

The Big (Little) 4

Saving four small-bodied fish species beyond the Millennium drought

The issue

Loss of habitat, increased threats and the Millennium Drought nearly resulted in the extinction of four specialist small-bodied fish species in the SA Murray-Darling Basin. The Murray hardyhead (*Craterocephalus fluviatilis*), Southern pygmy perch (*Nannoperca australis*), Yarra pygmy perch (*Nannoperca obscura*) and the Southern purple-spotted gudgeon (*Mogurnda adspersa*). These species could almost be considered relics of a time when our rivers and wetlands were more productive and dynamic; and supported unique, specialist species. Yet, these species have felt the impacts of river regulation and the introduction of foreign fish. Three of these four fish species heavily rely on healthy submerged plant communities. The rapid establishment of common carp in SA following floods in the early 1970's had a detrimental impact on these plant communities resulting in significant habitat loss for wetland fish species.

The effort

Thanks to passionate key individuals, threatened fish of the four species were rescued from drying habitats during the Millennium Drought. This enabled captive breeding with the aim to release fish back into the wild post-drought. The Critical Fish Habitat Project (enabled by drought funding from the state and Commonwealth governments) within the Department for Environment Water and Natural Resources partnered with Aquasave–Nature Glenelg Trust, the South Australian Research and Development Institute (SARDI), the SA Murray-Darling Basin Natural Resources Management Board and a number of community groups and landholders to establish surrogate dams as secure locations to maintain self-

sustaining populations to see out the drought. Surrogate refuges are less labour intensive, expose fish to wild conditions and allow for greater numbers of fish to be produced.

Captive breeding was also embedded into the special research project subject curriculum at Urrbrae Agricultural High School and now provide offspring for release into surrogate and wild sites. Rescued sub-populations successfully bred in captivity or surrogate dams were released back into the wild between 2012 and 2014. Continued small-scale releases and breeding has occurred since. While these species would most likely have been lost within this intervention, the recovery of suitable wild habitat has been slow and success has been mixed. Funding for the Critical Fish Project ended in June 2014 and since this time, recovery of these four species has been a loose collaboration of organisations, schools and individuals operating with limited funding and resources to secure the investment made during drought.



Figure 1; top left, Murray hardyhead (photo: MDFRC); top right, Southern pygmy perch (photo: M. Hammer); bottom left, Southern purple-spotted gudgeon (photo: M. Hammer); bottom right, Yarra pygmy perch (photo: M. Hammer).

Table 1 outlines the current status of the species, some of which are heavily reliant on their numbers within captive and surrogate locations, not wild fish (i.e. southern purple-spotted gudgeon) and others are captured consistently in small wild populations but have a limited surrogate back-up population should we experience prolonged drying events again.

Table 1: Current species conservation and population status

Species	Listing	Current population status
Murray hardyhead	<i>Nationally – Endangered, SA – Critically endangered</i>	Tenuous: Lower lakes genetic unit responded well, but still remain absent from large areas of former range (e.g. Lake Albert). Riverland unit responded well to management enough to enable translocation to Victoria in 2016
Southern pygmy perch	SA - Endangered	Tenuous: Low but consistent numbers of wild fish captured, very low numbers of captive stock
Southern purple-spotted gudgeon	SA – <i>Critically endangered</i>	Tenuous: Considered extinct in SA until 2002. Offspring of rescued broodstock released back in 2012 to original and another wild site. Original re-discovery site remains but low numbers detected. Semi-secure captive and surrogate stock
Yarra pygmy perch	<i>Vulnerable</i>	Critically tenuous: Regionally extinct during drought,, short reprieve (aided by reintroductions) but likely regionally extinction again, limited and tenuous captive stock

How is the work currently funded?

Natural Resources SAMDB uses NRM levy base-funding to leverage grants (i.e., National Landcare) or other ad-hoc funding and in-kind resources on a year-by-year basis. Aquasave–Nature Glenelg Trust receive partial funding from Natural Resources SAMDB in this way, the feasibility to do so assessed each year based on available funding. Much of the work is undertaken by the goodwill of individuals including substantial in-kind support from volunteers (such as the Eastern Hills and Murray Plains Catchment Group community nursery), and landholders (site maintenance around dams and eyes on the ground).

The opportunity

The potential release of the carp herpes virus in the near future creates a golden opportunity to help conserve native fish species, including these four species far more securely

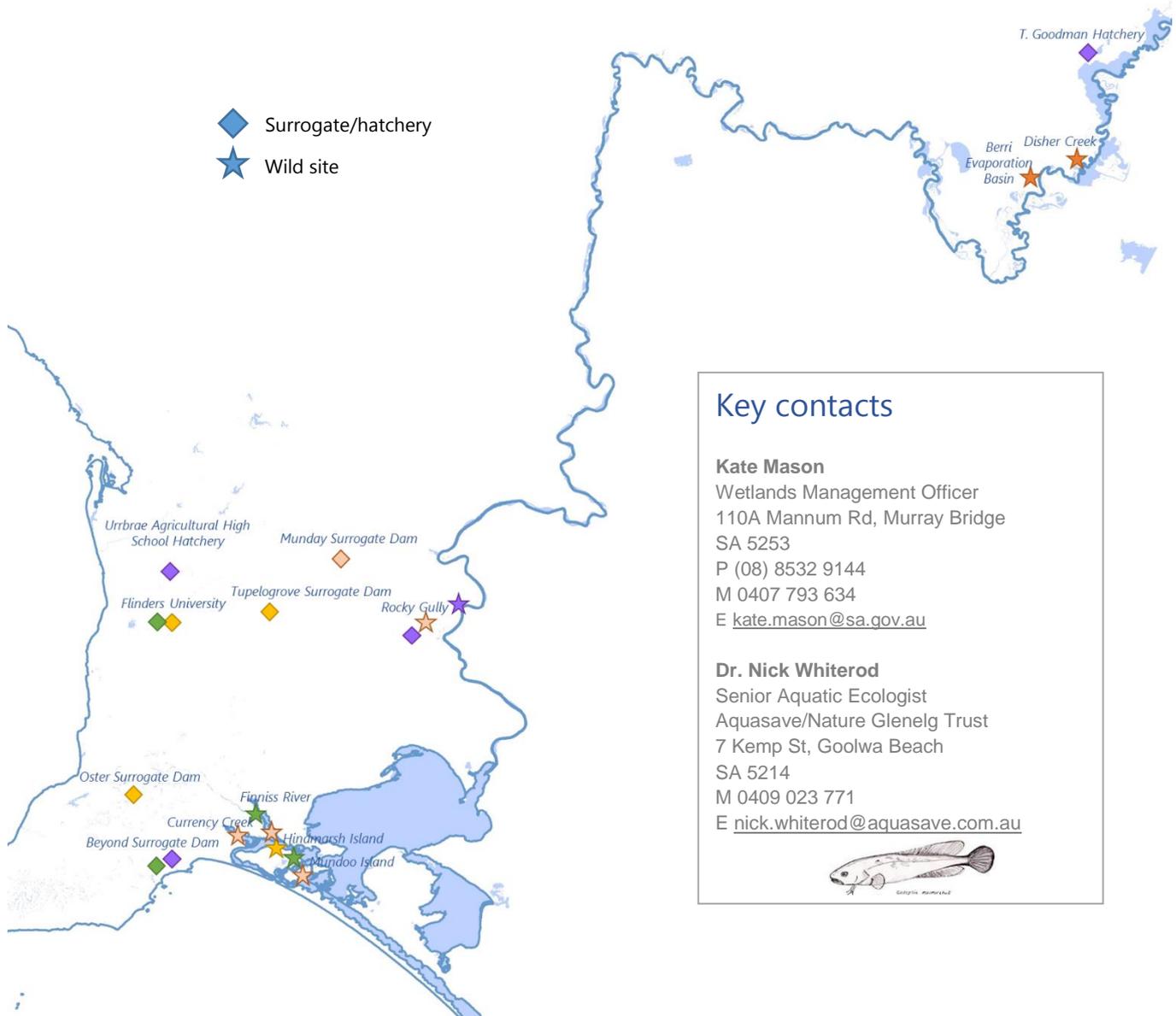
that we have been able to date, providing we can maintain populations in the interim. While reducing common carp doesn't address all threats affecting native fish (i.e., water security, other alien fish species), it will increase the extent of soft-rooted submerged plant communities that have become substantially diminished following the arrival of common carp. Future scenarios aside, the management of variable lake levels coupled with high flows in the Murray-Darling Basin in 2016 provides ideal timing to increase efforts on boosting numbers of wild fish by capitalising on increased food resources and extent of suitable wetland habitat. The next 12 months has become a critical but also opportune time for coordinated conservation of these threatened species before they become regionally extinct.



Figure 2; Urrbrae Agricultural High School and Alberton Primary School students releasing fish bred at their hatchery



Figure 3: Collapsed Yarra pygmy perch surrogate dam



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