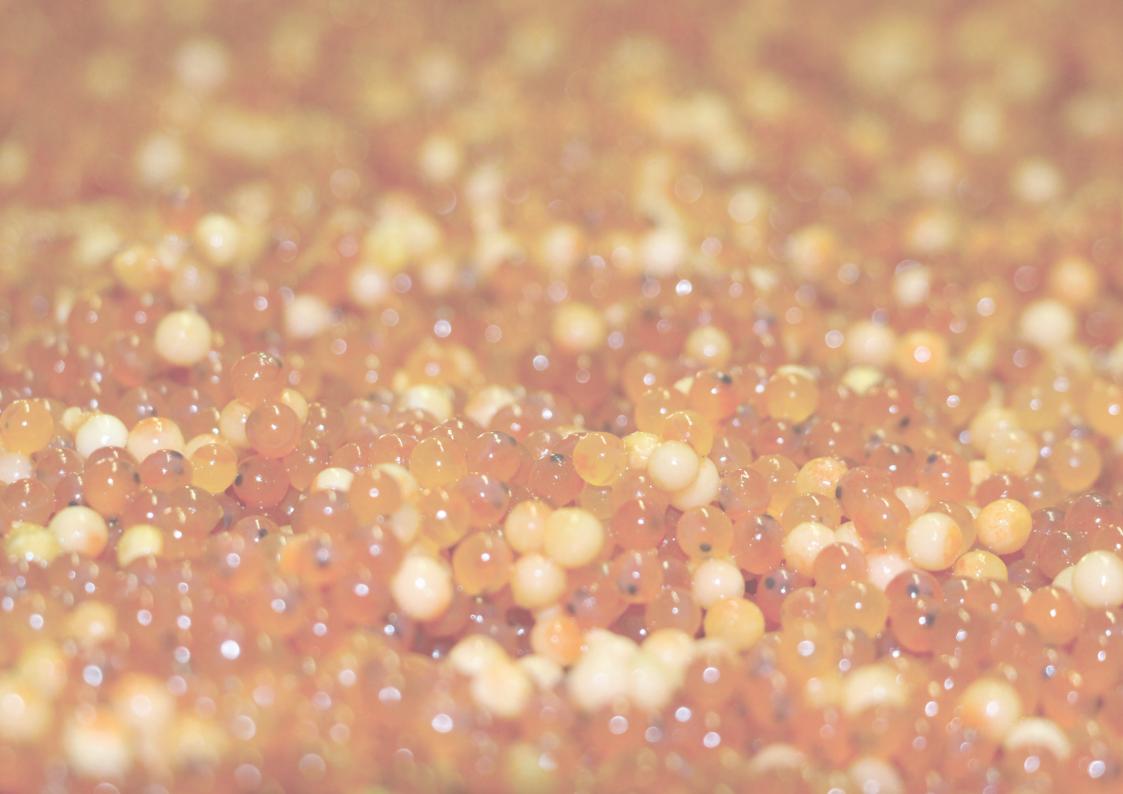


A brief history of the

Pemberton Trout Hatchery







Acknowledgments

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LHS: Young trout being released into a creek in the 1930s.

State Library of Western Australia

RHS: Pemberton trout hatchery pioneer Arthur Ralph Kelly with rainbow trout.

Colin Graham

Back: Trout in the Karri Country.

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DPIRD acknowledges the Traditional Owners of Country, the Aboriginal people of the many lands that we work on and their language groups throughout Western Australia and recognise their continuing connection to the land and waters.

We respect their continuing culture and the contribution they make to the life of our regions and we pay our respects to their Elders past, present and emerging.



Kangaroos going to the Waterhole.

Willarra Barker

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Introduction

The first successful shipment of trout into Australia occurred more than 150 years ago, in April 1864, when several thousand fertilised brown trout eggs managed to survive a threemonth journey across the seas from England packed between layers of damp moss and ice.

Most of the fertilised eggs would hatch a month later in the Plenty River in Tasmania and these first baby brown trout would later become the source stock for trout fisheries across Australian and New Zealand waters.

Several decades after the arrival of brown trout, a shipment of rainbow trout, originally from North America, would be brought to Australia via New Zealand in 1894.

Today, more than three million brown and rainbow trout are released into Australian lakes and rivers each year with each fish a relative of these original introductions more than a century and a half ago.

In Western Australia, trout introductions began in the 1870s with the transport of brown trout from Victoria. About 20 years later, rainbow trout would be introduced into the state from Tasmania.

Trout were originally brought to Australia as part of a broad range of northern hemisphere animal and plant species introduced by European colonists for agriculture, hunting, gardens and pets. The introduction of trout provided recreational fishing opportunities and an important food source for inland areas.

To oversee the adaptation of trout (and other animals) to local Australian conditions, so-called 'acclimatisation societies' sprang up across the nation. Run by volunteers, some of the societies became forerunners to modern zoos. In Western Australia, the Western Australian Acclimatisation Committee was formed in 1894 followed by the Game and Fish Acclimatisation and Protection Society in 1935. These societies played a central role in acclimatising trout into Western Australia and in the eventual establishment of the Pemberton trout hatchery, which has now been operating successfully for more than 80 years.

The story of the Pemberton trout hatchery is a story of tenacity, leadership and innovation in the face of adversity. The hatchery's success reflects the pioneering spirit of Pemberton's early years when skilful and enthusiastic characters harnessed community and government support to literally carve the hatchery out of Karri forest hillside.

The vision of these hatchery pioneers was that trout would one day be found in streams across the southwest where anglers could catch them for sport and food. Today, the trout fishery built on Pemberton hatchery success is conservatively estimated to deliver \$20 million to regional communities each year.

There is no doubt that the people who led to the hatchery's modern-day success would be extremely proud that their efforts all those decades ago managed to create the trout fishery of their dreams. This document tells the story of Pemberton's trout hatchery pioneers and how their vision was materialised over many years of hard work, applied science and impressive community collaboration.

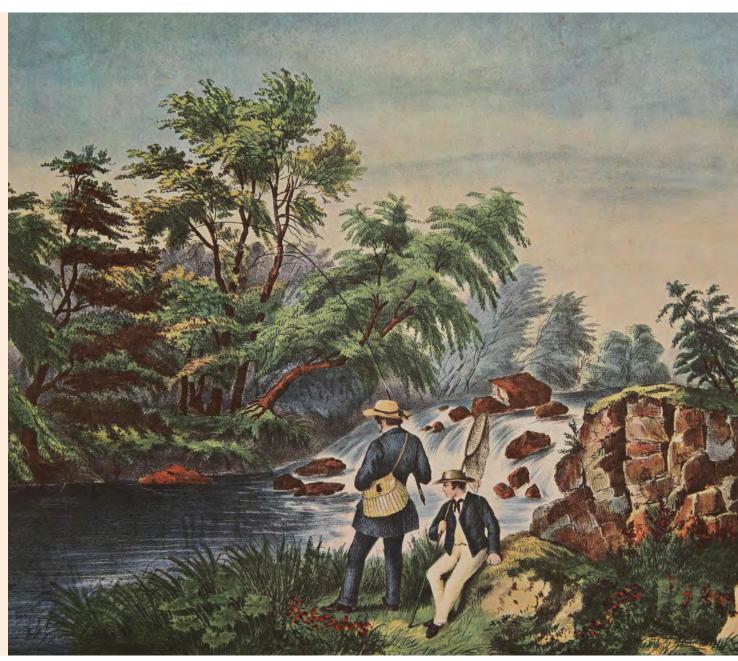
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Homesick colonials

Trout fishing has a long history – with accounts dating back to the Middle Ages in England. By the end of the 15th century, fly fishing had become a popular sport among the upper classes and by the mid to late 19th century fly fishing steadily grew in mass appeal.

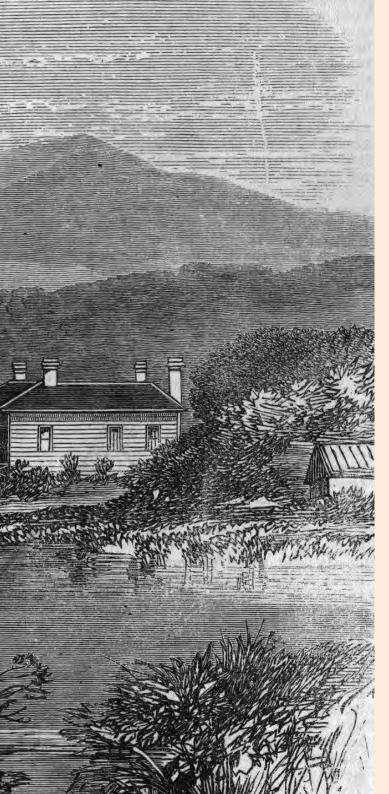
By the mid-20th century, trout fishing had become an important part of the British economy. Early colonists of Australia felt the absence of trout keenly and it was not long after settlement that efforts began to introduce brown trout and salmon into the colony from British waters.

But trout and their fertilised eggs (ova) proved a challenge to transport. To slow their development, the delicate ova had to be precisely chilled during months of travel across the seas. Perfecting the transport system was fraught with failures and it took several attempts over 20 years before trout finally arrived in Australia.



A 19th century view of fly fishing in England. Heritage Image Partnership Ltd / Alamy Stock Photo





Trout pioneers

Youl 1860

Sydney-born James Arndell Youl was instrumental to the eventual delivery of brown trout into Australia from England.

Youl spent most of his first 40 years working on his father's farm in Tasmania but in 1852 moved his family back to London where he worked for more than a decade to perfect the artificial propagation of salmon and trout and transport of their ova. Youl's first trial shipment of 80,000 Atlantic salmon ova to Tasmania in 1862 failed. In the days before refrigeration, the long voyage, rough weather and heat of the tropics were too much for the vulnerable cargo.

While another attempt in 1863 using moss and ice to preserve the 5,000 salmon ova was more successful, the salmon failed to survive in the wild. Unperturbed, in January 1864 Youl arranged for the transport of 100,000 Atlantic salmon and 3,000 brown trout ova to Tasmania.

Salmon ponds at New Norfolk Tasmania, 1867. Antiqua Print Gallery / Alamy Stock Photo The ova reached their destination in April 1864 with 30,000 salmon ova and 300 trout ova surviving the journey.

One month later, newly hatched trout and salmon swam for the first time in the southern hemisphere. By June 1864, more than 200 healthy trout and several thousand salmon were exploring their new home at Salmon Ponds next to Tasmania's Derwent River.

The brown trout escaped into the Derwent River with many thriving to create a self-sustaining population that ultimately became the source of breeding stock (broodstock) for the Australian brown trout industry.

In 1866, Youl organised a second shipment of 15,000 brown trout ova to Tasmania and enough hatched from this consignment to distribute throughout Australia and New Zealand.

Thanks to Youl, the Tasmanian Salmon Ponds became the birthplace of trout in Australia and in 1891 he was knighted in recognition of his services to fish acclimatisation in Australia.

Weld 1874

Following Youl's successful importation of brown trout into Australia, trout acclimatisation societies and hatcheries were established across the nation.

Western Australia's first official aquaculture enterprise for the acclimatisation of trout was at Albany Fish Ponds on Maley's Stream, which were established by the Governor of Western Australian Sir Frederick Weld in 1874.

Following a visit to the recently opened Ballarat Fish Hatchery in Victoria, Weld arranged for a supply of brown trout ova to be forwarded to Perth with a view of acclimatising them in Western Australia. The ova arrived in August 1874 and were placed in Maley's Stream and hatched one month later. However, the fate of these fish is unknown, and the Fish Ponds project proved unsuccessful.

In 1888, the hatchery site was used to supplement Albany's water supply and from 1897 it was occupied by the Western Australian Government Railways. Today, the site is heritage listed for its cultural and historical significance.

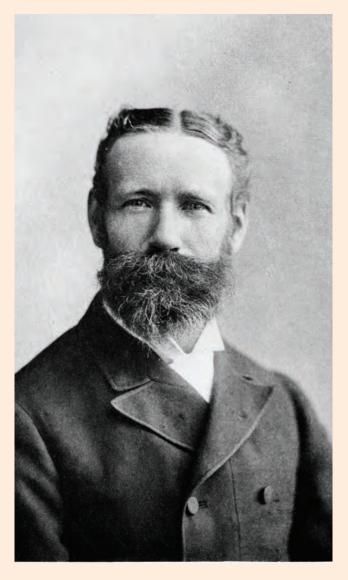
Saville-Kent 1894

William Saville-Kent was introduced to aquaculture early in his career at the British Museum in the 1860s.

In December 1891, Saville-Kent was appointed Commissioner of Fisheries by the Western Australian Government and in 1893 arrived in Albany.

When a fishing survey found the fresh waters of southern Western Australia were 'devoid of fish of economic value' Saville-Kent investigated the possibility of introducing 'exotic freshwater fish' into the region.

Following completion of a hatchery at the junction of the Preston and Ferguson rivers near Bunbury, ova of brown and rainbow trout were shipped west in August 1894. The trout grew so well that most were distributed in rivers across southwest Western Australia with the remainder kept at the hatchery as future broodstock.



William Saville-Kent: Western Australian Commissioner of Fisheries, 1891.

The Natural History Museum / Alamy Stock Photo

Doncaster 1896

One of the first matters to receive attention following the formation of the Western Australian Acclimatisation Committee in July 1896, was the building of a trout hatchery at Whitby Falls near Jarrahdale. The hatchery was situated on committee member William Paterson's estate beside Manjedal Brook. The Committee brought Ballarat Trout Hatchery employee W.C. Doncaster out from Victoria to supervise the development of the new hatchery.

Doncaster obtained 20,000 brown trout ova from hatcheries in the Ballarat district, which were grown in the partly completed Whitby Falls Hatchery before being released into the Murray, Blackwood and Serpentine rivers and into the Samson and Gingin brooks. However, many of the trout were later reported to have died.

In 1897, a consignment of 45,000 rainbow and brown trout ova was shipped from Tasmania to Albany and about 30,000 hatched at the Whitby Falls Hatchery. Two months later the trout were taken to prepared ponds at Samson's Brook, but half perished on the journey and most of the remainder succumbed to fungal disease. Of the

few trout released, it is unknown if any survived as the brook dried up over summer. This failure prompted the Acclimatisation Committee to move the hatchery to a new site, where there would be an unfailing supply of fresh water and where the fish could be confined if necessary.

The new hatchery was built close to the proposed reservoir of Mundaring Weir. In 1900, the Committee reported that brown and rainbow trout were still successfully hatching and being distributed throughout Western Australia, but that there was little evidence of their survival due to low rainfall, predation and a lack of spawning habitat.

Following its completion in 1903, 15,000 brown trout were hatched and released into Mundaring Weir and two years later both brown and rainbow trout were reported to be 'thriving'.

By 1909, trout in the Weir were 'showing up in considerable numbers' but as the catchment dam was used to provide drinking water, anglers were not permitted to fish there. It became clear that accessible and reliable streams in the south of WA were likely to be the future of trout acclimatisation.

Pemberton hatchery beginnings: 1927–1932

The town of Big Brook was settled in 1913 and named for the stream that supplied water to its two government-owned sawmills.

In 1925, Big Brook experienced a population boom following government release of free land to immigrants and in 1925 was officially re-named Pemberton after one of the area's founding pastoralists, Pemberton Walcott.

Glew 1927

In 1927, Cyril Allerton Glew arrived in Pemberton as the new school headmaster. Glew became heavily involved in industry development and community work and is widely recognised for his role in introducing trout hatchery technology into the district.

A keen fisherman, Glew immediately recognised the similarity between some of the best Victorian trout streams and those of the Warren and Donnelly river systems near Pemberton. Subsequent research on water temperature and food availability confirmed that conditions were perfect for trout acclimatisation.

Glew consulted widely and used every opportunity to gather advice and literature on trout culture.

After visiting Ballarat Trout Hatchery in Victoria, Glew organised for a consignment of 10,000 trout ova (half browns and half rainbows) to be sent to Western Australia. The consignment was donated by the Victorian Fisheries Department.

Schoolyard innovation

With assistance from fellow angling enthusiasts Arthur (Ralph) Kelly, Dr. Abbott, G. Betty and F. Goddard, and support from the Pemberton School P&C Association, Glew built an elaborate trial hatchery on the back verandah of the Pemberton School House in preparation for the trout ova.

The first consignment of trout ova from Victoria in 1930 did not survive the journey but a second consignment of 20,000 brown trout ova shipped to Pemberton in July 1931 from Traralgon South Hatchery in Victoria generated 16,000 healthy 'fry' (baby trout).



Cyril Glew, headmaster at Pemberton school, with students and the first batch of trout eggs from Victoria.

Colin Graham

The fry were fed six times a day with a ground paste of beef or bullock liver, heart, lungs and watercress. By the end of September, 15,000 fry around four centimetres long, were released into local Pemberton streams and into a control pool in Lefroy Brook, where their growth and survival could be monitored.

Glew's trout acclimatisation experiment created state-wide interest and he was promised support from several like-minded enthusiasts to establish a suitable hatchery. However, in 1932 Glew was transferred to Perth and the small school house hatchery was no longer used. Local angling enthusiasts waited anxiously for signs of the trout that had been released via Glew's efforts into local waterways.

Wherever Glew went, trout stocking or hatchery production soon followed and his advice as co-founder and Secretary of the Game and Fish Acclimatisation and Protection Society (1935) was highly sought after. In 1940, when he was appointed head teacher at Collie District High School, Glew leant his expertise to the construction and operation of a trout hatchery on the banks of the Collie River.



Glew and students releasing trout fry into a local Pemberton stream.State Library of Western Australia

Experimental hatchery: 1935-1938

Before Glew's release of 15,000 fry into Pemberton streams in 1931, most people in the district had never seen trout.

However, over the next few years large trout were noticed in local waterways, some as large as 30 to 45 centimetres long. By this time, Glew had returned to Perth where he began to coordinate support for trout production on an even wider scale.

In July 1935, the Game and Fish Acclimatisation and Protection Society of Western Australia (later shortened to the Fish and Game Society of Western Australia) proposed establishing a modern trout hatchery and holding ponds in Pemberton. Fry from the facility would be used to stock suitable southwest rivers and streams.

Pemberton resident Ralph Kelly was a driving force behind the hatchery venture and lobbied for government funding to support the fledgling industry. John Gregory, an experienced salmonid culture biologist trained in Canada, Alaska and the UK, was employed as hatchery manager even before the hatchery was built.



Original trout troughs at Pump Hill Road Hatchery 1936. Colin Graham

Gregory began investigating the suitability of the waters in the Pemberton region to hold trout. He observed that native minnows (Galaxias spp.), which resembled tiny trout, existed in the rivers around Pemberton, and reasoned trout could also find a natural home in the same rivers.

In January 1936, a public meeting was called to discuss the building of an experimental hatchery, to be constructed just west of Pemberton. The



Original trout raceways constructed at Pump Hill Road Hatchery in 1936.

State Library of Western Australia

Fish and Game Society raised £500, which was matched by funds from the state government. In February 1936, a site on Pump Hill Road was surveyed and deemed suitable by John Gregory. Plans for a modern hatchery were designed by Glew with assistance from hatchery operators in the eastern states.

Community commitment

Construction of the hatchery began in April and after four months of voluntary labour, the experimental facility was completed. Water was sourced from the Pemberton Power Company hydro-electric wooden pipeline that ran about 400 metres downstream beside the new hatchery.

A spur pipeline from the hydro supply pipe brought water to a concrete storage tank. Water flowed to the hatchery cottage that housed wooden troughs and then outside to three concrete rearing ponds. Arranged in a long-tiered raceway, the three concrete ponds outside the hatchery were used to hold fry large enough for transportation to southwest streams. The storage tank and the three ponds built in 1936 remain on site (and occasionally in use) at the Pemberton Freshwater Research Centre today.

In August 1936, after a long journey by rail, plane and truck, 100,000 brown and rainbow trout ova from the Ballarat Trout Hatchery arrived in Pemberton to be hatched out in the new facilities under the guidance of John Gregory. In September 1936, the Pemberton Trout Hatchery was officially opened.



First trout released

In October 1936, more than 60,000 trout fry were released into Big Brook and other streams in the district. Some were taken as far north as Yanchep and as far south as Two Peoples Bay, Albany. Four thousand were retained at the hatchery for spawning and observation over the following three years. By the end of summer, many rainbow trout had been sighted in streams with many measuring 12–15 centimetres. Some exceeded 20 centimetres, which was larger than any that had been seen at the same age in Victorian waters.

Water for the new hatchery was sourced from a wooden hydro-electric pipeline via the Pemberton Power Company.

State Library of Western Australia



Pemberton general store manager, Syd Young, fishing for trout in a local stream.Colin Graham

Trout find quells critics

In February 1937, Pemberton Trout Hatchery manager, John Gregory, received a surprising report. A local had seen a huge trout in a small pool in a tributary of Big Brook on his property.

The magnificent female brown trout was captured by Gregory and others and taken back to the hatchery. Unfortunately, due to the stress of capture, poor water quality from ash in recent fires and transit on a late summer day, the East Brook trout survived only two hours at the hatchery.

Weighing five kilograms and measuring 75 centimetres, tests revealed that the trout was five years old and had spawned twice in her lifetime, perhaps having populated Pemberton waters with her offspring.

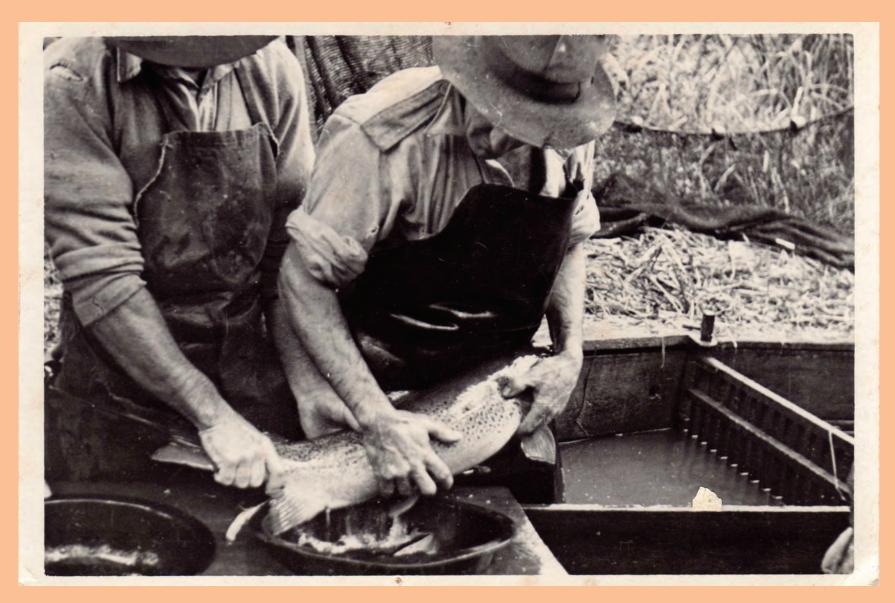
The fish was taken to a taxidermist at the Perth Museum to be preserved and displayed. Today, all that is left of the treasured East Brook trout is her life-size image hung at the current Pemberton Freshwater Research Centre.

The discovery of the large female was proof that trout could be acclimatised in Western Australia and the news spread quickly, silencing critics. More than a thousand visitors subsequently

visited the district to inspect streams for trout. However, despite the hatchery's success, the Society recognised that buying and importing large numbers of ova from the eastern states every year was not financially viable. A plan was needed to generate home-grown trout ova to sure up supply for southwest waters and create a sustainable trout fishery in the west.

Landing a trout in the rapids.Colin Graham





Trapped breeder trout were stripped of eggs and milt (sperm) by gently rubbing their underside.

State Library of Western Australia

Local breeders

With many mature trout now evident in Pemberton streams the first step was to capture some of these 'wild' trout and use them as local breeders. However, the timing of spawning runs under Western Australian conditions was not yet known.

In the wild, trout swim against the current, migrating upstream in cool, fast-flowing waters to 'spawn' (release their eggs) on stable beds of gravel. The male occupies a place on an area of gravel large enough to attract a female and the female then digs a nest in the gravel with her tail and positions herself over it.

With the male alongside, she expels her eggs, which the male then fertilises with 'milt' (sperm). After burying the fertilised eggs (ova), the female retreats downstream, leaving the ova to hatch in the fast-flowing waters.

Aware of this breeding process, the Society constructed wooden barrier traps and placed them across streams to prevent trout reaching the fast, clear head waters. By chance, when one of the captured trout was being handled, it 'blew', releasing tiny, transparent salmon-pink eggs.



Young trout being released into a creek in the 1930s. State Library of Western Australia

As the literature instructed, the amateurs then 'stripped' the ripe rainbow females by handling the fish with one hand and applying light pressure on the underside with the other hand. This squirted the ripe eggs into a waiting bowl. The male trout were handled in the same way and their 'milt' (sperm) mixed with the eggs. Water was added to the mix to activate the fertilisation process.

The newly fertilised eggs were placed on hatching trays and developed over the course of a month. However, unfortunately, they did not make it further than fry stage due to fin rot and 20,000 ova had to be ordered as replacements from Ballarat. These were hatched out in the facility and successfully distributed throughout southwest Western Australia.

Hatchery improvements: 1938–1950

Due to internal conflict the Society closed in 1938, leaving the Pemberton hatchery unfunded. In its wake, a group of Pemberton enthusiasts, led by Ralph Kelly and Jack Simpson united to form the Pemberton-Warren Trout Acclimatisation Society, which drove trout hatchery and stocking developments for the next 25 years.

With no financial assistance or facility in place to raise trout to sexual maturity, emphasis was placed on the capture of 'wild' trout to establish a brood stock population and create a local ova supply.

Plenty of brown trout were being sighted in Pemberton streams, but just when the Pemberton-Warren Society began to think that stocking of rainbow trout had failed, the first official rainbow trout was found. The rainbow weighed 1.1 kilograms and measured 37 centimetres and its capture rekindled great interest in the trout stocking plan.

In March 1939, Pemberton's local streams were, for the first time, declared open for trout fishing for the whole month. Fifty-seven trout were caught and many of the female fish captured were placed in holding ponds for egg stripping.

Trapping technology

Catching trout for breeding was crucial to the stocking plan but developing trapping techniques proved difficult. The most successful method was with hook and line, but this was time-consuming, and members of the Pemberton-Warren Trout Acclimatisation Society soon realised they were not going to collect a reliable broodstock base using this method.

Parties of volunteers would head out after work, often until midnight, to capture trout for propagation. Captured trout were held in a cage overnight and transferred to suitable ponds the following morning. In time, the Pemberton swimming pool was used to hold and trap trout. Dug by volunteers in 1928, the swimming pool is part of One Mile Brook and is situated just downstream from the old trout ponds.

Trapping breeders was proving much more difficult than first anticipated. Each weekend, the volunteers spent valuable leisure time building and testing improved trap designs. Wooden traps of various designs were built and placed in surrounding feeder streams, but none were successful and some were destroyed in floods.



Ralph Kelly and Jack Simpson cleaning a trout trap used to catch trout breeders as they headed upstream. The trout were then stripped of eggs and 'milt' (sperm).

National Library of Australia



Constructing trout breeder traps on East Brook.Colin Graham



New trout ponds

In 1940, the Pemberton-Warren Trout Acclimatisation Society received a £250 bequest from the late James MacCallum Smith which, together with a government grant of £185, was enough to construct a series of six new holding ponds with raceways.

The new site was on One Mile Brook, a small stream on the east end of the national park that flowed into the Pemberton swimming pool. The design of the pools was based on an American model using cast concrete to form the troughs, with a large cage made of wood and wire netting

Official opening of trout ponds and hatchery. State Library of Western Australia

covering the six concrete ponds to protect the fish from predatory cormorants.

On 19 July 1942, more than 200 people gathered at the new holding ponds for the official opening ceremony, which were named in honour of MacCallum Smith. The ponds were described as 'the most modern layout in Australia'. As the guests arrived at the trout ponds for the opening, they passed 18 rainbow trout held in a shallow pool. Later in the day, President of the Pemberton-Warren Trout Acclimatisation Society, Jack Simpson, demonstrated the process of ova stripping from trout bred in Western Australia.

After years of experimental work, the Pemberton-Warren Trout Acclimatisation Society had accomplished its objective of closing the trout life cycle by successfully propagating trout from hatched broodstock. This represented a significant milestone, as broodstock could now be farmed rather than collected from the wild.

In 1943, Pemberton volunteers stripped hundreds of breeding trout and fertilised the eggs. That season, over a third of the ova were lost but the remainder were raised to the yearling stage and held in the new ponds. Releasing larger fish meant they were less likely to be devoured by predatory fish.

One Mile Brook hatchery

The new MacCallum Smith Memorial trout ponds on One Mile Brook and a supply of contained broodstock meant Western Australia was becoming independent in trout propagation and no longer needed to rely on importing trout ova from the east. In 1943, the Pemberton-Warren Trout Acclimatisation Society approached the state government for a £10,000 grant to build a modern hatchery, close to the trout ponds, with the capacity to handle one million ova.

However, with the pressures of wartime austerity, the government could offer only a fraction of the required funding. Instead, the Society constructed a 500,000 ova facility with materials supplied by the state Fisheries Department and voluntary labour. The new facility was designed with an ability to double its ova capacity as funds allowed.



Trout ponds were aerated by spraying water into the air. State Library of Western Australia

Trap success

Once the trout ponds and hatchery on One Mile Brook were complete, trap experimentation resumed. In 1945, through a process of trial and error, three successful traps were constructed and built at a cost of a little more than £100 each.

The traps were placed in Lefroy Brook, Treen Brook and East Brook and were designed with holding pens to enable trout to be stripped, reducing handling and unnecessary transport.

Despite heavy rains hindering some trapping, 183 'wild' trout were caught over four weeks. Along with the 170 held in the Pemberton swimming pool, stripping began on 2 June with 250,000 ova collected and 150,000 of these successfully reaching the fry stage.

Staff at the One Mile Brook hatchery used several methods to ensure the captive mature trout became fertile. Water levels were varied regularly to encourage the fish to move, and Vitamin B was added to their feed to maintain growth and fin structure (this was a major achievement that other Australian hatcheries had not yet attained).



Trout trap on Treen Brook, Pemberton (still in operation in 1984).Department of Primary Industries and Regional Development

Expanded program

Pemberton was at the heart of fishing tourism and angling was quickly becoming the new popular pastime in Western Australia, attracting locals and visitors from interstate and overseas.

Trout were not only an excellent eating fish, but their capture also offered healthy open-air recreation and these benefits supported the post-war plan to 'ameliorate social conditions'. The Pemberton-Warren Trout Acclimatisation Society decided to expand their efforts and stock all suitable waters in Western Australia. The expanded program would provide 'fresh food for rural dwellers without access to the sea or market, an added and very valuable tourist attraction and a social amenity in the form of recreation of the best kind for rural and industrial workers.'

Hatchery tours

The new hatchery and trout ponds on One Mile Brook became a popular tourist attraction, with tours beginning in 1942 to generate revenue for the Pemberton-Warren Trout Acclimatisation Society. Money generated by the tours was matched dollar for dollar through government grants. Over the 1946 holiday season a record



The Duke of Gloucester visiting the ponds, 1947. Pemberton Visitor Centre

number of tourists visited Pemberton with anglers catching 1,200 trout. Almost all (99%) were rainbow trout with 90% of these taken from the four miles of stream adjacent to Pemberton.

A brochure, Trout in the Karri Country, was produced and printed by the Pemberton Tourist Bureau and sold to visitors from February 1948. The brochure detailed the history of trout acclimatisation in Western Australia and was distributed all over the world, selling 1,000 copies in the first year. The visitors' book at the trout ponds records 5,000 people having passed through during 1947.

Water issues

Following close observation of streams across the southwest, the Pemberton-Warren Trout Acclimatisation Society discovered that many released trout were not surviving beyond the fry stage of three centimetres. To improve survival rates, fry were not released until they had grown to about the size of a person's finger ('fingerlings'). As a result, demand for fingerlings and yearlings increased but insufficient space and water supply challenges at the MacCallum Smith Memorial Trout Ponds made it clear that more holding ponds were urgently required. Previous plans to further expand the hatchery at One Mile Brook were cancelled as water supply was becoming uncertain due to irrigation demand from local farms.

The Pemberton-Warren Trout Acclimatisation Society decided to look for another site with a more abundant water supply.

When the old hatchery site at Pump Hill Road on Lefroy Brook became available, the Society purchased the hydro-scheme pipeline and turbine house, making the required water available.

Funding secured for staff

More government funding was sought and an annual grant of £400 allocated. Jack Simpson was employed as full-time hatchery curator and Fisheries Inspector. Simpson's knowledge of trout culture, his extensive involvement in the Pemberton project and experience as President of the Society for eight years made him the perfect candidate.

With a full-time curator, trout could now be stripped when ripe instead of waiting for voluntary labour on weekends. In 1946, 400,000 ova were stripped and filled the hatchery to capacity. More than 100,000 fry were sold to trout acclimatisation societies throughout Western Australia and 20,000 were stocked in local streams.

Jack Simpson was transferred to the Fisheries Department in 1949 and from 1950 Bruce Shipway became curator of the Pemberton Trout Hatchery.

Frank Shoobridge was employed as hatchery manager, assisted by Howard Dunn and Edward 'Ted' Rowe on the weekends, ensuring the hatchery ran smoothly and efficiently for the

Pemberton-Warren Trout Acclimatisation Society.

When extra assistance was needed at the hatchery and trout ponds, the Fisheries Department made Simpson available. In 1950, he managed to recover an entire unsuccessful stripping season by performing a caesarean on a dead trout. The extracted and fertilised ova supplied more than half the year's brood of rainbow trout, resulting in 1,500 yearlings. The

summer of 1950 was the driest on record for 50 years but the stream that fed the hatchery and trout ponds continued to provide water for the five months of drought conditions.

Building trout ponds was a community effort.Colin Graham







Hatchery expansion: 1950–1970

In March 1950, the Western Australian Premier announced that the Pemberton-Warren Trout Acclimatisation Society had obtained a £4500 government grant for capital works and £800 for operations.

Existing Society funds of £840 and voluntary labour helped minimise the construction costs of the new ponds. Earthworks began in 1951 with more than 43 men offering their labour on weekends, overseen by Shipway, Shoobridge and Simpson. Despite various challenges, the new ponds were completed to a very high standard in time for the hatch.

The new site offered ample flow of unpolluted water and sufficient area to allow for expansion of 30 or more ponds. While the sloping ground of the new site created a levelling problem, it had the advantage of better drainage.

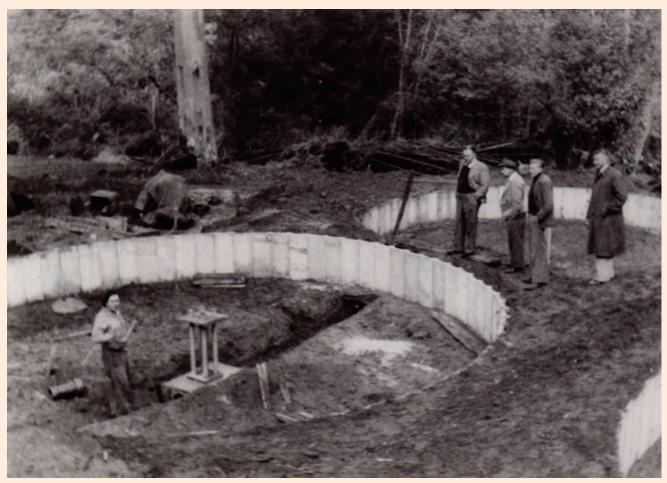
Circular ponds

Overseas research indicated circular ponds were far superior and more water efficient than rectangular ponds so eight circular cement ponds were constructed, each 25 feet (7.6 metres) in diameter with prefabricated cement slab sides. The circular shape gave them four times the capacity and each pond could carry 100,000 fry or 10,000 yearlings.

The ponds and plumbing were completed in under 18 months and all eight ponds were enclosed within a timber frame covered in wire netting to keep out predators. The facility was designed to supply Western Australia's trout needs for many years to come. The eight ponds and water supply plumbing are now 70 years old (2022) and continue to perform a vital role in trout production.







Constructing the circular ponds at the Pemberton Trout Hatchery, which are still in operation today.

State Library of Western Australia



Pemberton Trout Hatchery

The Pemberton Trout Hatchery on Lefroy Brook was officially opened on 6 September 1952. The taps to the ponds were turned on by Superintendent of Fisheries A.J. Fraser. A special mention was given to Ralph Kelly, President of the Society, and a tribute was paid to Cyril Glew for his pioneering efforts.

Ralph Kelly later addressed fisheries inspectors noting: "I want to say a word about the relationship between the Fisheries Department and trout societies, particularly the Pemberton-Warren Society, because we have received a very great amount of co-operation from your Department as an organisation, and from the Fisheries Department officials individually. They have done something more than just carry out the job allotted to them. They have applied themselves with an enthusiasm which goes far beyond their ordinary duties."

By the end of the opening weekend, six of the eight circular ponds had each been stocked with 50,000 rainbow trout fry and the remaining two ponds with 80,000. All available resources and equipment were put to immediate use, and it was clear a new era had begun. Some of the trout were

distributed as fingerlings and some as yearlings, with the remainder held as broodstock for future propagation. Netted cradles were used for the first time to handle trout during stripping. The nets provided a faster and more convenient method as staff could now stand on dry land to complete the task.

In 1953, more than one million eggs were stripped from a thousand rainbow trout held in the ponds, which had been built to handle only half that number. Few hatcheries in the world had been so successful and the Society launched an advertising campaign to distribute the fry before overcrowding became a problem. Considerable interest was received from farmers located near dams, streams and lakes. Trout were stocked wherever owners were prepared to launch an experiment and await the results. About 80,000 fry were delivered to Perth for the convenience of buyers further north. The geographic and climatic tolerances of rainbow trout would soon become known and such widespread stocking would later enable scientific research and breeding breakthroughs in the 1980s.



Ralph Kelly catching trout on Lefroy Brook, c1940s. Colin Graham

Success sends trout interstate

In 1953, the Pemberton-Warren Trout Acclimatisation Society purchased a small holiday cottage in Pemberton. 'Rainbow Cottage' was rented to anglers and visitors and provided the Society with additional income to cover its investment.

The 1953 season was so productive that a first ever parcel of ova was exported from Western Australia on 8 July 1953. About 100,000 rainbow trout ova were air freighted to Snob's Creek in Victoria; a gesture of appreciation in return for ova provided to Western Australia in 1930 and 1931.

In the Pemberton hatchery, 480,000 ova resulted in 418,000 fry. The young fingerlings were held through to maturity and observed under the new conditions of the circular ponds. They fared very well and lost the appearance of pond-held stock, taking on the attributes of 'wild' trout. These same trout came into breeding condition in 1956 and generated 50 per cent more ova and sperm per fish than similar fish held in the old ponds by the swimming pool.





In the 1954 season, 620,000 ova were taken with 567,000 of these resulting in 501,000 fry. After this, the Society decided to limit its program to a more manageable 500,000 ova per year. In 1954, a decision was made to close the MacCallum Smith Memorial Trout Ponds and shift all hatchery rearing facilities to the new ponds at the current Pemberton hatchery site.

Production focus

Due to the rapid growth of trout and hatchery activities, the Society handed the responsibility of distribution, planning, publicity and general control over to the Trout Acclimatisation Council and the Fisheries Department in 1954. The Society could then concentrate on trout production alone. During 1956 and 1957, a storeroom was built at the new hatchery, electricity connected to the rear ponds and a 24-metre circular channel, was constructed around the full circumference of the eighth pond. The channel allowed ripe males to exercise their normal spawning behaviour and minimised handling of the females. The channel remains in use in 2022.

Opening of the Pemberton Trout Hatchery, 1952. State Library of Western Australia

Self-funded

More than 7,000 visitors came through the hatchery and trout ponds in 1955, promoting Western Australia and Pemberton as a valuable tourist attraction. Funds collected helped maintain fulltime staff year-round. The Pemberton Tourist Centre provided guides to conduct tours of the facility. The revenue raised went towards development of the tourist bureau and the employment of tour guides. Visitors were shown the 'stripping' process along with samples of eggs, eyed ova and newly hatched fry.



AJ Fraser turns on the water to officially open the new trout ponds.

State Library of Western Australia

Drought

The year 1957 saw the start of a ten-year drought throughout Australia, including southwest Western Australia.

Severe water shortages and high temperatures proved deadly for the trout. In 1958, nearly all mature broodstock were lost, along with many two-year-old trout, yearlings and fingerlings. The trout ponds (1942) and hatchery (1944) built on One Mile Brook were abandoned in 1960 due to loss of water supply.

The quality and quantity of water available to the Pemberton Trout Hatchery on Lefroy Brook has, and always will be, critically important. In 1961, the hatchery faced a crisis when it was directed to reduce its water use to meet the increased demand of the nearby town. Hot weather and diminished flow caused water temperatures to rise, and fungus attacked the trout.

By 1962, with Ralph Kelly as President, the Pemberton-Warren Trout Acclimatisation Society decided to close and transfer all its administration to the Pemberton Hatchery Board, which consisted of the Director of Fisheries, a Fisheries Officer and three active members.

This would allow the hatchery to concentrate solely on producing trout. In 1965, the Fisheries Amendment Act of 1940 was amended, granting responsibility for trout fishing and acclimatisation to the Fisheries Department and relieving the Pemberton Hatchery Board of this role.

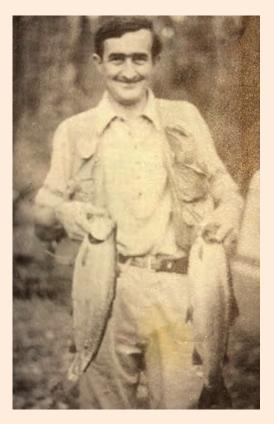
New representation

The decade long drought experienced across the southwest caused angler numbers to gradually decrease and de-registration of many trout societies. As a result, from 1966 all acclimatisation societies were legislatively repealed.

In 1967, with the drought over, Captain Noel Parker and a small group of remaining angling enthusiasts formed the Western Australian Trout and Freshwater Angling Association (WATFAA). As district trout societies no longer existed, WATFAA became the representative of the freshwater fishing community in southwest Western Australia.

Today, WATFAA remains a non-profit recreational fishing club and promoter of freshwater angling devoted to improving freshwater fishing throughout Western Australia.

In collaboration with other recreational angling groups, WATFAA provides expertise on the design of the current stocking program at the Pemberton hatchery – now called the Pemberton Freshwater Research Centre.



Dr Noel Morrissy, early 1970s.Morrissy after Coy, Freshwater Fishing in South-west Australia

Renewed science focus

In 1966, the Director of Fisheries in New South Wales, Dr Don Francois, examined Western Australia's freshwater fisheries and strongly recommended the appointment of a graduate biologist to undertake research into the state's strong trout fishery potential.

Dr Noel Morrissy, a trout population ecologist, joined the new research branch of the Department of Fisheries and Fauna in 1967 as freshwater biologist and teamed up with the strong technical and practical skills of Pemberton hatchery manager Frank Shoobridge and his assistant George Cassells. Dr Morrissy was appointed to study the freshwater fisheries of Western Australia, including trout acclimatisation, marron biology and the possibility of marron farming. A specific research focus was the low density of trout in streams and addressing ways to alleviate this.

Trout monitoring

To address the issue of low trout densities, Dr Morrissy initiated a logbook program to collect information on the success or otherwise of the ongoing trout stocking program. The research revealed that although trout were not reproducing naturally in southwest Western Australia, the Pemberton hatchery stock were thriving once liberated. The positive results stimulated increased state government support for the Pemberton Trout Hatchery and its annual stocking program, which in turn, ensured sufficient trout were released in southwest waterways for recreational angling.

Dr Morrissy provided technical advice for the hatchery, and later collaborated on relevant policy with Bernard Bowen, who had become Director of Fisheries after the retirement of A.J. Fraser in 1968. On 1 July 1970, an Inland Fisherman's Licence was introduced to help the Department manage Western Australian waters, with revenue from licence sales helping to support ongoing trout production.

Research infrastructure

In 1971, under Departmental supervision, a new trout-rearing shed was constructed at the Pemberton Hatchery along with a feed preparation room, cool room and freezer for feed storage, office, workshop area and a laboratory for Dr Morrissy. The new area contained 16 fibreglass troughs, lying side by side in groups of four, irrigated with a constant supply of running water. The new hatchery building and the eight broodstock and nursery ponds remain the core infrastructure for trout production at the current Pemberton Freshwater Research Centre in 2022.

In 1972, Dr Morrissy published a review of Western Australia's trout fishery and status of the trout stocking program. Dr Morrissy's scientific management and perseverance galvanised ongoing commitment to the operation of the Pemberton Trout Hatchery and the annual replenishment of trout in southwest waters.

New management

On 1 January 1972, the Department of Fisheries and Fauna took over complete management of the Pemberton Trout Hatchery, establishing a threefold function:

- Display fish for tourists
- Fish for sale and for distribution into suitable streams throughout WA
- Facilities for research into freshwater species, including marron.

An annual trout stocking list was drawn up in consultation with WATFAA to distribute rainbow trout throughout Western Australia. Waterways were chosen based on accessibility and previous fishing success, evidence of natural spawning, presence of brown trout, distribution difficulty and cost. Hatchery manager Frank Shoobridge retired in February 1972 but returned as a volunteer tour guide. His assistant, George Cassells, moved into the position of manager. Tony Church was employed as a technical officer in October 1973.

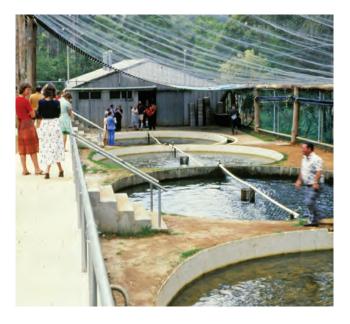
In 1974, the Fisheries Research and Development Corporation (FRDC) funded the installation of three 100m² earthen ponds and seven small rectangular concrete ponds. The ponds were

constructed alongside the first four circular ponds, to breed juvenile marron. This marked an enduring diversification into marron research and the ponds remain in use today.

Daily visitors

When the Department of Fisheries took over management of trout production at the current site, the hatchery was welcoming tourists through its doors daily. The Pemberton Tourist Centre provided tour guides with the revenue raised going towards the tourist bureau and employing guides. The ponds contained yearlings and large rainbow and brown trout, and visitors delighted in the opportunity to view the fish up close and in such abundance.

In 1980, a record of 31,000 visitors came through the hatchery, as well as hundreds of non-paying school children on private tours associated with the nearby Camp School. Tours ceased in the late 1990s when the revenue no longer covered expenses and since then the public has not been able to view hatchery operations. Modern biosecurity and animal husbandry protocols prohibit large-scale tours within the current facility layout.





Hatchery visitors and school children, c1980s. State Library of Western Australia

Water worries

Lefroy Brook has always been the main water supply for the town of Pemberton and the Pemberton Trout Hatchery. In most years, Lefroy Brook provided the water requirements of both the town and the hatchery, but low summer river flows often imposed some restrictions on the hatchery.

For example, restrictions in 1961 and 1970 resulted in significant loss of hatchery broodstock and the issue was brought to a head in the summer of 1983–84 when another severe drought threatened both the hatchery and town of about 900 residents.

"In the 1970 summer, severe water shortage led to complete recirculation of the rainbow trout breeding stock pond by a non-self-priming pump set up by Mr Kelly. Arriving at the hatchery early one morning, I noted a deathly silence and rushed inside to find the 40 or so large breeders splashing in the last inch of water in their pond. I turned on the water in their pond. I turned on the water supply tap from the Pemberton Weir and saved the fish. Each summer until Big Brook Dam was built, George Cassells would ring me, and I would ring the Director of Fisheries, Bernard

Bowen, and he in turn would ring Country Water Supply to plead for water to be released from the Manjimup Scabby Gully Dam on the headnote of the Lefroy Valley, located just south of Manjimup."

— Dr Noel Morrissy

Big Brook Dam

Urged on by hatchery manager George Cassells and Fisheries management, the Western Australian Water Authority and the Department of Fisheries devised a range of suitable options to ensure a more reliable water supply for the hatchery during summer and mitigate future risk. A water assessment of Big Brook by the Public Works Department in 1984 recommended construction of a water storage dam, seven kilometres upstream from the hatchery.

In 1985, funds from the Fisheries Department and Department of Tourism enabled a 100-metre dam wall to be constructed across Big Brook and clearing of 11 hectares of State Forest to contain the water. A stilling basin (designed to reduce the energy of the overflowing water) and fish trap were incorporated into the spillway design. The Big Brook Dam was completed in June 1986 and officially opened in October 1986.

Trout cooling

The new storage dam operated by releasing water to the Pemberton Weir and allowed much better control over water levels. However, even with a regular and reliable water supply, the temperature of the trout ponds still increased dramatically over the summer months. Between 1995 and 2004, Dr Morrissy organised for evaporative cooling towers to be installed, and these successfully reduced water temperature by up to 2°C. The towers are still in use today on each of the 12 circular ponds at the hatchery.

Hatchery staff continued the annual distribution of trout into public waters for recreational fishing and the selling of trout to farm dam owners in cooler parts of the southwest for 'put-and-take' fishing. Between 600,000 and 700,000 fry were hatched at the hatchery each year with about 400,000 going into public waters for recreational fishing, and some sold to private dams and commercial growers. Between 1970 and 2000 nearly eight million trout were released into public waters via the hatchery program.

Infrastructure upgrades

Over the past 30 years, modernisation and refurbishment works at the hatchery have helped maintain production capacity and quality. In 1994, the hatchery received a \$200,000 redevelopment with breeding and rearing facilities expanded to make room for an additional twelve fry-rearing troughs, bringing the total number of troughs to twenty-eight.

A salmonid egg sorting and counting machine was purchased, which sorts 100,000 eggs per hour reducing manual labour needs and egg damage.

Lifting capacity

Redfin predation of trout fry makes stocking dams with small fish ineffective and yearling trout must be produced in large numbers to maintain a high-quality recreational trout fishery. In 1999, four additional round concrete yearling ponds and a concrete swirl separator were constructed, lifting hatchery capacity from 10,000 to 40,000 yearling trout. The additional larger trout were used to stock rivers, lakes and dams for recreational fishing.

In 2004, a new corrugated roof was erected over eight broodstock ponds to provide shade, reduce algal growth and help keep the water cooler on hot days. The roof was later extended to cover the yearling ponds in 2014.



Yearling ponds constructed in 2000.Department of Primary Industries and Regional Development

Changing of the guard

When George Cassells joined Dr Morrissy in the Kimberley as part of a Fisheries Department investigation into barramundi aquaculture, Tony Church took over the hatchery manager role in 1984, assisted by Terry Cabassi.

Tony Church retired in 2015 having worked in the hatchery for 42 years and being responsible for the production of millions of trout. Terry Cabassi has led the hatchery team since 2015 and Tony's son Chris Church commenced work in 2002.

George Cassells returned to freshwater crayfish aquaculture in the mid–1990s working as a field extension officer for the Fisheries Department building and running commercial marron farms. George Cassells retired in late 2005 and passed away in 2006. A patrol vessel at the Department of Fisheries is named in his honour.

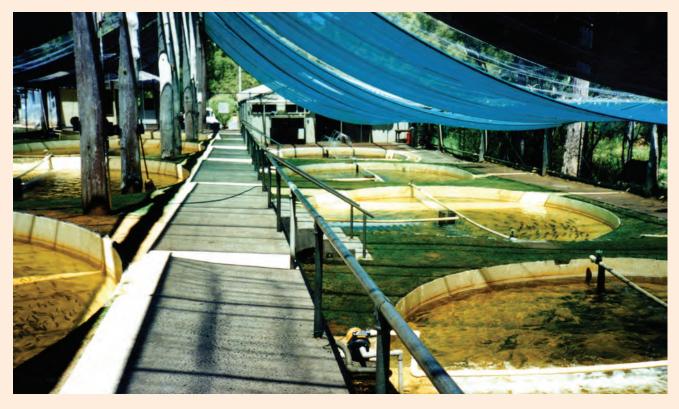
In July 1997, Dr Noel Morrissy retired from his long career with the Fisheries Department and passed away in October 2021. Known as the father of freshwater crayfish research in Western Australia, Dr Morrissy gained global recognition over his 30-year career.

When Morrissy retired, freshwater research at the Fisheries Department was split between marron and yabby aquaculture and trout hatchery production and freshwater fishery management. Dr Craig Lawrence, assistant to Dr Morrissy for six years, took on the marron and yabbies role to carry out important reproduction and genetics research and to develop the Thompson's Flat marron farm.

Trout tagging

In 1999, Dr Brett Molony took on the role of senior freshwater research scientist to oversee trout and marron recreational fisheries. As part of his role, Dr Molony developed the first estimates of catchand-effort for the freshwater angling fishery.

Dr Molony introduced tagging techniques and released about 10,000 tagged yearling trout into the Donnelly, Warren and Blackwood rivers during the inaugural Forest Fishing Festival in 2001. Anglers who caught a tagged trout were asked to record specific details about their catch, including weight, length and location on a catch card. Many businesses in the southwest forest region supported the festival with fishing classes, celebrity fishing events, fly fishing competitions,



Hatchery with shade sail over ponds, 1995.

weekend workshops, trout and marron cooking demonstrations and entertainment.

Tagging trout continues today as an important citizen science venture and provides critical information on trout movement, survival and growth.

In July 2018 marine biologist Greg Jenkins and

his team from the Fremantle Hatchery joined the Department of Primary Industries and Regional Development (DPIRD) to head up the aquaculture R&D program in Western Australia. In 2020, marine biologist Andrew Beer joined the team to oversee marron aquaculture, trout production and stocking programs at the Pemberton Freshwater Research Centre.

Commercial trout farming

In 1980, Dr Morrissy investigated the feasibility of growing rainbow trout commercially across southwest Western Australia ponds using pelleted feed.

He concluded that the long, hot summers and absence of suitable large permanent springs were a major obstacle to trout farming in the southwest as there was not enough cool water available for the frequent pond water changes required of trout farming. The capital investment required to establish a trout farm was also considerable and Dr Morrissy concluded the southwest was largely unsuitable for commercial trout production.

Despite the poor feasibility, several commercial trout farms began operating in the 1980s with accompanying 'put-and-take' fishing and tourist facilities. In 1985, 'A guide for trout farming in Western Australia' was published, which detailed intensive commercial trout farming under Western Australian conditions.

Climate change

Over the past few decades the climate of southwest Western Australia has become increasingly hot and dry with a 30% decline in



Hatchery ponds were covered with a roof in 2003 and evaporative cooling towers (blue boxes) installed to reduce water temperature during summer.

Department of Primary Industries and Regional Development.

rainfall since the 1970s.

This has continued to restrict the opportunities for pond aquaculture, but innovative growers are now adopting indoor tank systems with water recirculating from deep, large ponds. Over the same period, the Pemberton Freshwater Research Centre has implemented recirculating

water systems through evaporative chiller units to maintain water temperatures in the face of climate change.

Future plans are in place to counter the higher temperatures expected under climate change using a controlled water temperature 'recirculating aquaculture systems', or RAS.

Managing for the future

The recreational trout fishery in Western Australia has been built on the success of stocking pioneers and the efforts of trout acclimatisation societies. For more than a century these groups have played a pivotal role in trout production and stocking of rivers and streams across southwest Western Australia.

But over the past 20 years public perceptions about trout and trout fishing have changed and there is growing tension between environmental interests and the freshwater angling community. The challenge for the future is to balance the needs of both these groups.

Since the late 1960s, the Fisheries Department (and more recently the Department of Primary Industries and Regional Development) has consulted with angling groups such as WATFAA to manage the trout stocking program to best effect.

The approach now is to limit negative interaction between released trout and rare and endangered endemic fish species through careful selection of annual release sites based on risk management assessments.

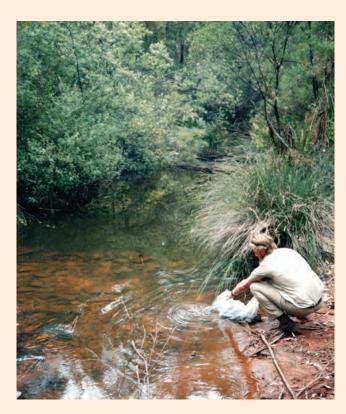
Several discussion papers around stocking trout options have been prepared by the Department in consultation with the Recfishwest. As a result, rivers and dams across the southwest have been categorised to ensure that minimal environmental impact arises from trout stocking.

Balancing act

Lack of suitable waters running over gravel and stones for spawning, high water temperatures and low oxygen levels are likely to limit natural reproduction in Western Australian southwest rivers and dams. Suitable hatching conditions are also limited and predation pressure on young fish is high from exotic species such as redfin.

This lack of natural trout spawning is a powerful management tool for a fishery based on an introduced species. Trout numbers can be easily managed by controlling stocking rate and release locations. Ceasing trout stocking completely would reduce trout numbers to zero within five years (their natural lifespan).

The trout stocking program at the Pemberton Freshwater Research Centre is designed to get 'the right fish in the right place at the right time' to benefit freshwater anglers and regional economies. Annual stocking is managed to match the angling demand and minimise interactions with endemic fish populations.



Pemberton Hatchery manager (1984 – 2015) Tony Church releasing trout fry into stream in the Donnelly River catchment.

Department of Primary Industries and Regional Development

Co-designed success

Climate change and private water storage dams for crop and pasture irrigation are growing issues for the southwest trout release program. Reduced rainfall and streamflow affect stream security and productivity which, in turn, reduce growth and survival of all freshwater plants and animals.

To ensure ongoing success for the trout release program in the face of these challenges, DPIRD aquaculture director Greg Jenkins, and senior freshwater scientist Andrew Beer, organised the formation of the WA Inland Fisheries Research Advisory Committee (WAIFRAC), which brings together Recfishwest, WA trout fishing experts, CSIRO, the Regional Development Commissions and Department trout research and production specialists. The committee advises DPIRD on the research directions required to enhance trout survival, optimise the stocking program and lift angler numbers in southwest Western Australia.



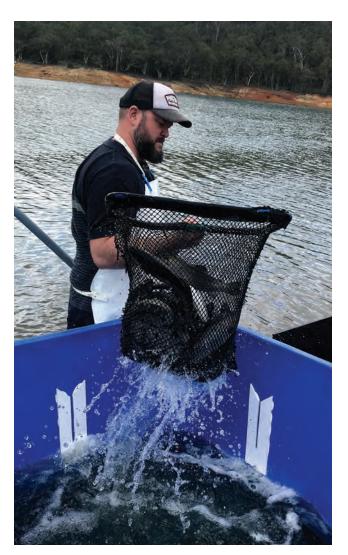
Pemberton Freshwater Research Centre facility manager Terry Cabassi holding a male brown trout broodstock.

Department of Primary Industries and Regional Development

Annual release plans

Annual trout stocking lists are prepared and approved by DPIRD with input from the Freshwater Fisheries Reference Group, a committee within Recfishwest. The Recfishwest committee meets annually to discuss which rivers and dams will be stocked with trout, guided by advice from the Pemberton Freshwater Research Centre staff and the Department's trout stocking policy.

Waters are selected based on a range of selection criteria and careful risk assessment. Where there is a high conservation value, trout are not stocked. Trout stocked in selected waters are intended to be caught and removed in a genuine 'put and take' fishery. Along with trout fry and yearlings, the Pemberton Freshwater Research Centre releases adult ex-brood stock into rivers and southwest dams each year. These larger fish offer an instant fishery as they can be captured immediately by recreational anglers. In the spring of 2022, about 2500 rainbow trout and 500 brown trout weighing up to 1.5 kilograms were released at more than 20 locations across the southwest.



Chris Church releasing rainbow trout yearlings at Harvey Dam.

Department of Primary Industries and Regional Development

Survival rates

A recent strategy developed through WAIFRAC is the release of fewer, but larger, trout. In trout production areas in the USA, growing trout to a larger size before release has been shown to improve survival rate in many studies. Such a strategy is particularly relevant to Western Australia's trout fishery and will reduce the amount of food trout need to find in waterways to grow to legal capture size (30 centimetres).

Historically, the Pemberton Freshwater Research Centre has released up to 800,000 trout fry of about five centimetres in length in spring when streams are full and flowing after winter rainfall. But a 2019–20 review found most stocked streams were dry by early summer and that very few of the fry were likely to have survived.

Since 2020, the Pemberton Freshwater Research Centre has been scaling down the annual release of fingerlings and only placing them in locations with good water security and lower probability of predation.

By retaining trout fingerlings in the nursery until they are larger, the fish will be more robust and will compete more successfully once released – especially against the introduced and predatory redfin perch.

Fish releases are also timed to coincide with peak angler demand during school and public holidays.

Larger fish

To accommodate the new strategy, the trout production system is being adjusted to generate an additional 10,000 to 20,000 yearlings each year. Scaling up to 40,000 rainbow and 10,000 brown trout yearlings (with some ready-to-catch at > 30 centimetres) has been made possible through improvements to the Centre's tanks and trout nutrition along with production and transport systems.



Pemberton Freshwater Research Centre hatchery staff in action (2022). Chris Church, Jonty East, Terry Cabassi picking trout eggs from hatching trays.

Department of Primary Industries and Regional Development

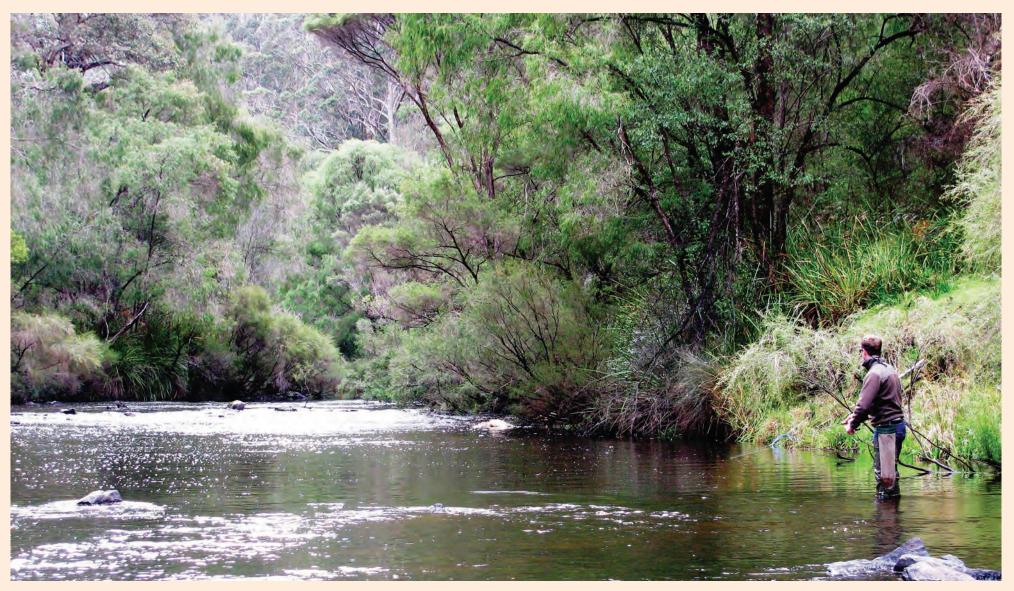
Further improvements to the Centre's infrastructure are underway to protect broodstock and yearlings from high summer temperatures. Investment in RAS will enable fine control of water quality, avoiding fish stress over summer and enhancing egg quality in broodstock.

The goal is to make the hatchery system more intensive, enabling increased productivity while maintaining fish quality.

Regional impact

Western Australia's trout fishery is a social and economic fishery that is totally reliant on ongoing stocking of chosen public waters. By altering the location, number and timing of fish releases, the Department can maximise the social and economic benefit accrued from the fishery. It is estimated that about 10,000 licenced freshwater anglers spend more than \$20 million in southwest Western Australia each year as they fish for trout in local waterways. This is a conservative estimate of direct expenditure on fishing tackle, boats and equipment as anglers also spend on fuel, food, accommodation and other tourism attractions when they visit the southwest with their friends and family. The true economic benefits of trout fishing are likely underestimated.

The Department engages with anglers to make it clear where and when trout will be released each year. Being in control of trout release means the trout fishery can be optimised for the needs of the fish and the industry's economic, environmental and social benefits.

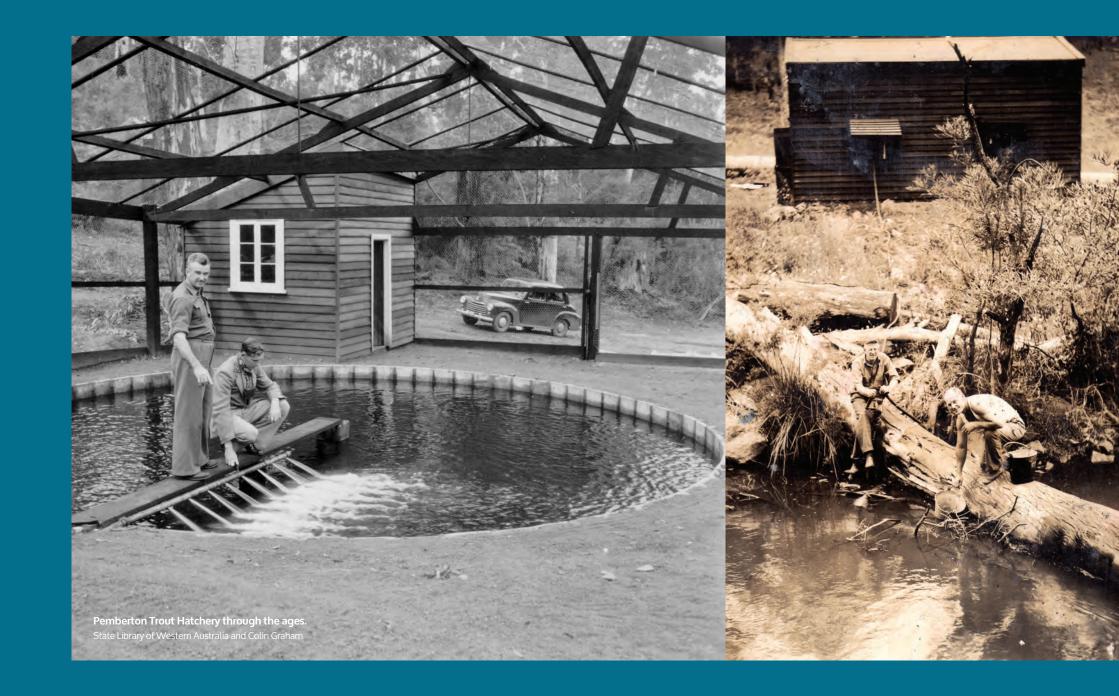


An angler enjoying some solitude on the Warren River. Terry Goodlich



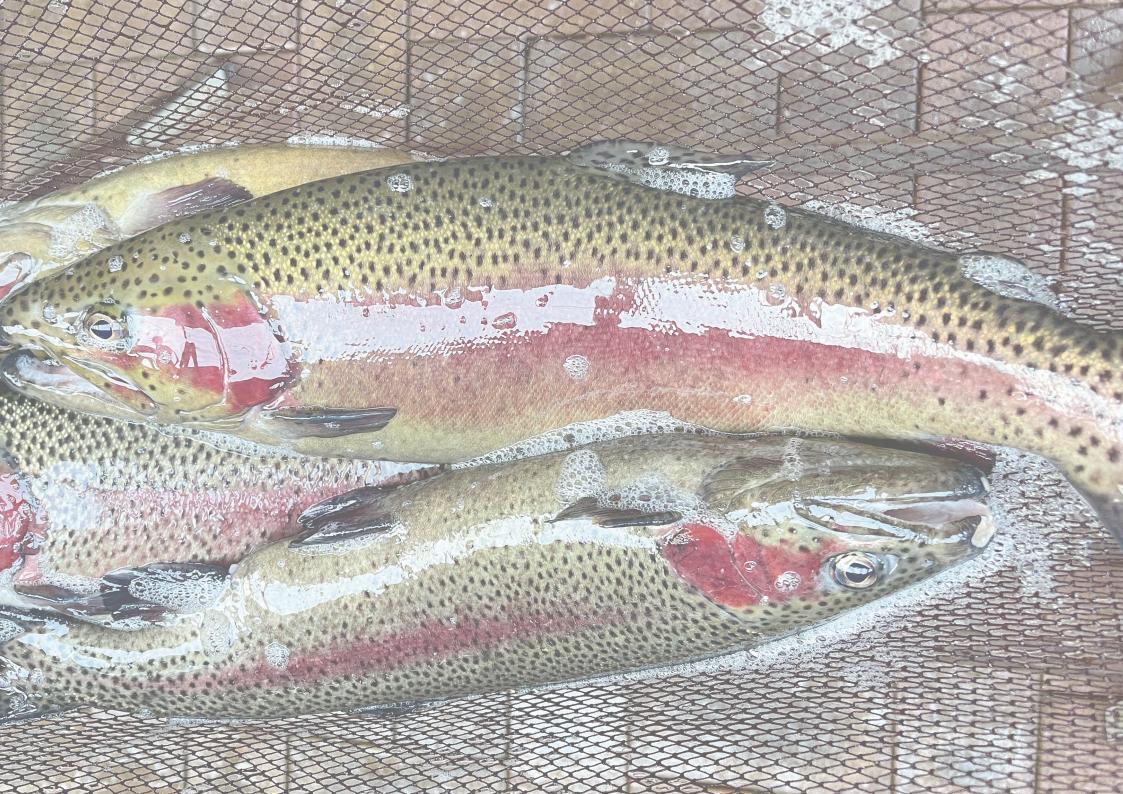
Final word

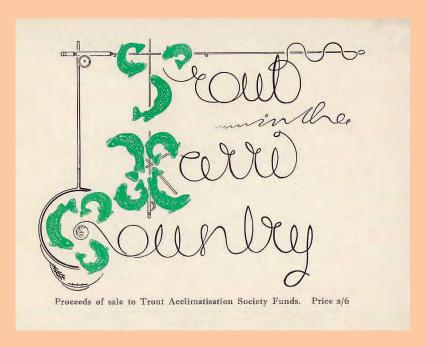
Western Australia's trout fishery has a long and rich history, with tenacious pioneers overcoming natural, financial and bureaucratic obstacles since the late 19th century. Central to the success of the trout story is the impressive community commitment and generosity that launched the original trout hatching experiments on the back verandah of the Pemberton School over 90 years ago. With firm state government support underpinning the Pemberton Freshwater Research Centre, the fishery will continue to generate strong economic returns to the communities of southwest Western Australia and deliver a rewarding fishing experience to the next generation of recreational anglers.











Front cover of the 1948 brochure 'Trout in the Karri Country.

To commemorate the growing success of the Pemberton Trout Hatchery a brochure, *Trout in the Karri Country*, was produced and printed by the Pemberton Tourist Bureau and sold to visitors from February 1948.

The brochure detailed the history of trout acclimatisation in Western Australia and was distributed all over the world, selling 1,000 copies in the first year. The visitors' book at the trout ponds records 5,000 people having passed through during 1947.