

# INLAND FISHERIES COMMISSION NEWSLETTER

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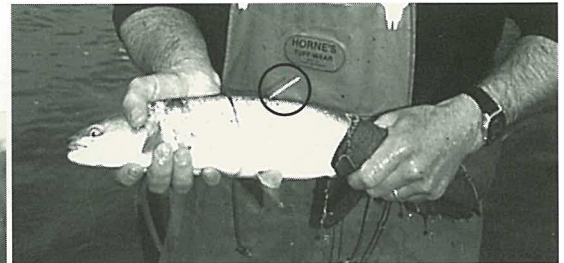
## Those tagged trout *do* exist!

**There is often a good deal of doubt in peoples minds about tagged fish competitions. Was the fish actually released? No one has ever heard of one being caught. We can now definitely say that they do get caught.**

Anglers would have been aware that the Commission recently released tagged brown trout in Lake Burbury (two fish) as well as Great Lake and Arthurs lake. These fish had

a \$5 000 prize on their heads if they were caught during the respective competitions that were conducted at these waters on the weekends of 22-24 October and 30 and 31 October.

*Below: Marcus Binns of Deloraine receiving his prize from Steve Bax of the Fishing Connection in Hobart.*  
*Right: A tagged fish just prior to release.*



Unfortunately none of the tagged fish were caught during the competition weekends. Consequently the Commission arranged for prizes to be available to anyone who caught one of these fish at any time throughout the rest of the 1993-94 season.

Well, the Arthurs Lake fish was recently caught by Marcus Binns of Deloraine and he received a rod and reel to the value of \$150

from Steve Bax of The Fishing Connection in Hobart. Incidentally, this fish had travelled about 4km from the original point of release.

There are still two tagged trout swimming around in Lake Burbury and one in Great Lake. Bradshaws Hardware of Queenstown has donated a rod and reel for the capture of the Lake Burbury fish whilst Wm L Wells and Sons of Latrobe will give a rod and reel to anyone who catches the tagged Great Lake fish.

There will also be another cash prize for a tagged fish in the Bronte system around March next year.

### IN BRIEF

#### Mersey River Fin-Clipped Brown Trout Update

Recently the Commission has become aware of reports of many catches in the lower Mersey River of fin-clipped brown trout which were marked by the Latrobe Branch of the North Western Fisheries Association. However, catches of these trout have not been restricted to the Mersey River. We have received an unconfirmed report of two fin-clipped silvery coloured brown trout caught during September in the lower reaches of the Great Forester River. The trout weighed in at approximately 1 000g. These trout had obviously spent several months in the sea in their journey between the two rivers.

#### Fishing Competitions

The Lake Burbury competition, as well as the Tasmanian Trout Fishing Championships run by the North Western Fisheries Association, were very successful events this year.

At Lake Burbury 336 anglers caught 440 fish with the major prize going to Garry Mather of Queenstown.

The NWFA competition was open to anglers fishing any water and 900 anglers caught a total of 1 288 trout. Most anglers

tended to concentrate on the waters containing tagged fish. The major prize in this competition was a return trip to New Zealand and this was won by Mark Taylor of Don.

The competitions continue to grow in popularity and certainly provide a focus for anglers. There is a good atmosphere at the weigh-in centres and the weekend is a great social event for individuals and families alike. The Commission would like to congratulate all the organisers for their efforts as this part can be a very thankless task.

#### Impersonating a Bailiff

The Commission is concerned to hear reports of a person apparently claiming to be an IFC inspector asking to see anglers' licences. The anglers have understandably become annoyed when subsequently checked shortly afterwards by a genuine inspector.

If you are asked to produce your licence and have any doubt at all, please ask to see the persons identification. You are perfectly entitled to do this and none of our inspectors will object to this request.

If you do have any doubts as to the identity of anyone claiming to be an inspector and they cannot produce satisfactory identification, then please get some details such as a car registration number and a description of the person and let us know. The Commission and all inspectors are anxious to prevent this type of harassment of anglers.



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Championship

ANDREW MCKENZIE

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# Elver capture and the Tasmanian Eel Fishery

**A notice recently appeared in the State's major newspapers for the sale by tender of 500kg of elvers or juvenile eels.**

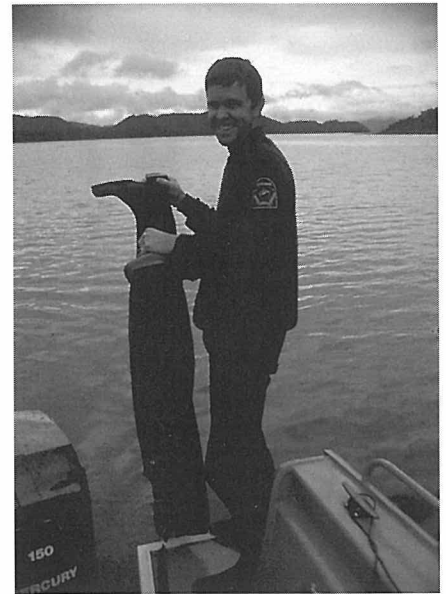
For some years now the Commission has organised the trapping of elvers as they attempt to move upstream through the Trevallyn Power Station. Some of these have been sold to the Victorian company that undertakes the capture, whilst the remainder are transferred within Tasmania to support the local commercial eel fisheries.

Interest in these elvers has increased markedly in the last couple of years and hence the open tender notice. The funds provided from these sales have enabled the Commission to employ a person to oversee

the management of the eel fisheries. Other duties will include aspects of the management of fish farms, especially their environmental performance, as well as the aquarium industry. The Commission is very pleased to be able to give some long overdue attention to these aspects of our responsibilities. Any work that has been done in the past has been minimal as it had to be funded from trout anglers licence fees which was obviously inappropriate.

Mr Chris Bobbi has been working with the Commission on the Hydro-Electric Commission consultancy project and is consequently familiar with most aspects of our operations.

*Setting nets for elvers in Trevallyn tailrace*

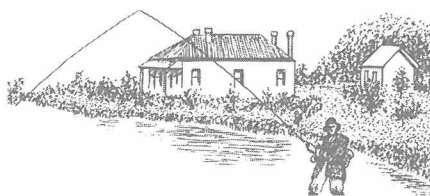


*Chris Bobbi after getting too close to Lake Burbury.*

The Tasmanian eel fisheries are managed as a closed fishery by the Commission. The number of licensed fishermen is limited and no new licences are issued unless an existing one is relinquished. Licences are not transferable at this stage. All aspects of the management of the fisheries has been under review in consultation with industry over the past 18 months. Some changes are likely to be introduced before the next licensing period in June next year.

The Commission's management of this fishery has seen stable annual catches of eels around 30 tonnes each year. It is believed that there is a capacity for some increase in production but it is not an industry that will ever support large numbers of people. Eels take at least ten years to grow to optimum market size in the wild and it is therefore simply not sensible or viable to fish the same small waters every year.

## Museum of Trout Fishing



Space prevents the inclusion of an extensive article on the museum this issue. It is perhaps fortuitous as progress has slowed somewhat over the past couple of months. However, with the onset of summer work will continue afresh and renovations on the main house should be completed early in the new year. A major step forward will also come with the appointment of the museum manager. This process has also taken much longer than expected.

Interpretation panels for the grounds and the hatchery are also well in course and these should greatly improve the visitors impressions and experiences from their visit to the Salmon Ponds.

The renovations completed so far have dramatically transformed the main house and Stannards room as can be seen from the accompanying photographs.



*The Keepers Cottage, Salmon Ponds – built in 1868 – tired after continuous use as a residence since that date.*



*Photographed after recent restoration works by Jack Bobbi, the cottage will soon house the angling museum.*

## Eel experts visit Tasmania

**Two prominent German experts on the biology of freshwater eels visited Tasmania during November.**

Dr Friedrich Tesch and Dr Michael Weber were in the State as part of an Australian visit and spent some time with Commission staff discussing various aspects of the biology of, and commercial fisheries for eels. Dr Tesch in particular has at least 30 years research experience on the biology of European freshwater eels.

Both visitors gave seminars at the CSIRO laboratories in Hobart and visited Tasmanian Smokehouse at Deloraine to talk with an eel processor. Drs Tesch and Weber were later shown the elver capture operations at Trevallyn.

## OTHER THAN TROUT

A regular article on animals of interest to the angler

# Longhorn Caddis Flies

by Stuart Chilcott, Scientific Officer, Inland Fisheries Commission

Longhorn caddis flies belong to one of the largest families of Trichoptera – the Leptoceridae. Of the 800 species world-wide, just over 80 can be found in Australia (Neboiss 1988). There are approximately 32 species known from Tasmania out of 163 species comprising the total Tasmanian caddis fly fauna. The taxonomy of adult Leptoceridae is relatively well documented and descriptions of new species are uncommon in current literature. Recent studies have focussed on linking undescribed larval stages to known adult stages. A recently published study has associated the larvae and adults of the diverse leptocerid genus, *Notalina* from the south east of mainland Australia (St Clair 1991). Larval taxonomy and general ecology of Tasmanian Leptoceridae is lacking, particularly in regard to the twelve endemic species.

The very long antennae of the adults have earned the group the aptly descriptive name of "longhorn" caddis flies. The adults are easily recognisable from other caddis fly families because of their long antennae which are often two to three times the length of the body. They also have a relatively long wingspan. The adults possess two pairs of wings with the narrow anterior wing longer than the hind pair. When in flight, the wings are coupled together by a series of microscopic hooks. These hooks fasten the posterior wing to the anterior wing so that the wings act as a single flight mechanism. Although wing coupling is common in caddis flies, there are several methods by which it is achieved. The presence and location of the hamuli are features used in the identification of adults belonging to family Leptoceridae, enabling them to be distinguished from other families.

The wings of most species are held over the abdomen resembling a tent. The colouration of the adult ranges from golden brown to black and is generally species specific. The colouration and pigment patterns on the head and hardened plates of the thorax and legs are also species specific. The hardened parts of some species are completely dark chocolate brown with little discernible head patterning whilst others possess banded legs together with a variety of pigment patterns on the head.

### Habitats and habits

Longhorned caddis flies are particularly abundant in slow lowland streams, ponds and most lakes where there are plenty of fringing aquatic plants. Aquatic plants are a source of cover, food and provide material for the construction of larval cases. The occurrence of particular species at various locations may be dependent on the presence of some plants. Some



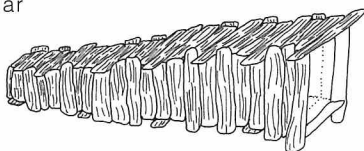
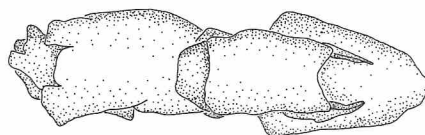
One adult Leptoceridae resting on plant stem.

species of leptocerid larvae may require a certain species of aquatic plant to build their case, whilst others may be more flexible in their preference and are able to build their cases from a variety of materials.

This group of caddis flies is extremely important in aquatic ecological systems. Some species, such as *Notalina*, are voracious feeders, consuming the blades of *Isolepus* – a fine thin bladed aquatic macrophyte found in the Macquarie River and other slow flowing lowland rivers. The larvae shred the blades of the plant and consume small particles of fresh plant material. Plant scraps that escape the mouthparts of the larvae and excreta from the digestive process become food for the myriad of other animals, phytoplankton, bacteria and plants in the aquatic system.

### Case structure

All leptocerids construct some kind of larval case and there are a variety of cases. The cases of many species are long and slender and made from the delicate foliage of



Types of leptocerid caddis cases

aquatic vegetation such as *Myriophyllum* (water milfoil). The larvae continually add to the case as they grow and develop. The cases are quite light and do not hinder the movements of the larvae, either when crawling or swimming.

One species of leptocerid has a case which resembles a traditional American log cabin. These larvae are also adept swimmers, having delicate long legs, adorned with long slender hairs (setae) which allow them to swim with ease.

The cases of other larger species eg. *Triplectides* are diverse in construction, ranging from hollowed twigs and small pieces of wood to small segments of reed stems. Often these larvae have strong, robust legs adapted for clinging and crawling rather than for swimming. Another large species, *Lectrides varians*, cuts fragments from fallen leaves and sews them together with fine strong silk.

### Food for trout

Larval longhorn caddis flies are a common source of food for trout as many early spring anglers have probably observed. Early season angling at waters such as Lake Sorell frequently yield trout that have stomachs filled with countless leptocerid caddis larvae. Trout feeding on these larvae can be found cruising just outside marsh fringes picking up larvae as they are drawn from the marshes by strong winds. The slow swimming action of the larvae make them particularly vulnerable in open water. If disturbed whilst swimming, the larva retreat into the case and slowly begins to drift downwards until swimming recommences. This behaviour affords protection to the larva as it may deceive the predator which may mistake the larva for a reed fragment or stick and thus not consume it.

Adult leptocerids at peak emergence times can be prolific around the edges of streams and lakes. Large spiralling columns of swarming adults extending several metres into the air, can frequently be observed on the Macquarie River for instance. Often underneath these columns a lurking trout may be seen, poised to either gently rise to a resting adult on the water surface or violently erupt from the water to intercept a low flying female. These columns of adult leptocerids serve to aggregate adults before mating or during the actual mating process.

### References

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- St Clair, R. M. (1991) The genus *Notalina* (Trichoptera : Leptoceridae : Triplectidinae) in southeastern Australia, with descriptions of the larvae and pupae. *Invertebrate Taxonomy*, 4, 895 – 934.

# Lagoon of Islands study

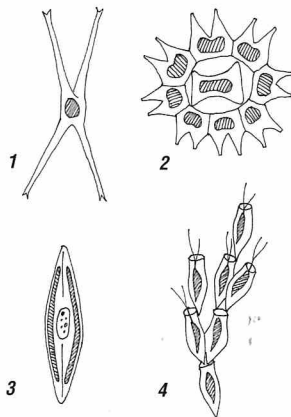
Andrew Sanger, Chris Bobbi and Laurie Cook –  
Scientific Officers, Inland Fisheries Commission

From time to time the newsletter has contained brief articles on the research and management program at Lagoon of Islands. This program, which is funded by the Hydro-Electric Commission, was initiated in 1989 after concerns about deterioration in the fishery and water quality at the lagoon were raised by anglers and downstream users of the water. The newsletter of March 1991 provides details on the background to the problem and the initial management strategies which were implemented to overcome it. The newsletter of March 1992 reported on encouraging improvements in both the water quality and fishery at the lagoon following implementation of these management strategies. This article is intended to bring anglers up to date with the current situation and also report on some of the behind the scenes activity relating to further management at the lagoon.

## Water quality

Lagoon of Islands was affected by a severe algal bloom in the 1988-90 period. The bloom was comprised of a single species, *Staurastrum excavatum*, and at its peak up to 200 million cells per litre were present. The specific conditions which favoured this species over all other species of algae are still unknown. However, elevated levels of the two principle plant nutrients, nitrogen and phosphorus, as well as high levels of iron were present in the lagoon at the time. Management strategies were set in place to bring the algal bloom under control through a combination of manipulating the aquatic environment in the lagoon to favour growth of aquatic plants rather than algae, and by controlling the inflows and outflows to minimise input and retention of nutrients in the lagoon.

These measures have been very successful so far. Over the past two seasons there has been vigorous spring growth of strapweed in the lagoon and this would have helped to remove nutrients from the water, thus avoiding further algal blooms. Detailed examination of the algal community has also shown that after the end of the algal bloom, around April 1991, the species composition

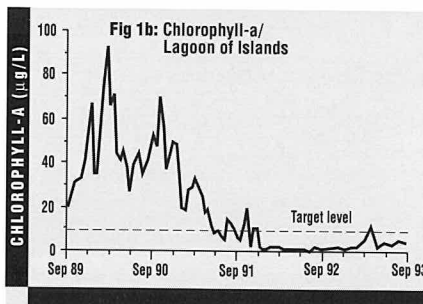
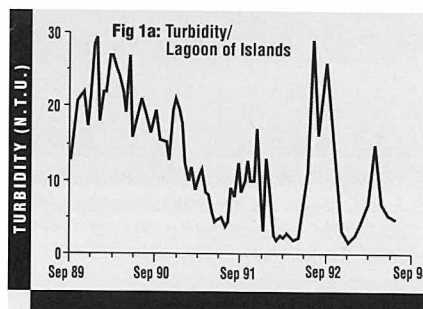


Common algal species in Lagoon of Islands  
1. *Staurastrum excavatum*; 2. *Pediastrum* sp.;  
3. *Navicula* sp.; 4. *Dinobryon* sp.

changed dramatically. The species causing the problem (*Staurastrum excavatum* – sketched below) became much less numerous, and the relative abundance of other species of algae such as *Pediastrum*, *Dinobryon* and *Navicula* began to increase. Total algal cell numbers are now in the range of 450 000 to 2.5 million cells per litre, about 1% of the value found during the worst of the bloom.

While the total algal cell density has decreased, the diversity of the algal community has increased since the end of the *Staurastrum* bloom. For example, the number of common species within the plankton has gone from only two or three to over ten. This is a more healthy species balance and is a good indication that the ecosystem of the lagoon is in a more balanced state. The biomass of algae has also declined since the end of the bloom period. A simple index of the total biomass of algae in a lake is the amount of chlorophyll-a per litre in samples of water. This is one of the standard measurements used to classify the trophic status of lakes. The three trophic states into which lakes are normally classified are oligotrophic, mesotrophic and eutrophic. Oligotrophic lakes generally have very low levels of plant nutrients and algae (as measured by chlorophyll-a) and are typically quite clear. Eutrophic lakes have elevated levels of these parameters and may, as a result, be quite turbid (dirty). Mesotrophic lakes have intermediate levels of these parameters, and often fluctuate between clear and turbid phases with the wax and wane of their resident algal populations. Although there are some regional differences in the various boundary values used to delimit these categories, typical yearly average and yearly maximum boundary values of chlorophyll-a for the various states are:

	AVERAGE (µg/L)	MAXIMUM (µg/L)
Oligotrophic	<5	<10
Mesotrophic	5-15	<25
Eutrophic	>15	>25



By these standards Lagoon of Islands has reverted from eutrophic to oligotrophic conditions in the last couple of years. The aim of the management plan for the lagoon is to maintain this oligotrophic state continually so that the water is of suitable quality for release to downstream users. An additional benefit of this objective is that there have been obvious improvements to the fishery which have come about as a result of the change from eutrophic to oligotrophic conditions. It is hoped that continued management of water quality at the lagoon will help to maintain the present favourable conditions for fish growth which, as is outlined below, looks like restoring the reputation of the lagoon as a trophy trout water.

The plot also shows that the turbidity of the lagoon has trended downwards over the past couple of years, but that there is still a seasonal peak in turbidity during the winter and spring each year. These peaks are due to the input of turbid water from the Ripple Creek diversion, and demonstrate the impact that this diversion has had on the lagoon. Further work designed to minimise the impact of the diversion on the lagoon is described below.

## The fishery

Very brief notes on the statistics of the brown and rainbow trout spawning runs from 1992, and the brown trout spawning run from 1993, have been included in the last two newsletters. These statistics have shown the quality of fish available at the lagoon to be quite good over the last couple of seasons, but they don't put the magnitude of the improvement over the conditions in 1988-90 into perspective. In order to gain this perspective, some comparisons of growth rates and condition factors of fish from the two periods, and also from prior to the water quality problem are included in the figures and tables below.

### Rainbow trout

Lagoon of Islands is managed as a rainbow trout fishery, with the angling season beginning on the Saturday closest to the first of October each year and continuing through until the last weekend in May. Rainbow trout spawn in August and September at the lagoon, and the IFC has kept very detailed data on the length, weight and age composition of the rainbow trout spawning runs since about 1976. This allows for some interesting comparisons.

Fish from the 1993 rainbow spawning run were weighed, measured and scale sampled on the 8 September. A total of 87 fish were sampled, 42 being male and 45 being female. The average length was 500mm, the average weight was 1 599g. These fish were aged from the scale samples and showed the following age composition.

AGE (years)	NUMBER	AV LENGTH (mm)	AV WEIGHT (g)
1	1	378	650
2	53	450	1 192
4	2	558	2 250
5	19	588	2 268
>5	11	580	2308

From the scale data we can also back calculate the lengths of fish at each previous winter check and thus are able to show growth rates over the fish's life. Figure 2 shows the growth rates of the two, four and five year old rainbows sampled in this year's spawning run. These fish all show the effects

of the recent improvement in water quality with increased growth rates over the last two years.

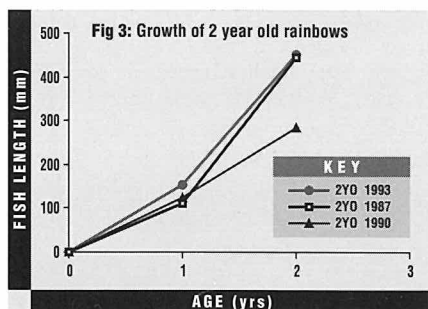
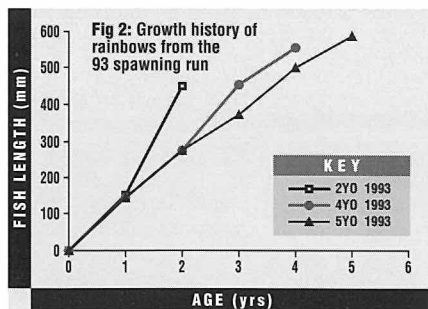
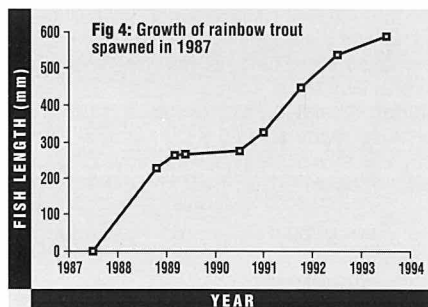


Figure 3 shows three samples of two year old rainbows:

- A** a sample taken in 1987 immediately prior to the algal bloom;
- B** a sample taken in 1990 during the bloom; and
- C** this years sample after the bloom.

The graph clearly demonstrates how growth was suppressed in these young fish during the algal bloom and that growth of two year olds this year is back to pre algal bloom rates.

By combining data collected from both spawning runs and test nettings we can look at fish quality in detail over a long period. We can follow the growth of a cohort (a group of fish born in the same year) through the problem period. Figure 4 shows a cohort which was spawned in September 1987 and follows it's growth (in length and weight respectively) through to this years spawning run when they were six years old. These figures graphically illustrate the suppressed growth over the period of the algal bloom (1988 - 1990) followed by a rapid recovery after water quality improved in 1991.



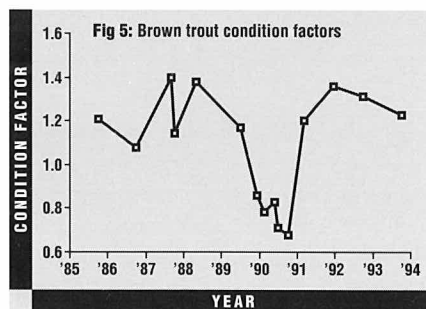
In general, our recent results suggest that the rainbow trout population in Lagoon of Islands is well on the way to recovery. The two year old fish, which made up over 50% of this years spawning run, should continue to grow well over this season and could be in the 2 to 2.5kg range by the end of the season. These two year olds are from a stocking of 4 000 domestic rainbow fingerlings in May of 1992. Rainbows that were

naturally spawned in 1992 should start turning up in next years spawning run and will probably be caught by anglers during this season. The older rainbows will probably not increase dramatically in size and will become scarcer as the season progresses. On the whole, provided water quality remains good, the angler can look forward to an improving rainbow fishery in years to come.

### Brown trout

Brown trout of various ages were stocked into Lagoon of Islands between January 1982 and February 1986. Since then they have maintained self reproducing populations, occasionally taking advantage of the Ripple Creek spawning channel when it flows early in the year. Brown trout have also been observed shore spawning in the lagoon. The data on brown trout is less detailed than that available for the rainbows. However, some comparisons of the performance of brown trout before, during and since the water quality problem are also shown below.

Data from this years brown trout spawning run, when 100 fish were sampled, showed similar growth rate patterns to those seen in the rainbow trout, with improved growth in all age groups over the last two seasons. Figure 5 shows the long term trends in the condition of brown trout from 1985 through to this year. This graph emphasises the effect the algal bloom had on fish quality with condition factors of brown trout dropping as low as 0.68 towards the end of the problem period. Again, the rapid recovery of the fish once water quality was restored is obvious with the average condition factor for males for this years spawning run being 1.24.



### Angler interest

The improvement in the quality of fish has led to a vast increase in angler patronage at the lagoon. From the results of the annual questionnaire survey conducted by IFC it appears that total angler effort is climbing back towards the levels which existed before the algal bloom.

SEASON	EFFORT (TOTAL DAYS)	ANGLERS (TOTAL NO.)	CATCH/ DAY RAINBOWS	CATCH/ DAY BROWNS
1985-86	7 100	2 100	1.1	(incl. browns)
1986-87	4 100	1 600	0.3	0.2
1987-88	2 900	1 450	0.3	0.3
1988-89	1 300	800	1.2	0.5
1989-90	350	200	1.6	0.5
1990-91	200	150	-	-
1991-92	1 100	600	0.3	0.1
1992-93	1 800	1 100	0.07	0.1

Catch rates, however, are still lower than for the years before the problems, which suggests that most anglers have to spend quite some time at the lagoon to secure

a fish. Hopefully, as a result of recruitment from the spawning channel and carefully managed stocking, the population of rainbow trout will build up in numbers and size over the next few seasons to give more anglers a chance of catching one of these fine fish.

### Catchment management

There have been significant changes to the way the Ripple Creek diversion has operated since the management strategies were first proposed. Flow has been limited by partially closing some of the control gates along the canal. This reduces the velocity of water and tends to limit the erosion of nutrient rich soils from the banks of the canal. At the beginning of each winter period, flow is only diverted into Lagoon of Islands after a significant flush of water has cleaned out the loose nutrient rich material which has accumulated in the creek and canal over the preceding dry period.

Further efforts have been made by both the HEC and the Downie family, who farm the land around Lagoon of Islands and the lower portion of the Ripple Creek Canal, to limit any run-off from fertilised pasture into the canal.

Mr Peter Downie has installed a number of drains which divert the majority of the run-off from the forested slopes around Jacks Marsh directly into the canal before this run-off has reached the flat pasture areas. This leads to a reduction in surface flow over the pasture, and should lead to a reduction in nutrient transport into the canal. Mr Downie has also constructed a diversion weir at the downstream end of the Ripple Creek Canal to allow some filtering of sediment and nutrients from the canal before this water passes down Jacks Creek and the Lake River on its way to Woods Lake. The efforts of the Downie family should be appreciated by all users of Lagoon of Islands.

The HEC has fenced off the lower portion of the Ripple Creek Canal to cut off direct stock access to the bed of the canal, and also to encourage vegetation to grow along the verges and banks of the canal. Anticipated benefits from this fencing include stabilisation of the banks leading to reduced erosion, further biological filtering of nutrients and sediment from run-off by the vegetation, and complete elimination of the significant amount of sheep and cattle manure deposited on the bed of the canal.

The HEC have also constructed two stilling basins, or sediment traps, on the canal which are intended to help remove nutrient rich suspended sediments from the water before it reaches Lagoon of Islands or Woods Lake. These traps have had their teething problems in their first year of operation, however, they promise to be very beneficial when fully operational.

Monitoring of turbidity levels and nutrient concentrations in Ripple Creek and the canal have shown that there is a gradual increase in turbidity as water passes along the length of the canal. This trend persists throughout the winter and spring period, even though turbidity levels gradually decrease over time as loose material is flushed from the canal and flows tend to stabilise. The HEC is installing permanent flow and turbidity monitors at two sites on the canal which, in combination with some weather station data recorded at Lagoon of Islands, will allow the relationship between flow, weather conditions, time of year, and turbidity and nutrient concentrations to be investigated further next year.

## Future management

Water quality in the lagoon is quite satisfactory at the moment, and future management is aimed more at consolidating the improvement rather than seeking any further radical reduction in either nutrient concentrations or algal levels. The continuing health of the strapweed populations is being monitored each year, as are changes in the species composition and abundance of other macrophytes. During the 1992-93 summer there were significant blooms of the filamentous algae, *Mougeotia sp.*, which formed green mats on the bottom of the lagoon. It is possible that this was a typical feature of the lagoon prior to the *Staurastrum excavatum* bloom, and that with increased water clarity, this bottom dwelling species is once more thriving. We will be keeping a close eye on this species during 1993-94. Water sampling for both nutrient and chlorophyll concentrations and phytoplankton sampling is also continuing on a monthly basis. Alarm levels are in place for all of these parameters which means the HEC and IFC are ready to investigate the cause of any developing problem and, hopefully, nip it in the bud.

The fisheries are being monitored by a combination of spawning run sampling and questionnaire returns. As pointed out above, the lagoon is managed as a rainbow trout fishery. Spawning runs of brown trout in the Ripple Creek spawning channel thus need to be controlled, or else this species may dominate to the point where the growth potential of the rainbows may be reduced. This year a total of 25 pairs of brown trout were allowed to spawn in the spawning channel, with the remainder of the run stripped of their spawn and returned to the lagoon. With an average weight of about 3kg, these fish could have laid anything up to 150 000 eggs. Survival rates from eggs through to one year of age for trout at Lagoon of Islands are not known, but experience overseas suggests that about 50% of eggs fail to develop through to free swimming fry, and that losses during the fry and fingerling stages may exceed 95%. If we assume a conservative figure of only 1% survival from the egg to the end of one year of life, then allowing 25 pairs of large fish to spawn still represents the equivalent of a stocking of 1 500 yearling fish. The impact of these limited brown trout spawning runs will be seen in future runs at the lagoon, and the long term management objective will aim to maintain a modest population of trophy brown trout, rather than a large population of smaller fish. A total harvest of something less than 1 000 brown trout per year should be adequate to satisfy the relatively small numbers of anglers who fish at the lagoon. This will be achieved by controlling the number of brown trout allowed to use the spawning channel each year.

Rainbow trout are a 'different kettle of fish' altogether. Because they are more readily caught than the browns, and also don't live as long, we feel confident that the lagoon can support a much larger spawning population of rainbows than currently exists. The spawning run this year comprised only 87 fish. However, when we consider that there are several age classes which are effectively missing from the population at the moment, most notably three and four year old fish which would normally comprise the bulk of a typical spawning run, it is a little early to say that the lagoon needs further stocking. There may well be a large number of fish from the 1992 stocking in the 1994 spawning run which mature for the first time

as three year olds. We also expect to see the progeny from the 1992 and 1993 spawning runs in the 1995 and 1996 runs. If that is the case then the population will be well on the way to achieving a target of between 100 and 200 pairs of rainbows each year. If these fish average 2kg over the long term, then that will ensure an annual egg production rate of approximately 200 000 to 400 000 eggs, which, using the same assumptions as above of 1% survival to one year of age will mean an annual recruitment of between 2 000 and 4 000 yearling fish. This level of recruitment should allow a relatively large catch of rainbows to be sustained each year, most of which are likely to be young fish of between 1 and 2 kilograms.

This information on the research and management program at Lagoon of Islands is provided to assure anglers that the IFC and the HEC are committed to maintaining the lagoon as one of the top fisheries in the state. We hope that the encouraging recov-

ery in the number of anglers using the lagoon continues, and that the catch rates gradually pick up to reasonable levels again in the coming seasons. The lure of the large browns and rainbows available this year should be enough to ensure a busy season at the lagoon.

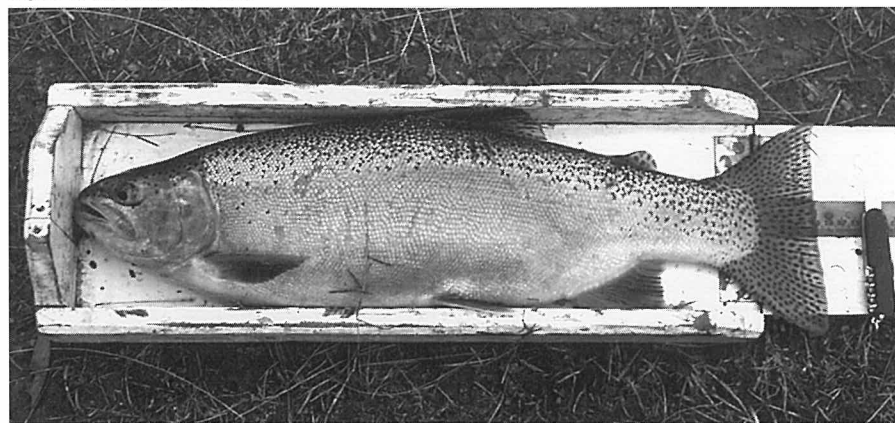
## Acknowledgments

Former staff of the IFC were responsible for collection of much of the data used in the preparation of this article. Particular thanks must go to Bill Thompson who collected the majority of the spawning run statistics, and Peter Davies for the questionnaire results.

## Editors footnote

This article was written before the fishing season opened in Lagoon of Islands. The superb 10lb+ fish that have been caught so far this year are evidence of the success of this project.

Lagoon of Islands rainbow 1993



# The 1993 World Fly Fishing Championship

Andrew McKenzie – Australian team member

## The 1993 World Fly Fishing Championship was recently held in the Kamloops area, British Columbia (B.C.), Canada.

The Kamloops community had been chosen as the hosts for the 93 championship after a rigorous selection process in Canada. The area itself is famous world wide as a trout fishery. Within a two hour drive of the city of Kamloops there are several hundred fishable lakes of various sizes and at differing elevations.

The lakes may be classified into various trout and insect habitat zones. Broadly speaking these are the shoreline areas up to a depth of 0.5 metres which, similar to the Tasmanian lakes, provide habitat for all manner of insect life and juvenile fish. The shoal areas then take in from the shoreline to a depth of approximately 6 metres. These areas are the most productive in the lake. The more shoal a lake had, the more productive it was in terms of fish numbers and size.

The majority of the lakes we fished were very clear and the shoal areas looked like they were white sand. These beds were really very soft and quite deep; very disconcerting if you went wading! Between 6-8 metres there was a drop off zone where the trout spent the majority of their time, particularly when summer temperatures drove them from the shoals. There were also deep water zones.

The lakes go through seasonal cycles and change in oxygen and temperature condi-

tions. The championship was timed to coincide with the end of the spring "turnover". Spring "turnover" is brought on by winds which cause the entire lake to mix. While this process is going on the water becomes quite murky and fishing is poor. Once this period is over however, the lake is re-oxygenated and fish feed actively on the shoal areas.

That was the theory. In practice, however, the three weeks prior to our arrival had seen some very consistent hot weather. As a result the lakes were running approximately one month ahead of schedule. The trout had started to move into the cooler depths. To confuse matters even more, almost to the day we arrived a very large low pressure system had passed over middle America and proceeded to drop the rain that caused the Mississippi to flood – we caught the tail end of that low for our practice sessions and the championship.

The team which consisted of Jason Garret and John Knowles from Tasmania, Reg Ransom from Western Australia and John Rumpf from Victoria with Laurie Matcham from Tasmania as reserve and Owen Nuttridge from Western Australia as team captain, arrived in Vancouver, B.C. on 26 May 1993. We hired an eight seater van and drove out through the spectacular Rocky Mountains scenery to Kamloops, a journey of approximately six hours. Despite poor navigation we managed to find Roche Lake

resort just outside Kamloops. Roche Lake was to be our base for our practice sessions on various lakes in the area. That night at dinner we met David Bryce, Chairman of the organising committee and Brian Chan. Brian was to be the Australian team guide for the championship. Brian is a fisheries biologist for the B.C. Ministry of Environment, Lands and Parks. His job is to manage the fishery in the hundreds of lakes and many rivers and streams in the Kamloops area. He is also a fly fishing enthusiast. He has written a book "Fishing Strategies for Still Waters" which has become the bible for people wishing to learn how to fish the area. He is renowned as a skilled exponent of the art of chironomid fishing; that should have been our secret weapon. We also had a lot of help from Dave Paille, a good friend of Brians. Dave was our unofficial guide, avid fly fisher and a great fly tyer.

Under competition rules competing teams were not allowed to practice on competition lakes. Brian had tried to choose practice venues whose characteristics closely mirrored the competition lakes. We fished seven different lakes during the practice session. They were Heffley, Horseshoe, Peterhope, White, Knouff, Leighton and Community. The weather was poor a lot of the time but we did have some great days fishing.

The lakes are nutrient rich and provide a myriad of food sources for trout. The most important of these is the shrimp. If present in the lake, shrimp are the mainstay of the trout diet as they are available all year round. Chironomids are probably the next most important food source. A chironomid goes through a life cycle of egg, larvae, pupa and adult. The most important stage to trout is the pupa which generally range in size from 3-15mm. However, lakes such as Leighton and Tunkwa have chironomids to 25mm in length.

There are good populations of Callibaetis mayfly in the lakes as well. Most of us had success with a nymph fished very slowly over the drop off on a long leader. One day on White Lake we saw fish rising freely to duns emerging on the shoals and along the drop off area. During the competition there was some dry fly dun action on Paul Lake where the successful imitation was a Grey Wulff.

The sedges were real eye openers. They were about 25mm long and fished like a mudeye. Damsel flies and dragonflies also feature on the menu. Fished around the drop off on a floating line and long leader or a sinking line they worked very well. The nymph of the Darner dragonfly is astonishingly large – up to 50mm long.

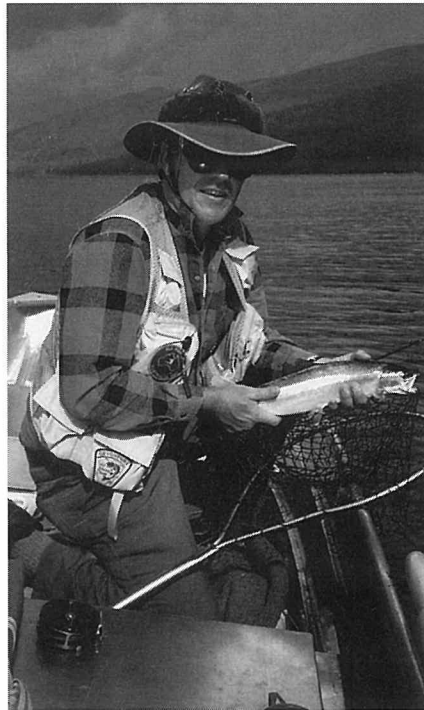
Leeches are found in all the lakes as well. They could be fished on the same lines as the damselfly and dragons but worked using long slow pulls to imitate an undulating movement.

The most interesting fishing, for me anyway, was the chironomid fishing. It was critical to match the hatch. The wrong colour or size pupa and you didn't get a bite. I've mentioned the long leaders we used; they were in fact around 20-22 feet long. The technique we learnt worked very well and involved casting a line at 90 degrees to the prevailing wind and allowing your fly to drift and sink as it approached the drop off zone/shoal area. Wave action during the drift gives the fly very lifelike movement. It was actually a matter of not doing anything as the fly sank. I would time around two minutes on my watch before I touched the line. The fly would lie in about 12-18 feet of water. A couple of twitches usually resulted in a strike. If it didn't a very, very slow hand twist retrieve with pauses to simu-

late the pupa resting, worked the fly into the strike zone. One cast can take 10-15 minutes to fish. The technique could be varied using shorter leaders in more shallow water and is one you could apply in Tasmania. I've heard that Burbury has a good population of chironomids!

We did have some great fishing during these sessions. I found the going pretty tough for the first two days - fishless and not a single bite. On the third day, just after lunch I changed leader material from brown chameleon Maxima to a "clear" line, caught a fish first cast and never looked back. A highlight for me was one day on White Lake which really showed how good the fishing was around Kamloops and how good it was on chironomids. Over a two to three hour period I doubt if one of the team didn't have a fish on all the time.

It was also a chance to watch some great fishermen from other countries get amongst them. On Horseshoe Lake we watched Bob Church and Brian Thomas from the English Commonwealth team catch around 50 fish in the day. The English were using type IV/V sinking lines and fast retrieves. It wasn't supposed to work but it did that day and all through the competition. Another Englishman on the same team, David Grove did very well at Peterhope Lake. He caught one 8lb+ first time out and topped that next trip with a 9lb 8oz fish. John Rumpf and John Knowles both caught fish around the 6lb mark. On average I would say the fish were around the 1 1/2lb mark.



*John Knowles at White Lake, Canada*

The competition started officially on 5 June with registration. The following two days were practice days. The competition had originally been set to fish lakes Tunkwa, Roche and Edith. Edith is a brook trout lake and had to be dropped from the program due to a winter kill of fish that year. Paul lake was substituted.

Set in grasslands, Tunkwa is around 300 hectares in size with a maximum depth of 18 feet. It is a very productive lake known for its chironomid hatches and abundance of shrimp.

Set amongst magnificent pine forests Roche is about 130 hectares in size with a

maximum depth of 76 feet. It offers a variety of fishing situations with varying bottom conditions, ie marsh, weed etc, and varying depths with abundant shoals. Primary food sources are again chironomid and shrimp although around the time of the championship the damselfly and sedge were supposed to start moving.

Paul Lake is much deeper, to 180 feet. Set amongst the pine forests and steep mountains it was very picturesque. The clear water and extensive shoal areas provide excellent habitat for shrimp, chironomid, mayflies, damselfly and dragons.

The competition was fished from anchored boats with two anglers from different countries and a controller (judge) in each boat. There was a day allocated to each angler to fish each lake. The day was broken up into two three hour sessions with half an hour break in between for lunch. All hooks were barbless to make the process easier.

Although it is often used as an excuse, the weather was pretty ordinary and it suited the European teams and others who were proficient at flogging a wet. There can, however, be no denying their skill with this type of fishing. At the end of the day the fast retrieve and sinking lines prevailed with a Welsh fly, a "Little Devil" doing the damage for the English team and individual champion as well. The winners in the team competition were England first, Poland second and Italy third. Australia finished 14th overall. The individual competition was won by a competitor from Wales, with Poland second and England third. A young New Zealander did well coming in fourth. Best for Australia was John Rumpf who finished a creditable 18th. Me? Well I finished 36th.

The championship was a lot of fun but it's pretty serious stuff as you are there to represent your country. It's also very hard work and long hours and I was totally exhausted at the end of the two weeks. However, the people you meet just make it all the more worthwhile.

I should now take this opportunity to thank all the Australian team members - it really was brilliant fun. Also Chris Stopp, Malcolm Crosse, Rob Sloane and Bill and Jan Spencer for their support and tuition. Brian Chan and Dave Paille for their endless efforts to keep us catching fish and to the Kamloops community for its genuine friendship shown throughout the competition. Canada won a lot of friends during this championship and I'd recommend a trip to Kamloops to anyone who loves good trout fishing.

*...In Brief continued from front page*

## **IFC/HEC Consultancy Agreement Renewed**

The biological consultancy arrangement between the Inland Fisheries Commission and the Hydro-Electric Commission is to be renewed for another three years from July 1994.

This arrangement has been most beneficial to both the HEC and the IFC and consequently to anglers since its inception three years ago. Mutual problems such as Lagoon of Islands algal blooms and the Pieman River fish kill have been rapidly investigated and solutions achieved through this arrangement.

Anglers have also benefited through water level agreements in waters such as Bronte and Little Pine. These have been negotiated through links formed in the course of the consultancy.

## Prosecutions

**The absence of the familiar list of prosecutions in this spot doesn't mean that your inspectors have had a few months off. Quite the contrary.**

The reason for the absence is simply due to producing three newsletters this year. It is easier to extract the information from our records at the end of each June or December period. So those waiting to see their name listed will have to wait for the next newsletter in the new year.

## Mercury in trout

**Anglers may have noted recent items in the news media regarding mercury levels in trout in south west Tasmania.**

Despite incorrect reports in most media, this work was actually done by the Inland Fisheries Commission as part of the IFC/HEC consultancy agreement.

The full text of the actual press release is repeated below for the benefit of anglers.

*The Senior Medical Officer with the Department of Community and Health Services, Dr Avner Misrachi, said today that tests on a sample of trout from the Lower Gordon River have revealed elevated levels of mercury.*

*He said tests were undertaken by the Inland Fisheries Commission on behalf of the Hydro-Electric Authority.*

*The tests showed that while levels of mercury in the flesh of wild trout caught in Lake Gordon averaged 0.33 parts per million, the lower Gordon River levels were between 0.34 and 2.3 parts per million, with an average of 1.13ppm. The recommended National Food Authority level is 0.5ppm.*

*However, because of the safety margins built into the recommended maximum intake levels, it is unlikely that human health effects have occurred.*

*These results, if they are a true representation of mercury levels in wild trout in the lower Gordon River, mean that people could exceed the maximum recommended intake of mercury if they eat these trout regularly.*

*As a result, it is recommended that people limit their intake of lower Gordon River wild trout in particular, to no more than once a fortnight, based on 200 grams per serve.*

*Children were the most likely group to exceed recommended intakes of mercury by eating fish.*

*In March this year, doctors in the area were contacted by officers of the Department of Community and Health Services Public Health Branch, and were unaware of any patients affected by mercury.*

*Mercury can cause a range of health effects in humans if consumed in excess over long periods of time.*

*The Hydro-Electric Commission and the Inland Fisheries Commission are carrying out further investigations to identify possible causes of the elevated levels found in trout in that general area.*

The area of concern is the lower Gordon River more so than Macquarie Harbour. The source of the mercury is yet to be determined. Other fish, such as eels, are also being investigated.

## Book Reviews

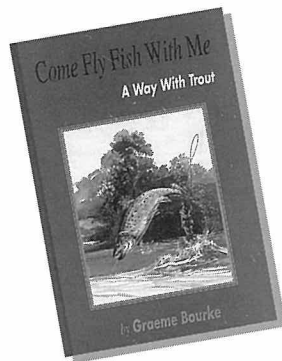
### It must be Christmas!

Three new angling books have recently been released by local authors, each looking at different aspects of the sport.

They are all priced below \$25 and are highly recommended additions to the anglers' library. Further details on each of the books are given below.

### *Come Fly Fish With Me – A Way With Trout*

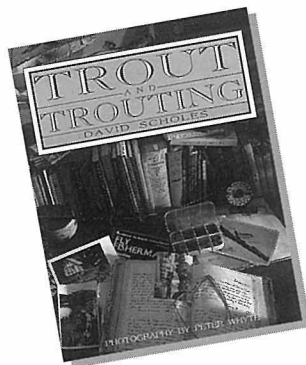
by Graeme Bourke  
Published by MBA Publishing



**Graeme relates his experiences and adventures in progressing from a "beginner to a rookie fly-fisherman" around highland lakes and northern rivers and streams of Tasmania. This book will provide entertaining reading for all anglers, particularly those just acquiring a penchant for fly-fishing.**

### *Trout and Troutling*

by David Scholes  
Published by Kangaroo Press

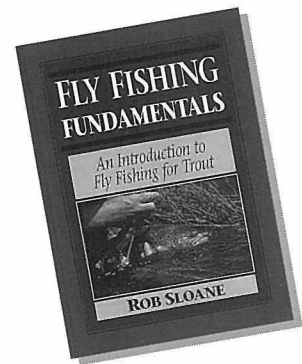


**Rich and precise are the observations of David Scholes in his latest contribution to Australian angling literature. His writings reflect on encounters with trout on some of his favourite rivers and streams as well as casting to the reader some advice on proven flies, tactics and angling issues.**

### *Fly Fishing Fundamentals*

*An Introduction to Fly Fishing for Trout*

by Robert Sloane –  
Published by Tas-Trout Publications



**This is a beautifully produced book for the new and recently converted fly fisher. The format is excellent with general subject chapter headings such as Getting Started, Understanding Trout, About Flies, Basic Techniques etc. Under each of these headings a series of questions are asked and answered.**

For instance, under Getting Started the questions –

- Should I enrol in a fly fishing school?
- What are the basic casting steps?
- How do I get more line out?
- What about false casting?

– are but the first few.

The text is informative without becoming highly technical and the arrangement allows the reader to check individual points or read the lot as they may wish.

The illustrations and photographs complete what is a very good introductory book on fly fishing. It is also produced and printed in Tasmania.

## Newsletter subscriptions

**It is still possible to subscribe to the Newsletter and have it mailed directly to you. For \$10 you will receive three newsletters dating from the time of payment as well as an Annual Report.**

This year the IFC will once again produce its own Annual Report in an updated and attractive format but still containing informative summaries of the Commission's activities for the 1992-93 financial year. The production of this has been delayed a little due to the format change but the report will be out early next year.

A reminder to those persons who subscribed to the Newsletter/Annual Report with the first issue this year. Your subscription is now due and a notice has been enclosed with this Newsletter. Other new subscribers will of course be gratefully accepted and you should simply send your name and address with \$10 to the Secretary, Inland Fisheries Commission, 127 Davey Street, Hobart 7000.

