

# NORTHERN INLAND BIOREGION

## ABOUT THE BIOREGION

The Northern Inland Bioregion, which encompasses the northern half of Western Australia, is predominantly a desert area, with few permanent water bodies. As a result of occasional summer cyclones, the various river systems flow at flood levels for short periods before drying-out to residual waterholes. The only exceptions to this are man-made dams, which trap rainfall for water supply purposes and irrigation.

The only significant fishable water body in the region is Lake Argyle, created by the damming of the Ord River. The continuous release of water from the dam has resulted in the Ord River maintaining its freshwater fish populations year-round, as does the lake, where some freshwater native fish populations have expanded.

Populations of reptiles, such as the protected freshwater crocodile, are also supported by the expanded food chain of native fish, and are thought to have increased significantly from their original billabong-based populations.

## SUMMARY OF FISHING AND AQUACULTURE ACTIVITIES

The creation of Lake Argyle has produced a unique inland aquatic environment which is now home to various fishing and tourism-related activities. The lake supports the State's only commercial freshwater fishery – for the silver cobbler or catfish – together with a processing facility supplying predominantly Western Australian and interstate markets. The lake and its associated river system also support recreational fishing for the freshwater component of the barramundi stock and cherabin (freshwater prawns).

Aquaculture development operations in the region have previously included the production of barramundi from a cage operation in Lake Argyle, and a small but growing pond production of redclaw crayfish in the Ord River irrigation system around Kununurra.

The State Government recently funded a stock enhancement project at Lake Kununurra to create a recreational barramundi fishery in the region.

## ECOSYSTEM MANAGEMENT

As one of the key ecosystem risks is the introduction of non-endemic species, the Department has an approval process in place for assessing proposals to translocate live non-endemic fish species into and within Western Australia, so as to minimise the environmental risks to freshwater ecosystems associated with this activity.

## ECOSYSTEM BASED FISHERIES MANAGEMENT

### Identification of Ecological Assets using the EBFM framework

The Department is now implementing an Ecosystem Based Fisheries Management (EBFM) framework (see How to Use section for more details). In terms of ecological assets, the Department has recognised the following for the Northern Inland Bioregion:

Ecosystem structure and biodiversity;

Captured fish species

Listed species (direct impact – capture or interaction);

The full set of ecological assets identified for ongoing monitoring are presented in Northern Inland Ecosystem Management Figure 1.

### Risk Assessment of Regional Ecological Assets

The EBFM process identifies the ecological assets in a hierarchical manner such that the assets outlined Northern Inland Figure 1 are often made up of individual components at species or stock level. The risks to each of the individual stock or lower level components are mostly detailed in the individual fishery reports presented in this document. The following table (Northern Inland Ecosystem Management Table 1) provides an overview and cumulative assessment of the current risks to the ecological assets of the Northern Inland Bioregion, at a bioregional level and provides a mechanism for reporting on their status and the fisheries management arrangements that are being applied. These bioregional level risks are now used by the Department as a key input into the Department's Risk Register which, combined with an assessment of the economic and social values and risks associated with these assets, is integral for use in the annual planning cycle for assigning priorities for activities across all Divisions in this bioregion.

### Summary of Monitoring and Assessment of Ecosystem Assets

The Department of Fisheries actively supports a number of studies into the native freshwater fish fauna and their habitats in northern river systems in conjunction with Murdoch University, the Department of Water and the Department of Parks and Wildlife, and through involvement with local natural resource management councils. New aquaculture ventures are also subject to strict environmental evaluation under the Department's licensing and on-going arrangements, in conjunction with industry and TAFE.

**NORTHERN INLAND ECOSYSTEM MANAGEMENT TABLE 1  
RISK LEVELS FOR EACH ASSET.**

Risk levels in this table are developed by combining the individual (lower level) elements that make up each of the higher level components. Low and Medium values are both considered to be acceptable levels of risk. High and Significant risks indicate that the asset is no longer in a condition that is considered appropriate and additional management actions are required. Where the value is followed by (non-fishing) this indicates that all, or the majority of the risk value, was not generated by fishing activities.

**Ecosystem Structure and Biodiversity**

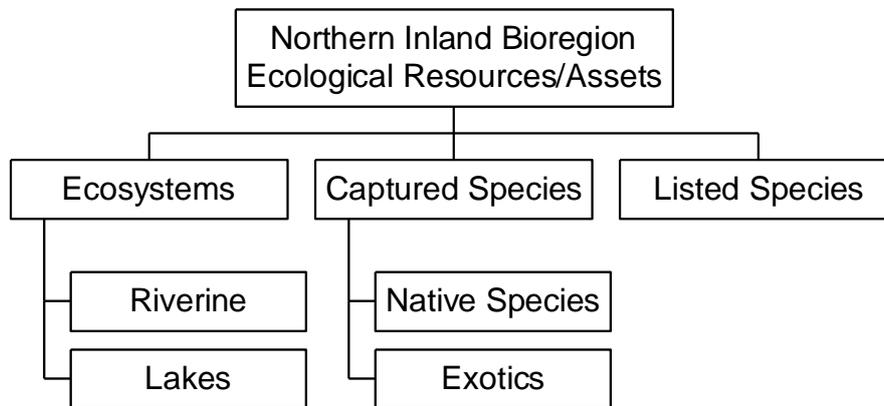
| Ecosystem  | Risk                 | Status and Current Activities                                    |
|------------|----------------------|--|
| Ecosystems | LOW<br>(non fishing) | Minimal threats and these would be due to non-fishing activities |

**Captured fish species**

| Fish species   | Risk | Status and Current Activities                                   |
|----------------|------|---|
| Finfish Native | LOW  | The stocks of freshwater fish are not under any material threat |

**Listed species**

| Listed fish species | Species    | Risk | Status and Current Activities   |
|---------------------|------------|------|---|
| Listed Species      | Crocodiles | LOW  | A small number of crocodiles have been reported captured in nets in Lake Argyle. The numbers are small and would not affect these stocks. |



**NORTHERN INLAND ECOSYSTEM MANAGEMENT FIGURE 1**

Component tree showing the ecological assets identified and separately assessed for the Northern Inland Bioregion

# FISHERIES

## Lake Argyle Silver Cobbler Fishery Report: Statistics Only

*S.J. Newman, G. Mitsopoulos, C. Skepper, A. Thomson and D. Wallis*

### Fishery Description

#### Commercial

The only commercial freshwater fishery in Western Australia is in Lake Argyle in the north-eastern. This gillnet fishery specifically targets the silver cobbler (*Neoarius midgleyi*).

#### Recreational

A small recreational and charter boat fishery for this species exists in Lake Argyle with fishing activities peaking during the dry season (winter months).

#### Boundaries

##### Commercial

The waters of the Lake Argyle Silver Cobbler Fishery (LASCF) include all waters of Lake Argyle between the dam wall and 16° 37' south latitude.

##### Recreational

In addition to the waters of Lake Argyle, recreational anglers can fish in all creeks and tributaries that feed into the Ord River and Lake Argyle.

#### Management arrangements

The LASCF is a limited entry fishery, with six Fishing Boat Licences permitted to operate in the Fishery. A licence condition restricts the net type permitted, with fishers only permitted to use set nets that have a minimum mesh size of 159mm and maximum net drop of 30 meshes.

In June 2012 the *Lake Argyle Fishery Notice 1994* was revoked and replaced with a new notice (Prohibition on Commercial Fishing (Lake Argyle) Order 2012) containing the management arrangements for the Fishery. Under this Order the six Fishing Boat Licences listed are permitted to use no more than 1,500 metres of net at any one time, and are prohibited from taking any fish whatsoever by means of nets during the period from 1 November to 31 December in any year. This seasonal closure is aimed at protecting silver cobbler during the spawning season. Furthermore, at this time of the year water temperatures in the lake are high resulting in spoilage of fish in the nets. Fishers in the LASCF operators are not permitted to take barramundi (*Lates calcarifer*) at any time and all nets used by LASCF operators must be suitably marked with licence identification.

In 2001, a voluntary industry Code of Practice was introduced to the LASCF, to implement sustainable fishing practices and to reduce conflict with other stakeholder groups in Lake Argyle. The Code specifies the accepted means of operation in the Fishery and outlines contingency procedures for lost or abandoned fishing gear.

A Bycatch Action Plan has also been developed for the LASCF which aims to minimise the incidental capture of

listed species in Lake Argyle (including freshwater crocodiles, freshwater turtles, and birds) during commercial gillnetting targeting the silver cobbler. The Lake Argyle Silver Cobbler Fishery Bycatch Action Plan and Code of Practice were revised in 2010.

### Landings and Effort

#### Commercial (season 2013):

**78 tonnes**

The fishery first developed in 1979 with increasing catches reported until 1989 (143 t). Catches have fluctuated between approximately 50 t and 230 t per year since 1990 (Lake Argyle Silver Cobbler Figure 1). Catches from 2009 to 2010 were less than 70 t, while the 2011 catch increased to over 100 t, with the 2012 catch over 118 t. The 2013 catch of 78 t is the lowest reported catch since 2011.

Nominal effort in this gillnet fishery is currently assessed using block days fished. Effort for silver cobbler is calculated as the effort associated with any catch of silver cobbler in each block of the LASCF. The effort used in the fishery is currently being reviewed. The net lengths reported by some fishers have been inconsistent. Fishing practices vary across the vessels used in the fishery and are not uniform. Furthermore, reporting practices are inconsistent across time. As such, block day is the only reliable effort measure available.

During 2013, three vessels were active in the fishery, and generated a total effort of 459 block days. This level of effort is higher than that reported from 2009 – 2012 (a range of 255 – 426 block days), and is similar to that reported in 2008. There is considerable latent effort available in the LASCF.

The overall catch in 2013 (78 t) was lower than 2012 (118 t) despite greater effort being expended across fewer vessels. The fishery requires further monitoring.

The level of catch in the fishery at present is a reflection of the variable level of effort expended. In recent years effort in the fishery has been variable due to inconsistent fisher participation rates. Participation in the fishery can be variable as a result of the availability of fishers (i.e. active in other fisheries/industries) and market demand.

#### Recreational:

**Charter <1 tonne**

Limited data are currently available on recreational fishing in this region. The reported charter boat catch for Lake Argyle from 2002 to 2013 was less than 1 t of silver cobbler per annum. There are no data available on general angling catches. There are no minimum legal size limits for silver cobbler, however, fishers are restricted to a mixed species bag limit of 4 freshwater fish per day.

## Fishery Governance

### Commercial

**Target commercial catch range: 93-180 tonnes**

The target commercial catch range is calculated based on catch information from 1990 – 1998, a period during which the fishery was stable and levels of exploitation were considered to have been sustainable. The target catch range for silver cobbler has recently been revised to be consistent with the reference points and control rules adopted for other fisheries. This catch range previously represented a confidence interval calculated using time series analyses (statistical control charting) of annual catch for the fishery. In contrast, the current approach specifies this range as the values within the minimum and maximum catches observed during the reference period. The revised target catch range (93 – 180 t) is similar to that previously used (90 – 155 t).

### Current Fishing (or Effort) Level      **Acceptable**

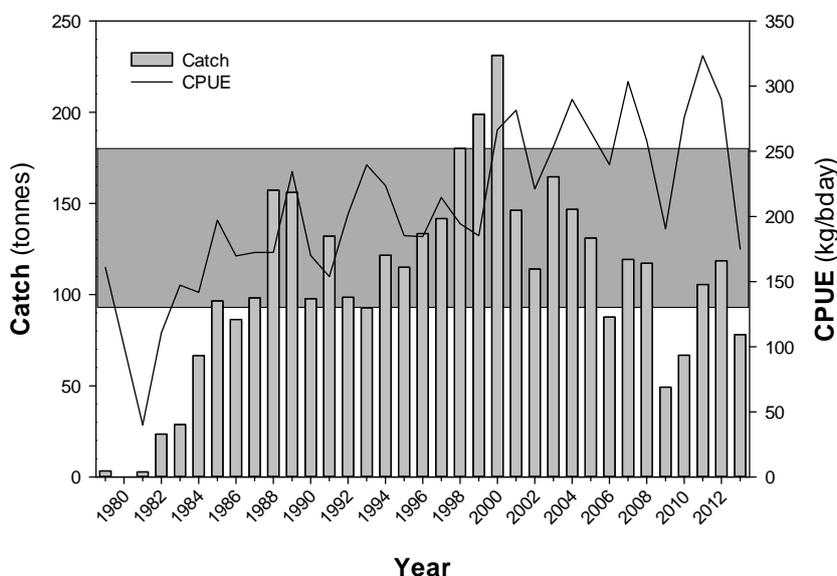
The level of catch in the fishery in 2013 is below the acceptable catch range. This level of catch is considered acceptable as the effort in the fishery is still low and the catch rate is within the historical range. The lower levels of catch in the fishery in 2009, 2010 and 2013 are likely to have allowed the stock to increase in size.

### New management initiatives (2014/15)

The next management review for the Fishery is scheduled for 2016/2017.

The LASCf underwent MSC pre-assessment in late 2013. Outcomes are expected in late 2014.

**Lake Argyle Silver Cobbler Fishery**



**LAKE ARGYLE SILVER COBBLER FIGURE 1**

The annual catch and catch per unit effort (CPUE, kg/block day) for silver cobbler in the Lake Argyle Silver Cobbler Fishery over the period from 1979 to 2013. The upper and lower bounds of the target commercial catch range are shown by the shaded catch area between 93 and 180 tonnes.

## AQUACULTURE

### Regional Research and Development Overview

The process to identify a site to enable and support aquaculture around Lake Argyle as part of the implementation of the Ord Stage II final agreement continues to progress slowly. The issue of a lease was delayed while the relevant group reviews its options.

A licence to produce barramundi has been issued, but is currently inactive; the licence holder has made substantial progress in its efforts to secure tenure over a land based lease to support its proposed aquaculture activities.

# COMPLIANCE AND COMMUNITY EDUCATION

The Northern Inland bioregion includes the freshwater rivers, lakes, billabongs and wetlands primarily located in the Kimberley. Commercial fishing is permitted in Lake Argyle (man-made lake) and in the tidal area of the mouth of the lower Ord River.

Compliance and education for the freshwater systems in the North Inland bioregion focuses on:

- translocation inspections of non-endemic freshwater species;
- listed species interaction;
- monitoring of introduced fish species;
- aquaculture lease and licence compliance;
- localised depletion of barramundi as a target recreational species;
- cherabin catches; and
- commercial Silver Cobbler fishery in Lake Argyle.

Patrols continue to focus on the Fitzroy and Ord Rivers, due to the large number of campers and fishers accessing the inland Kimberley rivers during the peak tourism period of May to October. Both the Fitzroy River and the Ord River are identified as major breeding areas for barramundi.

Officers pay particular attention to catch of any protected sawfish species, disused recreational fishing gear and localised impacts of fishers.

## Activities during 2012/13

During 2012/13, Fisheries and Marine Officers (FMOs) recorded 1,529 hours of active compliance patrol time in the Northern Inland bioregion (Northern Inland Compliance Patrol Hours Figure 1).

Across the Northern Inland bioregion, personal contact was made with 4,095 fishers and non-fishers across the commercial, recreational and other sectors (Northern Inland Compliance Table 1). FMOs focused on freshwater fishing compliance in areas of known high visitation or local complaints regarding illegal fishing activities.

Compliance and education was also undertaken in the Lake Argyle area, where FMOs inspected commercial silver cobbler fishers to ensure that compliance with management, listed species interaction and environmental objectives were being met.

The Community Education Officer develops programs and coordinates delivery of education activities to school-aged children and awareness raising activities with the broader community. In-school and school holiday programs are the main method of reaching students in both the Pilbara and the Kimberley, while attendance at shows and local events target the broader community. An increased emphasis has been placed on developing materials that focus on local issues and their dissemination through regional brochure stockists and local publications.

## Initiatives in 2013/14

Compliance service delivery will continue to target any areas of non-compliance and high levels of recreational fishing pressure. These locations are reviewed during annual risk-assessment processes.

The Departments Northern Region Mobile Patrol, will focus on compliance and education of recreational fishers. A large portion of the mobile patrols time will be spent ensuring that fishers are aware of, and comply with, bag, size and possession limits relating to barramundi, which is one of the States iconic fisheries that is primarily inland based.

The Departments Statewide Mobile Patrol will assist by delivering a compliance and education program through the Pilbara and Kimberley during the peak tourist season.

Compliance activities relating to the only freshwater commercial fishery, which targets the Lake Argyle silver cobbler, will continue. The operators in this fishery are inspected to ensure that high levels of compliance and community confidence are maintained.

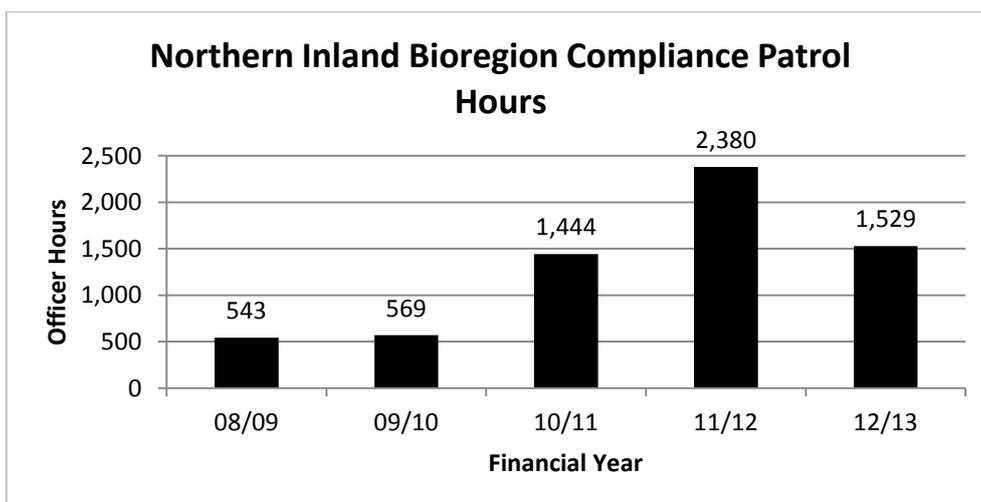
**NORTHERN INLAND COMPLIANCE TABLE 1**

This table gives a summary of compliance and educative contacts and detected offences within the Northern Inland bioregion during the 2012/13 financial year.

|  |                            |
|--|----------------------------|
| <b>PATROL HOURS DELIVERED TO THE BIOREGION</b>                   | <b>1,529 Officer Hours</b> |
| <b>CONTACT WITH THE COMMERCIAL FISHING COMMUNITY<sup>1</sup></b> |                            |
| Field contacts by Fisheries & Marine Officers                    | 11                         |
| Infringement warnings  | 3                          |
| Infringement notices   | 5                          |
| Prosecutions   | 6                          |
| <b>CONTACT WITH THE RECREATIONAL FISHING COMMUNITY</b>           |                            |
| Field contacts by Fisheries & Marine Officers                    | 3,322                      |
| Infringement warnings  | 3                          |
| Infringement notices   | 8                          |
| Prosecutions   | 3                          |
| <b>OTHER FISHING-RELATED CONTACTS WITH THE COMMUNITY</b>         |                            |
| Field contacts by Fisheries & Marine Officers                    | 762                        |
| Fishwatch reports <sup>2</sup>                                   | N/A                        |

1 Contacts are classified according to the specific fishery, which is usually clearly delineated as being either commercial or recreational. The “other fishing-related contacts with the community” category is used where multiple fisheries are contacted and it is not possible to accurately classify the contacts into one specific fishery – typically, the majority of contacts are these contacts are recreational in nature (e.g. personal contacts in marine parks), but contacts made in relation to fish kills, shark patrols and inspections of commercial fish wholesale and retail premises, etc, are also included in this category.

2 \*\*Fishwatch calls relating to the Northern Inland bioregion are not recorded as the service provider reporting mechanism only details calls referred to district offices. Calls relating to the Northern Inland bioregion will be included in both the North Coast and Gascoyne Coast Bioregion totals.



**NORTHERN INLAND COMPLIANCE FIGURE 1**

This figure gives the “On Patrol” officer hours showing the level of compliance patrol activity delivered to the Northern Inland Bioregion over the previous five years. The 2012/13 total gives the patrol hours in the bioregion that resulted in the contacts detailed in Table 1. The totals exclude time spent on other compliance-related tasks, e.g. travel time between patrol areas, preparation and planning time.