

Fish for the future

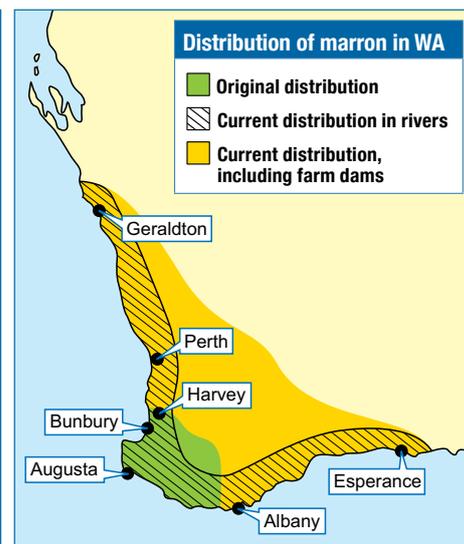
The Marron Fishery

Marron (*Cherax cainii* and *Cherax tenuimanus*) are the largest freshwater crayfish in Western Australia and have long been popular with recreational fishers in Western Australia's South west. Today, the species is successfully farmed to supply commercial markets, but in the wild (recreational) fishery, environmental changes and habitat destruction have reduced the marron's range. This has led to a short controlled summer fishing season, with bag and size limits and snare-only fishing areas.

AREA OF INTEREST

Marron are endemic to Western Australia. They were originally found in the south-west region between Harvey and Albany, but after European settlement they were stocked into farm dams and waterways from the Hutt River (north of Geraldton) as far east as Esperance. They have also been stocked into water bodies in South Australia and Victoria.

Their range in WA has been affected by rising salinity, land clearing and changing climate patterns, and natural occurrence has been augmented by restocking in rehabilitated and artificial waterways and water bodies.



Smooth marron (*Cherax cainii*).



Department of Fisheries

MARRON SPECIES AND OTHER CRAYFISH

There are other smaller native freshwater crayfish sharing Western Australian waterways with marron; gilgies and koonacs, all belonging to the *Cherax* genus.

Yabbies (*Cherax albidus*) were introduced from the Eastern States in the 1930s, but are usually now confined to dams on wheatbelt farms and their translocation is strictly controlled. In the wild they are considered a feral species and fishers should never return them to waters as they will compete with local species.

A species of marron (*C. tenuimanus*), known as the 'hairy' marron for the hair-like growths on its carapace, was identified in the Margaret River and during the 1990s this species was listed as critically endangered. The Department of Fisheries implemented conservation measures to reserve parts of the river for this animal and established a breeding program for restocking.

Female marron carry eggs and then larvae under their tails until summer, when the juveniles drop away and forage for themselves.

Marron are nocturnal (but most active just after sunset) and shelter during the day; refuges such as fallen logs and rocks in streams are essential, particularly for juveniles vulnerable to predators such as native water rats, chuditch, tortoises, birds, fish and larger marron. Clearing of waterways may deprive marron of such shelter and in dams artificial refuges are often provided.

The normal dark colouration of marron is good camouflage in southern waters rich in brown tannins from vegetation, but there is also an electric blue variety now raised for aquariums and recently an orange striped marron was found in the south-west. A reported red marron has not been rediscovered in the wild.

Marron are an integral part of WA's natural waterway ecologies, as both scavengers and prey for native mammals and birds. Unlike gilgies and koonacs, marron can't survive drought by burrowing, so they



Marron larvae. Photo: Michael Burgess



Berried female. Photo: Stephen Beatty



Margaret River hairy marron. Photo: Simon Visser

are an excellent indicator species for the health of rivers and lakes as they are susceptible to low oxygen levels and high water temperatures.

Marron process detritus, animal and vegetable, that falls into rivers; what they don't eat immediately, they shred for further bacterial breakdown. They also eat insects and worms, as well as other crustaceans and can eventually grow to around two kilograms, too big to be vulnerable to any predators other than humans. They are thus the top predators of their ecosystem and without them, it may become distorted.

“Marron are an integral part of WA's natural waterway ecologies, as both scavengers and prey for native mammals and birds.”



Fallen logs and rocks offer essential refuge for marron. Photo: Larisa Vanstien

OBJECTIVES FOR MANAGEMENT

The main objectives of management are to preserve a sustainable recreational wild marron fishery, support the production of high quality aquaculture marron by the industry and maintain research programs for selective breeding and conservation genetics.

Commercial marron fishing was banned in the 1950s and the wild fishery became wholly recreational. Changes to natural marron habitat, such as declining water quality and shrinking range, especially in the past decade, has meant greater levels of protection were needed and this has involved reducing the recreational fishing effort.

In 1987 recreational marron catches collapsed due to overfishing and drought, so the fishery was closed for two years and reopened with much stricter fishing rules.

The season was shortened in 2004 to only 16 days but has now been extended to one month long as the marron populations have recovered.



Marron may walk out of dams and water bodies if oxygen levels fall. Photo: Craig Lawrence

Fisheries and Marine Officers conduct dedicated marron patrols, equipped to visit marron habitats at night and prosecute people taking marron outside the season or ignoring bag, size and possession limits.

Community awareness campaigns inform the public of rule changes and the need for marron conservation, and large mandatory fines now apply to marron offences.

Fisheries scientists researched the biology and distribution of marron, and in recent years have focused on developing captive breeding programs to secure what genetic diversity there is in the marron populations in WA. They have also worked with farmers to develop a productive marron aquaculture industry by improving breeding stock and farming techniques.

The Department of Fisheries involves the wider community to improve marron habitat when feasible; local schools and conservation groups have rehabilitated

waterways (fishing out feral species and restoring vegetation) where marron are found or can be restocked.

The stretch of Margaret River occupied by the hairy marron has been regularly cleared of the introduced smooth marron and feral fish such as carp by local schoolchildren, volunteers and university students and they will remain an important factor in the marrons' survival. The Margaret River hairy marron has now been added to the list of endangered species in Western Australia to provide enhanced protection of this threatened freshwater crayfish.

Marron have been stocked into dams owned by the Water Corporation and are available to be fished by the public during the official marron season, but if dams are converted to sources of public drinking water, fishing and other public water activities are usually prohibited. Most of these dams are in the State's southern half and many are placed on waterways

where marron occurred naturally, such as Wellington dam, Stirling Dam, Harvey Dam, Harris Dam, Glen Mervyn, Big Brook and about 20 other dams. Check the Water Corporation website for dam status updates (www.watercorporation.com.au).

While dams are repaired or refurbished, marron and native fish are captured by Department of Fisheries scientists and kept at the Pemberton Freshwater Research Centre, where they form part of the breeding program before being returned to the dams.



A dry Drakesbrook Weir. Photo: Cameron Hugh

THE FISHERY

Recreational Fishing

The unique wild marron fishery in WA is entirely recreational and the fishing effort is controlled through measures such as seasonal and area closures, size, bag and possession limits and restrictions on fishing gear.

Marroning is a very popular pastime during hot summer nights. The season is confined to set dates that allow marroners the opportunity to plan their travels well in advance of the season and also incorporates a full lunar cycle. The marron season is open from 12 noon, 8 January to 12 noon, 5 February. The season was once based on the lunar cycle but this caused some misunderstanding as to the start date each year.

Many marron waters have been designated snare-only, where the more sporting method of using a pole equipped with a sliding noose is the only legal way

of catching marron. In other areas, baited traps are set and retrieved.

Traditionally marron were cooked immediately in pots over riverside fires, but today fire bans are usually in place. Littering and damage to river banks remain a concern.

In 2004, the Recreational Freshwater Fisheries Stakeholder Sub-Committee (RFFSS) was set up to develop a five-year strategy for the management of WA's freshwater fisheries in the south-west. Arrangements for the marron fishery were reviewed and in 2007 some changes were made.

Minimum legal size was increased from 76 mm to 80 mm carapace length.

A possession limit of 20 legal-sized marron per licensed fisher was introduced.

The fishing season was increased from 16 to 23 days (and is now 28 days).

Hutt River became a 'trophy' water, with a minimum size of 90 mm carapace length, and a bag and possession limit of 5 per fisher.

The snare-only status was removed from the Warren National Park.

The Shannon River was closed to all fishing.

A daily bag limit of ten marron per licensed fisher applies unless otherwise specified.

All these measures are designed to improve the quality of marron fishing, while allowing marron populations time to breed and keep some larger animals in the breeding stock. The growth rates of marron can vary widely depending on factors such as competition for available food and water quality and temperature, so size is not necessarily a guide to the age (and maturity) of the animal. However, most marron will have matured enough to breed by the time they reach 80 mm carapace length.



Snare-only areas offer a more sporting challenge for recreational fishers.

Commercial Aquaculture

Marron farming has the most participants in the WA aquaculture industry, with 176 productive farms. Licences take two forms; a limited licence allows farmers to grow marron on their own property and sell marron at 76 mm to a holder of an unlimited marron licence or a processor's licence with authorisation for marron. Marron must be sourced for aquaculture from the holder of an aquaculture licence endorsed for marron or from the Pemberton Freshwater Research Centre.

The Department sells surplus juveniles from research programs to licensed farmers for stocking their ponds, and this income supports further research into the genetics and selective breeding of marron for aquaculture and conservation.

There are farms from Hutt River to Esperance but most are in the higher-rainfall areas along the south-west coast.

Marron farming generally uses large earthen ponds equipped with an aerated water supply and drains for harvesting purposes.

Both the value and production of marron have increased in recent years and the industry is settling into two main styles of marron aquaculture. Many producers have low input and production, such as beef farmers, wineries or resorts who may be diversifying their farms or supplying local restaurants.



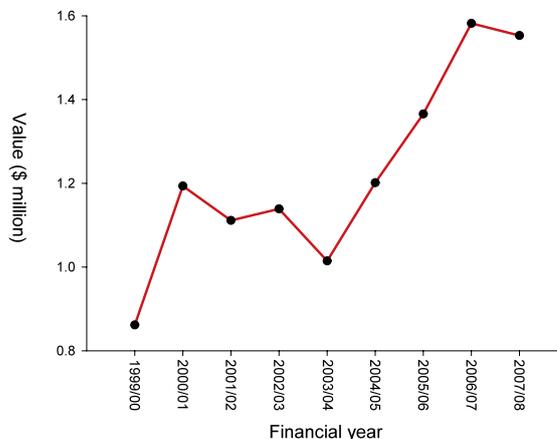
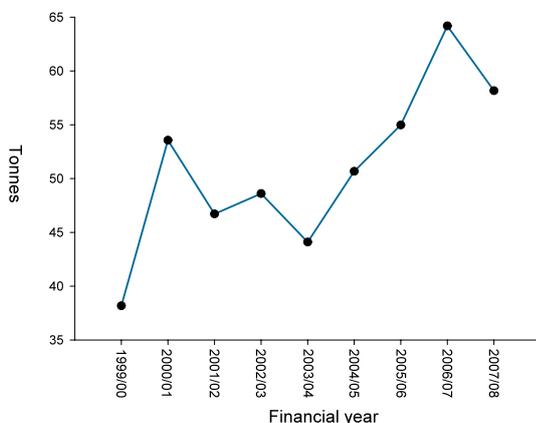
Farmed marron. Photo: Craig Lawrence

However, in WA only 10 per cent of the farmers produce 50 per cent of the marron and these are usually from purpose-designed and constructed marron farms that use best practice for high production. Marron farms in the top 30-40 per cent of production are gradually increasing their output, probably as they apply the results of research conducted by the Department of Fisheries.

Marron has the largest number of active producers of all the aquacultured species in Western Australia.

Financial Year	Number of aquaculture licences producing marron	Average price per kilo (\$)
1999/00	141	22.57
2000/01	181	22.28
2001/02	186	23.79
2002/03	186	23.43
2003/04	175	23.01
2004/05	187	23.71
2005/06	177	24.84
2006/07	178	24.65
2007/08	178	26.70

Marron production 1999 – 2008



The Science

As environmental and fishing pressure has increased on the wild marron fishery, breeding programs have been established at the Pemberton Freshwater Research Centre (PFRC). The programs have several purposes.

A captive breeding program to preserve marron biodiversity, particularly a breeding population of the critically endangered Margaret River hairy marron, was set up in 2005/06. A genetically pure breeding stock produced over 1,200 juveniles in its first year. The juveniles were reared to sexual maturity at the centre and their progeny have been used to restock the Margaret River catchment from 2009 onwards.

Marron were also taken from three other river systems, representing genetic diversity of northern, central and eastern marron populations, and they have been bred and reared as separate genetic lines. The progeny of these marron will be available to marron farmers wanting to improve the genetics of their stocks by reintroducing robust wild genes.

They will also be used for tagging and recapture research in the recreational fishery and for restocking catchments and farm dams in the appropriate region.

Department of Fisheries researchers have worked closely with the marron aquaculture industry to develop best farming practices, and breed a strain of marron that combines the most desirable characteristics of native marron for aquaculture purposes, such as a fast growth rate and large size. The marron from the Department's selective breeding research program can grow twice as fast as those presently stocked on most commercial farms and double production levels.

However, many farmers still tend to sell their largest marron and breed from remaining smaller stock, resulting in selection for slower growing animals. As a result they need regular infusions of 'wild' or improved genetic stock to maintain production and healthy populations. The PFRC is now supplying such purpose-bred stock and educating farmers about breeding strategies.

Researchers have also helped farmers improve their production systems, reducing the likelihood of disease and improving the quality of the artificial habitat.



Fisheries researchers monitor marron populations and advise managers. Photo: Vinh Nguyen

WHAT'S NEXT?

Marron can be stocked into a wide range of waterways as long as there is suitable water quality (marron can live in up to half the salinity level of seawater but do not breed in high salinity) and an ecosystem that provides food and shelter.

Genetic studies by Fisheries researchers have shown that wild marron genes are essential for developing selective breeding programs to improve production. The aquaculture industry therefore relies on healthy populations of marron in the wild.

Restocking of marron into the wild is only viable if habitats will support them, so environmental policies need to consider issues such as environmental flows and the protection of water quality in waterways where marron live.



Marron being removed from Drakesbrook Weir prior to draining. Photo: Cameron Hugh

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