INLAND FISHERIES COMMISSION NEWSLETTER

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TASMANIA INLAND FISHERIES COMMISSION

CONTENTS

WHITEBAIT STUDY FUNDED

The Federal Minister for Primary Industry, Mr John Kerin, recently announced grants for commercial fishing industry research totalling $3 596 704. The projects were funded through the Commonwealth Fishing Industry Research Trust Account which is supported on a dollar for dollar basis by Government and industry.

The Inland Fisheries Commission was successful in obtaining $41 500 for the first year of a proposed three year study of Tasmanian whitebait. The Commission will investigate the present status of whitebait populations in Tasmanian streams in order to determine whether stocks are adequate to support some level of commercial or recreational fishing. Investigations will also be linked to a CSIRO study of larval fish off the Tasmanian coast.

If a sustainable yield of whitebait is identified, procedures and guidelines will be developed to allow future management of the fishery. Management must be consistent with conservation of the various species involved in whitebait runs and must also be compatible with sea-run trout fishing interests.

If an open season cannot be justified, suitable measures will be established in order to protect further and assist recovery of whitebait runs wherever possible.

The Tasmanian whitebait fishery was formerly a lucrative commercial fishery with 480 tonnes of whitebait landed in 1947. The fishery went into a major decline after 1947 due to over-exploitation and lack of effective management and regulation. The whitebait fishery was finally closed in 1974 but persistent illegal fishing and sale of whitebait has continued.

For further information on the Tasmanian whitebait fishery refer to Inland Fisheries Commission Newsletter Volume 13 Number 3 – November 1984.

CLOSED SEASON PROPOSALS SUPPORTED

The Commission has received widespread support for the suggested changes to the rainbow trout closed season which were published in the last volume of the Newsletter.

It is proposed that Great Lake will close on Sunday nearest 31 May and open on Saturday nearest 1 August. Lagoon of Islands, Dee Lagoon and Lake Rowallan will close on Sunday nearest 31 May and open on Saturday nearest 1 October.

The Northern Tasmanian Fisheries Association, Southern Tasmanian Licensed Anglers' Association, Freshwater Anglers Council of Tasmania, Central Highlands Shack Owners Association, Tasmanian Professional Trout Fishing Guides Association, North West Fly Fishers Club of Tasmania, Fly-Fishers' Club of Tasmania and the Tasmanian Fly Tyers Club have all indicated support for the proposed changes.

The Commission will now seek Government support and will attempt to introduce the changes as soon as possible.

BROOK TROUT REINSTATED

In 1963 the Commission decided to discontinue brook trout propagation at Salmon Ponds. Since that time stocks of brook trout have gradually dwindled at the Salmon Ponds and by April 1985 only a single male fish remained.

In captivity these fish became extremely docile and proved very popular with visitors. Following regular inquiry and the increasing awareness of the problems posed by introducing live fish into Tasmania, attempts have been made to re-establish a small broodstock population at Salmon Ponds.

On 22 and 23 April 1985, Commission staff visited Clarence Lagoon to obtain pre-spawning brook trout. Monofilament nets were set in various areas of the lagoon and a catch of five live adult brook trout resulted. A further half-dozen fish escaped during net hauling, as continual monitoring of the nets was made to minimise damage to the fish. Brook trout were seen moving in the shallow marsh at the northern end of the lagoon and one, a female of 3 150 g was landed on the fly and was also kept alive.

All three spawning tributaries had low flows and despite careful inspection, no sign of fish or spawning activity was observed. Electrofishing of the first 200 metres of the main spawning creek also proved negative. (Subsequently regular inspections have resulted in the observation of good numbers of brook trout on the spawning beds.)

Six live fish were transferred to Salmon Ponds where details of weight, length and scale samples were obtained. Two pairs of the fish were found to be in spawning condition and a total of 6 500 ova was stripped and laid out for incubation. On 5 May the remaining fish were handled and a further 3 500 ova collected.

Details of brook trout from Clarence Lagoon are set out below.

Sex	Weight (g)	Total Length (mm)	Age	Condition
Female	850	348	2+	not ripe
Female	600	348	2+	not ripe
Female	1 460	422	3+	ripe
Female	3 150	592	4+	ripe
Female	2 600	566	4+	ripe
Male	2 550	527	4+	ripe

Brook trout return to Salmon Ponds.

TROUT STOCKING IN NEW ZEALAND

This article is a summary based on a series of contributions which appeared in Freshwater Catch, No. 26, Autumn 1985. Freshwater Catch is a supplement of Catch 85 and is published quarterly by the New Zealand Ministry of Agriculture and Fisheries.

Bob MacDowall, Brendan Hicks, Chas Hardy, Tom Kroos and David Stack provided the original contributions on behalf of New Zealand Fisheries Research Division, the Wellington Acclimatisation Society and the Internal Affairs Department.

The stocking philosophy

Early settlers found a sparse freshwater fish fauna in New Zealand (very similar to Tasmania) and soon introduced suitable sport fish species. Stocking was the initial means by which trout became acclimatised throughout the country and both brown trout and rainbow trout quickly became established and widespread.

Stocking thus became a management 'habit' in the early years of New Zealand's trout fisheries. It was necessary for establishment and over many years became regarded as being necessary for maintenance of trout stocks.

This practice was not seriously questioned until Derisley Hobbs began to study the effectiveness of trout stocking in New Zealand in the 1930's. Hobbs later travelled the country giving seminars in which he preached his views:–

- that trout are naturally highly prolific and successful in breeding
- that far more young were produced than were needed to sustain populations
- that natural mortalities were very high
- that exploitation rates by anglers in most waters were far below those that would cause population decline
- and that, for the most part, stocking of trout populations in New Zealand was unwarranted.

Hobbs was responsible for a major, but slow, change in attitudes amongst future fisheries managers in New Zealand (and later Tasmania), with managers adopting a far more selective attitude towards trout stocking.

In recent years, however, there has apparently been a shift backwards, towards increased stocking in New Zealand and this has been attributed to the following factors.

1. Fewer of the present managers are familiar with the philosophy and result of Hobbs' work.
2. Some agencies seem to regard perpetual stocking of fisheries as an economic and effective way of maintaining fisheries.
3. A very few fisheries are under sufficient fishing pressure to require stocking for maintenance.
4. There is an increasing demand for trout fisheries in all parts of New Zealand; this means that in areas where spawning habitats are limited or lacking (e.g. coastal dune lakes) stocking is required if trout fisheries are to persist.
5. Deterioration of conditions in rivers causing reduced *quality* and/or *quantity* of trout habitat (resulting from insensitive land and stock management, water abstraction, dam construction, fluctuating flows, etc.) has caused a reduction in trout populations in some areas. This has generated demands for stocking.

With few exceptions, New Zealand and overseas studies have shown that the need for stocking in most systems is very doubtful, indeed highly wasteful, and provides little or no return to the angler. Justifications have largely been political and psychological (pleasing the angler), and have resulted from an inherited stocking tradition.

The need for stocking

Each case must be considered on its merits but the following principles are suggested:–

- Releases should only be made where there is inadequate natural spawning to populate adult habitats
- or where exploitation rates are greater than natural recruitment rates.

There are waters in New Zealand which lack adequate spawning areas, these include lagoons and lakes without tributaries and a few rivers which lack gravels because of unsuitable rock substrates. However, it is considered that there are very few, if any, demonstrated situations in New Zealand where exploitation exceeds recruitment.

In general the capacity of headwater spawning streams to produce fry greatly exceeds the capacity of downstream waters to rear fish to a catchable size (very similar to the Tasmanian situation). Where this is so, it is considered that stocking cannot be justified.

Sometimes a case is made for stocking following habitat degradation. It is considered that stocking is useless in the case of long term degradation resulting from mining, excessive water abstraction or poor land management, because the ability of the habitat to support fish has been reduced.

If there has been a 'one-off' degradation or calamity, then some argument can be made to restock as a one-off exercise. Even so, it can be argued that the high reproductive rate and the natural plasticity of trout populations will result in rapid natural restoration.

Problems with stocking

There are many hidden problems associated with artificial stocking and these are often overlooked.

Mortality of hatchery trout released into streams can be very high. Studies have revealed that survival of released fish of comparable size and species is much less than that of wild trout. Even so, there is an enormous natural mortality rate within wild populations; this is Nature's way of ensuring that only the "fittest" survive to enhance the physical and genetic well being of the population.

Introduction of different genetic stocks may have a detrimental effect on the genetic make up of wild trout. Generally, hatchery trout are selected for survival in an artificial environment and may differ significantly from wild fish in terms of spawning time, behaviour and general wariness, growth rate and environmental tolerances.

Studies have shown that the survival of hatchery trout is dependent on size. Competition with wild trout usually results in poor growth, low condition and eventually mortality in hatchery fish. In some instances heavy releases of adult hatchery fish has resulted in displacement of wild fish leading directly to reductions in the wild population.

The cost of stocking

Those who favour stocking seldom consider or investigate the true cost-benefit. The costs of hatchery establishment, maintenance and depreciation; hatchery running costs, food, labour and health servicing; the costs of labour to trap, strip and transport fish must all be weighed against the resulting returns to anglers.

Analyses conducted by the Wellington Acclimatisation Society have indicated that it conservatively cost $25 to $45 N.Z. for each trout produced by the Society that was caught by an angler between 1966 and 1976. In one river studied, trout liberations gave only a 0.002% return of stocked fish to anglers. Another New Zealand acclimatisation society conservatively estimated it cost $31 N.Z. per fish creeled.

The cost of raising trout has skyrocketed in recent years. Before devaluation of the New Zealand dollar the cost to raise one yearling trout was conservatively estimated at between 50 cents and one dollar. Assuming a high rate of return to the angler at 1% of trout stocked, the cost of each trout landed would be $50 to $100 N.Z.

The benefits of stocking

The Wellington Acclimatisation Society has estimated that 94% of trout caught in that district by anglers have resulted from natural spawning. Between 1963 and 1967 it was estimated that only 0.5% of hatchery liberated trout were caught by anglers; from 1967 to 1977 the return was estimated at 0.17%.

It is interesting to note that most agencies have found that despite intensive stocking it has not been found possible to maintain a sufficient number of trout in any stream to enable most anglers to catch trout. (This is generally true of many overseas 'put and take' fisheries as well – the old saying that 10% of anglers catch 90% of the fish is very true, even in a 'put and take' situation.)

In the Rotorua Lakes district, stocking lakes with yearling rainbow trout is successful and can be justified on the basis of the 'numbers game'. Hatchery reared rainbow trout represented an estimated 30% of the total catch between 1972 and 1979. Poor natural spawning areas are a feature of lakes in this region and the cost of stocking can be justified on the basis of tourism and licence revenue alone. (Development of artificial spawning channels and improvement of existing spawning areas may still represent a cheaper means of achieving the same results.)

Selection of stock fish

Where stocking can be justified it is important to determine the most effective species, size and number of stock fish. Again, each case must be considered on its merits. Unfortunately a "put and hope" philosophy still predominates in many areas.

Generally it is a matter of "the bigger the better, as close to the angling season as possible". This is essentially "put and take" and the cost to support such fisheries is excessive. (The cost of supporting a fishery of this nature would require a day ticket fee comparable to the present level of full season fees.)

Consideration of harvesting over-populated wild adult trout is put forward as a cheaper alternative that should be considered. (This practice has long been conducted in Tasmania.)

Common sense suggests that it is a sound rule not to add to management problems by trying to establish a second or third competitive species where a species already present provides satisfactory angling.

The New Zealand experience indicates that the lilberation of brook trout into a brown trout fishery is a self-defeating exercise as brown trout will predominate. Millions of brook trout were liberated into New Zealand waters without significant success. Similarly where riverine conditions favour brown trout many unsuccessful attempts have been made to establish rainbow trout in waters where brown trout are already established.

Conclusions

- Before rivers or lakes are stocked the cost of rearing and liberating fish should be assessed.
- The need for stocking must be determined by electrofishing or netting surveys, evaluation of spawning areas, and by creel census surveys.
- Releases should only be made where there is shown to be inadequate natural recruitment to populate the available adult habitat, or where exploitation rates are greater than natural recruitment rates.
- Any stocking program should be followed by on-going analyses of catch returns through creel census, or by population assessment through surveys.
- The cost of each released fish caught by anglers must be assessed in order to determine the overall cost-benefit of the exercise.
- A fishery maintained by wild fish is preferable to one maintained by stocking because of the reduced cost and the superior qualities of wild fish.

LAKE ST CLAIR EXCURSION

Report on a field excursion conducted by staff and students of the Department of Zoology, University of Tasmania

by Dr Alistair Richardson, Senior Lecturer in Zoology

The main objective of the excursion was to collect crustaceans, especially *Anaspides spinulae*, *Astacopsis franklinii* and *Parastacoides* spp. from Lake St Clair, its environs and neighbouring lakes. In addition we made collections of aquatic invertebrates and fish.

Anaspides spinulae

This relative of the common "Mountain Shrimp", *A. tasmaniae*, has not been collected since 1962, when a few specimens were caught using a dredge near Cynthia Bay. It is listed in the IUCN Red Data Book as vulnerable, along with several other Tasmanian syncarids, and amongst those it is one of the most restricted and hence endangered species.

After a fruitless search at Cynthia Bay using SCUBA diving, the animals were collected from rocky reefs at depths of less than 10 m near Ida Bay. The animals were found living under the exfoliating sheets of rock on weathering dolerite boulders, and in this microhabitat they were reasonably abundant.

About 30 individuals were collected in order to make taxonomic comparisons between them and populations of *A. spinulae* from lakes on the western edge of the Central Plateau, where populations with characteristics intermediate between the typical forms of the two species have been located.

It is encouraging to find that *A. spinulae* persists in Lake St Clair despite the trout population. It is likely that the refuge provided by the dolerite plates protects them from predation. A similar situation seems to occur in Clarence Lagoon, where they shelter under large plate-like concretions on the bottom.

It is also worth noting that the reefs of boulders in which the animals were found could be easily located with an echo-sounder, and that we found several such reefs, one of which was examined by diving. Hopefully this means that there are a number of colonies in the lake and the species is reasonably secure.

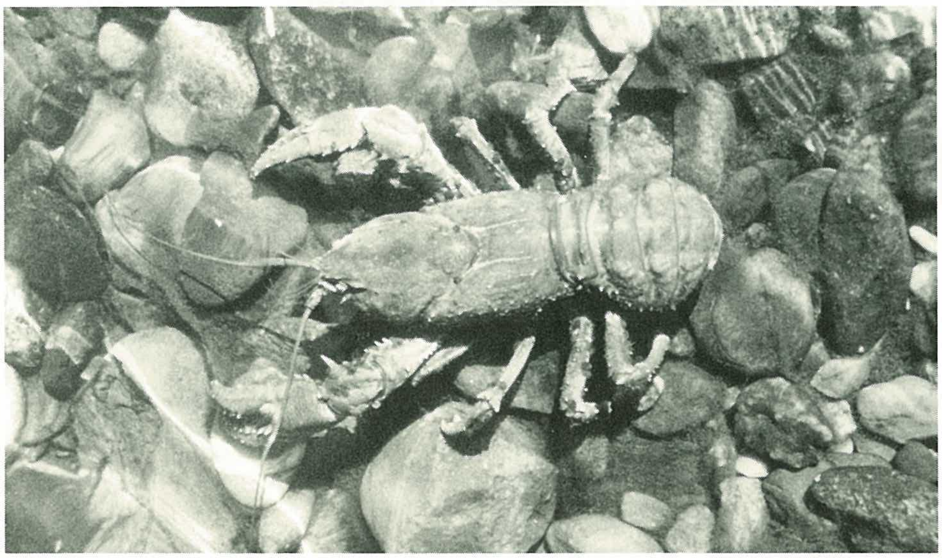
Astacopsis franklinii

This species of freshwater crayfish is common in streams almost throughout the state, but it is only recently that lake-dwelling populations have started to come to light. They are known from Arthurs Lake, Lake Dobson and Clarence Lagoon.

We collected specimens by hand around the shores of Lake Laura and Lake Sappho, and by SCUBA diving in Lake St Clair. In Lake St Clair it was found associated with rock piles and timber at all depths examined (<16 m); a wide range of sizes was present, indicating that breeding is occurring. Several females bearing hatched young were collected. The largest animals had a carapace length of 70-80 mm.

In Lake Sappho there were many burrows in the sandy lake floor. Such burrows in Clarence Lagoon are constructed by crayfish, but none were collected from the Sappho burrows.

Ten specimens were collected in order to culture them under laboratory conditions with a view to establishing their growth rates.



A fresh water crayfish from Lake St. Clair.

Parastacoides spp.

The taxonomy of this genus of burrowing crayfish is presently under review. All the specimens collected on this excursion would be allocated to *P. tasmanicus tasmanicus* on the present published taxonomy, but it is highly likely that they should be given specific rank and distinguished from *P. tasmanicus* from the type locality around Lake Margaret.

We collected animals from a dry swamp near the mouth of Mt Ida Creek, from wet ground near the creek draining from Lake Sappho and from moorland vegetation around Lake Sappho. A few specimens from each locality were collected for taxonomic purposes.

The collection from the Lake Sappho area is of considerable interest, since no previous records exist from the Central Plateau. It will be interesting to discover how far they extend eastward from there.

All specimens appear to belong to the same species and they are very similar to animals from Victoria Pass and King William Saddle on the Lyell Highway.

Other Freshwater Collections

Freshwater invertebrates were collected by hand and by handnet from Lake St Clair, Lake Laura and Lake Sappho. These comprised the usual mixture of dragonfly, mayfly and stonefly nymphs with some snails and aquatic worms. An amphipod, *Austrochiltonia* sp. was found in Lake Laura and Lake Sappho.

A portable electrofisher was used in the three lakes, but only yielded fish in Lake Sappho, where there were many climbing galaxias, *Galaxias brevipinnis*. It is highly likely that trout are absent from Lake Sappho, but they are abundant in Lake Laura.

SURVEY OF BLACKMANS LAGOON AND THE WATERHOUSE LAKES

by Wayne Fulton and Stuart Chilcott,
Scientific Officer and Research Assistant, Inland Fisheries Commission.

Introduction

The north-eastern part of the State is relatively remote from the major still-water trout angling areas of Tasmania's Central Plateau. Consequently, there is considerable interest in the trout fishing available locally. Blackmans Lagoon, Big Waterhouse Lake and Little Waterhouse Lake near the coast are known to support very large numbers of invertebrate animals and should provide a good environment for trout production.

However, Northern Tasmanian Fisheries Association annual reports over the past decade generally indicate that angling has been disappointing. The Scottsdale Branch of the NTFA has also expressed concern over these waters and has requested that their trout populations be investigated.

Blackmans Lagoon covers an area of 20-25 hectares, depending on water level. In recent years this has been quite low and emergent water weeds have been a significant problem. Recent efforts by the Scottsdale Branch to supplement the catchment of this lagoon should keep the water level higher in future and reduce the weed problem.

Little Waterhouse Lake is the smallest of the three waters and it also has a considerable amount of emergent weed which provides excellent cover and a source of food for trout.

Big Waterhouse Lake covers an area of approximately 130 hectares and is open to the sea via Lake Creek. Large areas of weed considerably reduce the fishable area but provide good conditions for fish growth. The salinity of this water at the time of sampling was 5 ppm which is regarded as brackish.

Stocking History

The stocking records for these three waters are given in Table 1. Earlier records show that the two Waterhouse lakes were first stocked in 1932 whilst Blackmans Lagoon was initially stocked in 1955.

Year	Blackmans Lagoon	Little Waterhouse Lake	Big Waterhouse Lake
1967	3000 R	1820 B	
1968	5000 R		
1969	50000 R	5500 B	
1970			
1971	5000 8000 B*		45983+
1972	220000		420000
1973	100000		405000
1974			
1975	50130++	1800**	110000
1976	50000		
1977	50000		
1978	39000		
1979	52000	50000 R	
1980	10000	10000 R	
1981	20000		
1982			
1983	20000	20000 R	
1984	70000	15000	

Table 1: Stocking history of Blackmans Lagoon, Little Waterhouse Lake and Big Waterhouse Lake since 1967. Figures indicate brown trout fry unless indicated, viz. R: Rainbow trout; B: Brook trout; *: fingerlings; **: yearlings; +: included 130 fish electrofished from rivers; ++: included 983 wild fish transferred.

Big Waterhouse Lake has received both brown and rainbow trout whilst both these species as well as brook trout have been placed in the other two waters at various times.

Methods

A survey of the trout populations in these waters was carried out using gill nets on 30-31 January 1985. The objective was to make some assessment of the status of trout stocks in these waters.

Mesh nets (100 mm) were set overnight in Blackmans Lagoon and for a full day in Little Waterhouse Lake. In Big Waterhouse Lake 100 mm mesh and 50 mm mesh nets were also set for a full day.

Results

The catch details are given in Table 2 below.

Water	Species		Average Wt. (g)	Range of Wt. (g)
Blackmans Lagoon	Brown trout	34	1527	751-2554
Little Waterhouse Lake	Brown trout	2	1512	890-2134
Big Waterhouse Lake	Sea mullet	9	1711	1470-2010

Table 2: Catch details for netting survey in north-east Tasmania, 30-31 January 1985.

The scales of the trout were examined to determine their age and growth rates. The results of this analysis showed that trout growth was excellent and comparable to that shown by Lagoon of Islands fish. The details are given in Table 3 below.

Age Class	Mean Weight
1 +	751 g
2 +	1 439 g
3 +	1 656 g
4 +	1 970 g

Table 3: Mean weight for age of brown trout from Blackmans Lagoon 30 January 1985.

Variations in weight around the mean of up to 500 g were observed within the 2+ and 3+ age group. Spawning checks were evident in a number of these fish.

The two fish from Little Waterhouse Lake showed a similar growth rate to those in Blackmans Lagoon.

The catch for Big Waterhouse Lake was a surprise, although the presence of sea mullet (*Mugil cephalus*) is probably known to locals. The fish caught were large examples of the species and were all in excellent condition.

The main tributary stream of this water, Sheepwash Creek, was briefly examined for trout spawning potential. It was not flowing at the time although it is known to carry a good volume of water in winter. The creek gradient was low, with little suitable spawning substrate in the area examined. The possibility of constructing a spawning channel by diversion of water appears unlikely but would require further examination before being completely rejected.

Discussion

Blackmans Lagoon is presently carrying a good population of excellent-conditioned fish. This lake has in recent years been extensively stocked with brown trout fry by the Inland Fisheries Commission and also with advanced fry from the Kamona rearing unit operated by the Scottsdale Branch. It is apparent that these efforts are showing dividends.

Catch returns to the angler from this water have not been high, probably due to the fact that there is still an abundant food supply in the lagoon. It should also be remembered that, owing to the size selectivity of the gill-nets used, larger fish than those recorded are also certainly present in this water.

In contrast to Blackmans Lagoon, Little Waterhouse Lake has not been extensively stocked, having received only 16 800 brown trout since 1967. Some rainbow trout have been released in recent years but reports of catches of these are sparse.

Big Waterhouse Lake has received almost one million trout, including nearly 1 000 adult fish, since 1971. However, when the area covered by this lake is compared to that of Blackmans Lagoon it shows that the latter water has received more than five times as many fish per unit area.

Another factor that has not been considered in previous stocking policy for these waters is the effect of salinity on trout fry. At 5 ppm, Big Waterhouse Lake is approximately twice as saline as Blackmans Lagoon and it is quite likely that this could be limiting the survival rate of hatchery reared stocks.

Big Waterhouse Lake has access to and from the sea as shown by the presence of sea mullet. As well as allowing for migration of trout out to sea it is possible for other migratory fish species to enter the lake. Among these would be predatory species such as the long-finned eel (*Anguilla reinhardtii*) which would further reduce the survival potential of brown trout fry. The sporting potential of some of these other species is also worth considering.

Conclusions & Recommendations

1. The quality and quantity of brown trout in Blackmans Lagoon is being adequately maintained.
2. Little Waterhouse and Big Waterhouse Lakes are apparently understocked.
3. Natural spawning facilities are absent in the two smaller waters and therefore stocks need to be fully maintained artificially.

Lake Barrington Trout Fishery Survey

by Wayne Fulton and Peter Davies, Scientific Officers, Inland Fisheries Commission

Lake Barrington is a picturesque 665 ha lake formed in 1969 by the construction of a Hydro-Electric Commission dam on the Forth River near the township of Barrington.

It is a long, narrow, steep-sided, deep lake which is mostly heavily forested to the shoreline. Areas of shallow water are largely confined to bays with tributary streams. There are no emergent trees around the shore, vegetation having been cleared to below low water level. Normal operation of the Devils Gate Power Station may cause a fluctuation in water level of some 5 m.

Water Quality

Following the initial filling of any new storage the biological breakdown of organic material on the lake floor places a heavy demand on dissolved oxygen which can result in severe oxygen depletion. This was the case in the deeper waters of Lake Barrington shortly after flooding.

In the deepest section of the lake near the dam, and stretching some 2 km south, the complete depletion of oxygen resulted in conditions which caused minerals such as iron and manganese to go into solution. This greatly increased the density of this deeper water, creating a stagnant, anoxic pool that did not mix with less dense waters above.

In addition to chemical stratification Lake Barrington has exhibited thermal stratification since first filling. This phenomenon is common to most similar deep, sheltered lakes and occurs due to heating of surface waters during summer resulting in the formation of non-mixing layers. These can persist until surface water cooling and strong winds in autumn cause the layers to mix.

Thermal stratification in the temperature ranges involved (6-20°C) has little effect on fish populations, but depletion of dissolved oxygen may have. Trout require dissolved oxygen levels greater than 6 ppm for full metabolic and behavioural functioning. Consequently, in the early 70's Lake Barrington was only suitable for trout survival and growth in approximately the top 10 to 15 m for most of the year. When complete mixing and aeration of the lake did occur, it was during the spawning season and the following winter when growth is minimal.

Invertebrate survival is also impaired in waters low in dissolved oxygen. As a result of this stratification invertebrate production and its utilisation by trout would have been limited to the upper shore areas and the surface. In the absence of such stratification, food production and utilisation by trout would be possible throughout the lake profile. This appears to be the case today.

A series of water samples taken in Lake Barrington on 16 April 1985 at 10 m intervals to the bottom at 50 m showed neither thermal nor oxygen stratification. Conductivity tests also showed that there was no unusual chemical build-up in the bottom of the lake. The findings are in agreement with those of Dr Tyler (University of Tasmania) collected during the last three years. The large anoxic pool is no longer present and with the continuous flow-through of water (10 lake volumes per year), the decay process has probably consumed the readily available material and the deeper water has been flushed out.

Lake Barrington is now a typical deep dark-watered, low productivity lake and seems to be a better habitat for trout than when thermal stratification was accompanied by marked dissolved oxygen stratification in the 1970's.

Access and Fishing Potential

Boat access to Lake Barrington can be made at two points on the eastern side; the rowing course and Kentish Park both have good boat launching ramps. Boats could also be launched from the old Wilmot Road on the western shore opposite Kentish Park. Shore access to the lake is only possible at these areas and at the top end of the lake near the Cethana Road bridge. The two eastern access points have fairly extensive clear areas for the shore based angler and camping areas are available at Kentish Park. A further potentially excellent camping area, accessible only by boat, is situated on the western bank about 3 km south of the rowing course.

The access areas would provide good scope for fishermen using either artificial lures or natural bait. The clearing of vegetation from the shoreline prior to flooding has provided excellent conditions for trolling over the full length of the lake. Although the lake is deep the large input of terrestrial insects from the heavily vegetated shoreline would often bring trout to the surface. In addition, numerous fallen logs in the small bays along the lake offer excellent habitat for blackfish and freshwater crayfish.

Fishing History

Lake Barrington has received little in the way of supplementary trout stocks. The Inland Fisheries Commission considered that trout already present in the flooded river sections would provide adequate stock. The only records of stocking of this water are: 200 tagged adult brown trout transferred from Great Lake in 1972; 10 000 rainbow trout fry liberated in 1975, and in 1984 a further 8 000 advanced brown trout fry, half from each of the Ulverstone hatchery and Devonport rearing ponds.

The North Western Fisheries Association annual reports do not give any favourable comments on fishing in the lake and it has been generally ignored since its initial flooding.

From the 200 tagged fish released in 1972 only nine tags were returned. Details of these fish are given in Table 1. Only five of the recaptured trout had remained in Lake Barrington whilst the other four were caught further downstream. All had lost weight since their release. There are few known records of recapture of the rainbow trout released in 1975, whilst the 1984 brown trout release is too recent to have resulted in returns to anglers.

Fish Survey

An inspection of the spawning areas available in Lake Barrington was made on 15-17 April 1985. There are several smal creeks flowing into the lake, especially from the western side. However, at the time of inspection, none showed outstanding potential. Water levels at the time were low but there were also large accumulations o debris around the stream mouths. Many o these stream mouths were steep, making access for fish difficult even if more water was present.

The one exception was Machinery Creek near the top end of the lake. Although there is a weir at the entrance to this stream, fish could negotiate it when the flow increased However, due to the abundance of floc culent sediments there is some doub about the suitability of the stream as a spawning habitat. Falls Creek enters the lake via a waterfall impassable to upstream migrants, but it could provide recruits from its resident fish.

A 5.2 kg brown trout from Lake Barrington.

The present fish population of Lak Barrington was surveyed using gill nets o 15-17 April 1985. Netting was concentrate around the area of the rowing course, nort to the Kentish Park area and south fo about 4 km. In all, 29 brown trout wer caught, ranging in weight from 762 t 5 216 g. The large 5 kg trout was a male fis in excellent condition. Excluding this fis

Weight (g) At Release	Length (mm)	Weight (g) At Recapture	Length (mm)	When and Where Recaptured
965	406	681	406	4.11.72 Forth River
680	381	454 clean	381	7.11.72 Lake Barrington
936	425	623	450	31.10.72 Junction Wilmot & Forth rive
908	406	850 clean	469	31.10.72 Lake Barrington
850	419	539	419	17.1.73 Lake Paloona
793	419	708	412	17.1.73 Lake Barrington
1 191	457	908		17.1.73 Lake Barrington
1 077	431	737	457	20.9.73 Junction Wilmot & Forth rive
1 247	457	1 021	469	8.4.72 Lake Barrington

Table 1: Details of tagged brown trout recaptured following release in Lake Barrington on 7 June 197

the average weight of the sample was 1 103 g.

Scale samples were taken to determine the age and growth rate of fish in this water. These showed quite slow growth rates, the majority of fish being in the 4+ to 7+ age groups. The largest fish was more than ten years old. Although the fish were in satisfactory condition they had taken 2-3 years longer than, for example, fish in Great Lake to reach the same size.

Gut analyses showed that the trout had all been feeding on insects and beetles of terrestrial origin. This is not surprising as at the time of the survey large numbers of these were present over the surface of the lake.

In addition to the trout, a blackfish weighing 791 g and two freshwater crayfish weighing 1 065 g and 1 650 g were also caught in the nets.

Discussion

Due to the change in water quality since the 70's Lake Barrington now appears to be a more favourable habitat for trout. Access to the lake has also been improved and the absence of emergent vegetation as well as the shelter provided by the steep valley locality make the water a particularly attractive fishing destination.

The trout caught during the survey show that excellent quality fish are present, especially since fish above about 2.5 kg are rarely caught in the 100 mm nets used, their heads being too large to penetrate the meshes. The 5 kg fish, for instance, was only caught by the hook on its lower jaw and by its large teeth.

According to the tag returns, fish generally showed a loss in condition after release into Lake Barrington in 1972. This is not surprising, considering the vast differences in water quality between their original habitat, Great Lake, and that of Lake Barrington. The fish caught during this netting survey would all have been local recruits and not stocked fish.

Dissatisfaction with the quality of fishing offered by Lake Barrington was probably justified in the 1970's. However, some encouraging reports received during the 1984-85 season indicate that better catches may be expected in the future.

The slow growth rates of brown trout caught during the survey suggest that further stocking with this species would not be beneficial as increased competition could further decrease growth rates. However it may be worthwhile to experiment with the introduction of rainbow trout, as these fish may make better use of the surface food available in this system.

In addition to trout, Lake Barrington is an excellent habitat for blackfish and freshwater crayfish, and fishing amongst the logs in some of the bays for these species could prove very rewarding. Some good catches of blackfish have been recorded from the water over the past season.

IN BRIEF

Brown Trout Ova Collection

A second collection of ova from spawners at Liawenee Canal, Great Lake, was made on 3 May 1985. From the 2 000-plus fish held in the bottom trap, a total of 69 litres of ova was collected with little difficulty. It was necessary to handle only about 700 fish and the quality of the ova was the best for several years. With ova size measured at 10 700 per litre, this resulted in a total of 738 000 ova being laid down at Plenty. The percentage of 'whites' (non-viable ova) was less than 1%. The total ova collected to date is 942 000, however, a further stripping will be necessary later in the season.

Electrofishing Course

A three day electrofishing course was recently conducted by Commission biologist Wayne Fulton at the Liawenee Field Station. Nine Commission employees who had not previously completed the course and four University personnel attended. The course covered theoretical, practical and safety aspects of electrofishing. Participants completed a written examination at the conclusion of the course.

Adult Trout Stocking

In recent weeks Commission field staff have transferred more than 1 500 adult brown trout from spawning beds at Arthurs Lake and Great Lake to other waters around the State. Adult brown trout have been transferred to Lake Dulverton, Waverley Dam, Lake Botsford, Carters Lake, Rocky Lagoon and several smaller waters in the Central Highlands including Camerons Lagoon and Bruisers Lagoon.

Lake Kara

Further netting trials at Lake Kara have confirmed early survey findings that brown trout are present in the lake, but in small numbers only. Analysis of water samples has revealed that deeper waters in the lake are unsuitable for trout growth and survival. This problem would be much greater in mid-summer with only the first few metres of surface water suitable for trout. The low dissolved oxygen levels are consistent with a shallow lake overlying a bottom rich in rotting organic material. The lake has suffered because vegetation was not cleared before initial flooding and the static water level and lack of bottom flushing has further compounded the problem.

PROSECUTIONS

Successful prosecutions since the last Newsletter are listed below.

Court Date	Offender and Address	Nature of Offence	Fine	Costs	Penalty
20.2.85	Noel ALLFORD 28 Latrobe Road Railton	Disturb spawning trout. Other than rod and line. Take fish from closed waters.	10.00 10.00 25.00	15.10	130.00
20.2.85	Gerrard ALLFORD 28 Latrobe Road Railton	Obstruct an officer. Disturb spawning trout. Other than rod and line. Take fish from closed waters.	Recorded 10.00 10.00 25.00	 15.10	 130.00
1.3.85	Robin John WILKINSON 10 Gale Street Glenorchy	Fishing without licence. False name and address.	Probation of Offenders 100.00	 15.10	
20.3.85	Paul Anthony FIDLER RSD 477 Weegena	More than 1 rod and line.	40.00	15.10	
20.3.85	Peter Anthony GILLAM 55 Cotton Street Latrobe	Take whitebait. Possession of net. Possession of whitebait.	60.00 30.00 Adjourned Sine Die	15.10	
20.3.85	Neil Craig PENFOLD 10 Holyman Street Devonport	Fishing without licence.	120.00	15.10	
20.3.85	Grant John WEEKS 184 George Street Devonport	More than 1 rod and line.	40.00	15.10	
20.3.85	Frederick DOUCE 13 Adina Place East Devonport	Fishing without licence. More than 1 rod and line.	120.00 40.00	15.10	
20.3.85	Reginald DOUCE 10 Caringa Place Devonport	More than 1 rod and line.	40.00	15.10	
20.3.85	Garry James DOUCE 10 Caringa Place Devonport	More than 1 rod and line.	40.00	15.10	
20.3.85	Darren James MURPHY 47 Foster Street Railton	Take fish from closed waters.	40.00	15.10	
28.3.85	Dale Lester LAMBERT 10 Dallas Court Smithton	Take whitebait. Possession of whitebait.	100.00 125.00	28.10 28.10	
21.3.85	William Leslie HACK Maydena	Other than rod and line. Disturb spawning trout. Take fish from closed waters. Possession of unclean fish.	100.00 80.00 120.00 50.00	44.10	 740.00
21.3.85	Stephen George MEAD 86 Hookey Street Rokeby	Other than rod and line. Disturb spawning trout. Take fish from closed waters. Possession of unclean fish.	Adjourned Sine Die 40.00 Adjourned Sine Die 40.00	 47.10	
28.3.85	Carl Wilhelm SCHRAMM 13 Hellyer Street Smithton	Possession of net. Take whitebait. Possession of whitebait. Possession of whitebait.	50.00 75.00 Adjourned Sine Die 200.00	15.10 15.10 15.10	
28.3.85	Darren Richard GREY 2a Ward Street Smithton	Possession of net. Take whitebait. Possession of whitebait.	50.00 75.00 Adjourned Sine Die	15.10 15.10	
28.3.85	Richard John JAEGER 26 Hill Street Smithton	Possession of net. Take whitebait. Possession of whitebait. Possession of whitebait.	50.00 75.00 Adjourned Sine Die 100.00	15.10 15.10 15.10	