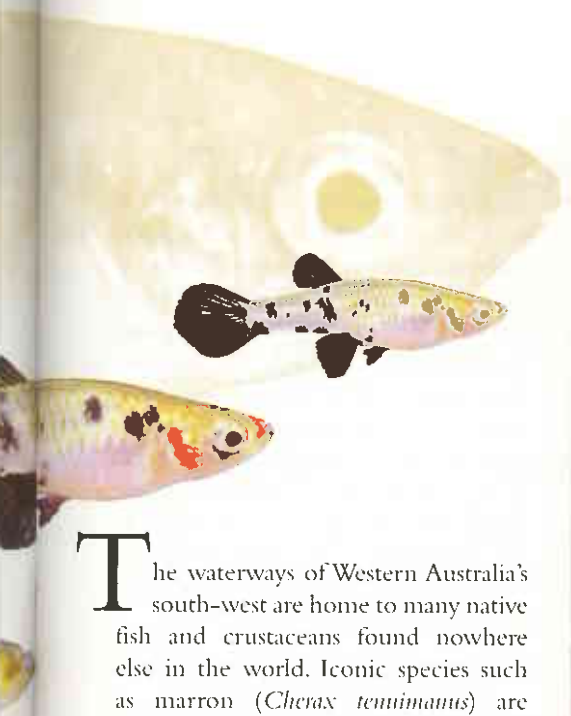
One-spot livebearer

by Mark Maddern

An invasive freshwater fish —the one-spot livebearer— is having a detrimental effect on native fish species around waterways in Perth and the south-west.



Opposite page
Main Canning River at Soldiers Road, Roleystone.
Inset top One-spot livebearer.
Photos – Mark Maddern
Inset bottom Mark Maddern electrofishing in the Canning River.
Photo – Leah Delfs

Above A section of Mary Street drain in Maylands, where one-spots have recently been discovered.
Photo – Mark Maddern

The waterways of Western Australia's south-west are home to many native fish and crustaceans found nowhere else in the world. Iconic species such as marron (*Cherax tenuimanus*) are popular targets for recreational fishers and support tourism in regional WA. Native species share these waterways with introduced freshwater fish, such as goldfish, carp, brown and rainbow trout, redfin perch and mosquitofish that may compete with, or predate upon, the natural inhabitants. Unfortunately, new introduced fish, often ornamental species with unknown ecological impacts, are regularly discovered in waterways of the south-west.

Spot the difference

The one-spot livebearer (*Phalloceros caudimaculatus*) is an aquatic invader becoming common in creeks and rivers within the Perth metropolitan area. These small fish (no greater than 60 millimetres long) are native to central South America and were imported into Australia to be kept as pets. Although one-spots have been in Perth for at least three decades, their range has recently expanded significantly. Within Perth, one-spots are found in the upper Canning River around Gosnells and Kelmscott, and in many tributaries including Bull Creek, Lesmurdie Brook and Southern River. They have recently been discovered in drains and creeks leading into the Swan River at East Perth, Maylands, Belmont and Bayswater.

One-spot livebearers are identified by the speckled markings and the yellowish tinge on the body that is particularly noticeable on the fins. They are easily discernible from all small, native species, and may be confused only with the introduced mosquitofish (*Gambusia holbrooki*). The name 'one-spot' refers to wild fish in South America that do not have the speckled markings, but only a single spot on the mid-flank. Ornamental strains were specially bred to have pronounced markings, and it was these varieties that were introduced into the waterways of Perth. Thus one-spot livebearers typically have many spots!

Like many introduced animals, one-spots compete with indigenous species for space and food sources, consuming aquatic invertebrates that are the preferred diet of native fish. They may also predate upon the fry of native fish and small tadpoles. One-spots will also readily consume low quality dietary items such as detritus and algae. The ability to consume a highly varied diet enables one-spots to thrive in a wide variety of environments, including degraded areas such as urban drains that native species will not inhabit.

Survival and spread

As the name 'livebearer' suggests, one-spots do not lay eggs but give birth to live young. Newborn fish are relatively large and are immediately able to swim, feed and escape predators. Therefore, one-spot offspring have a better chance of survival than the offspring of egg-laying native fish, which are much smaller. The production of live young also allows a single pregnant female to start a new population if released in a different waterway. In south-western Australia, one-spots breed continuously throughout the year and grow more quickly than native fish. A flexible diet and live young allow one-spots to readily settle in new environments and compete successfully with native fauna.

One of the most worrying aspects of their spread is that one-spots have dominated waterways in Perth and Sydney that previously contained only mosquitofish. The mosquitofish is the most abundant introduced freshwater fish in Australia, primarily due to its wide release as a mosquito biological control agent since the 1920s. It is now considered a pest due to its aggressive

Above Mosquitofish were introduced in the 1920s as a control agent for mosquitos.
Photo – Babs and Bert Wells/DEC

Left A suburban drain, where one-spots have recently been discovered.

Below left and right One-spots from South America were specially bred from having a single spot (left) to having speckles (right).

Bottom A brood of fully developed embryos and eggs removed from a pregnant female.

Bottom right A one-spot livebearer at actual size.
Photos – Mark Maddern

behaviour towards, and competition for food with, native fish. Furthermore, mosquitofish are poor consumers of mosquito larvae compared with the native fish they often replace. Unfortunately, much like the cane toad (*Bufo marinus*), while mosquitofish were released with the best intentions, they have become an ecological disaster. It is of concern that a well-established and highly successful invader such as the mosquitofish may have been out competed and replaced by one-spot livebearers.

Control

Now that one-spots have become established in Perth waterways, what can be done to remove or control them? Physically removing or poisoning fish is possible only in small, confined locations and, unfortunately, as one-spots are now established in many creeks and rivers within the metropolitan area this strategy would be unsuccessful. Other potential control strategies may include reintroducing larger, native fish which may prey on juvenile one-spots and help control their numbers. Typically, once introduced species become firmly established it is very difficult to remove them. The most important strategy is to prevent the further release and spread of one-spots around Perth through greater public education.

Mark Maddern, from the School of Animal Biology at The University of Western Australia, is conducting research on the biology and ecology of one-spots, and their potential to affect natural ecosystems. If you see one-spot livebearers in south-western Australia please contact him on 0422 068 870 or by email (mark.maddern@gmail.com), or the Department of Fisheries translocation officer on (08) 9482 7205. Mark is a recipient of a Land and Water Australia postgraduate scholarship and acknowledges financial support from Land and Water Australia and The University of Western Australia.

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