

Smooth marron case study



Smooth Marron on the march (Photograph: S Beatty)

The native freshwater crayfishes of south-western Australia are 100% endemic to the region and play important roles in aquatic food webs.

The Smooth marron (*Cherax cainii*) is a species that originally occurred between the Harvey and Denmark catchments, however, it has been extensively translocated to now be found from the Hutt River north of Geraldton to the Esperance region.

The Smooth Marron is a gastronomic delicacy and supports an iconic Western Australian freshwater recreational fishery. It was also an important food source for traditional owners. The recreational fishery is open annually for a ~1 month period in January.

Being a fast growing species, the Smooth marron also supports an inland aquaculture industry based in ponds and dams that supplies domestic and overseas markets.

It is also a major component of south-western Australian aquatic food chains and, being a benthic omnivore, consumes all levels of the food web.

Threats

The fishery is composed of many discrete populations (Beatty et al 2016) that exhibit biological and life history traits that differ among systems (Beatty et al 2011), including fecundity (Beatty et al 2016) and growth (Lawrence 2007). Distribution of fishing effort between dams and rivers has remained consistent with historic patterns (approximately 35% in dams and 65% in rivers).

It is crucial that the fishery continues to be carefully managed to ensure its sustainability.

Monitoring of the recreational Smooth Marron Fishery since the mid-1970s has shown both a reduction in total catches and a reduction in catch rates (Figure 1). There is some evidence of site-specific reductions in abundance from fishery independent CPUE data (Fletcher and Santoro, 2013).

However, overall marron stocks are considered adequate due to relatively stable recreational catch in recent years; although fishery independent survey data suggests they are under pressure from environmental factors (de Graaf et al., 2010).

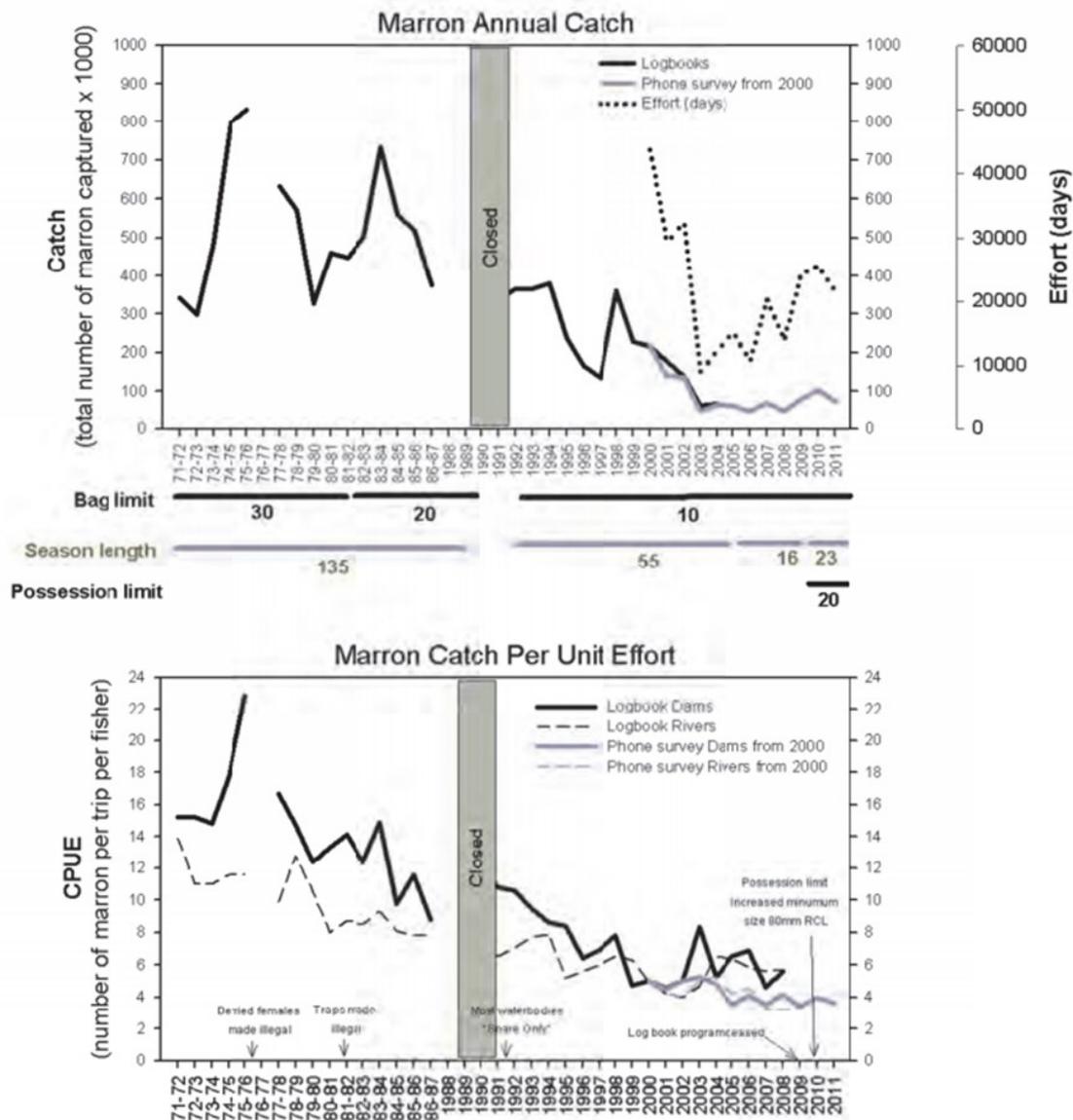


Figure 1: Estimated total catch (a) and catch per unit effort (b) of the recreational marron fishery between 1971 and 2011. Reproduced from Fletcher and Santoro (2013)

While past translocations of Smooth Marron have resulted in an expansion of its distribution northward and eastward, there has also been a decline in its inland range and local abundances due to water quality decline and loss of habitat (de Graaf et al., 2010).

Salinisation of major rivers that have catchments arising in the inland region of the south-west has resulted in contraction of the species range coastward.

The species requires permanent water of reasonable quality (particularly adequate levels of dissolved oxygen) and also favours complex instream habitat such as large woody debris that is provided by a healthy riparian zone.

The more pristine forested reaches of rivers are the

remaining stronghold of the species but in many of those rivers introduced predatory fish, particularly Redfin Perch, are also a threat by preying on smaller individuals (Morgan et al., 2002; de Graaf et al., 2010).

Marron catches have been partially correlated with rainfall (de Graaf et al., 2010) and climate change is likely to exacerbate the other major threats.

While more research is required to fully understand the relationship between surface flow, population viabilities and catch rates, as with freshwater fishes, higher water levels and flows in south-west rivers may enhance annual recruitment and survivorship of the species by increasing available habitat and resources.

Therefore, the ongoing reductions in rainfall in the region may place pressure on marron populations by reducing recruitment and also reducing the availability and quality of dry season refuge.

Trend, condition & information reliability

Trend: Deteriorating past 40 years but some evidence of recent stabilisation.

Condition: Moderate - 48%

Information reliability: Long-term fishery dependant and independent data used to underpin fishery status. Reasonable levels of other scientific surveys that have demonstrated past range declines, mostly due to salinisation. Reasonable biological information on population and reproductive biology across the range.

Knowledge gaps still include quantifying effects of flow declines and temperature increase on populations and interactions of climate change with other factors (such as physiological tolerance to salinity, dissolved oxygen).

Conservation activities

Long term fishery monitoring and management underpinned by understanding of annual catches and species biology.

Indirect positive effects of addressing secondary salinisation and riparian protecting and rehabilitation would have benefited the species in some cases.

Active management of populations in public water supply dams during engineering works have prevented population losses in several systems.

Call to action

The long-term sustainability of the species will depend on continuing the careful monitoring of fisheries stocks and addressing the many threats that south-western WA rivers face.

These include efforts to address the major issue of secondary salinisation of waterways, protecting and rehabilitating riparian zones, and ensuring surface and groundwater extraction considers the water requirements of the species.

Novel management actions such as captive breeding for re-stocking certain dams are also being investigated.

The threats posed by illegal poaching and the possibility of additional large predatory fishes being introduced should also be addressed.

The social, ecological and economic value of this iconic invertebrate makes it an ideal indicator species

Did you know?....

The Smooth Marron (*Cherax cainii*) is the third largest crayfish in the world!
It can grow more than 380mm in

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