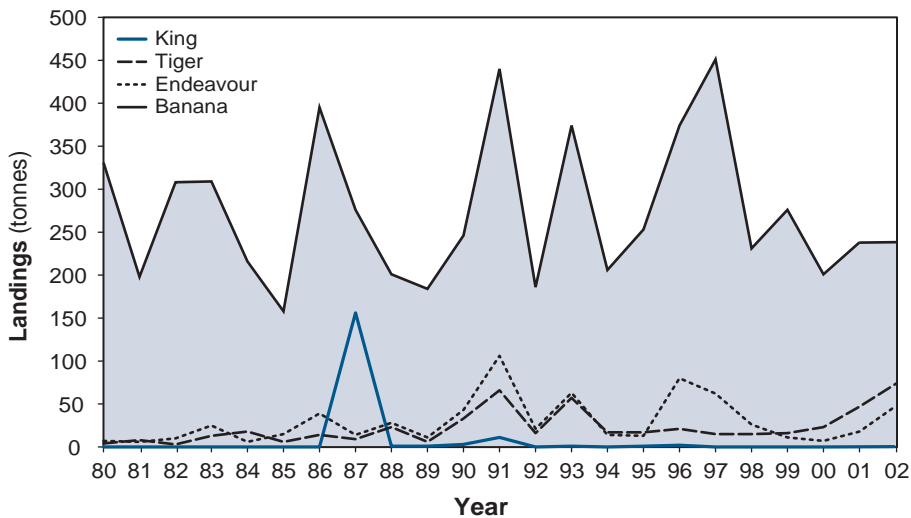


# NORTH COAST BIOREGION

## Kimberley Annual Prawn Catch



### KIMBERLEY PRAWN FIGURE 1

Annual landings for the Kimberley Prawn Managed Fishery, 1980–2002

## Kimberley Gillnet and Barramundi Managed Fishery

### Management Summary

The Kimberley Gillnet and Barramundi Managed Fishery (KGBF) extends from the WA/NT border to the top of Eighty Mile Beach, south of Broome (latitude 19° S). It encompasses the taking of any fish by means of gillnet and the taking of barramundi by any means.

The species taken are predominantly barramundi (*Lates calcarifer*) and threadfin salmon (*Polydactylus macrochir* and *Eleutheronema tetradactylum*). The main areas of the fishery are the river systems and tidal creek systems of the northern Kimberley, King Sound, Roebuck Bay and the top end of Eighty Mile Beach.

Following the development in 2000 of the 'Barramundi Accord', management arrangements have now been put into place for both the commercial and recreational exploitation of barramundi. These arrangements include extensive areas closed to commercial fishing around major town sites and recreationally important fishing locations.

#### Governing Legislation/Fishing Authority

Kimberley Gillnet and Barramundi Managed Fishery  
Management Plan 1989

Kimberley Gillnet and Barramundi Managed Fishery Licence

#### Consultation Process

Department–industry meeting

### Research Summary

A collaborative three-year FRDC-funded research project between Murdoch University and Department of Fisheries began in July 2002 to study the biology of both the threadfin salmon species along with estuary cod (*Epinephelus coioides*), Malabar grouper (*E. malabaricus*) and mangrove jack (*Lutjanus argentimaculatus*). A detailed stock assessment of the threadfin salmon in the KGBF will be undertaken at the completion of this project.

The data used in this report to assess the status of the series of barramundi stocks taken by this fishery are provided from the CAES database. The following status report is compiled annually and provided to industry and regional management.

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.

## Kimberley Gillnet and Barramundi Managed Fishery Status Report

Prepared by S. Newman

### FISHERY DESCRIPTION

#### Boundaries and access

The boundaries of this limited entry fishery are defined as 'all Western Australian waters lying north of 19° south latitude and west of 129° east longitude and within three nautical miles seaward of the low water mark of the mainland

of Western Australia and the waters of King Sound of 16°21'38" south latitude'.

The distribution of barramundi and threadfin salmon catches in Western Australia extends south of the KGBF along the Pilbara coast. These latter catches are outside of the boundaries of the managed fishery, but have been shown in the summary table (Kimberley Gillnet Table 1) for completeness.

Access to the KGBF is currently limited to seven licences, with all seven vessels fishing during 2002. Currently there are two exemption holders authorised to operate along the Eighty Mile Beach in the Pilbara Coast fishing area.

### Main fishing method

Gillnet.

## RETAINED SPECIES

### Commercial production (season 2002):

**All species 124.4 tonnes**  
**Barramundi 39.5 tonnes**  
**Threadfin salmon 76.4 tonnes**

### Landings

The principal species in the landed catch are two species of threadfin salmon, the giant threadfin salmon *Polydactylus macrochir* (also called whites) and the bluenose threadfin salmon *Eleutheronema tetradactylum* (also called blues), and barramundi (*Lates calcarifer*). Lesser quantities of elasmobranchs (sharks and rays, e.g. blacktips, pigeyes, sawfish), black jewfish (*Protonibea diacanthus*) and tripletail (*Lobotes surinamensis*) are also landed.

There are five principal fishing areas within the northern (Pilbara/Kimberley) bioregion: Cambridge Gulf (including Ord River), Kimberley Coast (six river systems), King Sound (including Fitzroy River), Broome Coast, and Pilbara Coast (extending to the Ashburton River). Only four of these fishing areas lie within the boundaries of the prescribed KGBF, with the Pilbara fishing area lying outside the managed fishery area below latitude 19° S. Each of these principal fishing areas is considered separately because of their differing histories of development, effort application, recreational interest and unit stock considerations. Landings from the Pilbara Coast are not included in the total catch figure for the KGBF, but are reported in Kimberley Gillnet Table 1 for completeness along with the catch from each of the four sectors within the managed fishery.

The total reported catch of all species in the KGBF in 2002 (previously reported on a financial year basis) was 124.4 t (Kimberley Gillnet Figure 1). Recent annual catches of the major target species by the KGBF are reported in Kimberley Gillnet Table 2.

The total landings of barramundi from all four prescribed fishing areas within the KGBF were 39.5 t for 2002 (Kimberley Gillnet Figure 2), approximately the same as in 2001.

The 2002 landings of threadfin salmon in the KGBF were 76.4 t, almost double those of barramundi (Kimberley Gillnet

Figure 3). It should also be noted that the total KGBF catch of threadfin salmon was exceeded by the reported catch of 86.1 t of threadfin salmon in the Pilbara Coast fishing sector. Catches of threadfin salmon from the KGBF can be seen to vary substantially from year to year, with the 2002 catch up from last year but close to the five-year average.

These two main species groups (barramundi and threadfin salmon) comprise 93% of the total catch of the KGBF. The reported catch in tonnes and the percentage composition of each of the major species taken in the fishery in 2002 are summarised in Kimberley Gillnet Table 3. The 2002 reported landings in the KGBF also comprised a total of 18 other species categories, including 3.2 t of sharks and rays (all species).

### Fishing effort

The annual fishing effort in this gillnet fishery is calculated as the total number of fishing days by all boats multiplied by the average daily total of 100 m lengths of gillnet used per boat. During 2002, the total effort across the four prescribed fishing areas was 1,568 units. This total level of effort is the highest in the fishery since 1998 (Kimberley Gillnet Figure 1) but considerably lower than during the early 1990s.

### Catch rate

The catch and effort for barramundi peaked in the late 1980s and since then total catch and effort have fallen, with an accompanying increase in catch per unit of effort. The catch of barramundi in the fishery has been steady over the last decade with decreases in effort resulting in an increase in CPUE. The CPUE in 2002 was down on that reported in 2001, whereas effort increased (Kimberley Gillnet Figure 2).

The trends for catch and CPUE for threadfin salmon are very similar: both peaked during 1999 and declined from 1999 to 2001 before increasing in 2002 (Kimberley Gillnet Figure 3). The reduced catch and CPUE from 1999 to 2001 may have resulted from a switch in targeting practices from threadfin to barramundi during this time. The current system does not allow us to determine the targeted effort applied to each of these species.

### Recreational component:

**Not assessed**

A 12-month creel survey of recreational boat-based and shore-based fishing in the Pilbara and West Kimberley region was conducted from December 1999 to November 2000 (Williamson et al., in prep.). In the entire survey area (Onslow to Broome), the total recreational fishing effort for the year was estimated to be 190,000 fisher days. The total recreational scalefish catch was estimated to be about 300 t. Recreational fishers in the survey area reported an estimated total catch of about 18 t of threadfin salmon, whereas the estimated total catch of barramundi was less than 1 t. The proportion of the recreational catch from the West Kimberley region will be available during 2003. In addition, data has been collected from a recent National Recreational Fishing Survey and it is hoped that this data will become available on a regional basis in the near future.

# NORTH COAST BIOREGION

Recreational fishing records from charter boats were not included in the Pilbara and West Kimberley survey data. In late 2001, 85 fishing tour licences and 5 ecotour licences were issued for the north coast bioregion (Pilbara and Kimberley coasts). At the same time, a logbook system was instigated to collect catch and fishing effort information from tour operators. These data are being analysed and will be available in 2003.

**Stock assessment completed:** **Yes**

The last detailed stock assessment, reported in the *State of the Fisheries Report 2000/2001*, indicated that the barramundi stocks in the Cambridge Gulf, Kimberley Coast and King Sound sectors were being harvested at sustainable levels, while in the Broome Coast sector the spawning biomass was declining. The trends in catch and effort were relatively stable in the Broome Coast sector from 1998 to 2001, but both increased substantially in 2002. This increase in catch and effort will be monitored closely in future years. The catch levels in Cambridge Gulf in 2001 and 2002 are slightly lower than that recorded in 2000. Since 1994 the level of catch has reflected the level of effort in this sector of the fishery. Overall effort in this sector has declined to an historical low. There is on average an increasing trend in CPUE in the Cambridge Gulf sector. Similarly in King Sound the level of catch has reflected the level of effort expended in that sector of the fishery, noting that the CPUE has remained relatively stable. In both sectors, effort tends to fluctuate at low levels.

The reported catch of threadfin salmon, the other key target species, declined from 1999 to 2001 before increasing to some extent in 2002. This decline may have been a function of declining abundance of threadfin or specific targeting of barramundi. The catch of threadfin salmon will be closely monitored in future years.

**Exploitation status:** **Fully exploited**

Barramundi are considered on average to be fully exploited.

**Breeding stock levels:** **Adequate**

Assessment of the barramundi stocks indicates that breeding stocks in most areas are adequate. There has been no formal assessment of the breeding stock levels of threadfin salmon but there are currently no indications of any problems.

## NON-RETAINED SPECIES

**Bycatch species impact:** **Low**

The fishery operates at a relatively low intensity over a wide area of the Kimberley region, specifically targeting barramundi and threadfin salmon. The fishing gear uses large mesh sizes, and hence does not generate a significant bycatch of species important to other sectors, but does take some unwanted sharks and rays including sawfish. Because of the low effort levels, these impacts are unlikely to be significant to the stocks involved. Overall, this fishery is likely to be having only a minimal effect on the Kimberley ecosystem as a whole.

**Protected species interaction:** **Low**

The fishing gear used for this fishery does take some estuarine

crocodiles (*Crocodylus porosus*). Because of the low effort levels, these impacts are unlikely to be significant.

## ECOSYSTEM EFFECTS

**Food chain effects:** **Not assessed**

**Habitat effects:** **Low**

The fishing gear has minimal impact on the habitat. The area and habitat fished is subject to extreme tidal currents and associated changes.

## SOCIAL EFFECTS

During 2002, seven vessels fished in the KGBF with an average crew level of 2, indicating that at least 14 people were directly employed in the fishery. There was additional employment through local processors and distribution networks. The fishery provides local fresh fish for the tourist industry throughout the Kimberley region.

## ECONOMIC EFFECTS

**Estimated annual value (to fishers) for year (2002):**  
**\$713,000**

The KGBF landed a total of 124.4 t of fish in 2002, for a catch value of over \$713,000. This estimate is based on the landed weight of each species recorded in the CAES system and the 2001 average price per kilogram of whole weight of each species as supplied by fish processors.

The Pilbara Coast sector landed a total of 118.3 t of fish in 2002 for a catch value of \$453,000. The value of this sector is lower than the KGBF value as the catch of the highly prized barramundi is negligible in this sector. However, the catch of the KGBF and the Pilbara Coast sector together yields an annual value to fishers from this near-shore coastal fishing zone of over \$1.17 million.

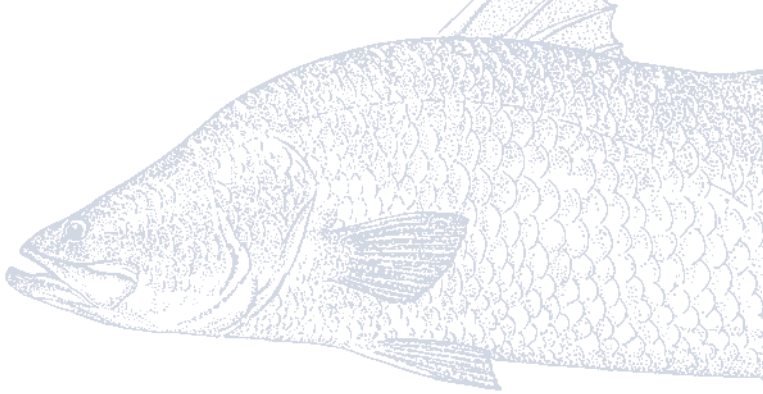
## FISHERY GOVERNANCE

**Acceptable catch range:** **Barramundi 25–40 tonnes**

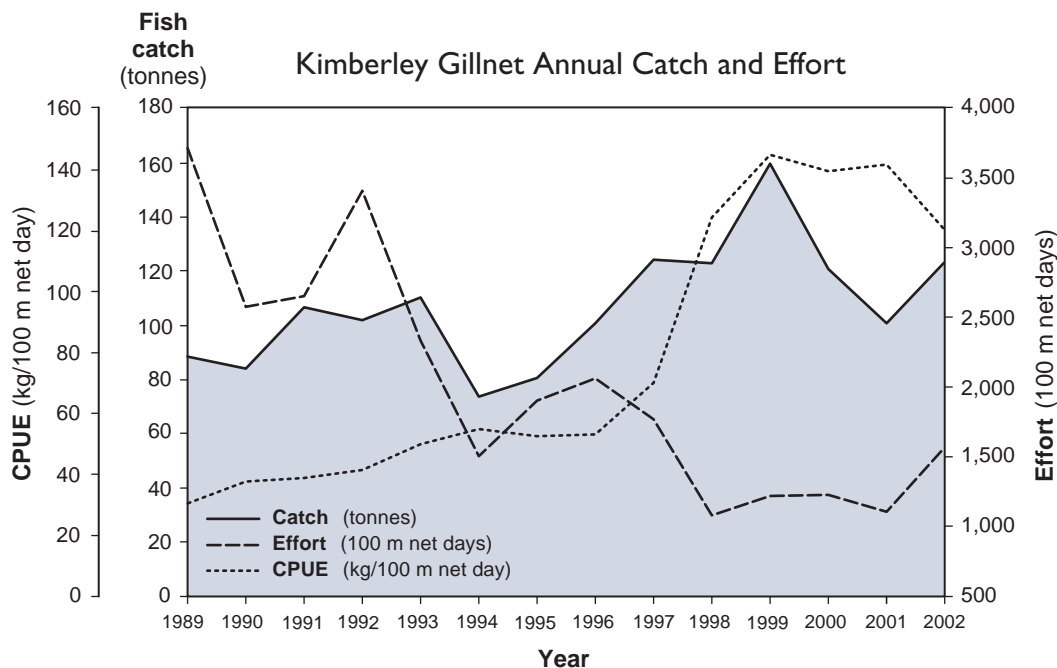
The acceptable catch range for barramundi (25–40 t) is derived from a double exponential smoothed forecasting model of the annual barramundi catches of the KGBF up to 1999. For the past four years (1999–2002), the level of barramundi catch has been at the top end of the acceptable catch range due to an increasing abundance of the target species flowing from substantial decreases in effort over the past decade.

## EXTERNAL FACTORS

The barramundi stocks utilising the large, productive Kimberley river systems as nursery areas are expected to be reasonably resilient to fishing pressure. However, the smaller, isolated stocks along the arid Pilbara coastline are likely to experience more variable recruitment. These stocks are subject to relatively uncontrolled fishing under general wetline licence arrangements, as well as from recreational fishers, and are likely to need more specific management arrangements in the future.

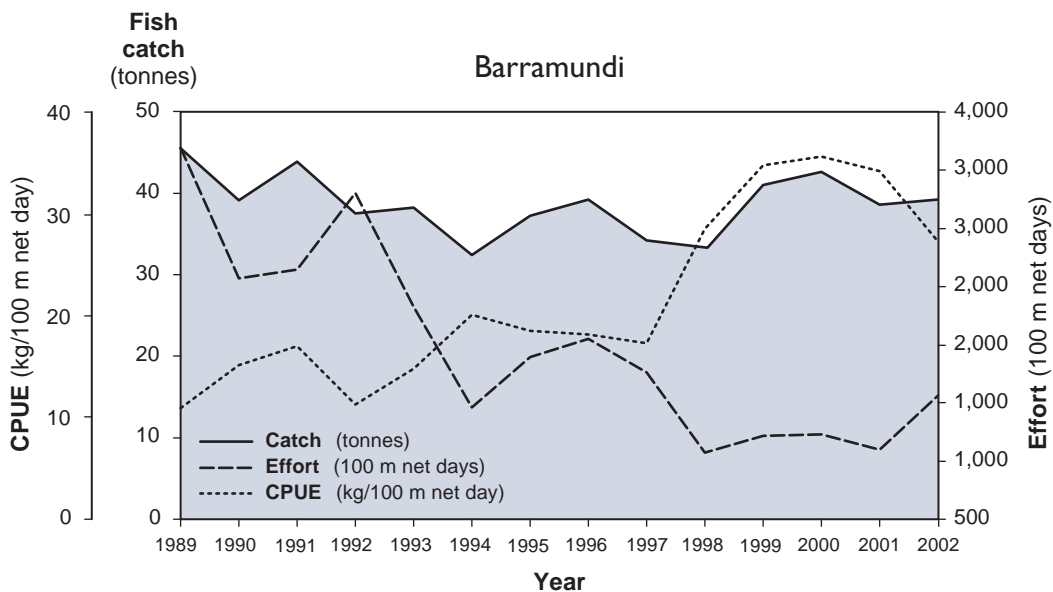


Resource sharing between commercial and recreational fishers on the Ord River has been an ongoing issue of debate. However, recent and anticipated levels of commercial fishing by existing operators are not considered to pose a threat to the viability of the resource. Given the present levels of commercial fishing effort across the KGBF, it is unlikely that the abundance of barramundi is being significantly impacted.



**KIMBERLEY GILLNET FIGURE 1**

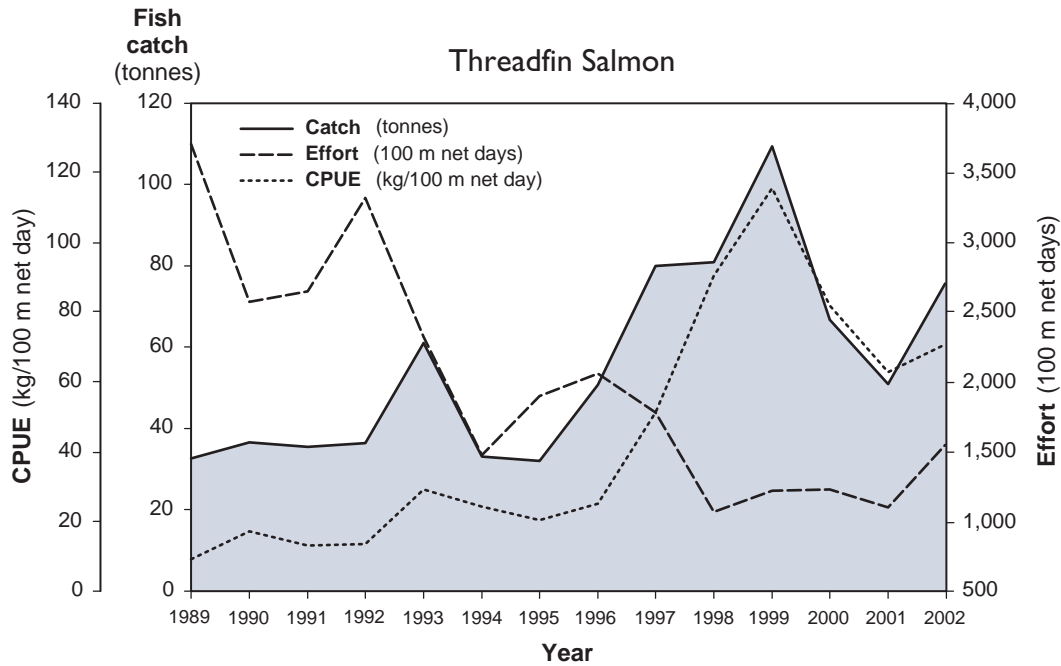
The annual total catch, effort and catch per unit effort (CPUE, kg/100 m net day) from the KGBF over the period 1989 to 2002.



**KIMBERLEY GILLNET FIGURE 2**

The annual catch, effort and catch per unit effort (CPUE, kg/100 m net day) for barramundi from the KGBF over the period 1989 to 2002.

# NORTH COAST BIOREGION



**KIMBERLEY GILLNET FIGURE 3**

The annual catch, effort and catch per unit effort (CPUE, kg/100 m net day) for threadfin salmon from the KGBF over the period 1989 to 2002.

**KIMBERLEY GILLNET TABLE 1**

The reported catch (t) of the major commercial species from each of the principal fishing areas in the north coast bioregion in 2002.

CATCH CATEGORY	PRINCIPAL FISHING AREA				
	Cambridge Gulf	Kimberley Coast	King Sound	Broome Coast	Pilbara Coast
Barramundi	8.1	12.1	6.5	12.8	<1.0
Threadfin salmon	1.9	4.1	1.9	68.5	86.1
<b>Total</b>	<b>11.3</b>	<b>17.3</b>	<b>9.8</b>	<b>86.1</b>	<b>118.3</b>

**KIMBERLEY GILLNET TABLE 2**

Recent annual catches of the major target species by the KGBF.

SPECIES	KIMBERLEY GILLNET ANNUAL CATCH (tonnes)							
	1995	1996	1997	1998	1999	2000	2001	2002
Barramundi	37.8	39.4	34.3	33.5	41.2	42.9	38.8	39.5
Threadfin salmon	32.5	51.0	80.2	81.3	109.8	66.7	50.9	76.4
<b>Total</b>	<b>81.2</b>	<b>101.0</b>	<b>124.6</b>	<b>123.2</b>	<b>160.4</b>	<b>120.7</b>	<b>100.5</b>	<b>124.4</b>

**KIMBERLEY GILLNET TABLE 3**

Summary of the reported catch (t) and percentage composition of each of the major species taken in the KGBF in 2002.

SPECIES	CATCH (tonnes)	COMPOSITION %
Threadfin salmon	76.4	61.42
Barramundi	39.5	31.71
Sharks and rays	3.2	2.56
Black jewfish	1.7	1.37
Tripletail	1.0	0.76
Other fish	2.6	2.18
<b>Total</b>	<b>124.4</b>	<b>100</b>