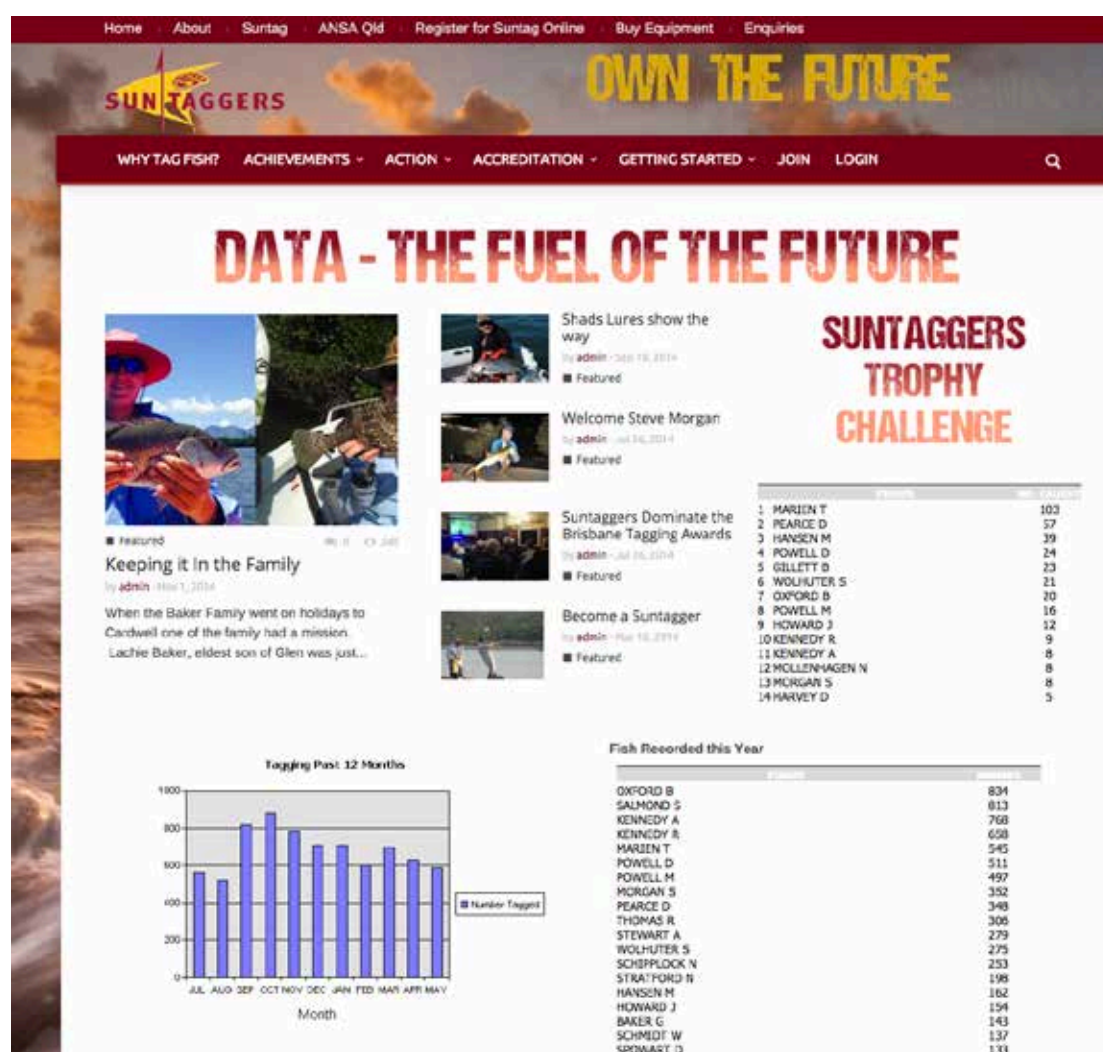


Figure 12: Suntaggers website homepage

To provide Suntaggers access to data the Suntag website includes pages for groups active in Suntag and provides real time details of their tagging direct from the database. This can be clubs, stocking groups or businesses that are involved in Suntag. A Suntaggers website was established this year to provide members with access to all aspects of Suntag. *Figure 12*

shows the homepage of the Suntaggers website showing the real time links to the data in the database.

## Suntag Feedback on Recaptures

A very important aspect of Suntag is providing feedback to fishers, particularly about recaptures of fish. Recapture details can be reported through:

- ✦ 1800 free call number
- ✦ Infofish websites
- ✦ Facebook
- ✦ Infofish etrip form
- ✦ Commercial fishers
- ✦ Email
- ✦ Fax
- ✦ Mail

Feedback is provided in a number of ways.

- ✦ Verbally when reported through the 1800 toll free number
- ✦ Certificate to both the fisher recapturing the fish and the tagger (*figure 13*)
- ✦ Details are provided direct from the database when reported through the website (*figure 14*)

Certificates are generated electronically and there are a number of templates that can be used as backgrounds for the certificates. Customised templates can be made for any project. Specialised certificate templates are available for the Rocky Barra Bounty, Gladfish (*figure 13*), McArthur Monitoring and XXXX Island projects as shown in *figure 15*.

**Tag and Recapture Certificate**

**Gladfish**

**DALLAS POWER**

**TAG DETAILS:**

Tag No.	Species	Tagger	Date	Total Length	Fork Length	Tag Location	Map	Grid
US3439	BARRAMUNDI	CREAGH K	8/11/2011	1070		BOYNE RIVER	BRG	X22

**RECAPTURE DETAILS:**

Recap No.	Angler	Date	Days Out	Total Length	Growth	Fork Length	Recapture Location	Map	Grid	Movement	Released
1	POWER D	28/04/2013	537	1110	40		BOYNE RIVER	BRG	Y21	4KM UP RIVER	No

infofish GLADSTONE SPORTSFISHING CLUB INC. Gladstone Area Water Board SUNTAG QCC A BQ Group business

Figure 13: Gladfish project tag and recapture certificate

**infofish**

If all the tag details of this fish are available in the Suntag database, you will receive a **Tag and Recapture Certificate** in the mail within 10 working days providing you with the history of your fish. A summary of the current information follows.

**Tag and any previous Recapture Details**

Tag Details:

Tag No.	Species	Tagger	Date	Total Length	Fork Length	Tag Location
143423	BARRAMUNDI	DFISF NPC	9/11/2004	1223		LAKE TINAWOOD

Recapture Details:

Recap No.	Angler	Date	Days Out	Total Length	Weight	Fork Length	Weight	Recapture Location	Province	Notes
1	ALLAN R	5/12/2010	2212	1220				LAKE TINAWOOD	4 KM UP LAKE	Yes

Google Maps automatically zooms to the level it thinks is best, if you wish to see more details zoom out using the slider.

privacy | disclaimer | copyright 2009 infofish

Figure 14: Tag and Recapture certificate templates currently available

**Tag and Recapture**

☒ RECAP CERTIFICATE RED

☐ RECAP CERTIFICATE BLUE

☐ KAB RECAP CERTIFICATE

☐ GLADFISH CERTIFICATE

☐ RBB RECAPTURE CERTIFICATE

☐ XXXX ISLAND RECAPTURE CERTIFICATE

Figure 15: Feedback provided on recaptured fish when reported through the website



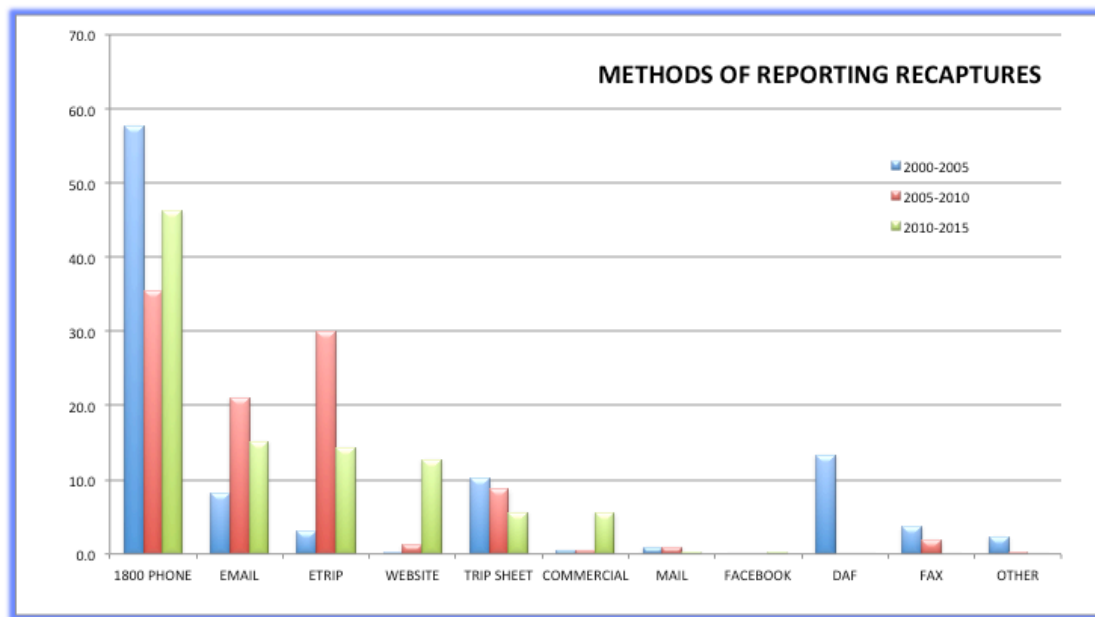


Figure 16: Methods of reporting recaptures from 1985 using a 5 year time span

The methods for reporting recaptures have changed significantly. *Figure 16* shows how recaptures were reported over the last 15 years from 2000-2015. While reporting through the 1800 toll free number remains the most used method this has fallen from 57.7% in 2000-2005 to 46.2% in 2010-2015.

Reporting through the website, etrip forms and email collectively has increased from 11.3% in 2000-2005 to 42.3% in 2010-2015. Reporting through trips sheets, fax and mail collectively has fallen from 14.8% in 2000-2005 to 5.8% in 2010-2015.

## Infofish Websites

Infofish has a number of websites that it maintains for its projects that all use the Suntag database to store their data. *Figure 17* shows the homepage for the Suntag website.

The Infofish websites are:

Infofish Australia	<a href="http://www.info-fish.net">www.info-fish.net</a>
Suntag	<a href="http://www.info-fish.net/suntag">www.info-fish.net/suntag</a>
Suntaggers	<a href="http://www.suntaggers.com">www.suntaggers.com</a>
Crystal Bowl	<a href="http://www.info-fish.net/crystal-bowl">www.info-fish.net/crystal-bowl</a>
Rocky Barra Bounty	<a href="http://www.rockybarrabounty.com">www.rockybarrabounty.com</a>
Mulloway Marathon	<a href="http://www.mullowaymarathon.com.au">www.mullowaymarathon.com.au</a>
Gladfish	<a href="http://www.info-fish.net/gladfish">www.info-fish.net/gladfish</a>
King Ash Bay	<a href="http://www.info-fish.net/king-ash-bay">www.info-fish.net/king-ash-bay</a>
CapReef	<a href="http://www.info-fish.net/capreef">www.info-fish.net/capreef</a>

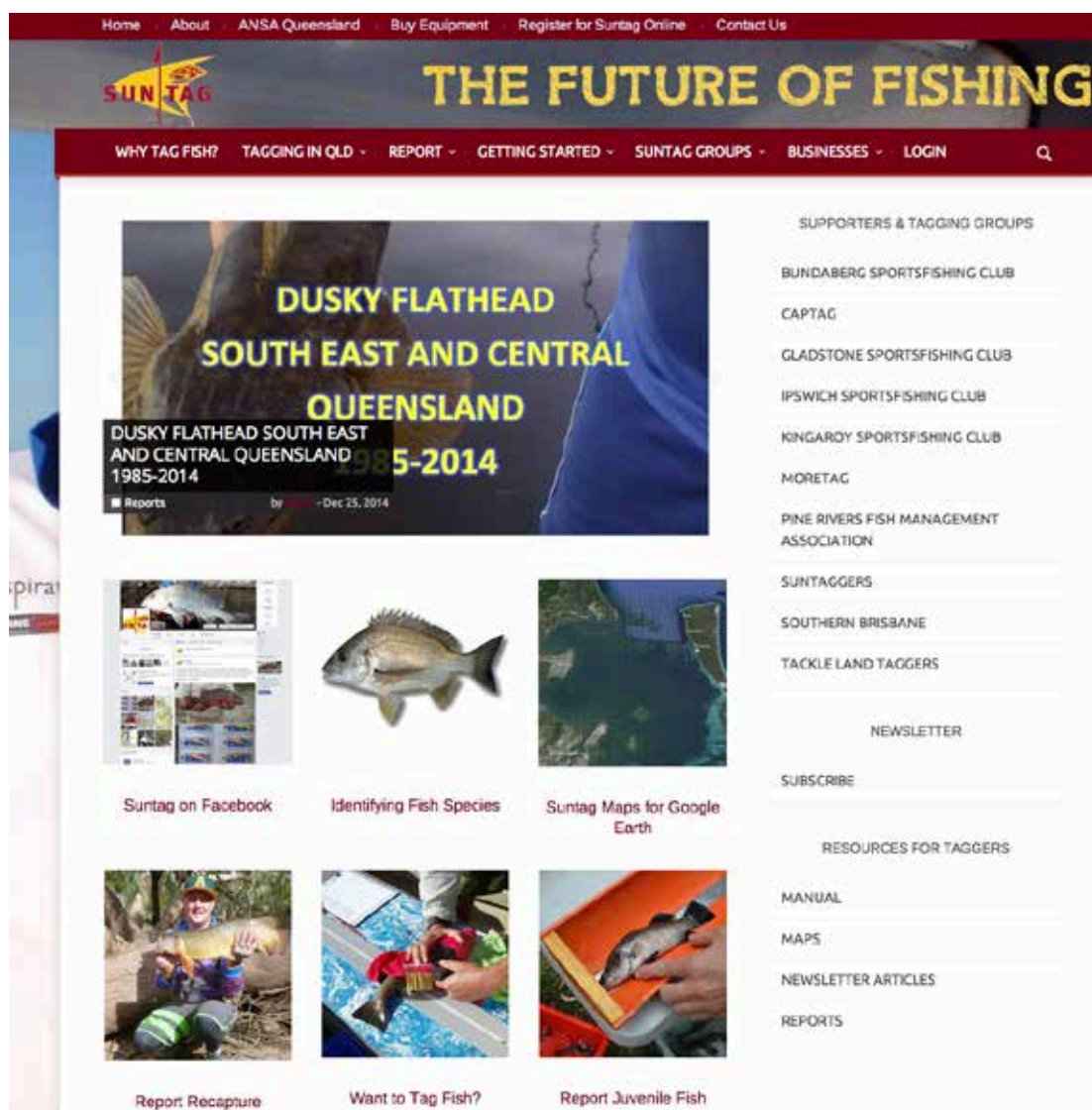


Figure 17: Suntag website homepage

The websites provide the following:

- ✦ Resources for taggers (maps, projects, awards, manual)
- ✦ Access to taggers own records (read only) through Suntag Online
- ✦ Taggers can load trip and tag data for inclusion in database (after validation)
- ✦ Taggers can monitor progress towards tagging awards and print certificates
- ✦ Improved reporting and feedback on recaptures
- ✦ Suntag reports
- ✦ Google Earth files for viewing data interactively
- ✦ Links to Facebook pages
- ✦ Upgraded Infotag Shop for buying tagging equipment
- ✦ Live data from the database showing progressive tagging results for clubs and businesses involved in Suntag
- ✦ Provide information on Infotag managed competitions including real time scoreboards during the events

## Infofish Facebook Pages

Facebook has become the prime medium for distributing real time information from Suntag and other Infofish projects. Each project has its own Facebook page to compliment the website. Infofish Facebook pages are:

Suntag	<a href="http://www.facebook.com/Suntag.Queensland">www.facebook.com/Suntag.Queensland</a>
Crystal Bowl	<a href="http://www.facebook.com/infofish.crystal.bowl">www.facebook.com/infofish.crystal.bowl</a>
Gladfish	<a href="http://www.facebook.com/Gladfish">www.facebook.com/Gladfish</a>
King Ash Bay	<a href="http://www.facebook.com/king-ash-bay">www.facebook.com/king-ash-bay</a>
Rocky Barra Bounty	<a href="http://www.facebook.com/RockyBarraBounty">www.facebook.com/RockyBarraBounty</a>
Mulloway Marathon	<a href="http://www.facebook.com/mullowaymarathon">www.facebook.com/mullowaymarathon</a>

The Suntag Facebook page was introduced in 2011 and Crystal Bowl page in 2012. These allow information on fish to be provided more quickly and to a much wider audience.

For the year there were 72 posts on the Suntag Facebook page with 2,603 likes (948 In 2013/14). Total reach for 2014/15 was 252,000 with an average reach of 3,500 and a maximum reach of 13,400 for a single post. *Figure 18* shows the Suntag Facebook page.

For the year there were 48 posts on the Crystal Bowl page with 470 likes. Total reach for 2014/15 was 43,400 with an average reach of 900 and a maximum reach of 7,760 for a single post. *Figure 19* shows the reach for each Suntag Facebook post in 2014/15.

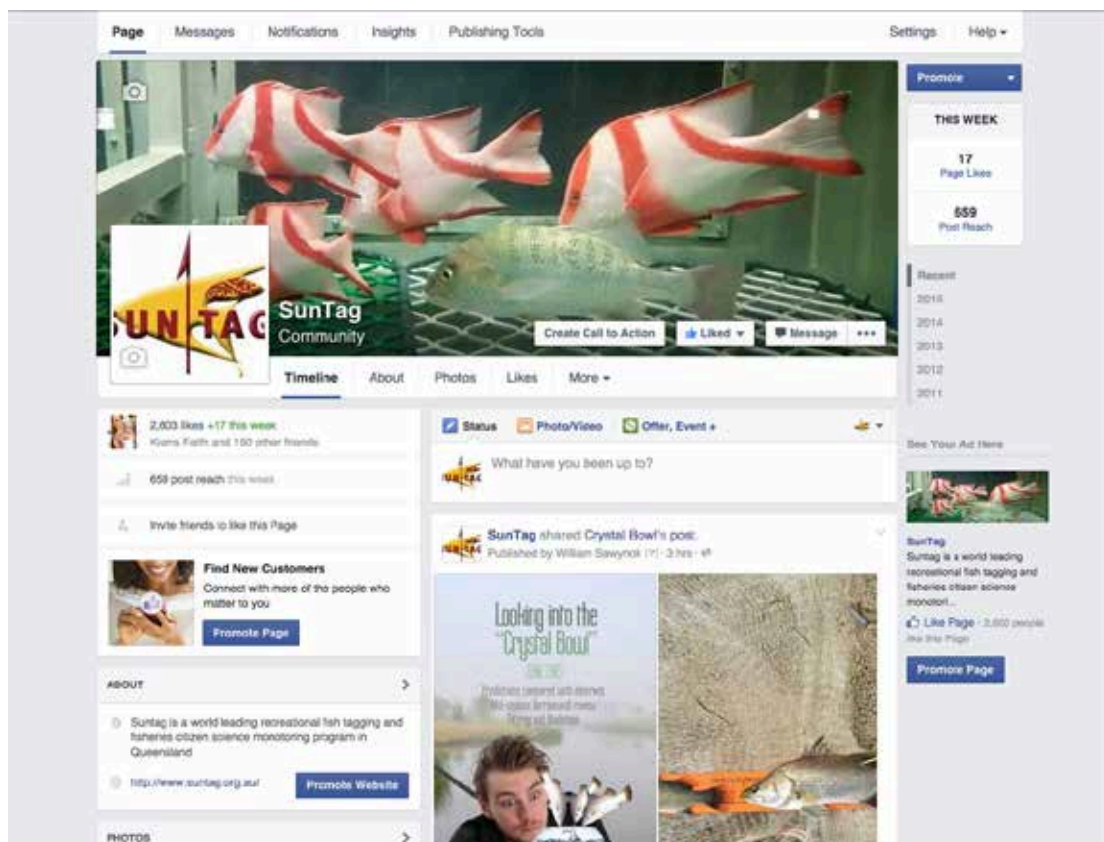


Figure 18: Suntag Queensland Facebook page

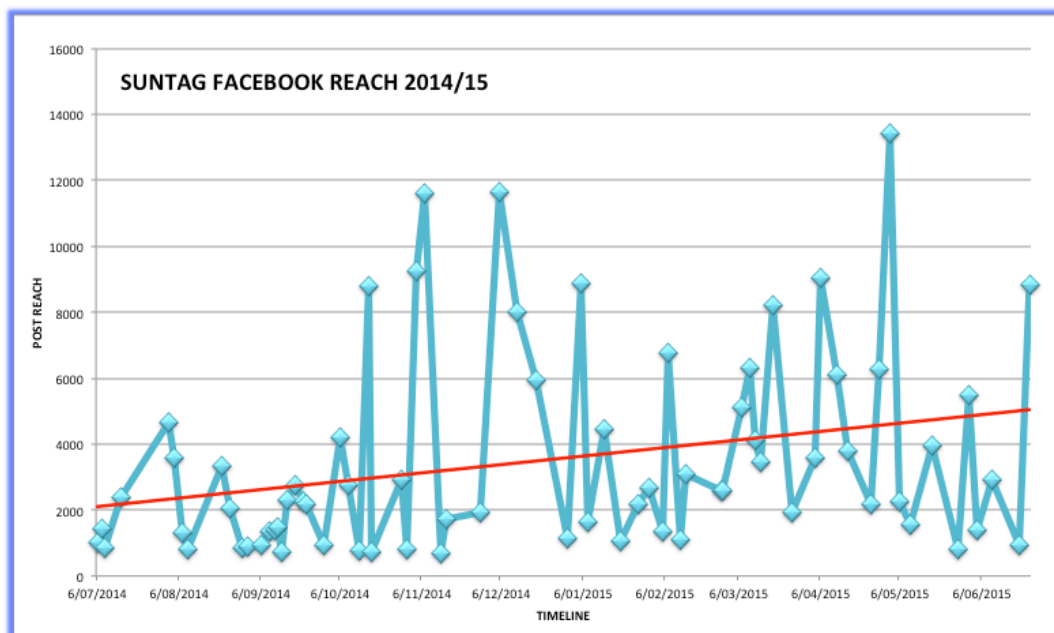


Figure 19: Timeline of Facebook posts in 2014/15

## Suntag eNews

Facebook has become the prime means of reporting on interesting recaptures of fish along with other interesting snippets of information related to fish. This led to a review of the Suntag News bulletin. After 200 editions of the bulletin in its original format (one page sent out by email) it was revamped to an online newsletter telling the interesting stories hidden within the data (*figure 20*) rather than focus on individual fish.



Figure 20: Suntag enews bulletin in 2014/15



The new format includes links to Suntag mini-reports, Google Earth maps and video clips on the Suntag website making it much more interactive. With the change in format the frequency of sending out the News bulletins has been reduced. There were 7 editions (206-212) sent out this year.

## Suntag Mini-reports

This year there has been a strong focus on Suntag mini-reports. These reports provide a snapshot of Suntag data for a particular species, location, timescale, issue or all of those. The reports are short and designed to provide information to fishers in a simple and easily understood format (*figure 21*).

A total of 18 reports were produced this year and a total of 25 since the reports were introduced in 2014. There were over 20,000 downloads of mini-reports in total from the website so are proving to be very popular. Reports included:

- ✦ Tagging in Gulf of Carpentaria Gilbert River to Flinders River 1985-2015
- ✦ Looking into the “Crystal Bowl” (5 reports predicting fish stocks)
- ✦ Infofish Citizen Science and Suntag Report 2013/14
- ✦ Tagging Australian Bass and Golden Perch in Burnett River catchment 1986-2014
- ✦ The Big Picture Tagging and Recaptures 1985-2014
- ✦ Dusky Flathead South East and Central Queensland 1985-2014
- ✦ Yellowfin and Pikey Bream South East and Central Queensland 1985-2014
- ✦ Impact of Climate on Barramundi in 12 Mile Creek 1985-2015
- ✦ The Awoonga Barramundi Story 1985-2014



Figure 21: Suntag Mini-Reports in 2014/15



## Visualising Suntag through Google Earth

With the volume of data held in the Suntag database it was decided in 2010/11 to start the development of tools that would allow the visualisation of data using Google Earth. The use of grid maps provided the opportunity to develop a range of map types and there are now 272 Google Earth maps in use where the maps can be regenerated at any time to reflect current data in the database.

Google Earth maps are produced in conjunction with mini-reports. This allows data to be viewed interactively with maps available from the Suntag website.

Google Earth maps can now be generated to display the following:

- ✦ Tag and recapture location of recaptured fish
- ✦ Tag locations showing extent of tagging using Suntag grid maps (*figure 13*)
- ✦ Extent of fishing effort in an area
- ✦ Time sequencing of tag locations showing changes over time
- ✦ Flyovers following fish from tag to recapture site
- ✦ Photographs, video, graphs and environmental data can be added to the maps
- ✦ Combined fishing effort and tagging
- ✦ Recruitment survey details

Figure 22 shows the grids for the entire tag records (over 735,000) stored in the database from an altitude of over 2,000km. Data are shown for over 12,000 grids where fish have been tagged. When viewed using Google Earth, clicking on a tag grid will provide a graph showing the number and size range of fish tagged in each grid or details of a recaptured fish.



Figure 22: Google Earth map showing over 12,000 grids where all fish have been tagged from an altitude of over 2,000km

Figure 23 shows the movement of juvenile and adult Snapper in southeast Queensland based on time at liberty. This is just one of many presentations of data that can be made using Google Earth.

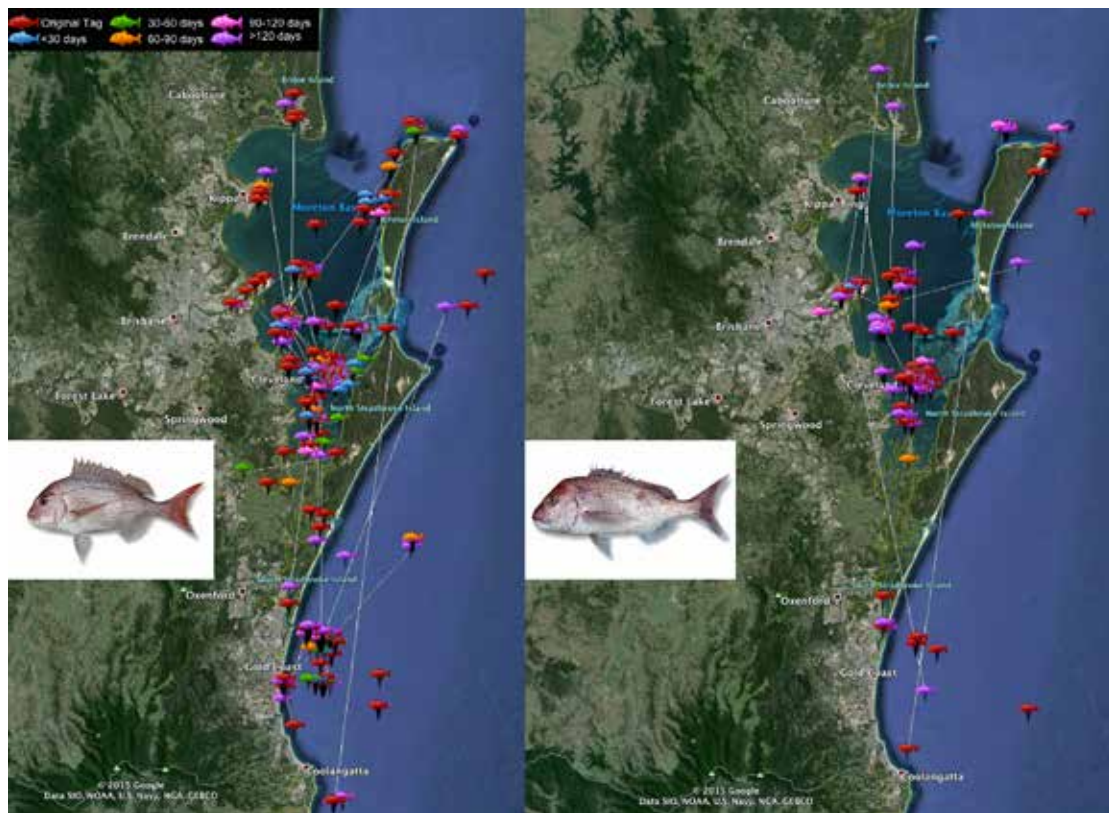


Figure 23: Google Earth map showing movement of SEQ juvenile and adult Snapper

## Suntag Moving Forward with Technology

Every so often a new piece of technology comes along that makes a big change in how we see the world. Insight Genesis is one such technology.

Suntag tagging maps use grids of  $1\text{km}^2$  partly because in estuaries smaller than that is not very meaningful but also to ensure that specific fishing spots are not published. In impoundments however that big brush masks how the fish use the space available to them.

Enter Insight Genesis from Navico, makers of Lowrance. Insight Genesis is a technology that combines the individual sounding data of fishers and boating enthusiasts into an underwater topographical map.

Using data from Lake Somerset combined with even a crude cut and paste of the Insight Genesis community map the tagging data makes a lot more sense as shown in *figure 24*. What it shows is the way in which the fish stick to the old riverbed. Regular fishers at Somerset were not surprised but getting a very visual confirmation that the environment and tagging data line up is a first.

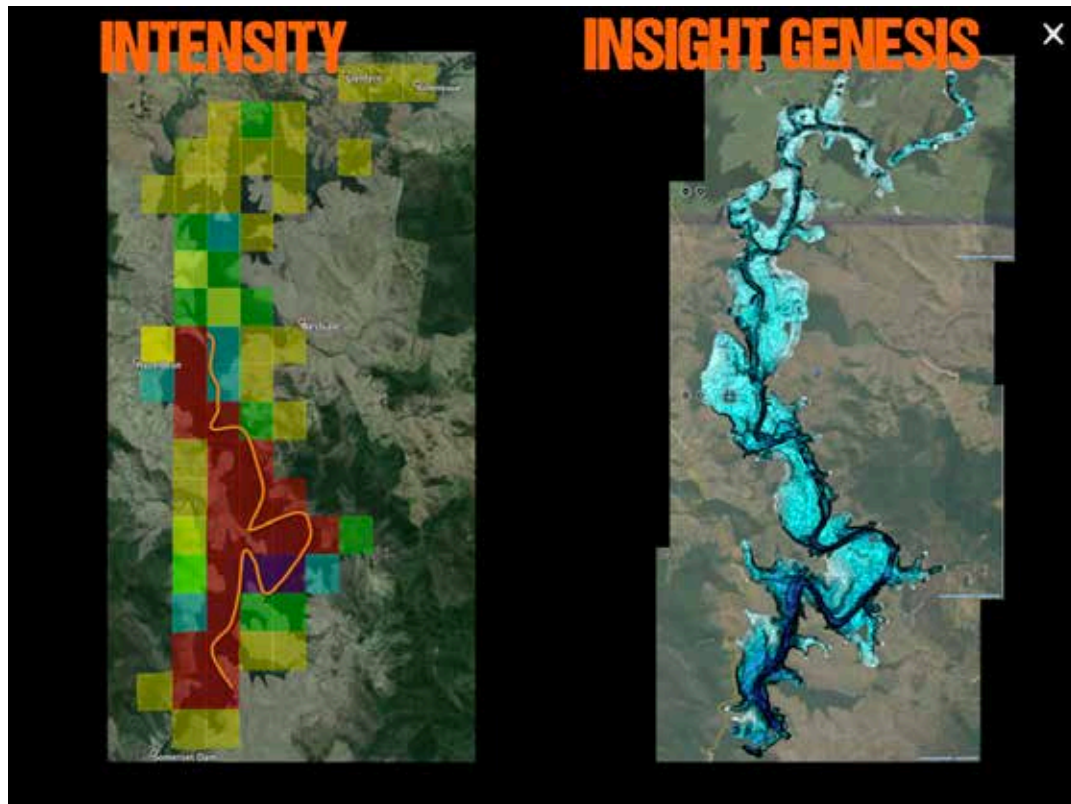


Figure 24: Tagging data in Lake Somerset matches bottom mapping by Insight Genesis

## Suntag Awards

Suntag provides a number of awards to recognise the efforts of its top taggers. These awards are important in providing recognition for the contribution of individuals. The awards are:

- ✦ Tagging Excellence Award (tag a minimum number of fish for 2,000 points)
- ✦ Tagging Achievement Award (tag a minimum number of fish for 200 points)
- ✦ Frequent Tagger Award (tag a minimum of 1,000 fish)
- ✦ Phil Books Award (tag the most fish in any fishing year)

Taggers that use Suntag Online can look up their progress towards awards. When a particular award is achieved the system sends an email to the tagger, Infofish Australia and ANSAQ Records Officer. Recipients can then log in and print their own certificates or request a certificate from Infofish Australia. They can also print certificates for old awards where the certificate was never received, lost, destroyed or damaged.

Certificates include a photo of the species for the particular award as shown in *figures 25 and 26*. For those taggers without access to Suntag Online an email is sent to Infofish Australia and the certificate can be emailed or printed and sent in the mail.





Figure 25: Tagging Achievement Award certificate introduced in 2013



Figure 26: Tagging Excellence Award Certificate introduced in 2013

A total of 52 taggers qualified for Tagging Achievement Awards (TAA) during 2014/15. There have now been 1,559 TAAs achieved by taggers.

There were 3 Tagging Excellence Award (TEA) awarded in 2014/15. One was awarded to Andrew Kennedy for tagging 558 (required 750) Australian Bass, Ray Kennedy for tagging 935 (required 750) Australian Bass and the other to Steve Salmond for tagging 799 (required 500) Pikey Bream. There have now been 104 TEAs achieved by taggers.

To date 106 taggers have reached the Frequent Tagger milestone of 1,000 fish tagged. Frequent taggers have collectively tagged 293,000 fish in total and that is around 40% of all fish tagged. This year there were 2 taggers joining this group being Evan Thompson (1,480) from Captag and Steve Salmond (1,211) of Suntaggers.

The Phil Brooks Memorial Award is in memory of Phil Brooks who was an avid supporter of Suntag. Each year this award is presented to the person that tags the most fish. No award was made since 2012/13 due to the loss of funding that caused problems in providing tags to taggers on an equitable basis. In 2014/15 Evan Thompson of Captag tagged the most fish with 872.

Mick Dohnt (*figure 27*) remains the top individual tagger overall having added 206 fish to his tally that is now 23,854 fish tagged. In 2008/09 Tony Stewart became the second tagger to have tagged over 10,000 fish having now tagged 10,715 fish. In third place on the list is Daniel Powell having tagged 9,489 fish.



Figure 27: Mick Dohnt (front left) is the top overall Suntag tagger



## Suntag Accreditation

Last year saw the introduction of Suntag video clips on YouTube as shown in *figure 28*. Video clips on how to tag fish have been produced and can be viewed from the Suntag website.



Figure 28: Video clips on tagging available through Suntag website

Last year also saw the introduction of Suntag Training Online. Training of taggers has always posed significant challenges given the limited funding available and the geographic spread of taggers. An online training module was developed this year and introduced in 2014. It is still in its infancy and will be improved, as we better understand the best ways to deliver that training. There are now 41 accredited taggers and that number will grow next year.

A 3 step accreditation process allows taggers to gain basic accreditation (*figure 29*). The process involves:

- ✦ A Personal Tagging Plan
- ✦ A number of available courses on the tagging process requiring tests to be passed
- ✦ Submission of 3 photos of tagged fish

All taggers that complete the process successfully become Accredited Suntaggers and are issued with an accreditation card. The training module will be added to for specialised tagging and refined as feedback is received.

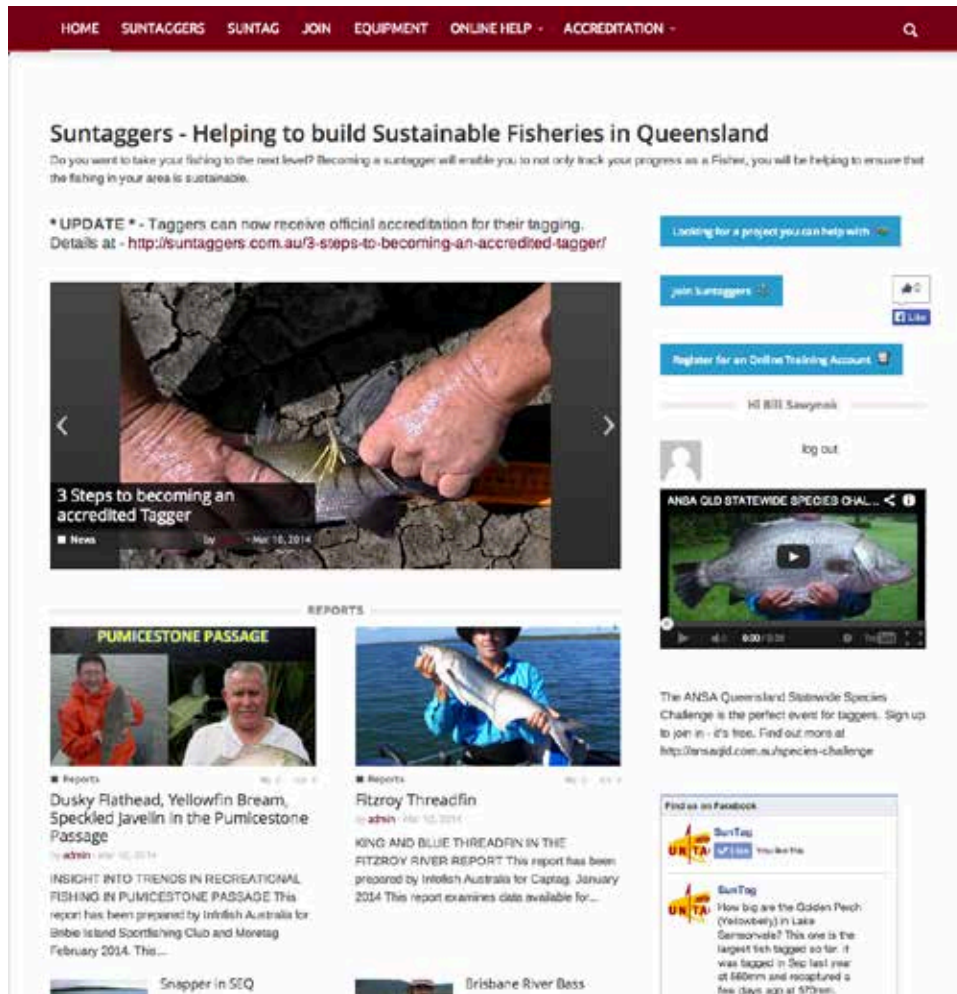


Figure 29: Suntag accreditation available through online training

## Tags and Equipment

### Tags used in Suntag

Tags used in Suntag are Hallprint tags obtained from Hallprint Pty Ltd of South Australia. The long-standing support of David Hall of Hallprint for Suntag is acknowledged. The two types of tags most commonly used in Suntag programs are the dart or spear tag and the anchor or gun tag (figure 30). Both these tags are used in a number of sizes.

The durability of these tags is demonstrated by recaptures of fish up to 20 years after tagging and having the number still able to be read.



Figure 30: Tags and tagging equipment used in Suntag

## Suntag Equipment from Infofish Shop

A full range of tagging equipment is available from the Infofish Shop through the Infofish website. All the equipment required to tag is available including starter kits, tag applicators, record books, measuring rulers and other ancillary equipment. The shop includes a secure payment method for online purchases. *Figure 31* shows a part of the Infofish shop.

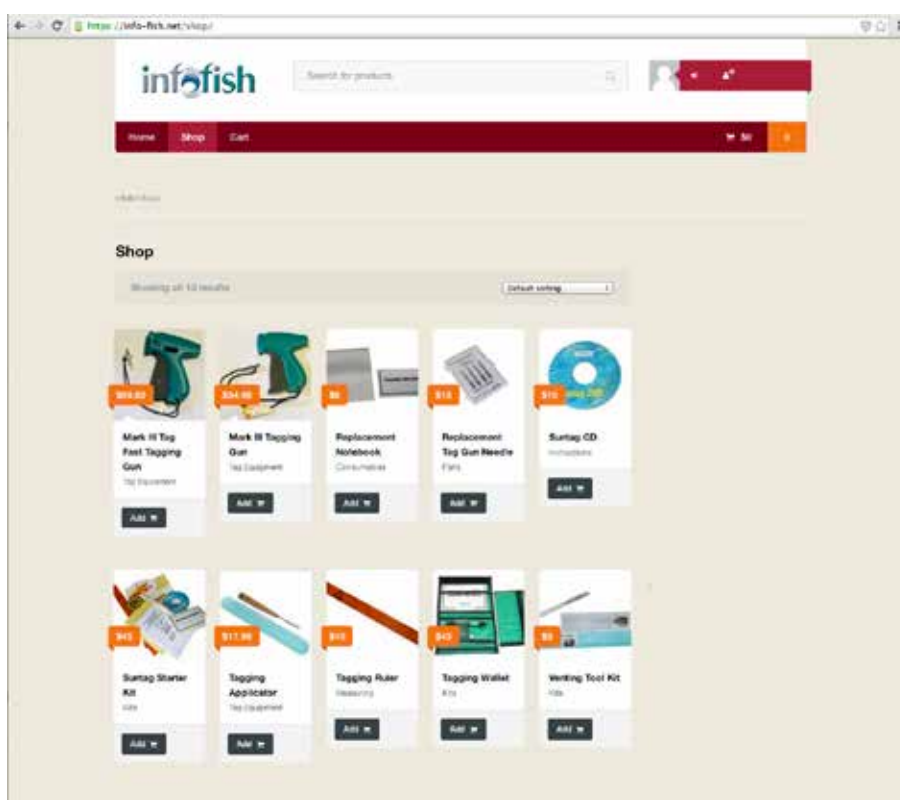


Figure 31: Online store allows purchase of tagging equipment and accessories

## Suntag in 2014/15



### Suntag Highlights 2014/15<sup>1</sup>

- ✦ Total fish and crab records in the database now exceed 1.13 million fish records
- ✦ Recruitment surveys were added to the database with 690 surveys and 47,300 fish
- ✦ This year saw the first recapture of a fish out for over 20 years being a Barramundi tagged in Lake Tinaroo in Oct 1994 at 550mm and recaptured in Nov 2014 at 1,230mm
- ✦ 106 Frequent taggers account for 293,000 (39%) of the total number of fish tagged while the remaining 9,500 taggers account for 302,400 (40.9%) of the fish tagged
- ✦ Fish stocking groups account for 101,300 (13.7%) of the fish tagged and researchers 42,000 (5.7%)
- ✦ Fishing trips with catch and effort details now total 44,200 (3,200 this year)
- ✦ A total of over 9,600 taggers (640 this year) have now participated in Suntag and 17,300 fishers (750 this year) have reported the recapture of a tagged fish
- ✦ A total of over 1,470 fishers contributed data to Suntag this year through tagging fish, reporting recaptures and catch
- ✦ Barramundi is the most tagged species with over 247,100 tagged and 18,100 recaptured (over 21,800 including multiple recaptures)
- ✦ The overall recapture rate for fish, excluding crabs was 6.6% with a 6.6% recapture rate for 2010-15 the same as the long term average
- ✦ The release rate of recaptured fish for the past 9 years was over 60% and over 70% from 2007/08 to 2009/11 and in 2014/15
- ✦ Mick Dohnt remains the top tagger overall having tagged a total of 24,780 fish
- ✦ A total of over 91,000 fish have the location where the hook was lodged in the fish recorded with 10.6% of fish caught on bait being deep hooked (throat or gut) and 2.1% for fish caught on lures
- ✦ There are over 3,000 photographs in the database with those in the Gladstone area used to monitor fish health
- ✦ Monitoring recruitment was extended to include Bream in the Gladstone area and now included Barramundi, Bream and Threadfin as well as other species
- ✦ A total of 25 mini-reports were produced featuring a species, location, timeframe, issues or all of those with over 20,000 downloads from the website
- ✦ Websites for Suntag and Crystal Bowl were revamped to be integrated with Suntag eNews and Suntag mini-reports

### Suntag Background

Suntag commenced in 1986/87 as a tagging program to obtain movement and growth of key recreational species. Suntag is now the primary repository of tagging data in Queensland for tagging carried out by Suntag taggers, DAF researchers, fish stocking groups, government monitoring programs and some research institutions and universities.

Suntag is now a substantial dataset spanning a 30 years timeline and data have been used for a wide range of purposes including:

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<sup>1</sup> All figures to 30 June 2015 in database at 31 July 2015

- ✦ Growth and movement
- ✦ Stock assessments
- ✦ Monitoring stocked fish
- ✦ Stock predictions (Barramundi)
- ✦ Assessing recruitment
- ✦ Assessing the effects of management plans and regulations
- ✦ Assessing local/regional fishing
- ✦ Fish survival
- ✦ Environmental impact assessments
- ✦ Ecosystem modelling
- ✦ Climate change
- ✦ Fish health

## Fish in Suntag Database

The Suntag database passed its most significant milestone with over 1 million fish and crab records in the database in 2013. Current statistics (added in 2014/15):

- ✦ 1,132,800 fish records (42,700)
- ✦ 738,700 tagged fish (24,100)
- ✦ 58,500 recaptures (1,450)
- ✦ 43,300 fishing trips 2,800) with catch and effort
- ✦ 288,200 other fish 9,400) from catch records
- ✦ 690 recruitment surveys (130)
- ✦ 47,300 fish from recruitment surveys (8,000)

Total fish added to the database each year is shown in *figure 32*. Fish from recruitment surveys were added to the database this year. The most fish were added to the database in 2007/08 when 108,170 fish were added. In 2014/15 there were 42,700 fish added.

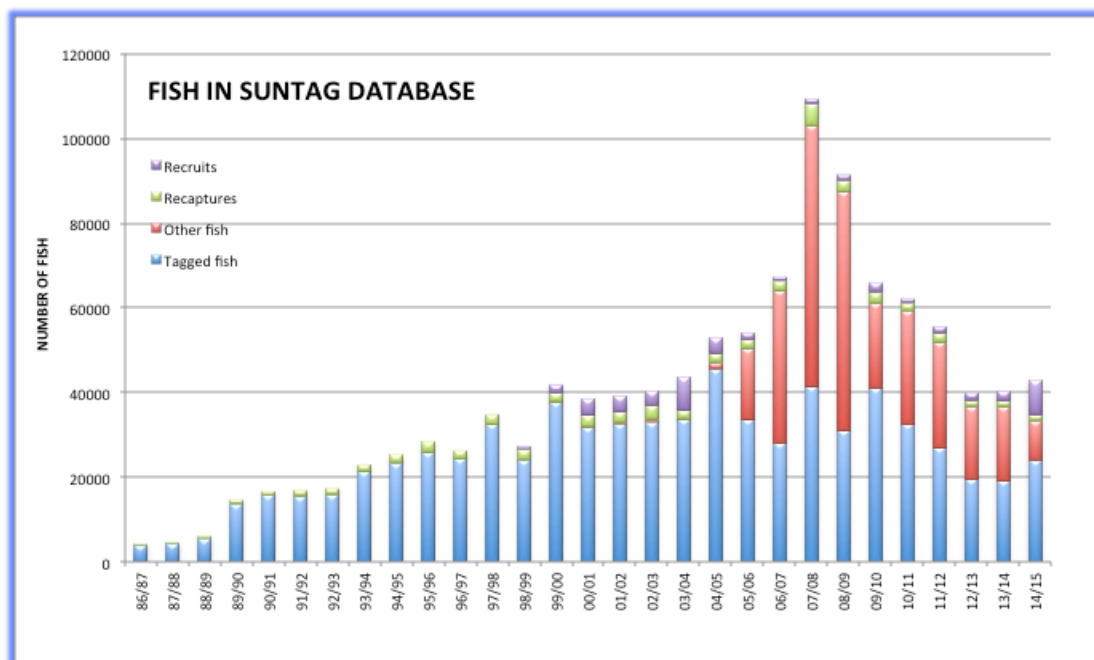


Figure 32: Total fish added to database each year from 1986/87 to 2014/15

## Suntag Participation



Numbers participating in Suntag are shown in *figure 33*. A total of 9,600 taggers have now participated in Suntag having tagged fish since 1986/87. In 2014/15 there were 640 fishers that tagged at least one fish. A total of over 17,300 fishers have participated in Suntag though reporting the recapture of a tagged fish.

In 2014/15 there were over 750 fishers that reported the recapture of a tagged fish with many fishers recapturing more than one fish. A total of over 1,470 fishers contributed data to Suntag this year through tagging fish, reporting recaptures and catches.

The steady decline in fishers tagging from 2001/02 to 2008/09 reflects a general decline in participation in recreational fishing from 2000-2010. Numbers participating in Suntag peaked from 1995/96 to 2001/02 when around 1,000 taggers tagged fish each year. This steadily declined to around 600 in 2008/09 and since then has fluctuated from 600-800.

The increased level in participation, from 2008/09-2011/12 is likely to be a result of the significant improvements in Suntag services over those years. The drop in 2012/13 was a result of the disruption caused by the loss of funding.

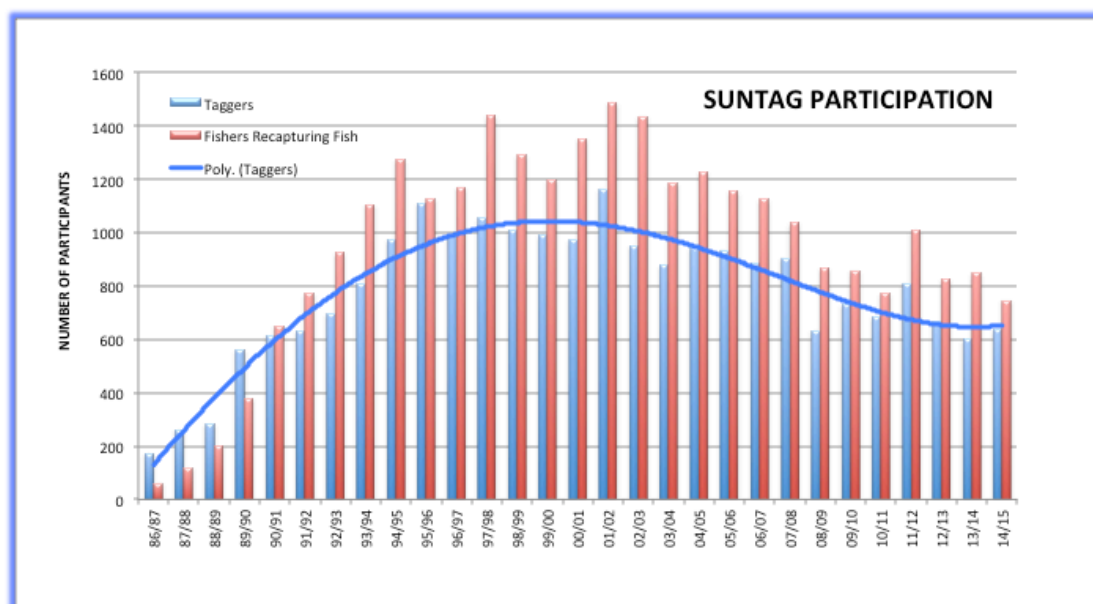


Figure 33: Summary of participation in Suntag from 1986/87 to 2014/15

## Suntag Fish Tagged and Recaptured

*Figure 34* shows the number of fish tagged and recaptured each year since 1986/87. In 2014/15 there were 24,100 fish tagged and 1,450 recaptures (including multiple recaptures) recorded. Since 1999/2000 there were over 25,000 fish tagged in each year except 2012/13 and 2013/14. The drop in numbers tagged is mostly due to the significant reduction in funding for the past 3 years. However numbers for this year will increase as late data are received and the total will likely be close to 25,000.

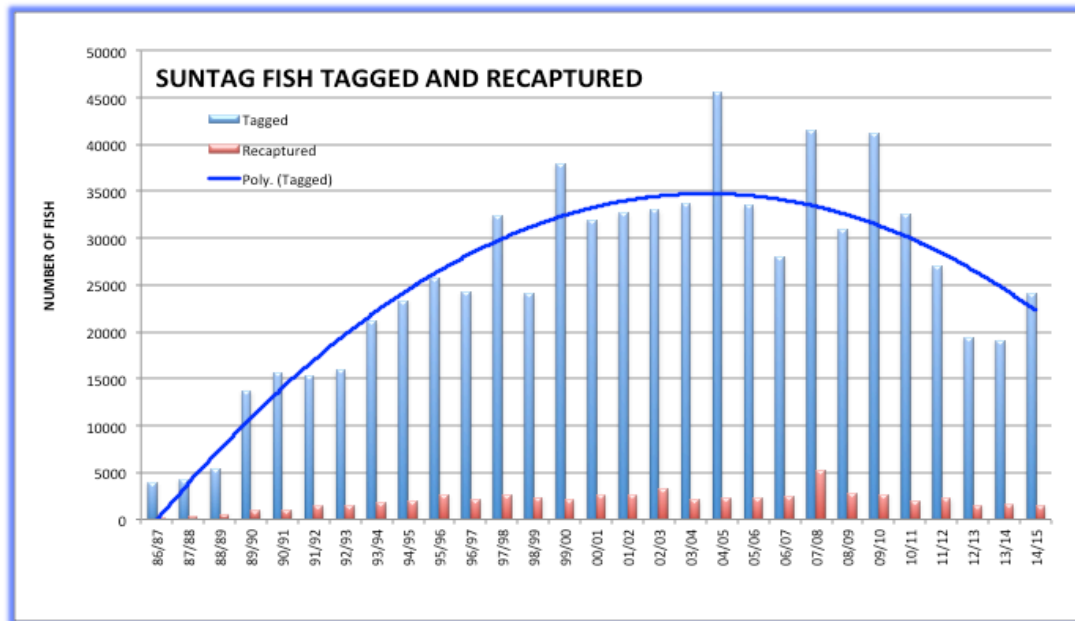


Figure 34: Fish tagged and recaptured each year from 1986/87 to 2014/15

Figure 35 shows the categories of taggers that have tagged fish. These are:

- ✦ Frequent taggers (tagged over 1,000 fish)
- ✦ Other Suntag taggers (tagged at least 1 fish)
- ✦ Fish stocking groups
- ✦ Researchers (DAF and others)

Just 106 Frequent Taggers account for 293,000 (39.7%) of the total number of fish tagged while the remaining 9,500 taggers account for 302,400 (40.9%). Fish stocking groups have tagged 101,300 (13.7%) and researchers 42,000 (5.7%).

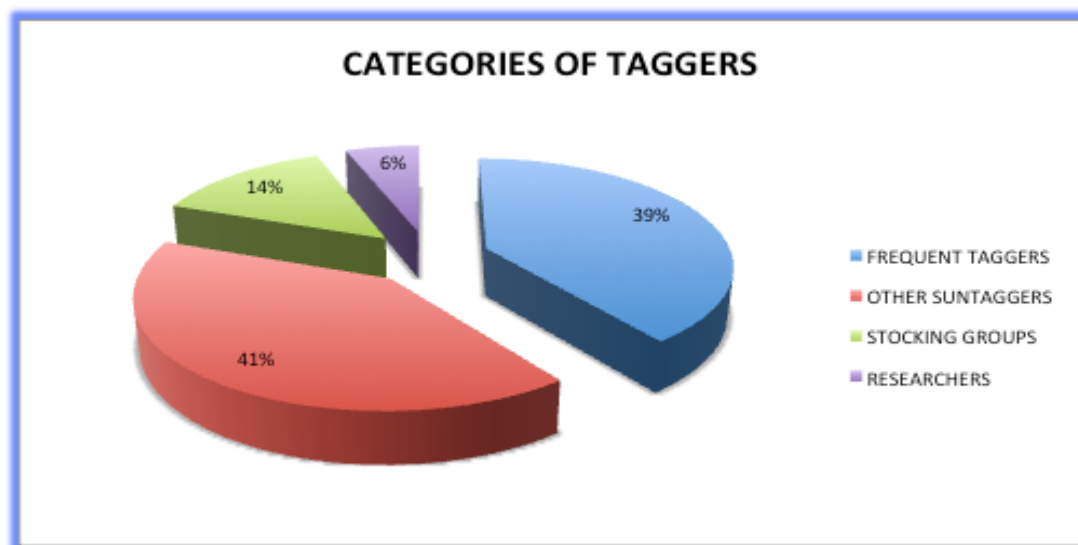


Figure 35: Categories of tagger participation in Suntag based on the total numbers of fish tagged

## Suntag Key Species Tagged and Recapture Rates

Barramundi remains the most tagged species and was the first species where over 200,000 fish were tagged. The total number of Barramundi tagged is now 247,133 with 18,086 recaptures of individual fish and 21,848 total including multiple recaptures. Numbers of Barramundi tagged were significantly boosted from 2004/05-2009/10 when fish stocking groups released large numbers of tagged Barramundi into impoundments and waterways. The overall recapture rate for Barramundi recaptured once is 7.3% however is as high as 17.0% in the Fitzroy River estuary and 19.5% in 12 Mile Creek in Central Queensland.

Australian Bass is the second most tagged species with 68,194 tagged and 5,174 recaptured once and a recapture rate of 7.6%. *Figure 36* shows the number of the top 20 species tagged with the corresponding recapture rate.

While many fish are recaptures several times the recapture rate here is based only on a single recapture of each fish. Species with over 4,000 fish tagged that have recapture rates above the average 6.8% include Dusky Flathead (8.4%), Goldspotted Rockcod (9.9%), Golden Perch (8.0%), Mud Crab (14.4%), Red Emperor (12.2%) and Blackspotted Rockcod (12.2%).

Species with recapture rates below 5% include Yellowfin Bream (3.8%), Barred Javelin (2.6%), Pikey Bream (4.6%), Speckled Javelin (2.0%), Giant Trevally (3.7%) and School Mackerel at (1.9%).

Saddletail Snapper has the highest recapture rate at 13.6% of any of the fish species tagged. This result is interesting as the survival rate for released Saddletail Snapper from experimental work is 50% (see section 12) and one of the lowest survival rates for any species assessed. The difference most likely results from fish being tagged in shallow water (less than 20m) where barotrauma is less of an issue.

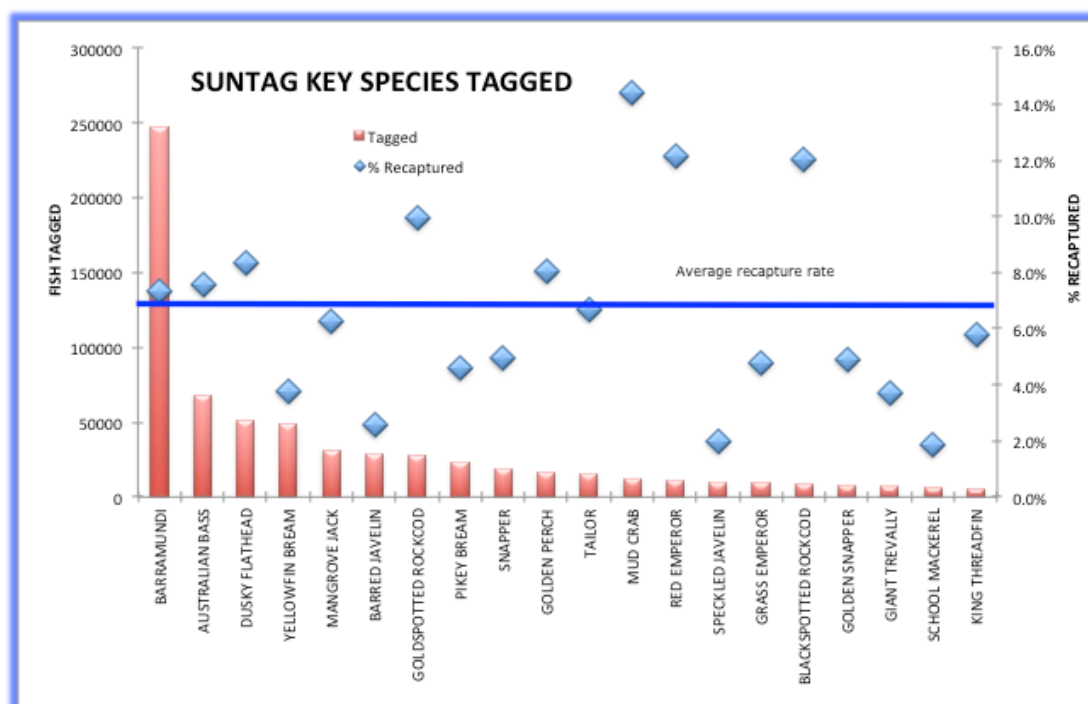


Figure 36: Total numbers of key species tagged and their recapture rate

## Suntag Recapture Rate

The Suntag recapture rate has been used for a number of years as a coarse indicator of trends in fishing effort. While there are many factors that influence the recapture rate most of these are near constant from year to year or small in their effect on the recapture rate. The greatest variable is fishing effort and this can be demonstrated by comparing the recapture rate from heavily fished and remote lightly fished locations eg Barramundi recapture rate in Fitzroy River is 17.0% from 37,773 fish tagged and for Weipa is 1.7% from 36,528 fish tagged.

The recapture rate was simply calculated as the ratio of the total number of fish recaptured (once) over time compared with the total number tagged over that same time. Some data that were not typical of fishing effort were excluded.<sup>2</sup> The overall long-term recapture rate for all fish, excluding crabs, at the end of 2014/15 was 6.6%. The recapture rate for 2010-15 was 6.6% and the same as the long-term average.

Figure 37 shows the overall and 5 year recapture rates from 1985/90 to 2010/15 for all fish. This suggests that fishing effort peaked from 1990/95, fell significantly from 1995/2000 and has remained steady since then.

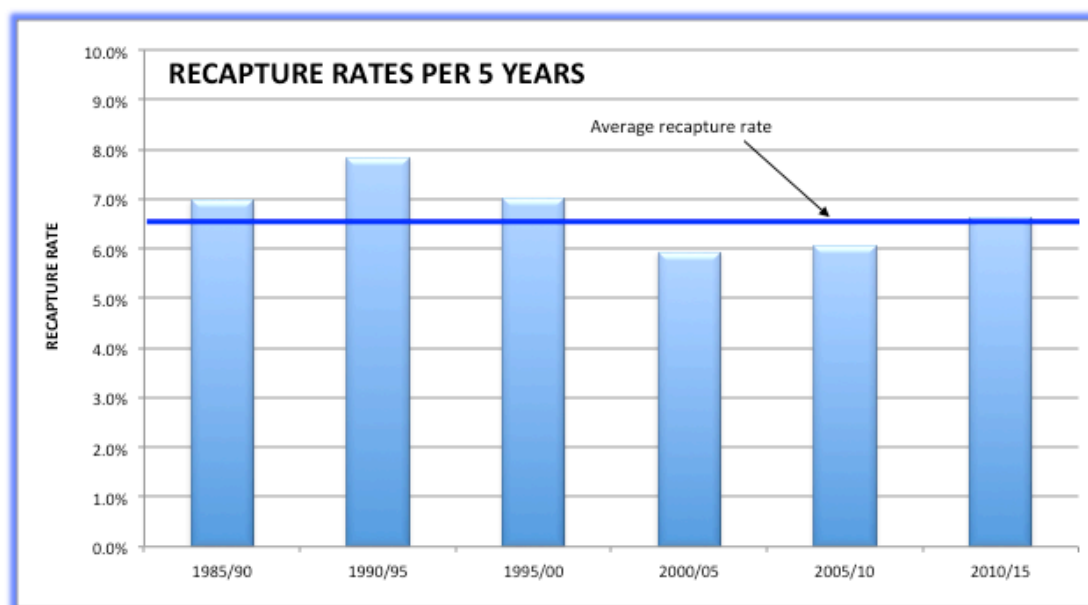


Figure 37: Recapture rate from 1985-2015 per each 5 year period

<sup>2</sup> Data from fish tagged in no fishing zones (green zones) in Keppel Bay in 2007/08 and 2011/12, Mud Crab and Northern Territory (McArthur River) tagging were not reflective of normal fishing effort and were excluded

Figure 38 shows the number of participants and participation rates in recreational fishing as a percentage of the Queensland population from 1996-2014. This shows a drop in the percentage of the population participating in fishing from the mid 1990s to 2014. The trend in participation is also reflected in a reduction of fishing effort over the same time.

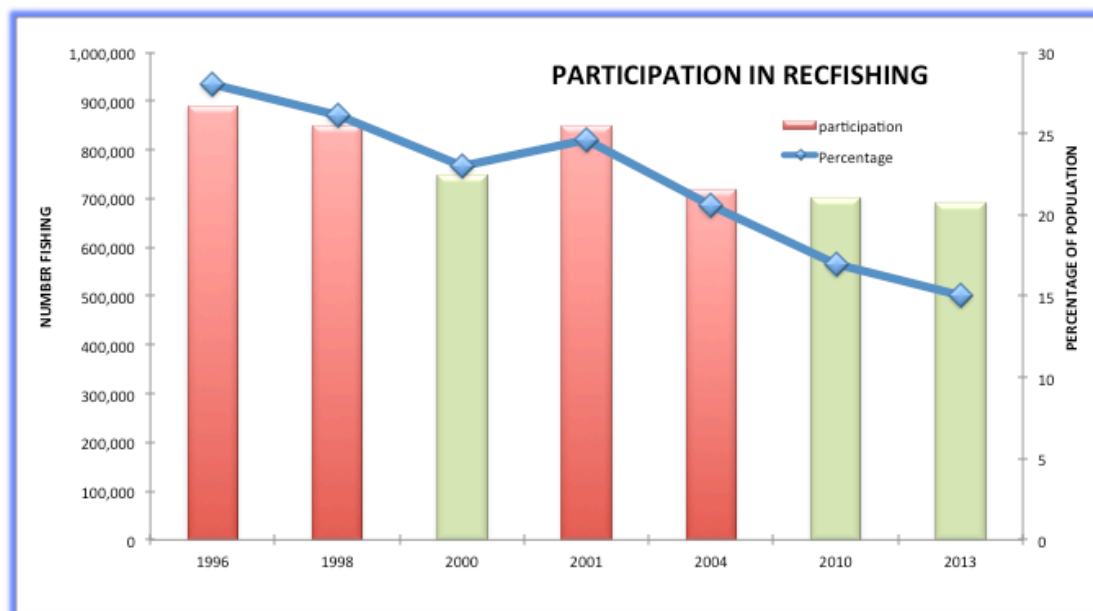


Figure 38: Participation rates in recreational fishing in Queensland from 1996-2014 - Rfish surveys 1996-2004 and Statewide surveys 2000, 2010 and 2013/14

## Suntag Released Fish Rate

The rate that recaptured tagged fish are released each year allows the trend in the numbers of fish released to be monitored over time. The released fish rate has been calculated by comparing the number of recaptured tagged fish that are released to the total number of recaptures each year for ANSAQ members and other recfishers (excludes ANSAQ members), however the analysis does not take into account whether the fish was of legal size or not.

Figure 39 shows the release rates for ANSAQ members and recfishers over the last 30 years. There is a clear trend among recreational fishers towards releasing more fish with the release rate for the past 12 years since 2003/04 over 60%. ANSAQ members have had a consistently high release rate of tagged fish of over 90% almost every year since 1991/92.

Figure 40 shows the release rate of recaptured legal sized Barramundi and Dusky Flathead by recfishers (excluding ANSAQ members) over the past 30 years. These were fish that could have been legally kept. For Barramundi up to 1989 the minimum legal size was 500mm, from 1989-1999 it was 550mm and then rose to 580mm. For Dusky Flathead the legal size was 300mm from 1985-2002, was 400-700mm from 2002-2009 and 400-750mm from 2009-2015.



There is a clear trend over the 30 years with an ever-growing percentage of legal size fish being released for both species. There were over 40% of legal sized Barramundi that were caught in the past 2 years that were released again. There were over 25% of legal sized Flathead released again for the past 3 years.

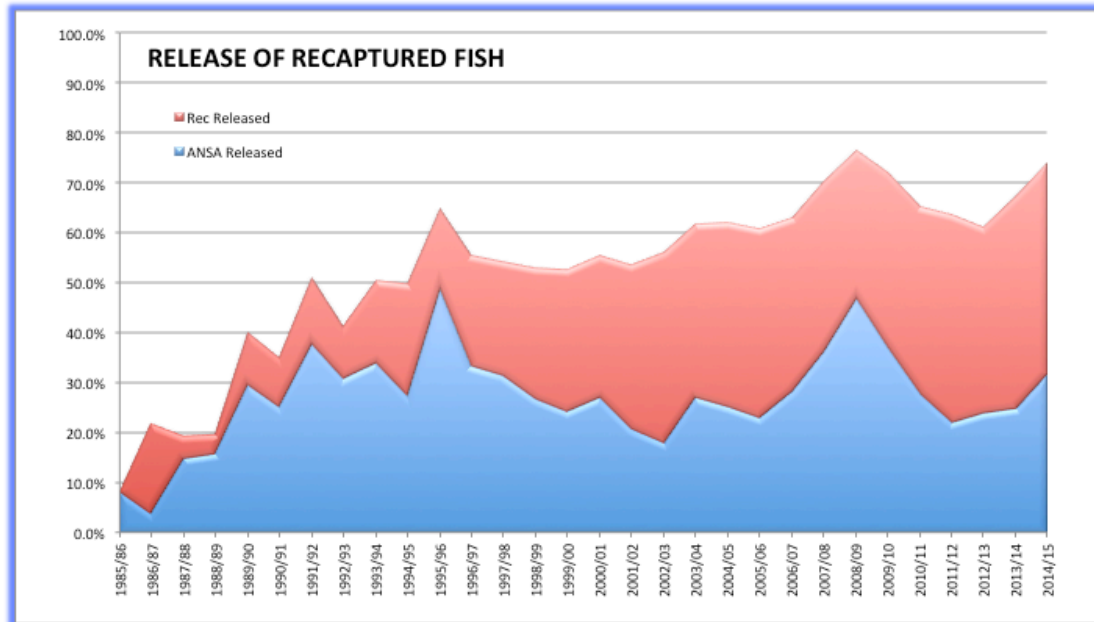


Figure 39: Percentage of recaptured tagged fish released by recreational fishers and ANSA members each year compared to total recaptures for each group

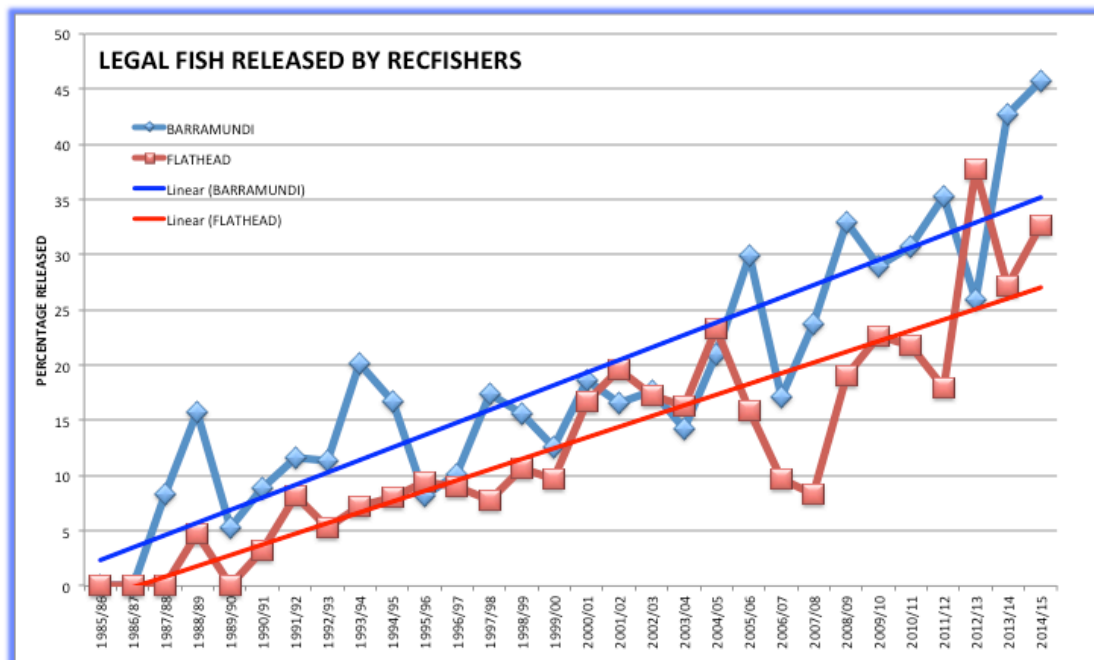


Figure 40: Trend in legal Barramundi and Flathead recaptures released by recfishers

## Community Monitoring - Crystal Bowl

Predicting fish stocks is becoming a growing activity as the fishing community continues to look for information about the future status of fish stocks to assist in their investment decisions in their fishery.

The “Crystal Bowl” concept emerged at the end of 2007 when, at the end of a long drought period, Barramundi stocks in the Fitzroy River were considered to be at their lowest in decades. It was only through a wet period starting from 2008 with strong recruitment in 2008, 2009 and 2010 that a very serious situation was averted. The “Crystal Bowl” concept was developed in response to those circumstances. The idea was to be able to predict what Barramundi stocks would be like in the coming years so that fishers could respond to what to expect.

The first predictions were made in 2011 for Barramundi in the Fitzroy River. That was extended to Barramundi in the Gladstone area in 2013 and extended to Threadfin in the Fitzroy River in 2015. It is currently being extended to Mulloway in the Moreton Bay area.

From 2007-2015 the process has constantly evolved as more data was collected, improved understanding of what was required and how to provide the information back to fishers. The process is outlined in *figure 41* outlining the sequence followed.



Figure 41: Crystal Bowl process for predicting aspects of stock and assessing predictions

Predictions within a 20% range, are made for fish sizes, catch rates and stock levels. Recruitment is assessed as poor, moderate or strong. Predictions made for the 2015 season in Nov 2014 were recently reviewed and updated. A report ‘Looking into the “Crystal Bowl” June 2015 – Predictions compared with observed Mid-season Barramundi review Fitzroy and Gladstone’ is available from the Crystal Bowl website at [www.crystal-bowl.com.au](http://www.crystal-bowl.com.au).

Data used in assessing the predictions are:

- ✦ Fish size from recreational catch
- ✦ Commercial catch
- ✦ Tag and recapture data
- ✦ Recruitment surveys
- ✦ River flows and rainfall
- ✦ BOM long range forecast
- ✦ Stocked fish records

For the 2015 Barramundi season in the Fitzroy River the catch rate for legal fish for both commercial fishers and taggers was predicted to fall by 30-50%. At the mid-season review in Jun 2015 the commercial catch rate was down 37% (*figure 42*) and for taggers was down 43% (*figure 43*). Catch rates for undersized fish was only predicted for taggers. The prediction was for no change in the catch rate based on climate predictions of El Nino during the recruitment season. However actual conditions produced strong recruitment and following strong recruitment in 2013 and moderate in 2014 the catch rate for undersized fish was up 124% and the prediction was revised to be up 120-140%.

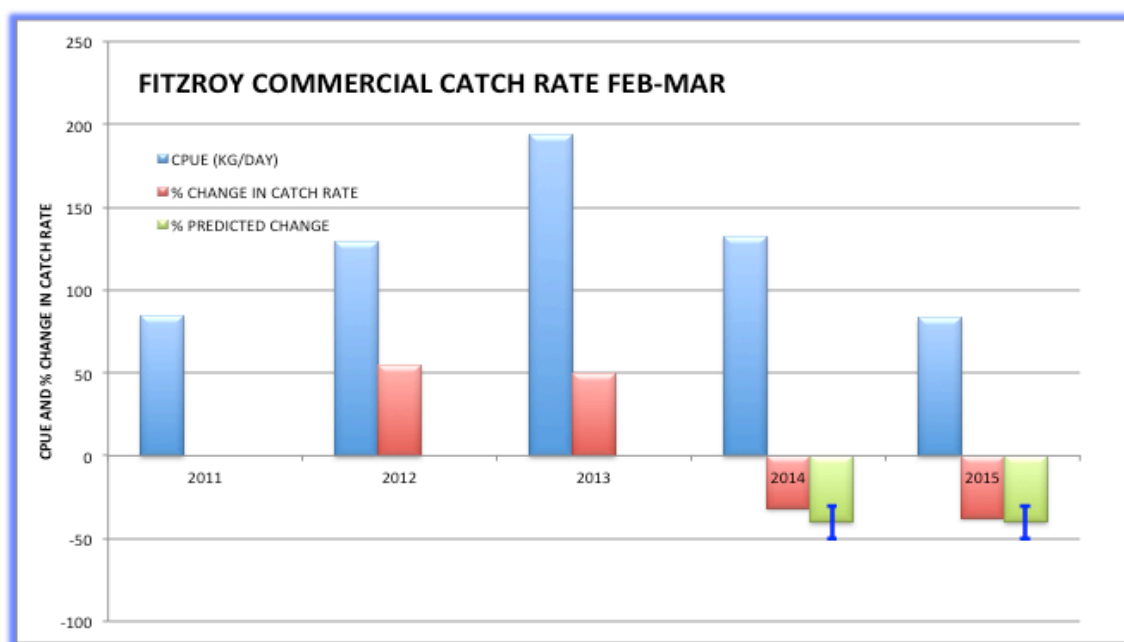


Figure 42: Fitzroy Barramundi size range predicted compared with observed Feb-Oct 2014

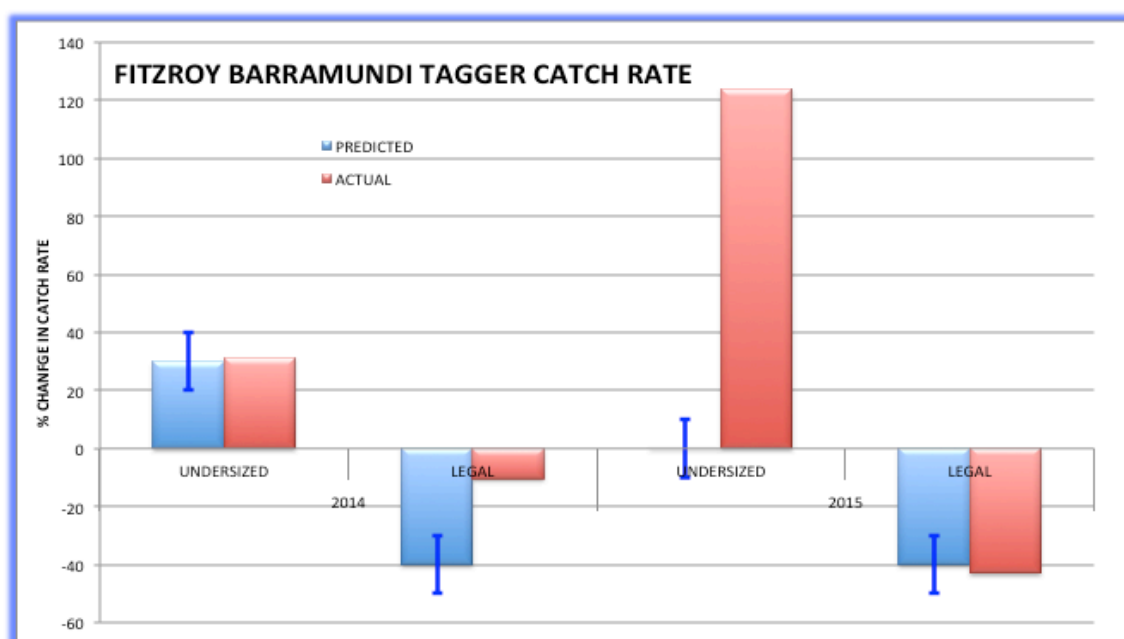


Figure 43: Gladstone Barramundi catch rates predicted compared with observed Feb-Oct 2014



Figure 44: Crystal Bowl mid-season review reports for Barramundi and Threadfin in the Fitzroy River

Figure 44 shows the 2 mid-season review reports for Barramundi and Threadfin in the Fitzroy River. The Threadfin report was the first for King and Blue Threadfin and there was a higher level of uncertainty with those predictions compared with those for Barramundi due to less data being available.

## Community Monitoring - Gladfish

Gladfish was a community monitoring project ran from 2011-2015 and monitored trends in recreational fishing in Gladstone Harbour and adjacent waterways. Data was collected through boat ramp surveys, trailer counts, tagging, recruitment surveys, attitudinal surveys, recording fish health and examining historical catches of fishing clubs. The project was funded by QGC as part of its Social Investment Management Plan.

The period 2011-2015 saw significant industrial development with 3 LNG plants constructed on southern end of Curtis Island along with a coal terminal at Wiggins Island and other developments.

At the start of 2011 Lake Awoonga spilled for the first time since the dam wall was raised in 2002. This resulted in an estimated 30,000 large Barramundi<sup>3</sup> spilling from the lake in 2 sizes with fish from 400-600mm and 800-1200mm. This had a significant impact on the fishing in the Gladstone area where Barramundi become the focus for both commercial and recreational fishers and wider community attention due to fish health issues that prevailed through 2011 and 2012.

<sup>3</sup> Estimate by the Gladstone Area Water Board was 20,000 fish spilling from Lake Awoonga



There were 3 Gladfish reports produced covering 2012-2014. The third report on this project titled "Gladfish 2014: Assessing trends in Recreational Fishing in Gladstone Harbour and Adjacent Waterways" (*figure 45*) is available from the Gladfish website [www.infofish/gladfish](http://www.infofish/gladfish).

Another report titled "The Awoonga Barramundi Story 1985-2014" (*figure 45*) traced the history of fish stocked in Lake Awoonga and where fish that spilled from the lake ended up. That report is available from the Suntag website [www.suntag.org.au](http://www.suntag.org.au).



Figure 45: Gladfish 2014 and The Awoonga Barramundi Story 1985-2014 reports

In the Boyne River fish over 800mm accounted for 60.1% of fish measured in 2011 while this was reduced to 6.4% in 2014. Fishing effort and large Barramundi dying in the Boyne River have largely accounted for the reduction. In contrast fish in the Calliope River over 800mm accounted for 45.3% of fish in 2011 and 40.2% in 2014. Fish health issues and fish dying had significantly less effect on the Calliope River.

*Figure 46* shows Barramundi recorded in the Boyne River from 1990-2014 with the influx of fish from Awoonga in 2011. This shows the reduction of fish over 800mm since 2011. A further spilling of fish from the lake in 2015 may change the size profile of fish in the river once again.

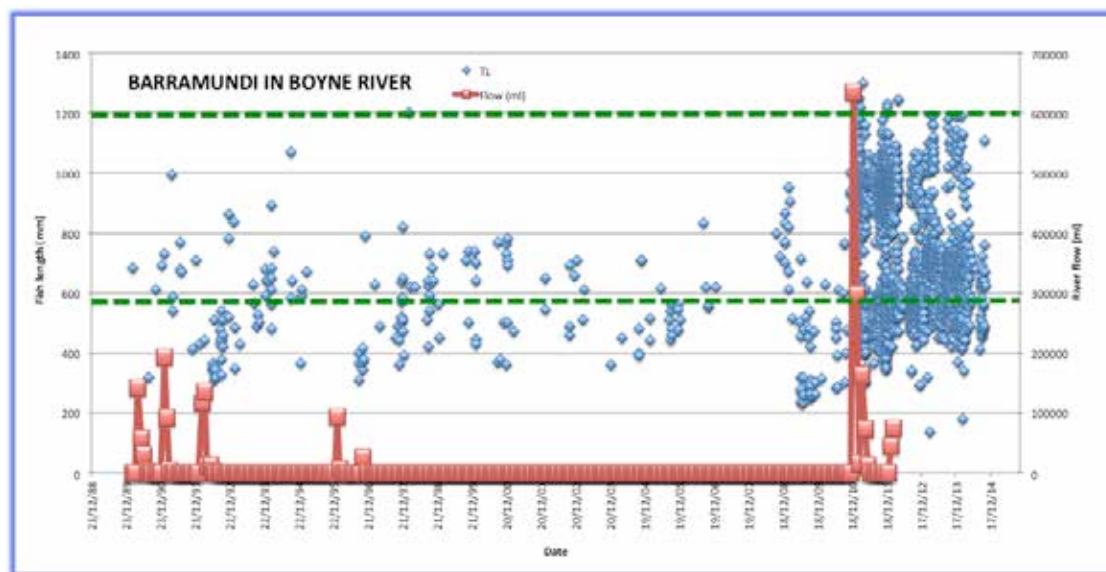


Figure 46: Barramundi in Boyne River from 1990-2014 showing influx of fish from Lake Awoonga

## Community Monitoring - Recruitment

A prerequisite to being able to predict fish stocks is the need to understand recruitment. The environmental drivers of recruitment vary from species to species and can also vary from location to location. Therefore collecting data on recruitment needs to be carried out on a local or regional scale.

Infofish has been monitoring Barramundi recruitment in Central Queensland since 1999. This year the recruitment survey data have been integrated into the Infofish 2015 database so that it could be more easily analysed with tagging and other data.

Barramundi recruitment continues to be monitored in the Fitzroy River. In Gladstone recruitment monitoring included Barramundi and Bream (Yellowfin and Pike) as part of the Gladfish project and Gladstone Healthy Harbour Partnership developing a report card on the health of Gladstone waterways. More extensive recruitment surveys were also undertaken in the Calliope River as part of a Fish Habitat Area proposal. Some initial assessment of Mulloway recruitment in Moreton Bay was also undertaken to try to identify nursery areas used by juvenile fish.

Recruitment surveys were undertaken using a castnet in nursery areas with a standardised number of casts being 5, 10 or 20 depending on the size and configuration of the site. This allows repeatability of surveys over time so that changes in recruitment can be measured. When recruits reach 150mm they are tagged so that they can be tracked over time.

Barramundi recruitment is strongly correlated to rainfall, river flows and timing of flows. A recruitment predictor was developed based on tagging data from 1985-1999 and on recruitment surveys and tagging since 1999. *Figure 47* shows the predicted level of recruitment each and the number of recruits recorded in the Fitzroy River and 12 Mile Creek (reference site). Years where there are all green bars are years of strong recruitment.

YEAR	FLOW AND TIMING						FITZROY RIVER			12 MILE		RECRUITS	
	monthly flow >0.5GL	wet season flow Dec-Mar >1.5GL	Max flow Jan-Feb	low flow previous Sept-Nov <0.5GL	12 mile rain >150mm Jan-Feb		monthly flow	wet season flow	low flow previous Sept-Nov	12 mile rain	rain timing	Fitzroy recruits Jan-Oct	12 Mile recruits Jan-Oct
1988	✓	✓	✓	✓								95	68
1989	✓	✓		✓								247	29
1990				✓								53	1
1991	✓	✓	✓	✓	✓							421	179
1992				✓	✓							52	7
1993				✓								7	0
1994				✓	✓							10	0
1995			✓	✓	✓							7	1
1996	✓	✓	✓	✓	✓							1594	1496
1997		✓		✓	✓							88	42
1998				✓								16	8
1999	✓	✓	✓		✓							232	138
2000				✓								71	17
2001	✓	✓	✓	✓	✓							568	487
2002				✓								38	6
2003	✓	✓			✓							28	4
2004	✓		✓	✓	✓							257	32
2005		✓		✓	✓							173	64
2006				✓								46	6
2007				✓								18	0
2008	✓	✓	✓	✓	✓							1402	401
2009	✓	✓	✓	✓	✓							691	120
2010	✓	✓	✓	✓	✓							1477	543
2011	✓	✓	✓		✓							107	23
2012				✓								60	7
2013	✓	✓	✓	✓	✓							405	316
2014	✓		✓	✓	✓							283	101
2015	✓	✓	✓	✓	✓							434	387
	Conditions outside range											Jan-Feb	<=250mm
	Conditions close to range											Mar-Apr	<=300mm
	Conditions inside range											May-Aug	<=350mm
												Sep-Oct	<=400mm

Figure 47: Recruitment predictor for Barramundi in Central Queensland

For Barramundi data from recruitment surveys and tagging are combined to provide the number of recruits/fisher/day so that the strength of recruit can be compared with the predictions and from year to year. Recruitment is assessed as strong, moderate or poor.

Figure 48 shows the number of recruits/fisher/day for the Fitzroy River and the Gladstone area. This shows that recruitment is much stronger in the Fitzroy and 2015 is likely to be the third strongest recruitment years since 1999.

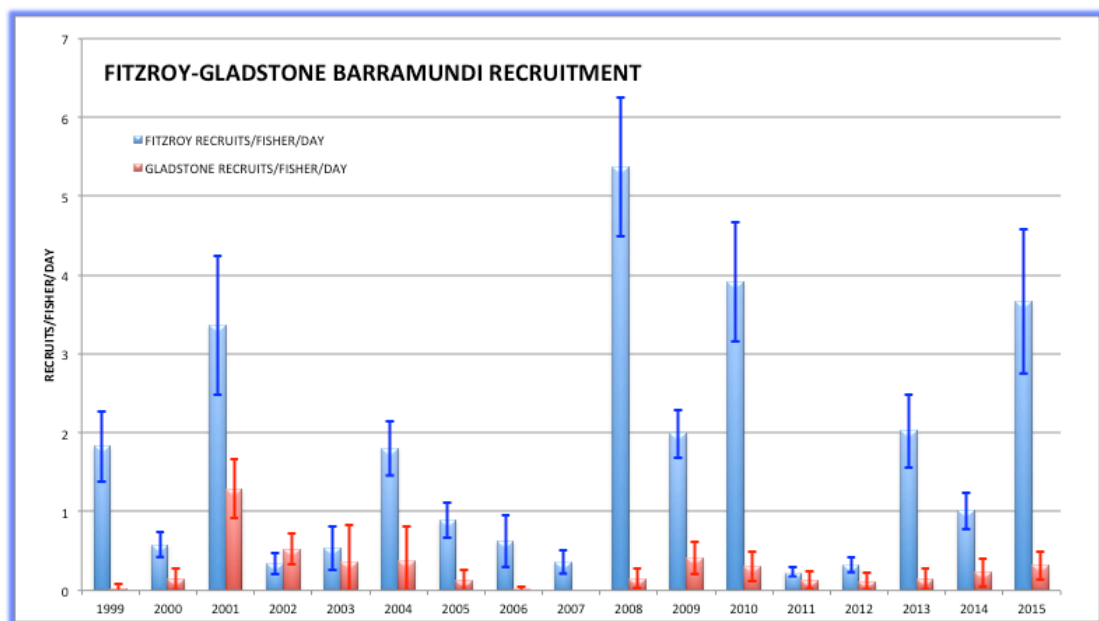


Figure 48: Barramundi recruitment strength in the Fitzroy River and Gladstone from 1999-2015

This was the first year where Bream (Yellowfin and Pikey) were the focus of recruitment surveys in the Gladstone area (*figure 49*). There were 103 surveys undertaken at 32 sites for a total of 51 fish and 4 crustacean species and 7,701 individuals recorded. Yellowfin Bream were recorded at 27 sites (84%) and Pikey bream were recorded at 19 sites (59%). *Figure 50* shows the Bream catch rates based on local areas.



Figure 49: Bream recruits recorded during Gladstone recruitment surveys

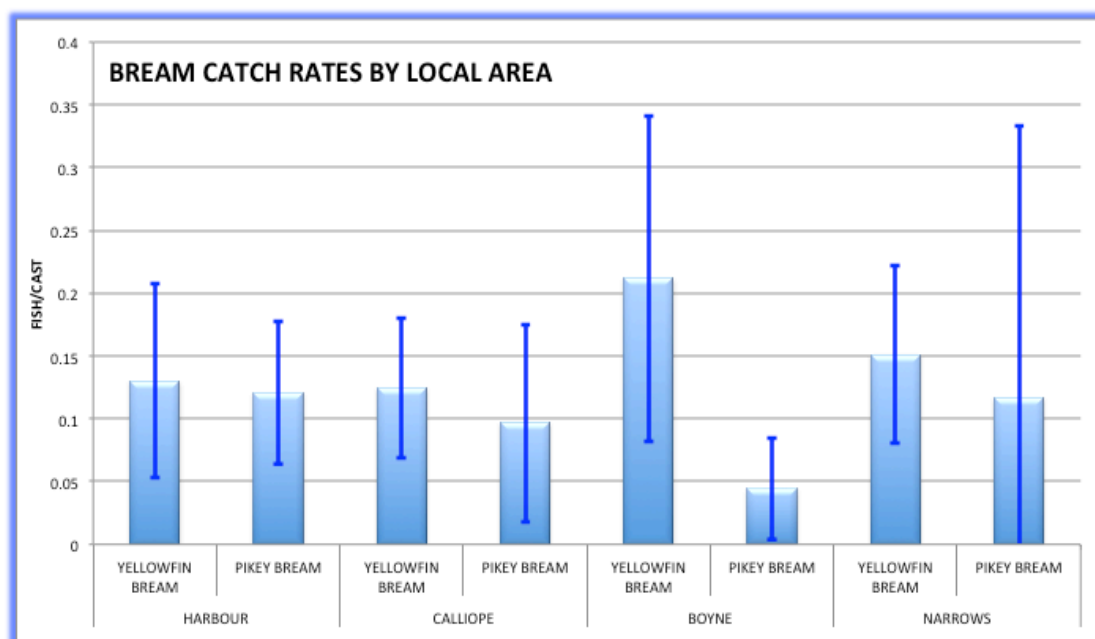


Figure 50: Catch rates of Bream recruits by local area in Gladstone



## Community Monitoring - Stocked Fish

Tagging of stocked fish commenced shortly after the introduction of the Recreational Fishing Enhancement Program in the 1980s. In the late 1990s stocking of larger Barramundi around 200-300mm commenced and since then the practice has been adopted by a number of stocking groups. A number of groups have tagged these batches or a subset to monitor them over time. This is an effective way of monitoring these fish as it provides data over a long period of time at little cost after the initial investment in tags.

Tagging has provided data on growth of fish in different impoundments, survival of Bass during low water levels during drought and the escapement of fish when dams spilled during flooding.

In 2007/08 funding was provided by the Queensland government to assist stocking groups to increase monitoring of stocked fish through tagging and to produce a number of reports on stocked fish. That resulted in 3 reports:

- ✦ Summary of tagging of stocked fish in impoundments and waterways of Queensland 1987-2007
- ✦ Growth, movement and survival of stocked fish in impoundments and waterways of Queensland 1987-2008
- ✦ Fish death events: Impact on stocked fish - winter 2007

Tagging allows stocking groups to monitor their stockings in a cost effective way and provides data on growth, movement, survival and mixing with wild populations. That data can then be used to refine stocking practices in the future.

A number of Suntag mini-reports have been produced in relation to tagging of stocked fish. These were:

- ✦ Monitoring Australian Bass In the Brisbane River 1990-2013
- ✦ Tagging Stocked Fish in the Cairns area 2002-2013
- ✦ Tagging Australian Bass and Golden Perch in the Burnett River catchment 1986-2014
- ✦ The Awoonga Barramundi Story 1985-2014

This year saw the first Suntag Barramundi recaptured over 20 years after it was tagged. The fish was tagged in Oct 1994 and recaptured in Nov 2014. The fish was 550mm when tagged and 1,230mm when recaptured. *Figure 51* shows the Barramundi recaptured by Zac Wilkinson.

An Australian Bass tagged in Lake Boondooma on the Boyne River in 2006 was recaptured 7.4 years later in 2014 in Splitters Creek near Bundaberg. After going over the dam wall it went downstream 320km over weirs and another dam wall.

*Figure 52* shows the growth of Lake Awoonga Barramundi compared with days out between tagging and recapture. Growth after 1 year was around 320mm, after 2 years was around 468mm and after 5 years was around 784mm. Based on that growth a fish stocked at 216mm would reach 1m in length 5 years after release.



Figure 51: Barramundi recaptured in Lake Tinaroo was first fish to be recaptured after 20 years at liberty

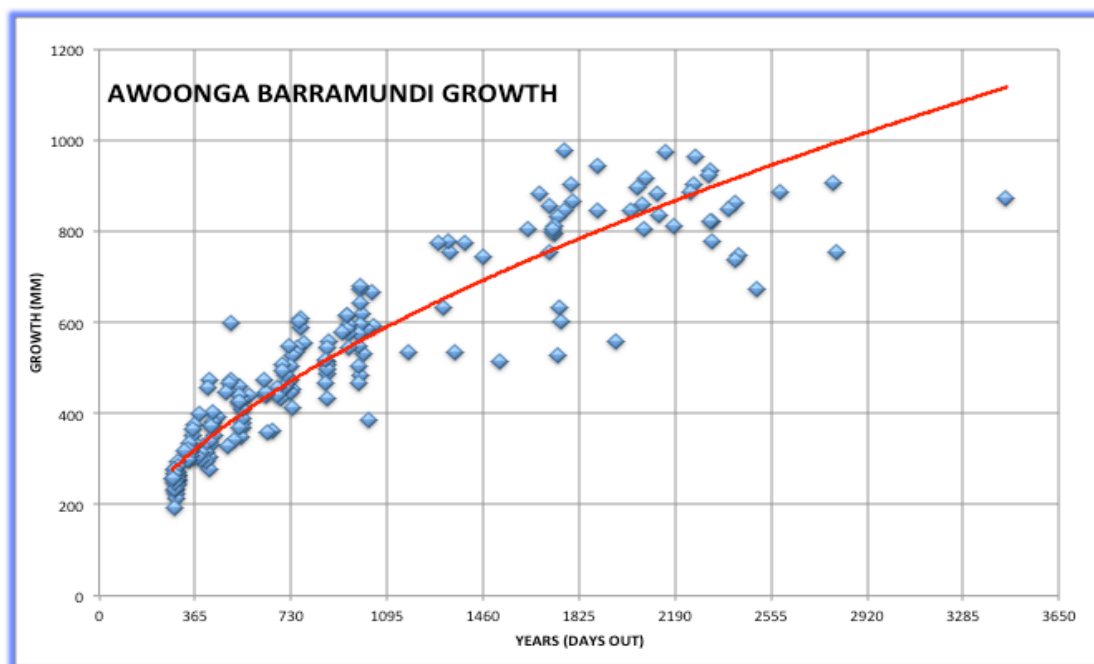


Figure 52: Growth of Barramundi stocked in lake Awoonga

## Community Monitoring - Fishing Competitions

There is a growing trend in fishing competitions to include the tagging of fish. Some events offer prizes for the recapture of a tagged fish while others use tagging to monitor their local fisheries. Many fishing clubs or groups are looking to use data they have collected over long periods of time, particularly during competitions, to assess trends in their local or regional fishing. The following fishing competitions have a tagging component supported by Suntag:

- ✦ Rocky Barra Bounty at Rockhampton (1999-2014)
- ✦ Boyne Tannum Hookup at Gladstone (2000-2015)
- ✦ Bundaberg VMR Family Fishing Classic (2007-2015)
- ✦ Lake Moondarra Fishing Classic (2012-2014)

Catch and effort data from the first 2 competitions have also been collected as part of the CapReef, Crystal Bowl and Gladfish programs.

The Rocky Barra Bounty targets Barramundi in the Fitzroy River and has been held in Sep-Oct each year for the past 15 years. The Rocky Barra Bounty is a tag and release only event with fish tagged and released where caught with a photograph providing evidence of the catch. It has received a 5 star rating under the NEATFish competition accreditation system (see [www.neatfish.com](http://www.neatfish.com)).

Catch rates in the Bounty are used, along with other data, to assess trends in catch rates in the Fitzroy River. *Figure 53* shows the catch rates from 1999-2014. In 2006 towards the end of a long dry period it took 43.1 hours to catch a Barramundi while in 2011 it was 1.6 hours. In that year the event went for 1,200 minutes and there were 1,210 Barramundi caught (1 fish/minute). In 2014 it took 8.9 hours of effort to catch a Barramundi. Further details of the event are available from [www.rockybarrabounty.com](http://www.rockybarrabounty.com) and a report titled "Rocky Barra Bounty meets Crystal Bowl" is available from [www.crystal-bowl.com.au](http://www.crystal-bowl.com.au).

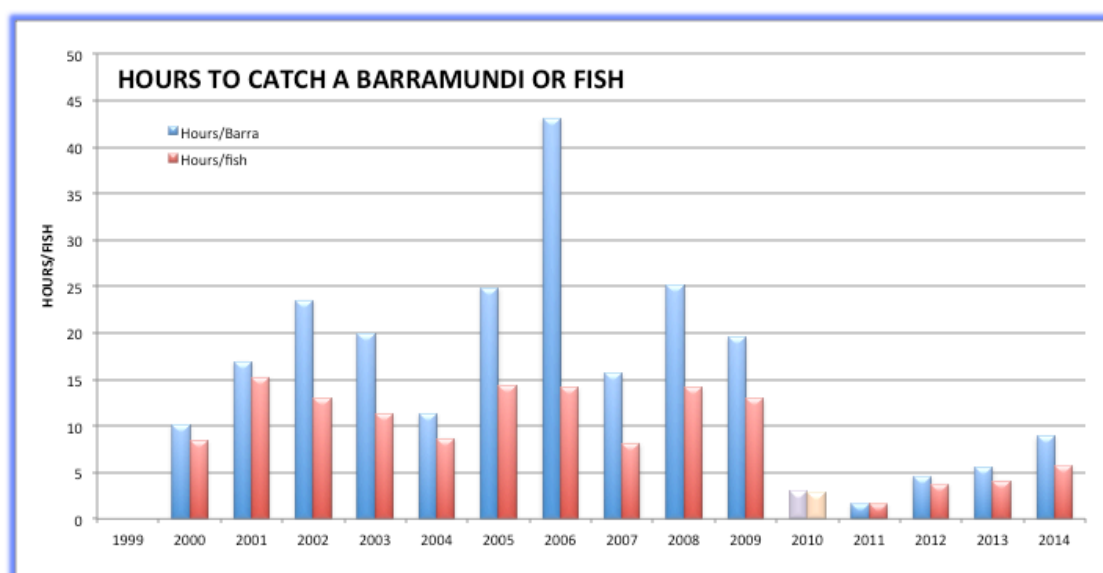


Figure 53: Hours to catch a Barramundi or fish in the Rocky Barra Bounty 1999-2014

The Boyne Tannum Hookup in Gladstone is one of the largest fishing competitions in Australia with around 3,000 participants. From 2000 the Gladstone Sportfishing Club has managed a live weigh-in section of the event where fish are brought in alive, tagged, held in display tanks and then released.

All fish have been released at the competition headquarters at Bray Park near the mouth of the Boyne River. Of the fish recaptured 75.3% were recaptured within 6 months and 97.1% were recaptured within 20km of where released. *Figure 54* shows the distance fish moved compared to the time at liberty. Details of tagging and catch and effort data collected at the Hookup are in the Gladfish 2014 report available at [www.info-fish.net/gladfish](http://www.info-fish.net/gladfish).

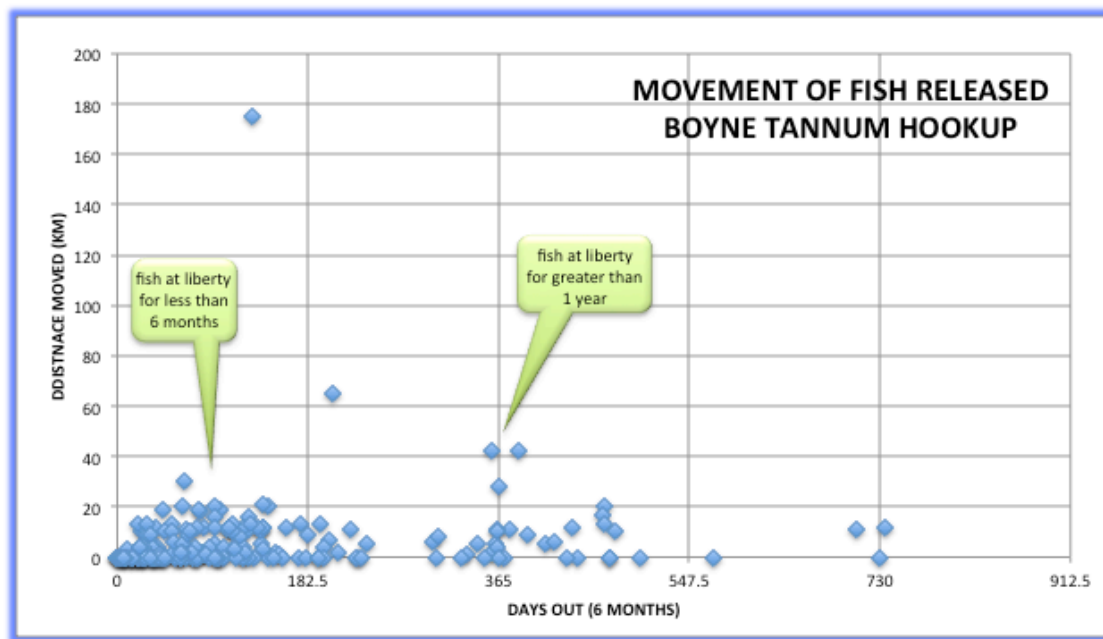


Figure 54: Movement of tagged fish released at the Boyne Tannum Hookup

The Bundaberg VMR Fishing Competition held in June each year also has a live weigh-in section and for the last 6 years fish presented at the weigh-in have been tagged and released by the Bundaberg Sportfishing Club. Key species have been Yellowfin Bream and Dusky Flathead although a number of other species have also been tagged.

The overall recapture rate for fish released to 2014 was 4.3% as the 2015 event has just been completed. *Figure 55* shows the number of fish tagged in each competition and the recapture rate of fish tagged each year. All fish were released at the Burnett Heads marina. Of those recaptures 64.1% were recaptured within 6 months and 87.2% recaptured within 20km of where released.



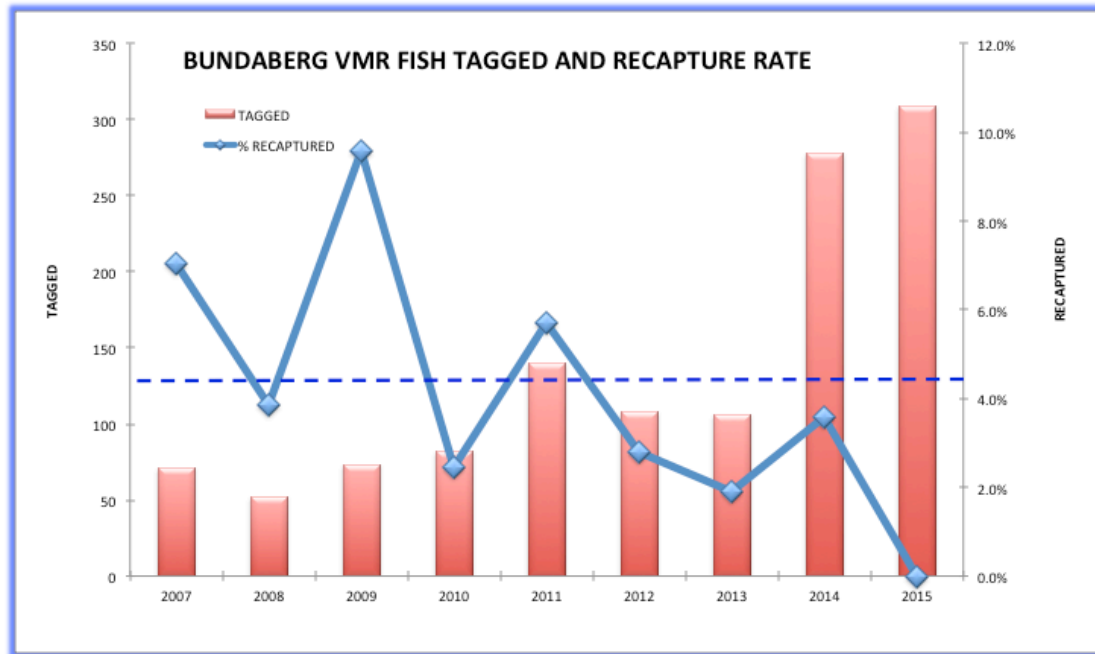


Figure 55: Numbers of fish tagged and percentage recaptured in each Bundaberg VMR competition from 2007-2015

## Community Monitoring - Fish Health

Storing photos of individual tagged or recaptured fish was added to the database in 2011/12. This was to supplement the textual data with image data. An early use for this facility has been in assisting to monitor fish health in Gladstone. Fish health issues in Gladstone surfaced around the middle of 2011 and were the subject of extensive investigations in 2011/12.

Suntag has played a part in collecting data on the health of fish, particularly Barramundi, through getting taggers to photograph their tagged fish to provide a record of their health status and report any lesions or other health issues. A health assessment scale was provided by DAFQ and is in use on Barramundi in that area and especially in the Boyne River.

While the incidence of sick or dead fish in the Gladstone area has diminished there have been dead fish, mostly large Barramundi, recorded in the Boyne River every year since then. *Figure 56* shows 1 of a small number of large dead Barramundi recorded in the lower Boyne River in Feb 2015.

A number of diseased Mullet were recorded during recruitment surveys in 2015. While the overall incidence of diseased Mullet was very low of 57 fish recorded over 150mm there were 3 (5.7%) diseased fish. *Figure 57* shows a diseased Mullet recorded at Callemondah in Dec 2014. While the incidence of dead Barramundi was mostly in the Boyne River the diseased Mullet were recorded in Auckland Creek and the Calliope River.



Figure 56: Dead Barramundi in the Boyne River Feb 2015



Figure 57: Diseased Mullet at Callemondah in Dec 2014

## Community Monitoring - Catch and Effort

From 1996/97 Suntag extended its data collection to obtain details of catch and effort of fishing trips undertaken by taggers. This covers estuary, offshore and freshwater fishing and provides catch and effort data for those participating. In 2005/06 with the introduction of the Infotish 2006 database this significantly improved the collection of catch and effort data. There are now 44,200 trips (3,200 added this year) in the database with catch and effort.

From 2005/06 the calculation of catch and effort has been confined to a number of clubs that have provided consistent data since then. Catch and effort is only assessed for the following clubs:

- ✦ Brisbane Sportfishing Club (Moretag)
- ✦ Captag
- ✦ Gladstone Sportfishing Club
- ✦ Ipswich United Sportfishing Club
- ✦ Bundaberg Sportfishing Club
- ✦ Suntaggers
- ✦ Brisbane Valley Anglers

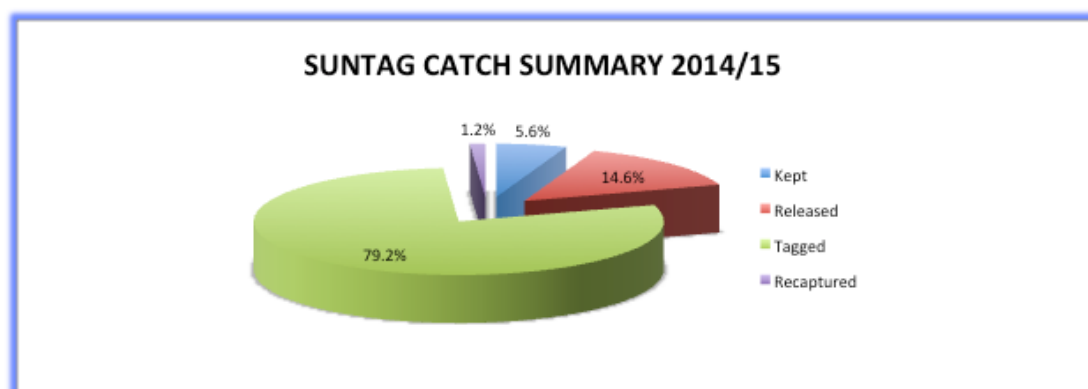


Figure 58: Summary of Suntag catch by fate of fish

Figure 58 shows the fate of fish caught by Suntag taggers in 2014/15. Of the fish caught 5.6% were kept, 79.2% were tagged and 14.6% were released without tags. There were 1.2% of fish caught that were recaptures with 95% of those re-released.

Effort is measured by the total time at or on the water, which includes travel time on the water and any time spent collecting bait or doing other things. This is considered to be the simplest means of collecting time and has proven to provide consistent data. This provides a lower catch rate than if fishing time only were used.

For the clubs assessed there were a total of 12,802 trips recorded for Suntag taggers since 2004/05. The total time spent fishing is 102,709 hours for 157,536 fish caught or 1.53 fish per hour of effort.

In 2014/15 there were 1,686 trips recorded for 12,527 hours of effort and 12,371 fish caught or 0.99 fish per hour of effort. The average Suntag tagger trip was 1.4 fishers fishing for 5.1 hours. On each trip there was an average of 7.4 fish caught of which 0.4 fish were kept.

## Community Monitoring - Released Fish Survival

There are now 30 species, as shown in *figure 59*, where the survival rate of released fish has been estimated from research experiments. The types of experiments have varied widely with many variations in results however the estimated survival rates are considered to be a reliable estimate.

The 3 simple best practices that have the most effect in maximising survival of released fish to the greatest extent are:

- ✦ Minimise fish playing time and handling time to the shortest time possible
- ✦ Use hooks and fishing techniques that minimise deep (gut) hooking of fish
- ✦ Use knotless landing nets to land fish that are to be released

For deep water (particularly reef) species there is an additional best practice:

- ✦ Learn to recognise the symptoms of barotrauma and how to deal with it

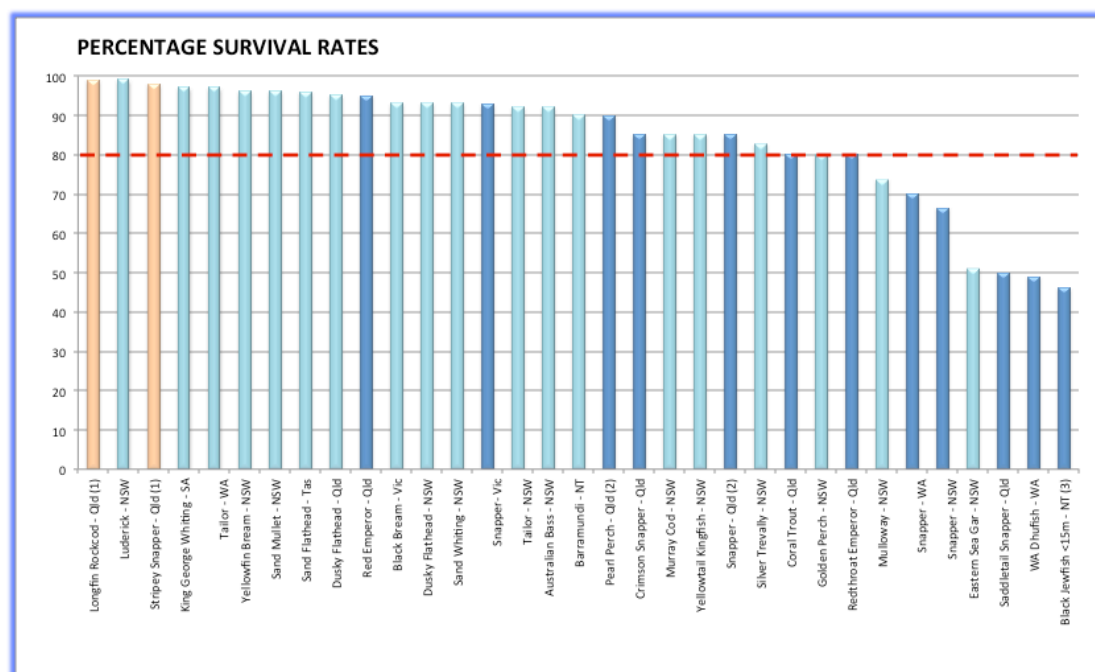


Figure 59: Survival rates from research for key Australian recreational fish species

### Deep hooking

Deep hooking has been recognised as a major contributor to mortality of fish. Since 2003/04, Suntag has continued to collect data from taggers on hooking locations to assess the level of deep hooking. *Figure 60* shows a summary of hooking locations using bait or lure. A total of 91,000 hooking locations have been recorded with 10.6% of bait caught fish deep hooked and 2.1% of lure caught fish deep hooked.



Figure 61 shows the deep hooking rate for 5 key species. The rate of deep hooking on bait was highest for Dusky Flathead at 27.6% and lowest for Red Emperor at 7.7%. The rate of deep hooking on lure was highest for Barramundi at 2.7% and lowest for Yellowfin Bream at 0.5%.

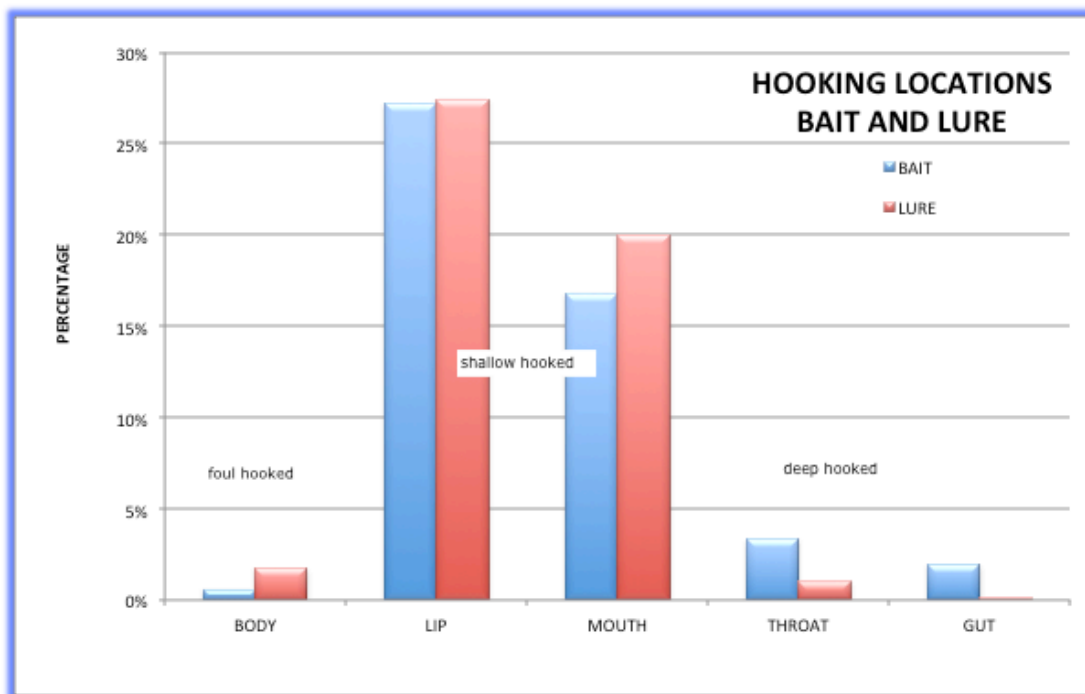


Figure 60: Summary of hooking locations using bait or lure

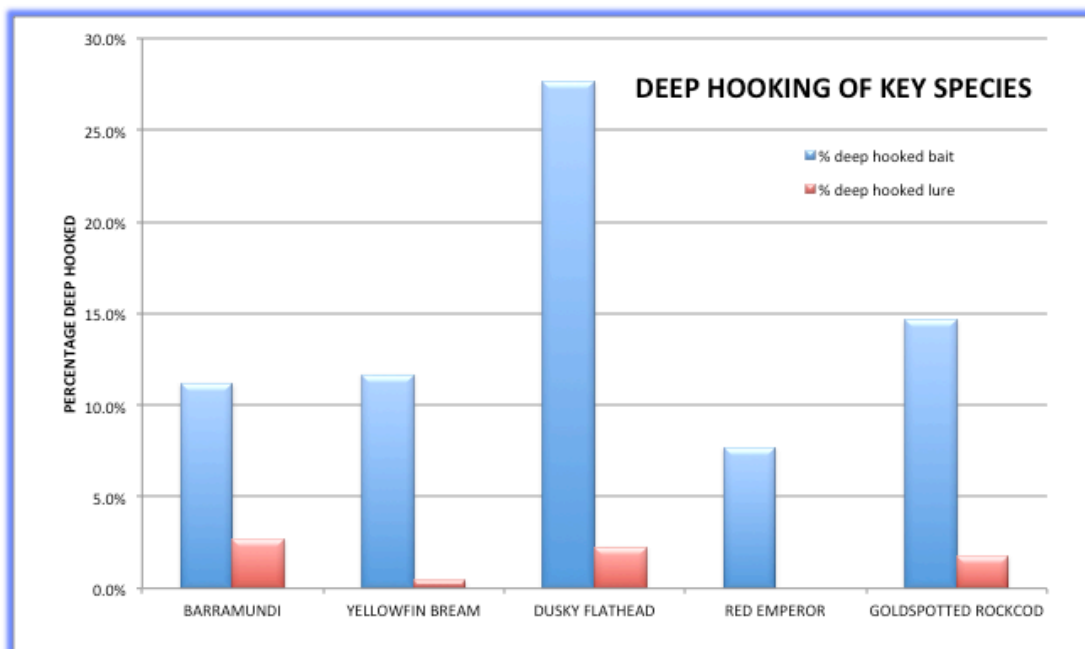


Figure 61: Summary of hooking location using bait or lure recorded by Suntag

## Barotrauma

In *figure 59* reef species are shown in yellow and dark blue. These species when caught, particularly from depths greater than 15-20m, will show the symptoms of barotrauma.

(1) These are reef species caught in deep water however the survival rates are based on fish caught in shallow water <10m.

(3) The research indicates that the survival rate for fish from greater than 15m was near zero.

Barotrauma is a major contributor to mortality. It affects fish caught in deep water and is mostly related to reef species but can affect fish caught at depth, even in freshwater lakes. Barotrauma symptoms generally can be observed in fish caught in depths of 15m or more. Symptoms of barotrauma are:

1. Swollen and hardened stomach (mild symptom)
2. Stomach protruding from mouth (severe symptom)
3. Bulging eyes (severe symptom)
4. Bubbles in the blood if the fish is bleeding (severe symptom)
5. Raised scales standing out from body (severe symptom but only on some species)
6. No symptoms visible (for fish from very deep water may indicate that the swim bladder has burst)

While there are differing views on dealing with barotrauma, and some of the research is inconclusive as to its benefits, fishers are still encouraged to deal with it (especially if they have the skills in the release methods). Methods for dealing with barotrauma:

1. No treatment (generally OK for fish from shallow water <15m)
2. Venting gases from swim bladder with a hollow needle (needs knowledge of where to vent).
3. Use a release weight to get the fish back down to the bottom.
4. Use a bottomless cage to return the fish to depth.

Equipment for venting, release weights and cages is available to a limited extent commercially however many fishers improvise, sometimes using inappropriate tools such as a fishing knife for venting.

## Support for Research Projects

As well as the projects already mentioned Suntag in Queensland provides support to a number of research projects. That support is generally in the form of collecting tag and recapture data, long-term data storage, and in some projects assistance with the tagging.

In 2014/15 Suntag supported the following additional research and monitoring projects:

- ✦ Mud Crab tag and recapture data in the Barron River by Holloways Beach Environment Education Centre
- ✦ Barramundi and Mangrove Jack in the Johnstone River by DAFQ
- ✦ Queensland Lungfish and other species being monitored in the Burnett River by DAFQ
- ✦ Stocked Bass in Lake Samsonvale at Brisbane by SEQwater and Pine Rivers Fish Management Association
- ✦ Fish monitoring in Logan-Albert Rivers by SEQwater

- ✦ Environmental impacts of stocked Barramundi research in North Queensland by DAFQ
- ✦ Monitoring of Murray Cod in the Dumaresq River in South Queensland by DAFQ
- ✦ Mud Crab tagging on Gold Coast by Griffith University
- ✦ Monitoring of Barramundi in the McArthur River by King Ash Bay Fishing club

While a number of these projects have been completed fish tagged during them continue to be recaptured and that will continue for some years into the future.

## Suntag Data Requests, Reports and Scientific Publications

With the volume of data that are now in the Suntag database there are many significant datasets that are associated with specific projects. Every year there are requests for data from Suntag to be used in technical reports and scientific publications as well as reports associated with community monitoring projects. Many of those reports are produced in conjunction with other programs such as Crystal Bowl (*see Crystal Bowl section*), reports on monitoring of stocked fish (*see Stocked Fish section*) and reports on fishing competitions (*see section 15*). This year there were a further 3 technical reports that were published that used Suntag data.

In 2014/15 there were 36 requests for subsets of data from the database ranging from recreational Barramundi catch for Fitzroy River and Gladstone 2010-2014 for Barramundi stock assessment by DAFQ, Barramundi recruitment data for Fitzroy River 2013-2015 for the Fitzroy Partnership for River Health, Golden Snapper tagging in the Mossman area, time from tagging to recapture of Barramundi in Tinaroo and Awoonga for Kimberley Training Institute in Western Australia to Google Earth maps of proposed Net Free Area in Mackay for Mackay Recreational Fishing Alliance.

## Westag in 2014/15



### Westag Highlights for 2014/15

Westag commenced in 1998/99 managed by ANSA WA. Westag adopted the Infotish database in 2011 and Infotish has provided technical support since then. In 2014 Infotish ran a Citizen Science workshop in conjunction with Westag in Perth looking to provide a more coordinated approach to citizen science and tagging. A report titled “Developing a Citizen Science Culture among Western Australian Recreational Fishers” is available outlining the outcomes from the workshop.

Westag tagging and fishing trip highlights<sup>4</sup> for the year were:

- ✦ A total of over 1,005 taggers have now participated in Westag and 814 fishers have reported the recapture of a tagged fish
- ✦ Total tagged fish in the database is now over 36,600 and over 1,320 recaptures
- ✦ Key species tagged with recapture rates were Samsonfish 10,060 (2.5%), Barramundi 4,080 (3.4%), Mangrove Jack 3,950 (3.1%), West Australian Dhufish 2,000 (9.5%) and Sailfish 1,880 (0.1%).

<sup>4</sup> All figures to 30 June 2015 as at 31 July 2015

## Westag Participation

A total of 1,005 taggers have participated in Westag having tagged fish since 1988/89. In 2014/15 there were 42 participants that tagged at least one fish. There have also been 814 fishers that have reported a recapture of a tagged fish.

Numbers participating in Westag peaked from 2004/05 to 2005/06 where over 100 taggers tagged fish each year. There were also over 150 taggers in 2010/11. Participation in Westag is shown in *figure 62*.

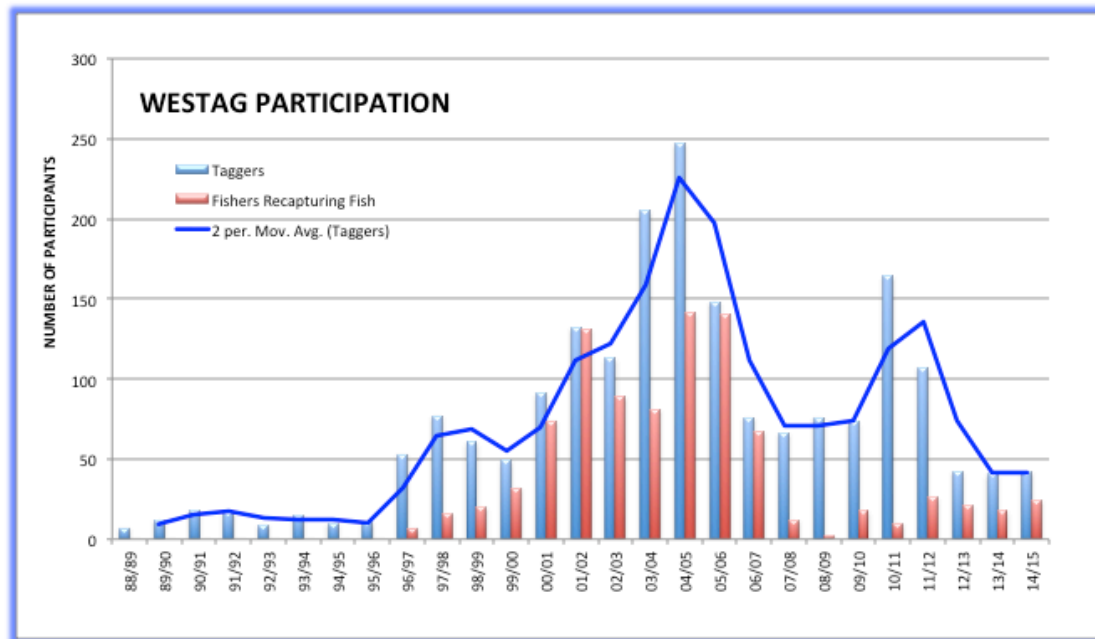


Figure 62: Summary of participation in Westag from 1988/89 to 2013/14

## Westag Fish Tagged and Recaptured

The Westag database now has over 37,500 tagged fish records. There have been over 1,350 recaptures over the same period. The overall recapture rate is 3.6%. *Figure 63* shows the number of fish tagged and recaptured each year since 1988/89. In 2014/15 there were 507 fish tagged and 27 recaptures recorded.

Tagging peaked from 2000/01 to 2009/10 there were over 1,000 fish tagged each year with a peak of 6,415 in 2004/05.

The number of fish tagged in the last few years is greater than shown as taggers have not submitted all tag records. Efforts are underway to collect old tagging records as there are a number of recaptures where there is no corresponding tag record.

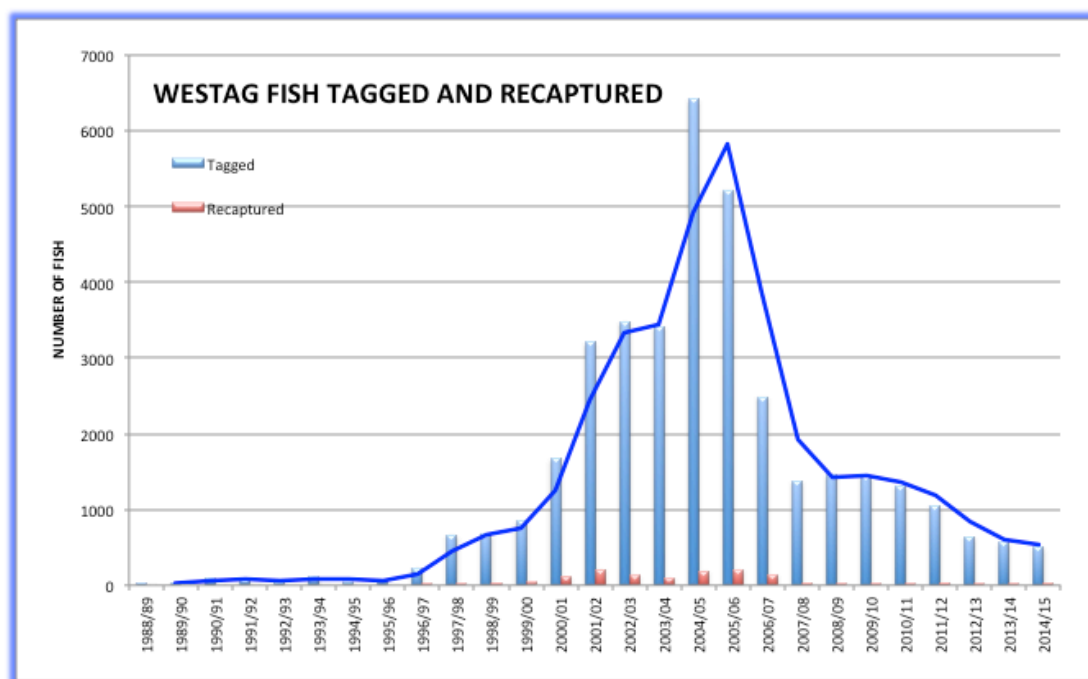


Figure 63: Westag fish tagged and recaptured each year from 1988/89 to 2013/14

## Westag Key Species Tagged and Recapture Rates

There were 17 species where over 500 fish were tagged as shown in *figure 64*. Key species and their recapture rates are Samsonfish 10,066 (2.5%), Mangrove Jack 4,727 (2.7%), Barramundi 4,725 (3.1%), West Australian Dhufish 2,089 (10.6%) and Sailfish 1,884 (0.1%).

While many fish are recaptures several times the recapture rates here are based only on a single recapture of each fish. Species with a recapture rate of over 5% were Mulloway with the highest recapture rate (18.7%) followed by West Australian Dhufish (10.6%) and Pink Snapper (7.8%).

Other species where the recapture rate was above the overall average of 3.6% were Tailor (3.7%) and Black Bream (4.1%).

Species with a low recapture rate of less than 1% were Black Marlin (0%), Sailfish (0.1%), Spangled Emperor (0.4%), Coral Trout (0.8%) and Spanish Mackerel (0.5%).



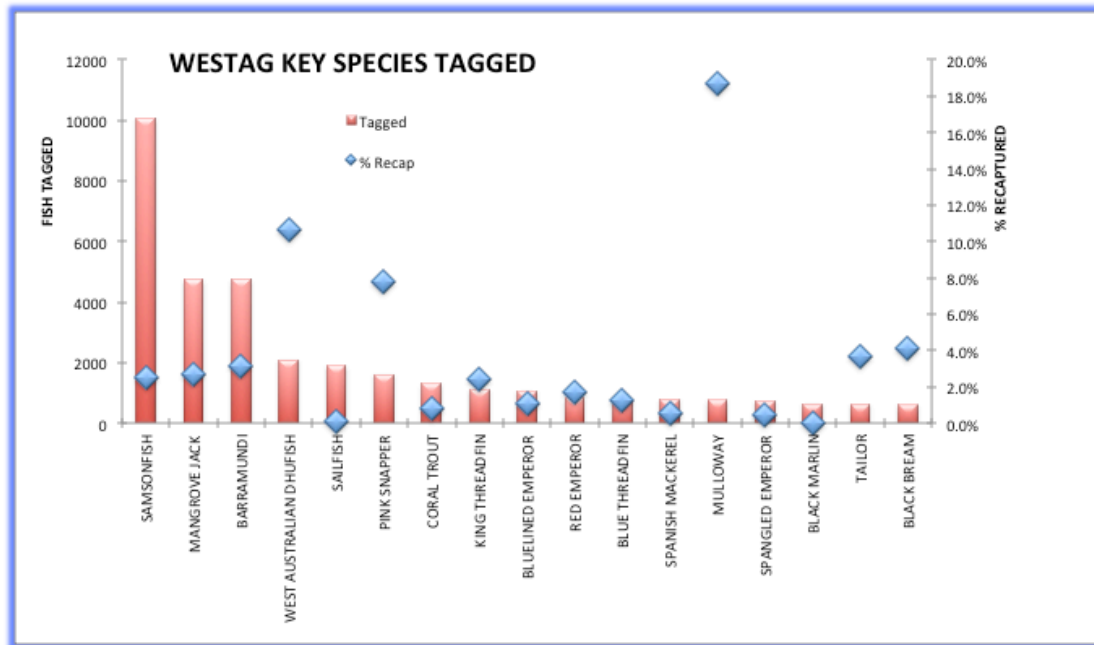


Figure 64: Westag key species tagged and recapture rates

## West Australian Dhufish

From 1996-2015 there were 2,089 West Australian Dhufish tagged. *Figure 65* shows the numbers tagged each year, average length and the size range of fish tagged. The largest Dhufish tagged was fish of 1,260mm in 2002/03.

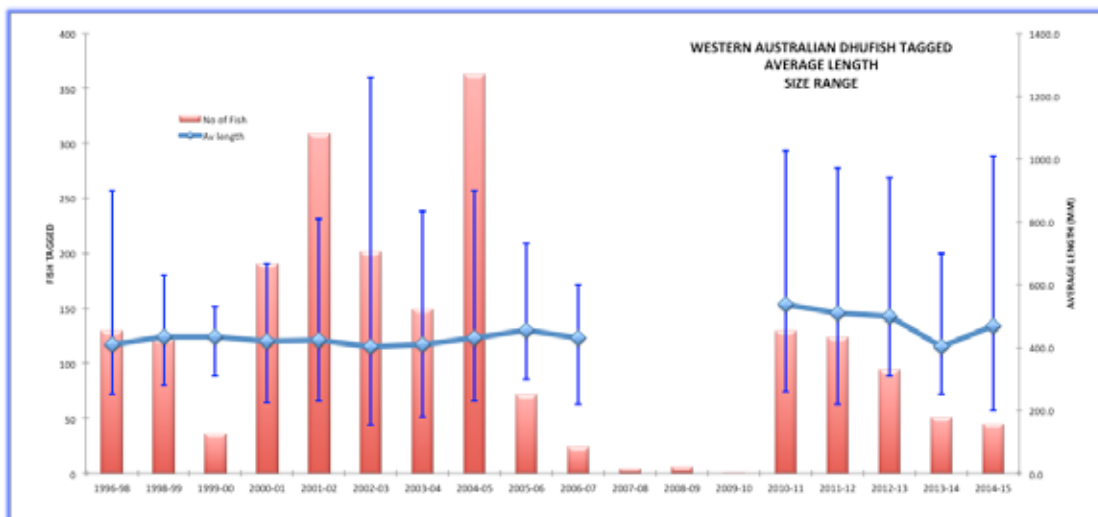


Figure 65: West Australian Dhufish tagged, average length and size range

Depth of capture was recorded for 1,947 Dhufish and *figure 66* shows the recapture rate for fish tagged at different depths. The recapture rate for fish tagged in over 100m depth needs to be treated with caution due to the low number (14) of fish tagged.

Release method was recorded for 968 Dhufish and *figure 67* shows the recapture rate for fish released using different release methods. The highest recapture rate of 11.1% was for fish released using shotline (release weight used to return fish to the bottom).

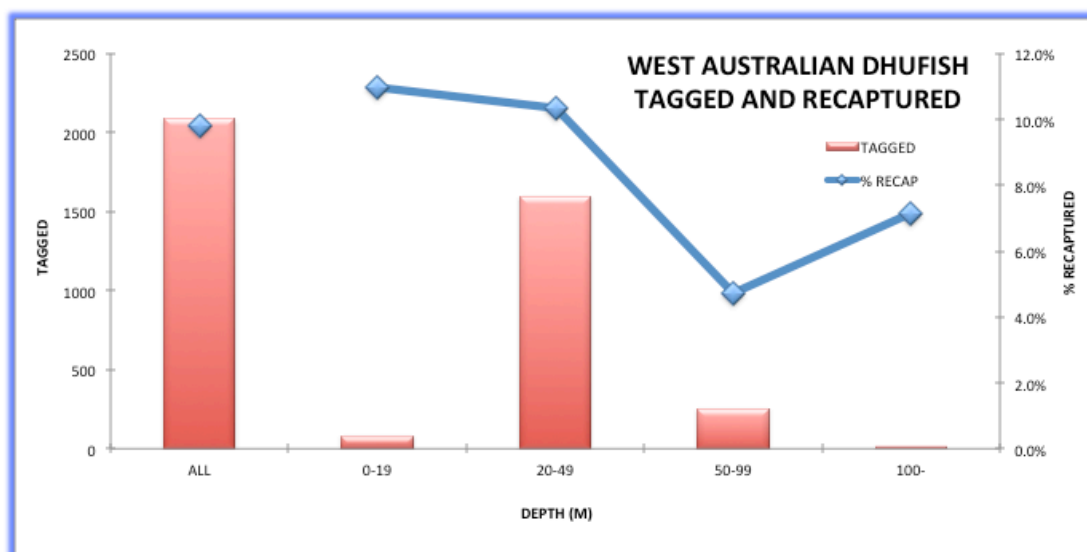


Figure 66: West Australian Dhufish tagged at different depths and recapture rates

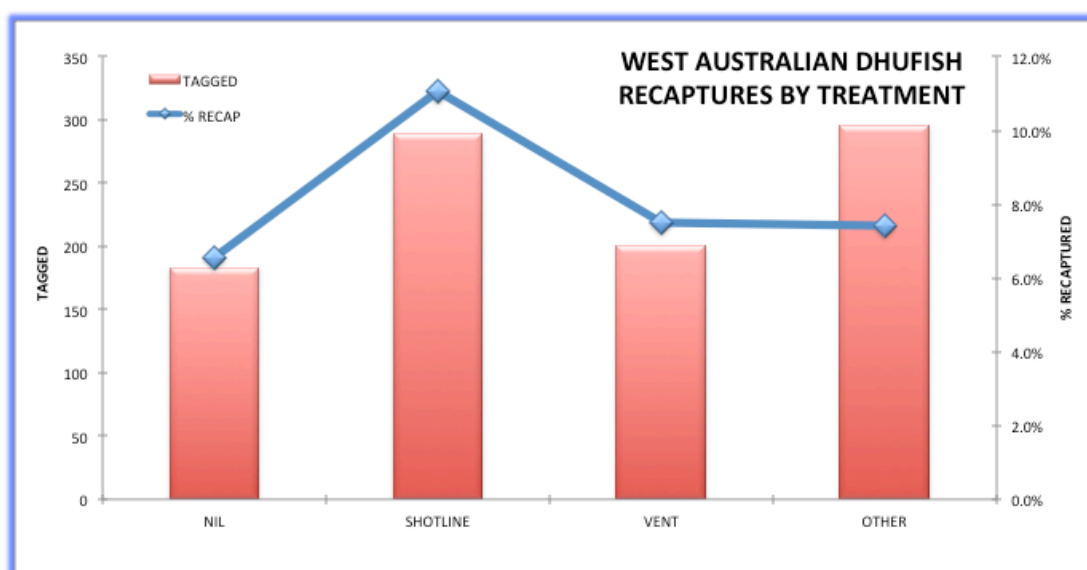


Figure 67: West Australian Dhufish tagged and recapture rate from different release methods

## Where to in 2015/16?

The year saw a continuing shift in focus from collecting data to providing an information service to industry and the community. As part of that process the Crystal Bowl concept for predicting Barramundi stocks was extended to Gladstone and to Threadfin in the Fitzroy River.

The introduction of Suntag mini-reports, revamped eNews bulletins, use of Google Earth, Facebook and YouTube has significantly changed the delivery of information. The Suntag and other websites have become the repository of reports and more detailed information.

These are the main target areas for improvement in 2015/16:

- ✦ Continued improvement in the use of technology to deliver an information service that is relevant to industry
- ✦ Continued development of the Crystal Bowl concept with extension to other species and other locations
- ✦ Development of proposals in relation to data collection in proposed Net Free Areas
- ✦ Million Dollar Fish promotion in Northern Territory
- ✦ Continued recruitment surveys in the Fitzroy River and Gladstone
- ✦ Integration of data collected on fish frames into the Infofish database
- ✦ Continued expansion of intelligence gathering from the community, particularly in relation to recruitment of key species and fish deaths
- ✦ Improve training of taggers through Suntag Training Online

Underpinning all that will be the need to continue the expansion of funding sources so that these developments can be realised.



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