

# NORTHERN INLAND BIOREGION

## REGIONAL MANAGEMENT OVERVIEW

The only commercial fishery in the northern inland bioregion is the Lake Argyle Freshwater Catfish Fishery (LAFCF). Future management arrangements for this fishery are currently under examination.

## REGIONAL COMPLIANCE AND COMMUNITY EDUCATION OVERVIEW

There is limited compliance monitoring in the LAFCF, with seven commercial contacts made during 2001/02. There were no compliance problems encountered, and monitoring continues to be a low priority. However, since 2002, gear identification requirements have been implemented in this fishery, and this will require some additional level of activity by Fisheries Officers.

## Lake Argyle Freshwater Catfish Fishery

### Management Summary

The only commercial freshwater fishery in Western Australia is in Lake Argyle in the Kimberley. This fishery, currently utilising gillnets, specifically targets the catfish or silver cobbler (*Arius midgleyi*) and is managed through a set of licensing conditions. There is a two-month closure during the wet season breeding period of November and December.

As a result of conflict with charter operators as well as the general public and conservation groups, Lake Argyle catfish endorsement holders developed an industry code of practice that was implemented in 2001. The code specifies the accepted means of operation in the fishery, as well as outlining contingency procedures for circumstances when fishing gear has been lost or abandoned.

Future management measures for this fishery will include a review of the possible impact of latent effort within the fishery and a shift in the seasonal closures to better accommodate the wet season breeding period.

#### **Governing Legislation/Fishing Authority**

Fisheries Notice no. 665 (Section 43 order)  
Condition 55 on a Fishing Boat Licence

### Research Summary

Data for assessing the status of the freshwater catfish stock in Lake Argyle are derived from the catch and effort returns provided by industry. These data are compiled on an annual basis.

This information is subsequently used to develop stock assessment models for the fishery. The modelling approach used in the following assessment of the fishery requires a number of assumptions, and the available data are not sufficiently detailed to determine whether or not these assumptions are valid. This creates a high degree of uncertainty around the results generated from the models. The only way to reduce this uncertainty is to allocate more resources to the gathering of the necessary data from the fishery, and to gain an understanding of some key characteristics of both the fishery and the biology of the species.

The research report released to industry in April 2000 outlined the Research Division's concerns over the future of the fishery if catch and effort levels remained high. Since 2000, operators have responded by voluntarily reducing effort and hence the levels of catch. Nevertheless, the latent effort remaining in this fishery is of biological concern because of the specialised reproductive behaviour and low fecundity of the species, which may predispose the stock to recruitment over-fishing. Anecdotal evidence from sectors of the Lake Argyle catfish fishing industry has indicated a decline in fish size during recent years, supporting the view that exploitation rates were too high.

In previous years, the data for this fishery has been reported on a financial year basis, but from this year it is presented on a calendar year basis to better reflect the actual fishing season and summer closure.

The following status report provides a synthesis of the current data from the fishery.

## Lake Argyle Freshwater Catfish Fishery Status Report

*Prepared by S. Newman*

### FISHERY DESCRIPTION

#### **Boundaries and access**

The Lake Argyle Freshwater Catfish Fishery is contained in the impounded waters of the Ord River at Lake Argyle and on part of Lake Kununurra. During 2002 there were six licensees who had access to the fishery. There is a net length restriction of 1,500 m. While there is no mesh size restriction, the fishers have adopted a code of practice that states that nets should be no less than 6 inch (150 mm) mesh and 30 meshes deep. All fishers are prohibited from taking any fish whatsoever by means of nets during the period from

1 November to 31 December in any year. Fishers in the LAFCF are not permitted to take barramundi (*Lates calcarifer*).

#### **Main fishing method**

Gillnet.

# NORTHERN INLAND BIOREGION

## RETAINED SPECIES

**Commercial production (season 2002):** 114 tonnes

### Landings

The primary target species in the fishery is the shovel-nosed catfish or silver cobbler (*Arius midgleyi*). The fishery first developed in 1979 with increasing catches reported until 1988 (138 t). Catch levels then fluctuated between 90 t and 145 t until 1997 (Lake Argyle Catfish Figure 1), following which they increased to a peak catch of 231 t in 2000. Owing to voluntary reductions in effort, catches have declined in both 2001 and 2002. The 2002 catch, at 114 t, is back to the levels taken during the early 1990s and is now within the acceptable catch range for this fishery (Lake Argyle Catfish Figure 1).

### Fishing effort

Nominal effort in this gillnet fishery is calculated as the total number of fishing days by all boats multiplied by the average daily total net length fished per boat divided by 100 to give '100 m net days'. The fishing effort for 2002 was 4,698 units (100 m net days), which is lower than the 2001 fishing effort of 5,570 units and considerably lower than the effort expended in the fishery from 1998 to 2000 (Lake Argyle Catfish Figure 1). This suggests that the voluntary reduction in effort agreed by the fishers is working.

### Catch rate

The catch rates achieved in the fishery from 2000 to 2002 have been similar to those achieved in 1993 and 1994. These catch rates are higher than those reported in the intervening five-year period (Lake Argyle Catfish Figure 1).

**Recreational component:** Not assessed

No data are currently available. It is possible that some data on recreational catches in Lake Argyle were collected during the recent National Recreational Fishing Survey, in which case these will be reported next year.

**Stock assessment completed:** Yes

The fishery was last formally assessed in 2001 when a process error model and an observational error model replaced the biomass dynamics model previously used. The results of this assessment work indicated the fishery was either fully fished or over-fished. Both models indicated that the catch levels of 180–230 t reported by the fishery during the period 1998–2000 were not sustainable.

The catches during the past two years, and particularly in 2002, have been at more appropriate levels, with the 2002 catch now back within the acceptable catch ranges for this fishery.

In addition, the catch rate in the fishery from 2000 to 2002 has been higher than that recorded in the preceding five-year period.

**Exploitation status:** Over-exploited

**Breeding stock levels:** Increasing

The assessment completed in 2001 indicated that the fishery

was probably over-exploited and the breeding stock may not have been sufficient to maintain existing recruitment to the fishery if fishing had continued at the catch levels seen during the years 1998–2000. The significant reductions in catches that have occurred during the past two years are assisting the recovery of the breeding stock, which should now be increasing towards adequate levels.

## NON-RETAINED SPECIES

**Bycatch species impact:** Low

Minimal fish by-catch occurs in this fishery as a result of the large mesh size used relative to the species present in the lake.

**Protected species interaction:** Low

There is an incidental capture of freshwater or Johnston's crocodiles (*Crocodylus johnstoni*) by the freshwater catfish fishery in Lake Argyle. On the basis of the fishers' anecdotal information, the incidental capture of crocodiles is considered to be of minimal ecological significance.

## ECOSYSTEM EFFECTS

**Food chain effects:** Not assessed

**Habitat effects:** Negligible

The nets have minimal impact on the habitat.

## SOCIAL EFFECTS

During 2002, six vessels fished in the LAFCF with an average crew level of 2 people per vessel, indicating that 12 people were directly employed in the fishery. Additional employment occurs in local fish processing plants and the distribution networks.

## ECONOMIC EFFECTS

**Estimated annual value (to fishers) for year (2002):**  
\$302,000

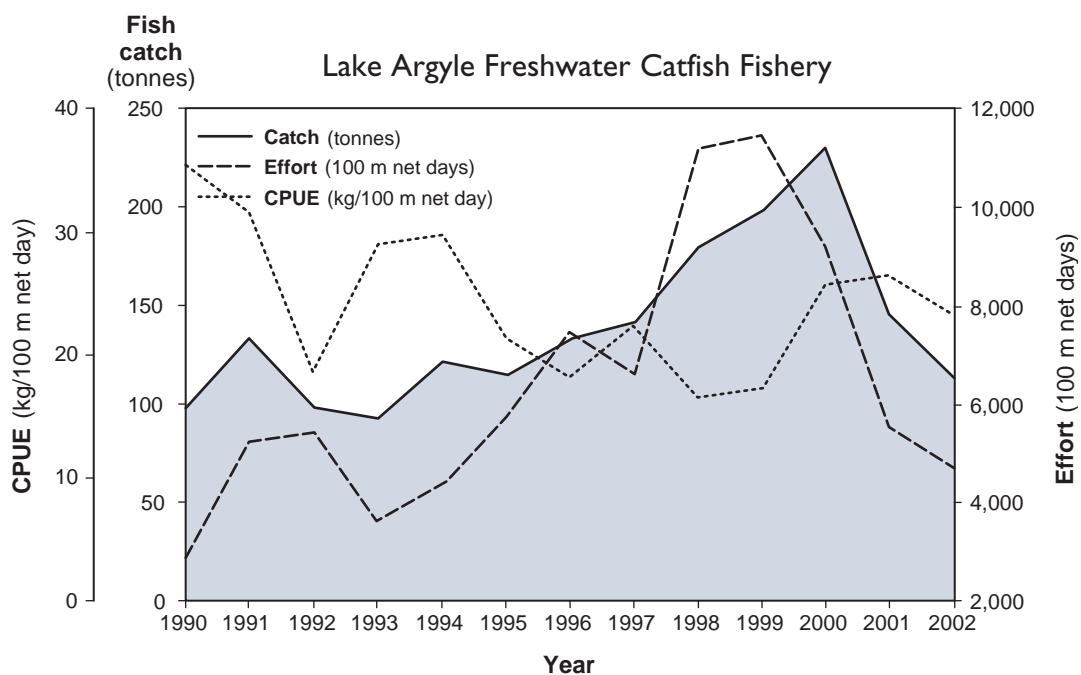
## FISHERY GOVERNANCE

**Acceptable catch range:** 100–140 tonnes

The acceptable catch range under the current management regime is considered to be in the range of 100–140 t of Lake Argyle catfish. This estimate is based on the 80% confidence limits around the average of the observed catches for the 10 years up to 1998. The catches from 1997 to 2001 exceeded this range (Lake Argyle Catfish Figure 1) and were driven by the utilisation of latent effort. The 2002 catch is now within the acceptable catch range as a result of voluntary decreases in effort in this fishery.

## EXTERNAL FACTORS

The variations in catch and catch rate seen from year to year are possibly related in part to the unknown catchability dynamics and age and growth structure of the freshwater catfish, each of which may be affected by variations in environmental conditions within the Lake Argyle system.



**LAKE ARGYLE CATFISH FIGURE 1**

The annual catch, effort and catch per unit effort (CPUE, kg/100 m net day) for the Lake Argyle Freshwater Catfish Fishery over the period from 1990 to 2002.

