

INTRODUCED FISH

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INTRODUCTION

Needs of the Early Settler as a Sportsman

Sportsmen fish the rivers and lakes of Australia for brown trout which is an introduced species. The acclimatisation of the trout into the Southern Hemisphere took place in 1864 when ova from England arrived safely in Tasmania. Atlantic salmon *Salmo salar* Linn., and brown trout, *Salmo trutta* Linn., hatched from ova in the Salmon Ponds hatchery at Plenty. Nearly all the Australian and New Zealand brown trout caught today can be traced back to stocks once spawned in Tasmanian waters.

The early settlers who crossed half the globe brought domestic animals, seeds and plants with them, but it was left to a later generation to put its mind to the problem of bringing out to Tasmania the prize fish of their earlier homeland. Why Tasmania should have taken the initiative in the field is not hard to determine. Factors undoubtedly were the cool climate together with the snow fed lakes and numerous streams and rivers. Settlers drew comparisons with the British Isles and felt that the southern environment would be ideal for trout from the Northern Hemisphere. The new nineteenth century settler, even if colonial born, was essentially British and retained the love of sport. It is true that there was fishing to be had in inland waters but it was in no way comparable with that enjoyed in British lakes and streams.

Native Fish and their Shortcomings

When they had time to examine their environment, the settlers found the coastal areas and tidal estuaries rich in edible fish but they were disappointed in the rivers and lakes. Species of freshwater fish native to Tasmania included *Prototroctes maraena* Gunther, the Australian grayling, and a number of species of Galaxiidae which the locals christened with the honorary title, mountain trout, although they are not really members of the Salmonidae. Another freshwater species, the Tasmanian blackfish, now known as *Gadopsis marmoratus* Rich. was reported by Johnston

to be an excellent fish, peculiar to the northern rivers. It had a delicious taste but it did not occur in the Central Plateau. The short finned eel *Anguilla australis occidentalis* (Schmidt) was known from rivers and lakes but its potential for development as the basis of a commercial fishery was not recognised until recently.

The settlers criticism of the native freshwater species was on two grounds. The fish were too small and their fighting qualities, apart from the Australian grayling, fell far short of those required for angling. The resulting discontent together with the primary aim of establishing a commercial fishery for Atlantic salmon fostered the experiments to acclimatise salmonids in Tasmania.

SUITABLE WATERS

The State is well endowed with natural lakes in the highlands. In the north west of the Central Plateau there are over 4800 lakes and ponds formed by glacial action, many of which are connected in the winter. Further, the inland waters of the Central Plateau have been considerably modified and augmented by the building of dams to store water for power generation. Lake St. Clair was one of the first lakes to be modified. To the south, Butlers Gorge dam formed the large impoundment known as Lake King William at 2,343 feet (714m). Slightly to the north there is a small storage known as Laughing Jack Lagoon formed by a dam across a tributary of the Clarence River. Slightly further north there is the Pine Tier Lagoon which was formed by the erection of a dam across the Nive River. Towards the centre of the plateau there is a dam across the Little Pine River to form Little Pine Lagoon. Bronte Lagoon, Brady's Lake, Lake Binney and Tungatinah lagoons were all developed for use in power schemes. To the south is Lake Echo with a dam at the southernmost extremity across the Dee River. Dee Lagoon itself was modified. The Great Lake scheme has several dams, one at Lake Augusta across the Ouse River and another across the Ouse River, both of which divert water into Liawenee Canal. At Great Lake itself a succession of dams has been erected at Miena to enlarge the lake. Shannon Lagoon and Penstock Lagoon are a part of the former Great Lake drainage system. Slightly to the east, dams on the Lake River and subsidiary dams further to the east coalesced three lakes to form Arthurs Lake. One small dam at the outlet from Lagoon of Islands impounds water to serve as a fishery and to supply riparian rights.

The effect of the creation of impoundments on the fisheries development has been to increase the habitat for trout by providing a greater surface area of suitable water. Most of the impoundments on the Central Plateau now have stable fisheries which in their early years provided outstanding fishing. The famous Shannon Rise came as a result of the Great Lake impoundment. The phenomenon came into prominence in 1925 and occurred annually about December in the three-quarters of a mile of Shannon River between Miena dam and the Shannon Lagoon. It finished in 1965 when Great Lake water was diverted to the north. The Shannon Rise, in essence, consisted of a mass emergence of a caddis fly *Asmicridea grisea* (Mosely). The young of this aquatic insect fed and thrived in the plentiful flow of cold water in the Shannon River. When the adult snow caddis or, incorrectly called, "Shannon Moth", emerged, the large head of trout in the nearby Shannon Lagoon moved up into the Shannon River and fed voraciously on the emerging adults and it was at that time that anglers assembled from far and wide to fish for the trout.

ACCLIMATISATION

The saga of acclimatisation of the salmonids in Tasmania is a heroic story. After a number of unsuccessful attempts to send impregnated salmon ova from England to Tasmania, James Youl arranged for the first successful shipment of Atlantic salmon ova and brown trout ova in 1864. The venture created much excitement at the time and details of how the eggs were brought more than 12,000 miles by sailing ship through the tropics is a fascinating one. On a smaller scale, the actual transportation and liberation of trout on the Central Plateau is a dramatic story.

The first species liberated in Great Lake was brown trout. In 1870 Mr. James Wilson of Steppes obtained 120 brown trout fry as a favour from "The Hermitage" near Bothwell and he put them in billy cans and rode his horse along a bridle track for 25 miles (40 km) before liberating the fish in Beckitt's Bay. All the stock for Great Lake until 1910 came from these fish and their progeny.

The first recorded brown trout caught from Great Lake was landed by a Mr. A. Weedon of Launceston in 1874 and the fish weighed three pounds (1.36 kg). So well did the fish do in Great Lake that in one day in 1898 an angler, Mr. A.D. Wall, caught 18 fish which weighed a total of 148½ lb (67.42 kg). One of the biggest fish to come out of Great Lake, caught in 1897 by Matthew Seale, was a 25½ lb (11.5 kg) brown trout.

The introduction of rainbow trout *Salmo gairdneri* Richardson into Great Lake was no less spectacular than that of brown trout. The fingerlings were raised at the Waverley hatchery, Launceston, transported by train to Tunbridge between the 25th April and 23rd May, 1910, then taken by a horse drawn vehicle to the southern end of Great Lake where they were liberated. In all, it was necessary to make eight trips to put the 5550 rainbow yearlings in the lake.

In 1909 Atlantic salmon, *Salmo salar* Linn., was liberated in Great Lake but did not become acclimatised. In 1911 quinnat salmon, *Oncorhynchus tshawytscha* Walbaum, were liberated in Great Lake as yearlings but also did not become acclimatised. The last attempted introduction of a salmon to Great Lake was in 1936 when 2500 two year old Sebago salmon, a land locked form of Atlantic salmon, were released. Again, the result was a disappointment as the fish failed to become acclimatised.

The most recently introduced salmonid, introduced to provide angling diversity, is the brook trout, *Salvelinus fontinalis* Mitchell. The ova were imported from Canada and in December 1963 the first liberation of 600 fingerlings was made in Clarence Lagoon. The first recorded catches from this liberation occurred in the following December in the pondage where the Clarence River joins the stream from Laughing Jack Lagoon. Since then the numerous landings of brook trout in Clarence Lagoon itself clearly indicates that a self-sustaining population has been established here. The only other liberation of brook trout in the Central Plateau was in July 1966 when 6942 yearlings, 6 to 8 inches (15-20 cms) long, were placed in Little Pine Lagoon. A few were caught in Little Pine Lagoon and Lake Fergus but it appears that a sustaining population was not established in this system, possibly because of the presence of brown trout.

FISH CULTURE

The salmonid stocks in the Central Plateau were important in fish culture and for some years a hatchery was in operation at Miena. Between 1910 and 1920 brown trout ova were collected at Miena from spawners moving down from Great Lake to spawn in the Shannon River. After about 1928 it was found convenient to collect rainbow trout ova at Liawenee. The practice of extensively collecting ova for raising young fish in hatcheries continued until the nineteen fifties when Nicholls demonstrated that most populations of trout in Tasmania were maintained by recruits from natural spawning.

The brown trout is now the most successful species in Great Lake but at one time rainbow trout was the species caught in greater numbers here. There are several reasons for the final dominance of brown trout. It has larger eggs, it spawns earlier than rainbow trout and so its young have a competitive advantage for space and food. The habits of the two adult fish are different in that the rainbow trout ranges more widely in search of food than the brown trout which tends to occupy a limited territory close inshore.

Inland Fisheries Commission investigations at Great Lake have, in the main, been directed at increasing the numbers of rainbow trout present and decreasing the numbers of brown trout. In the 1960-61 season the recapture of tagged fish by anglers in Great Lake showed that rainbow trout were twelve times more catchable than brown trout. This difference was in spite of the fact that counts of spawners indicated that brown trout was the more numerous species. A further aggravating aspect of the differential exploitation of rainbow trout was in relation to the harvesting of immature fish. It was found that 51 per cent of the rainbow trout taken were less than 2 lb (0.9 kg) in contrast to only 8 per cent of the brown trout taken below this weight.

Consideration was given to the artificial stocking of Great Lake with rainbow trout but this would be an expensive project. From data gathered by Nicholls, it was clear that of the 15,000 marked rainbow trout yearlings only 24 were handled in subsequent runs of nearly 2,500 fish. The experiment was repeated in 1960 and up to 1962 there was only 0.5 per cent recovery. From this evidence it is obvious that to make any appreciable contribution to the angler's catch massive numbers of young rainbow trout from hatcheries would need to be put into Great Lake.

The Inland Fisheries Commission catches adult brown trout from Great Lake and transfers them to other waters with the objective of assisting the rehabilitation of the rainbow trout fishery and, as a side effect, providing brown trout fishing close to lowland urban areas. Since the programme commenced in 1959 nearly 66,800 trout weighing about 300 tons (305 tonnes) have been taken out of Liawenee Canal.

VALUE OF THE INTRODUCED FISH

In conclusion the consequences of the acclimatisation of the salmonids in the Tasmanian highland waters are important. Since 1910

there has been an expansion of the aquatic environment due to the projects carried out by the Hydro-Electric Commission which created large impoundments. Brown trout, rainbow trout and, to a lesser extent, brook trout have filled a vacant niche in these newly created or expanded habitats. A unique phenomenon known as the Shannon Rise was created and lost. The value to the State, as a whole, of the introduction of salmonids to the Central Plateau is considerable. It provides for the annual recreational opportunity for more than 20,000 resident or visiting anglers. On the other hand, there could be an adverse effect as trout is a predator with almost catholic eating habits so that perhaps aquatic animals such as crustaceans, mayflies or native fish may have decreased in numbers. However, in balance, the introduction of the salmonids to the waters of the Central Plateau has created a new resource which is of continued benefit to the State.

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