Information Series QI 00106

Post Stocking Survey Report

Lake Wuruma Dam, Eidsvold
Survey 1

9 July 1999

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QUEENSLAND FISHERIES SERVICE ● DEPARTMENT OF PRIMARY INDUSTRIES ● QUEENSLAND ● 2000

QI 00106
ISSN 0727-6273

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Cover Photo: Wurma Dam

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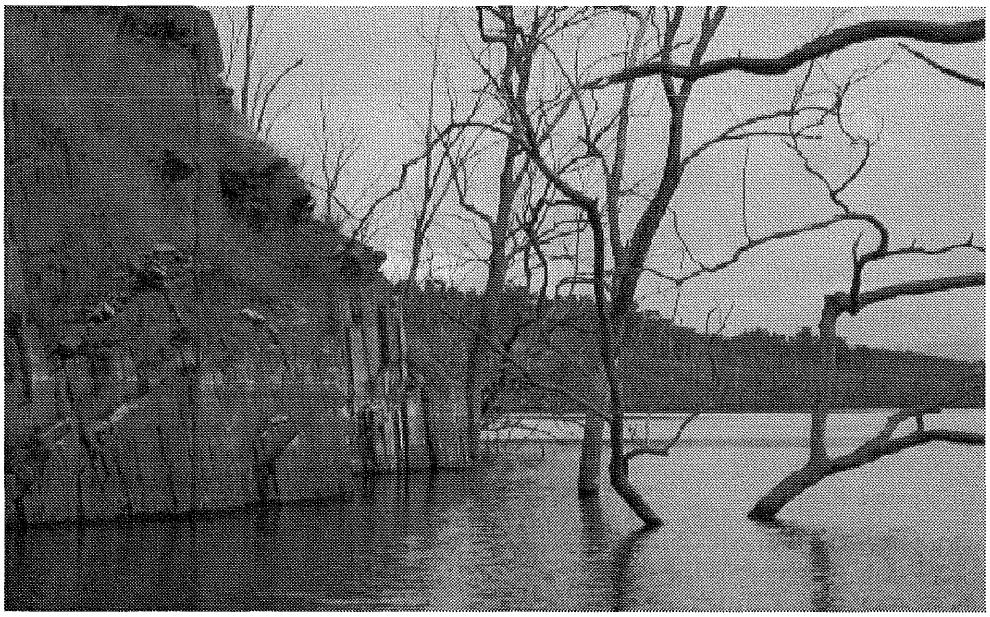
ACKNOWLEDGEMENTS

Assistance from members of the Wuruma Dam Fish Restocking Association with setting and clearing nets, recording data and participating in the electrofishing survey was greatly appreciated. The number and enthusiasm of members that arrived to assist our officers was very encouraging. Without this assistance the post stocking survey would not have been possible.



SUMMARY

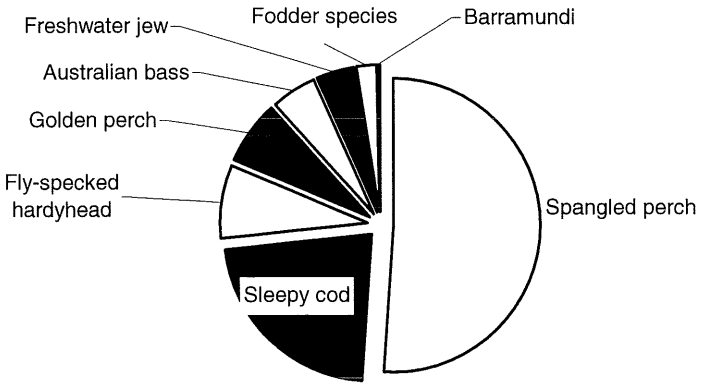
This document details results from the electrofishing and netting survey conducted at Wuruma Dam on 9 July 1999.

The aims of this survey were to

- Measure the relative abundance of angling species;
- Determine the status of barramundi population;
- Monitor growth of stocked species where stockings can be differentiated;
- Monitor the relative abundance and species composition of forage and non angling species;
- Review and provide recommendations on management strategies for the fishery.

Results The survey resulted in the capture of a total of 388 fish from the two sampling methods, electrofishing and netting. Spangled perch dominated the catch accounting for 199 fish followed by sleepy cod (86), fly-specked hardyhead (32), golden perch (26), Australian bass (19), freshwater jew (16), glass perch (5), rainbow fish (3) barramundi (1) and gudgeon (1).

Figure 1 Species composition of total catch (electrofishing and trapping)



The average lengths of the two stocked species caught were Australian bass 357 mm and golden perch 387 mm

- ***Electrofishing:*** The total electrofishing time of 57 minutes the catch resulting catch was 310 fish giving a catch effort ratio of 5.4 fish/minute. Three species of stocked fish caught were golden perch, Australian bass and barramundi.

- ***Panel nets:*** A total of 78 fish were netted during this survey. The catch included 25 golden perch and 17 Australian bass for a total of 42 stocked fish.

Reservoir details Wuruma Dam was built in 1968 and is owned by Department of Natural Resources. It is situated 36 km north west of Eidsvold on the Nogo River. The dam is used for irrigation supply for the surrounding area and downstream. At full supply level the dam's surface area is 1,780 hectares.

Stocking A total of 563,614 fingerlings have been stocked since stocking began in 1985/86. Species stocked since the inception of the enhancement program include golden perch, Australian bass, silver perch and saratoga. There has also been a one off stocking of barramundi in 1996/97. In the last five years stocking densities have ranged from 0 fingerlings/hectare/year (calculated on full supply level) in 1994/95 to 64.61 fingerlings/hectare/year in 1995/96. In this period the

stocking composition has been 66% golden perch, 15% silver perch, 17% Australian bass and 1% barramundi.

Recommendations Given the water levels over the last few seasons, the Wuruma Dam Fish Stocking Association should be commended for their efforts in maintaining a mixed fishery.

In a put grow and take fishery such as Wuruma it is important that stocking occurs each and every year where possible, otherwise missed year classes may significantly effect the content of the fishery.

Hopefully with the introduction of the Stocked Impoundment Permit (SIP) fee will ensure a regular and consistent funding base where it will be possible to ensure that all non-recruiting species are stocked on an annual basis.

The successful mixed fishery of golden perch, Australian bass and silver should continue as per the management plan. While it was encouraging to see a barramundi, consideration should be given to stocking with a known food source (such as bony bream) if further major barramundi stockings are to continue.

Unfortunately, while the sleepy cod population appear to be doing well, these may impact in time on future stockings of other desirable species. Now that the population is successfully established there is no known way of eliminating sleepy cod from Wuruma dam.

INTRODUCTION

The Queensland Government's Recreational Fishing Enhancement Program commenced in 1986 with the intention to stock freshwater systems with native fish species of interest to anglers. Before stocking commenced most impoundments contained only endemic species such as freshwater jew (*Tandanus tandanus*), fork-tailed catfish (*Arius graffei*) and spangled perch (*Leiopotherapon unicolor*). As part of this program the Government has committed to monitoring impoundment fisheries through post stocking surveys, creel surveys and the catch card record system.

Post stocking surveys commenced during the early years of the Recreational Fishing Enhancement Program and are presently undertaken in response to specific problems encountered within each impoundment fishery.

This document details results from the post stocking survey conducted at Wuruma Dam on 9 July, 1999. The purpose of this survey was to:

- Measure the relative abundance of angling species within the inherent limitations of a one night netting/electrofishing exercise;
- Monitor growth of stocked species where stockings can be differentiated;
- Monitor the relative abundance and species composition of forage and non angling species.

The opportunity is also taken to review, and comment on, other aspects of importance to the development of the fishery.

Results for the different fishing methods used in this survey are given as catch per unit effort (CPUE). CPUE is the number of fish caught, divided by the amount of time spent fishing. In this survey, CPUE is expressed as:

- electrofishing - effort is the number of minutes ('power on' time) spent electrofishing. Results are expressed as the number of fish caught per minute of 'power on' time.
- netting - effort is the number of hours that the net was set. Results are expressed as the number of fish caught per trap hour

CPUE data are useful for comparing surveys over time as well as between dams where the same fishing method is used.

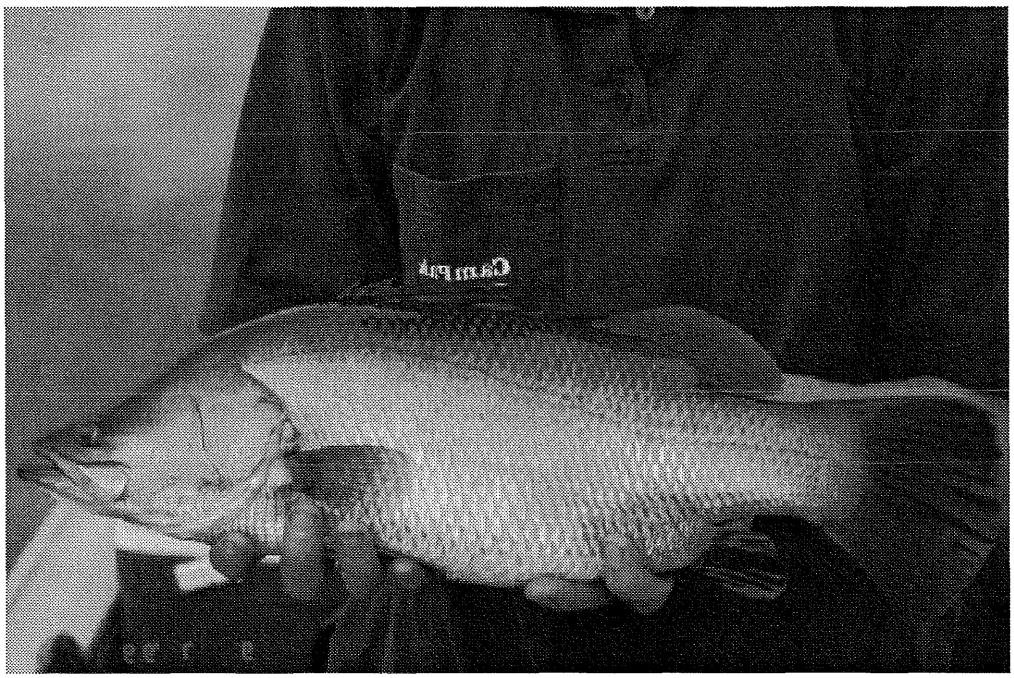
SAMPLING METHODS

1 Electrofishing

Electrofishing was conducted using a Smith Roote 7.5 kva unit mounted on a 4.3 m aluminium 'Edgetracker' vessel. The crew consisted of a skipper and two net operators operating from the bow of the vessel. Electrofishing commenced on the 9th of July 1999 at 2:00pm and concluded at 7:00pm. Total operations time for the electrofisher was 3,401 seconds. Operations were performed both during the day and night, over a selection of habitats. For optimum results the electrofishing survey was performed within shallow water. Results are expressed as number of fish per electrofishing minute ('power on' time). 'Power on' time is the time during which current is flowing from the cathode (boat hull) to the anodes.

2 Panel Nets

Panel nets were used for this survey and were set for 10.35 hours.. Each panel net consists of four 10 m sections of 1½, 2½, 3½ and 4½ inch mesh with a total length of 40 m, and a drop of 2.4 m. Each net was set perpendicular to the shoreline. Results are expressed as number of fish per panel net hour.



RESULTS

The survey resulted in the capture of a total of 388 fish via two sampling methods, electrofishing and netting. Spangled perch dominated the catch accounting for 199 fish followed by sleepy cod (86), fly-specked hardyhead (32), golden perch (27), Australian bass (19) freshwater jew (16),barramundi (1) and Other species (9)

The average lengths of the two stocked species caught were Australian bass 357 mm and golden perch 387 mm

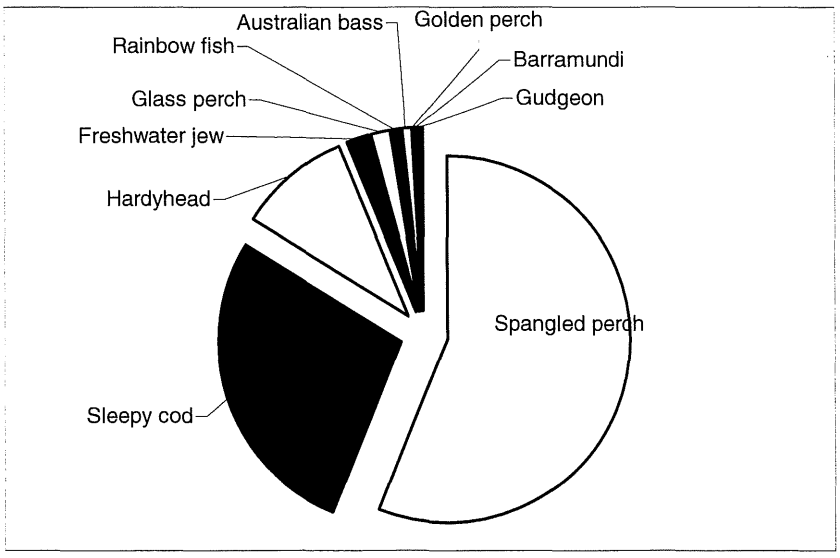
Species caught are listed below:

• Australian bass	*Macquaria novemaculeata*
• Banded grunter	*Amniataba percoides*
• Barramundi	*Lates calcarifer*
• Freshwater jew	*Tandanus tandanus*
• Glass perch	*Ambassis sp.*
• Golden perch	*Macquaria ambigua*
• Hardyhead	*Craterocephalus sp.*
• Rainbowfish	*Melanotaenia sp.*
• Sleepy cod	*Oxyeleotris lineolatus*
• Spangled perch	*Leiopotherapon unicolor*

1 Electrofishing

After 57 minutes ('power on' time) of electrofishing, the total catch consisted of fish: spangled perch (174 fish), sleepy cod (86), hardyhead (31), freshwater jew (6), glass perch (5), rainbowfish (3), Australian bass (2), golden perch (1), barramundi (1) and gudgeon (1) (Figure 1). The catch effort rate for electrofishing was 5.4 fish/minute ie, approximately 5.4 fish were caught for each minute of 'power on' electrofishing.

Figure 2 Species composition of total electrofishing catch



Catch details for the electrofishing operation are given in Table 1. For interest, electrofishing results are compared with results from surveys performed on a number of other impoundments in Appendix 4.

Table 1 Catch effort ratios for electrofishing

Species	Power on time (minute)	Number	Fish/minute
Spangled perch	56.6	174	3.07
Sleepy cod	56.6	86	1.52
Hardyhead	56.6	31	0.55
Freshwater jew	56.6	6	0.11
Golden perch	56.6	1	0.02
Australian bass	56.6	2	0.04
Barramundi	56.6	1	0.02
Other species	56.6	9	0.16
Total	**56.6**	**310**	**5.48**

3 Panel Nets

Table 2 Catch effort ratios for each panel net

Net 1

Species	Net hours	Number	Fish/net hour
Freshwater jew	3.1	2	0.6
Golden perch	3.1	7	2.2
Australian Bass	3.1	1	0.3
Spangled perch	3.1	4	1.3
Total	**3.1**	**14**	**4.5**

Net 2

Species	Net hours	Number	Fish/net hour
Freshwater jew	2.25	1	0.4
Golden perch	2.25	6	2.7
Australian Bass	2.25	10	4.4
Spangled perch	2.25	9	4
Total	**2.25**	**26**	**11.5**

Net 3

Species	Net hours	Number	Fish/net hour
Freshwater jew	3.5	6	1.7
Golden perch	3.5	2	0.6
Australian Bass	3.5	2	0.6
Spangled perch	3.5	12	3.4
Hardyhead	3.5	1	0.3
Total	**3.5**	**23**	**6.6**

Net 4

Species	Net hours	Number	Fish/net hour
Freshwater jew	1.5	1	0.6
Golden perch	1.5	10	6.6
Australian Bass	1.5	4	2.6
Total	**1.5**	**15**	**10**

DISCUSSION

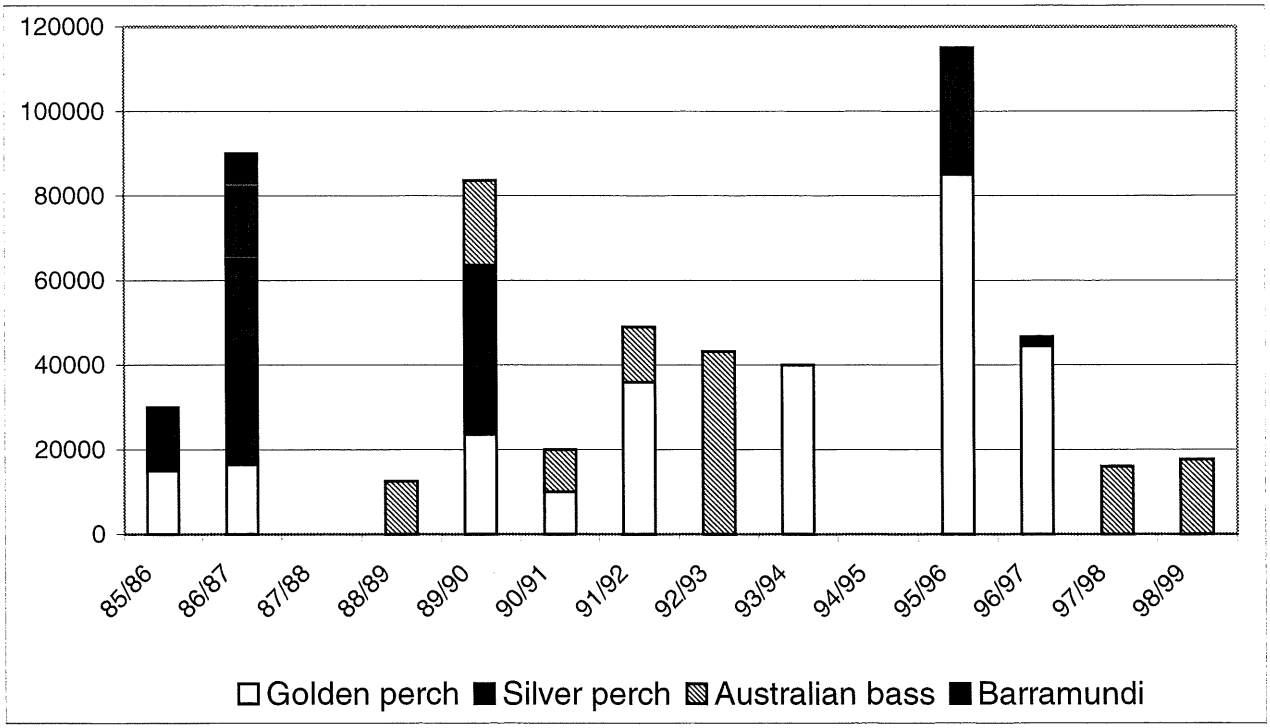
1 Stocking history

Wuruma Dam was built in 1968 to supply water for irrigation to the surrounding district. Stocking commenced in 1985/86, however prior to the construction of the dam, endemic species in the river system would have included eels, freshwater jew, and spangled perch. These species are not considered to be particularly good angling species due to their poor fighting qualities. Consequently the lake was stocked with freshwater sport fish.

Impounded waters need to be continually restocked because in most circumstances, stocked species will not reproduce. This is called a *'put grow and take'* fishery. In Wuruma Dam this applies to golden perch, silver perch, Australian bass and barramundi. Freshwater jew, spangled perch, sleepy cod and saratoga have the ability to reproduce in impounded water and therefore continual stocking of these species is not generally required.

A total of 563,614 fingerlings have been stocked since stocking began in 1985/86. Species stocked since the inception of the enhancement program include golden perch, Australian bass, silver perch and saratoga. There has also been a one off stocking of barramundi in 1996/97. In the last five years stocking densities have ranged from 0 fingerlings/hectare/year (calculated on full supply level) in 1994/95 to 64.61 fingerlings/hectare/year in 1995/96. In this period the stocking composition has been 66% golden perch, 15% silver perch, 17% Australian bass and 1% barramundi.

Figure 3 Stocking History for Wuruma Dam

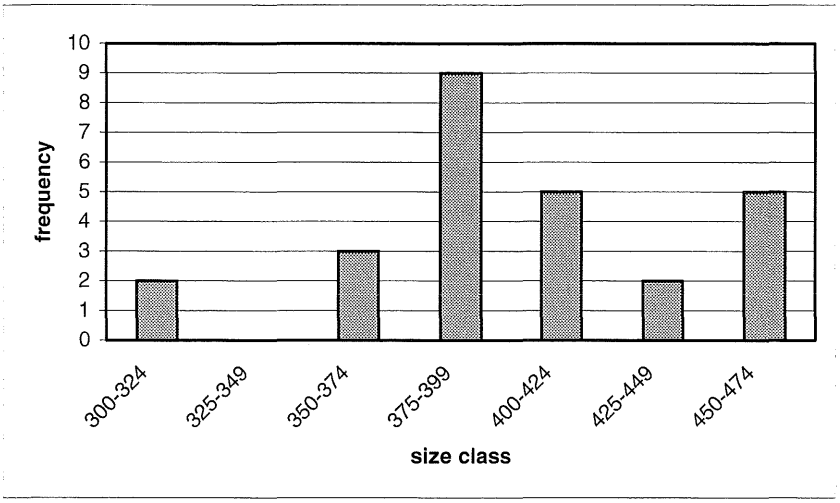


2 Survey results

a) Golden perch

Golden perch stocking has not occurred for the last two seasons. This is reflected in the results as no golden perch were sampled under 300 mm. Golden perch did not feature in electrofishing activities. All golden perch sampled were a result of netting.

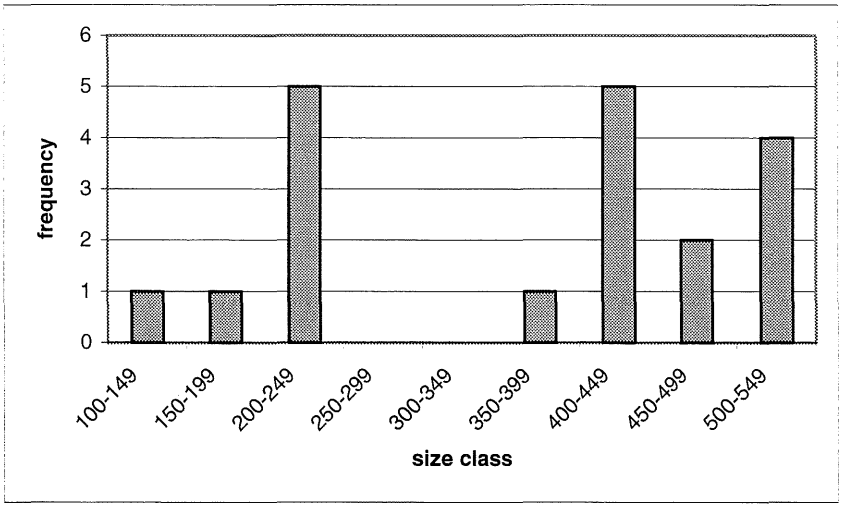
Figure 4 Golden perch length frequency



b) Australian bass

No Australian bass were sampled in the 250 – 350 mm size range. This may be because no bass have been stocked in the 1994/95 and 1995/96 seasons.

Figure 5 Australian bass length frequency



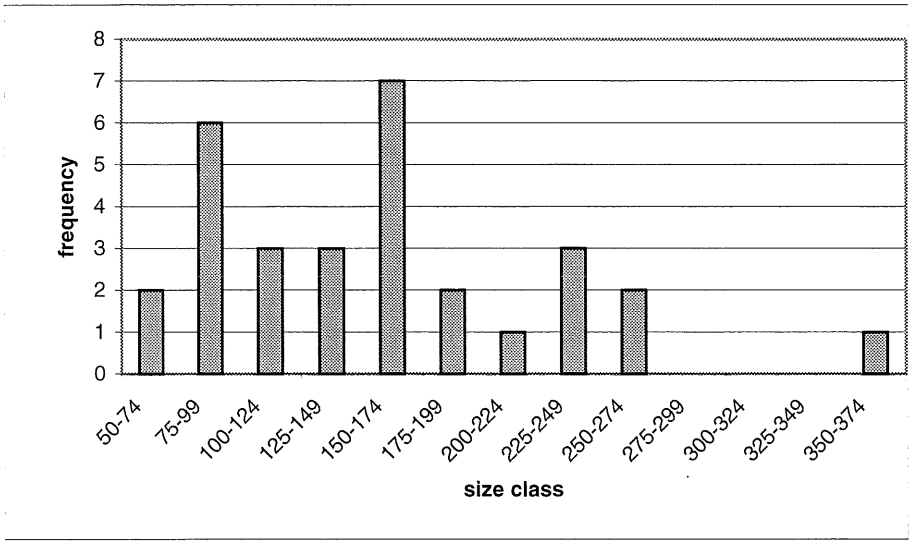
c) Barramundi

Of particular note was the capture of one barramundi. This specimen was 500 mm total length and weighed 2.010 kg. Two thousand two hundred barramundi were stocked in Wuruma in 1996/97. This suggests that barramundi may well survive within the higher Burnett catchment.

d) Sleepy cod

These illegally introduced fish appear to have established a viable self supporting population. Sleepy cod were a significant feature of the overall catch. Very few large specimens (over 300 mm) featured in the sample. This could be a reflection of overpopulation or stunting. Populations of this and forage species should be monitored.

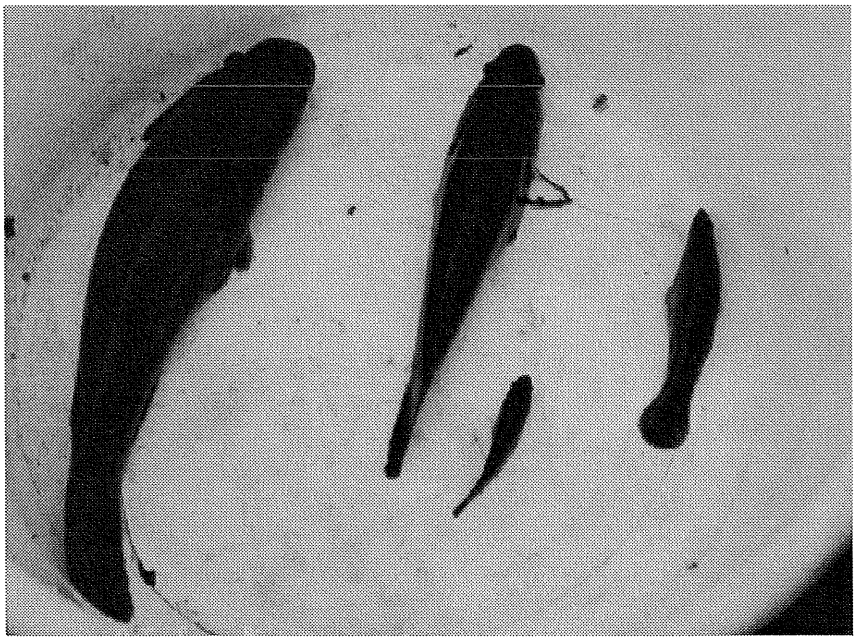
Figure 6 Sleepy cod length frequency



e) Habitat

Water levels in Wuruma have often been a concern. There are good areas of submerged rocks and boulders, standing and flooded timber and aquatic plants.

Sleepy Cod from Wuruma Dam



RECOMMENDATIONS

Given the water levels over the last few seasons, the Wuruma Dam Fish Stocking Association should be commended for their efforts in maintaining a mixed fishery.

In a put grow and take fishery such as Wuruma it is important that stocking occurs each and every year where possible, otherwise missed year classes may significantly effect the content of the fishery.

Hopefully with the introduction of the Stocked Impoundment Permit (SIP) fee will ensure a regular and consistent funding base where it will be possible to ensure that all non-recruiting species are stocked on an annual basis.

The successful mixed fishery of golden perch, Australian bass and silver should continue as per the management plan. While it was encouraging to see a barramundi, consideration should be given to stocking with a known food source (such as bony bream) if further major barramundi stockings are to continue.

Unfortunately, while the sleepy cod population appear to be doing well, these may impact in time on future stockings of other desirable species. Now that the population is successfully established there is no known way of eliminating sleepy cod from Wuruma dam.

APPENDICES

1 Length and weight data

Australian bass

LENGTH (mm)	WEIGHT (g)	LENGTH (mm)	WEIGHT (g)
505	2370	200	80
400	880	200	100
201	125	430	1100
420	1500	500	2600
435	1800	195	280
480	2250	520	3000
490	2600	500	2500
200	300	400	1100
380	900	130	18
200	150		

	LENGTH (mm))
Average	357
Min	130
Max	520

Barramundi

LENGTH (mm)	WEIGHT (g)
500	2010

Fly-specked hardyhead

LENGTH (mm)	WEIGHT (g)
89	15

Freshwater jew

LENGTH (mm)	WEIGHT (g)	LENGTH (mm)	WEIGHT (g)
530	2160	520	2080
230	142	200	95
509	2020	464	1475
451	1475	425	1350
440	1000	445	1350
350	900	500	1700
500	2100	460	1475
242	158	280	230

	LENGTH (mm))
Average	409
Min	200
Max	530

Golden perch

LENGTH (mm)	WEIGHT (g)	LENGTH (mm)	WEIGHT (g)
424	1360	380	1100
455	2125	411	1050
385	925	370	1100

411	1110	390	1400
420	1200	390	1200
450	2000	390	1100
430	1400	370	1200
440	1800	308	1050
410	1250	470	2000
385	1000	390	1100
380	1200	370	1200
380	1300	308	1050
460	1600	470	2000

	LENGTH (mm))
Average	387
Min	308
Max	470

Sleepy cod

LENGTH (mm)	WEIGHT (g)	LENGTH (mm)	WEIGHT (g)
350	648	155	43
198	109	113	14
210	130	155	38
275	258	146	31
220	130	110	12
234	160	115	12
155	45	130	20
155	43	134	17
92	5	90	3
85	3	58	1
90	10	195	100
65	1	154	50
92	2	162	54
76	2	174	54
242	158	280	230
232	150		

	LENGTH (mm))
Average	159
Min	58
Max	350

Spangled perch

LENGTH (mm)	WEIGHT (g)	LENGTH (mm)	WEIGHT (g)
215	187	230	200
168	84	134	40
190	124	158	68
185	110	130	58
150	52	195	130
152	53	145	52
180	39	208	169
210	157	160	75
175	83	210	140
190	113	185	102
195	130	165	67
155	57	215	168
195	130	123	20
195	125	123	25

199	120	161	100
204	225	126	26
205	110	190	30
194	100	210	100
211	130	200	100
214	140	185	45
210	125	140	20
220	150	200	70
205	125	130	20
114	25	150	35
230	200	120	15

	LENGTH (mm))
Average	170
Min	114
Max	230

2 Day and night electrofishing operations

Day operation

Species	Power on time (minutes)	Number	Fish/minute
Barramundi	31.5	1	0.03
Freshwater jew	31.5	3	0.10
Glass perch	31.5	1	0.03
Gudgeon	31.5	1	0.03
Hardyhead	31.5	23	0.73
Rainbowfish	31.5	3	0.10
Sleepy cod	31.5	29	0.92
Spangled perch	31.5	60	1.90
Total	**31.5**	**121**	**3.84**

Night operation

Species	Power on time (minutes)	Number	Fish/minute
Australia bass	25.2	2	0.08
Banded grunter	25.2	2	0.08
Freshwater jew	25.2	3	0.12
Glass perch	25.2	4	0.16
Golden perch	25.2	1	0.04
Hardyhead	25.2	8	0.32
Sleepy cod	25.2	57	2.26
Spangled perch	25.2	114	4.52
Total	**25.2**	**191**	**7.58**

3 Habitat electrofishing operations

Standing timber

Species	Power on time (minutes)	Number	Fish/minute
Barramundi	15.6	1	0.06
Hardyhead	15.6	13	0.83
Sleepy cod	15.6	3	0.19
Spangled perch	15.6	25	0.62
Total	**15.6**	**42**	**2.69**

Submerged rocks

Species	Power on time (minutes)	Number	Fish/minute
Banded Grunter	22.8	2	0.09
Freshwater jew	22.8	3	0.13
Glass perch	22.8	4	0.18
Golden perch	22.8	1	0.04
Hardyhead	22.8	7	0.31
Rainbowfish	22.8	3	0.13
Sleepy cod	22.8	78	3.42
Spangled perch	22.8	117	5.13
Total	**22.8**	**215**	**9.43**

Submerged weeds

Species	Power on time (minutes)	Number	Fish/minute
Australian bass	18.15	2	0.11
Freshwater jew	18.15	3	0.17
Glass perch	18.15	1	0.06
Gudgeon	18.15	1	0.06
Hardyhead	18.15	11	0.61
Sleepy cod	18.15	5	0.28
Spangled perch	18.15	32	1.76
Total	**18.15**	**55**	**3.03**

4 Catch effort results: comparisons

Electrofishing results: comparisons with other impoundments

Impoundment	Date	Power on time (min)	Golden perch	Silver perch	Australian bass	Cod	Saratoga	Other	Total Stocked Species	Stocked Fish per min.
Wuruma Dam	9/7/99	56.6	1		2	NP	-	1	4	0.07
Monduran Dam	17/5/99	60.28	0	0	0	NP	0	2.59	0	0
T Pukallus Weir	22/4/99	33.82	2	0	2	NP	NP	8	4	0.12
Leslie Dam	15/3/99	52.2	25	41	NP	4	NP	42	70	1.34
Connolly Dam	9/12/98	50.60	7	9	NP	0	NP	45	16	0.32
Leslie Dam	8/12/98	8.2	3	1	NP	0	NP	39	4	0.49
Lake Dyer	20/5/98	6.3	-	-	-	-	-	12	12	1.9
Cressbrook Dam	16/12/97	41.7	30	-	6	10	-	-	46	1.10
Cressbrook Dam	2/4/96	78.7	21	-	8	-	-	-	29	0.37
Baroon Pocket Dam	14/12/95	60.3	-	-	-	1	-	-	1	0.02
Cooby Dam	13/12/95	53.1	44	71	NP	4	NP	-	119	2.24
Cressbrook Dam	21/11/94	52.9	15	-	3	-	-	-	18	0.34
Hinze Dam	12/10/94	63.9	11	25	52	1	-	-	89	1.39
Leslie Dam	18/5/94	43.1	58	4	NP	1	NP	-	63	1.46
Cania Dam	18/4/94	35.2	3	16	4	NP	1	-	24	0.68

NP: Not present either as stocked species or naturally.

Panel net results: comparisons with other impoundments

Impoundment	Date	net hours	GP	SP	Bass	Cod	Sar	Total stocked species	Bony bream	Jew	Other	Total all species
Wuruma Dam	9/7/99	10.35	2.5	0	1.6	NP	0	4.05	NP	0.9	2.51	7.53
T Pukallus Weir	22/4/99	13.67	0.37	0	0	NP	NP	.037	NP	0.29	0.51	1.17
Connolly Dam	9/12/98	11.25	1.87	0.44	NP	0	NP	2.31	NP	0.89	0	3.20
Leslie Dam	8/12/98	13.25	1.51	3.70	NP	-	NP	5.21	NP	0.91	0.08	6.20
Lake Dyer	20/5/98	3.75	0.53	1.33	-	-	-	5.61	-	16.53	8.80	30.94
Cressbrook Dam	2/4/96	8.2	0.2	0.1	9.3	-	-	9.6	-	2.6	4.4	16.6
Baroon Pocket Dam	14/12/95	9.75	-	-	2.15	-	-	2.15	-	-	15.08	17.23
Cressbrook Dam	21/11/94	11.75	-	-	0.25	-	-	0.25	-	0.85	17.45	18.6
Hinze Dam	12/10/94	7.7	-	1.83	8.76	-	-	10.6	-	-	-	10.6
Claude Wharton Weir	20/4/94	8.6	-	-	-	NP	0.12	0.12	29.2	-	5.1	34.5
Cania Dam	18/4/94	16.8	0.30	0.30	2.92	NP	0.18	3.69	NP	0.18	0.06	3.93

5 Stocking data-1985/86 to 1998/99

Season	Golden perch	Silver perch	Australian bass	Barramundi	Saratoga	Total	Stocking rate (fish/ha)
1985/86	0	0	0	0	0	30000	16.85
	15000	15000	0	0	0		
1986/87	0	0	0	0	0	90000	50.56
	16500	73500	0	0	0		
1987/88	0	0	0	0	0	0	0
	0	0	0	0	0		
1988/89	0	0	0	0	0	12522	7.03
	0	0	12500	0	22		
1989/90	0	0	0	0	0	48632	27.32
	23632	25000	0	0	0		
1990/91	10000	0	10000	0	0	20000	11.24
	0	0	0	0	0		
1991/92	36000	0	13000	0	0	49000	27.53
	0	0	0	0	0		
1992/93	0	0	30000	0	0	43166	24.25
	0	0	13166	0	0		
1993/94	40000	0	0	0	0	40000	22.47
	0	0	0	0	0		
1994/95	0	0	0	0	0	0	0
	0	0	0	0	0		
1995/96	0	0	0	0	0	115000	64.61
	85000	30000	0	0	0		
1996/97	0	0	0	2200	0	46600	26.20
	44444	0	0	0	0		
1997/98	0	0	0	0	0	16000	8.99
	0	0	16000	0	0		
1998/99	0	0	10000	0	0	27650	15.53
	0	0	17650	0	0		
Grand total	270576	143500	122316	2200	22	563614	316.64
Annual average	24597	10250	8736	200	2	40258	22.62
Stocking rates	152.01	80.62	68.72	1.24	0.01	22.62	
LAST FIVE YEARS OF STOCKING							
Total	129444	30000	43650	2200	0	205294	115.33
Annual average	25888	6000	8730	440	0	41058	23.074
Average stocking rate	14.5	3.37	4.90	0.25	0	23.07	

FSL: *Full Supply Level 1,780 ha*
Top line: *Stocking funded by Wuruma Dam Fish Restocking Association*
Bottom line: *Stocking funded by Queensland Government Recreational Fishing Enhancement Program*