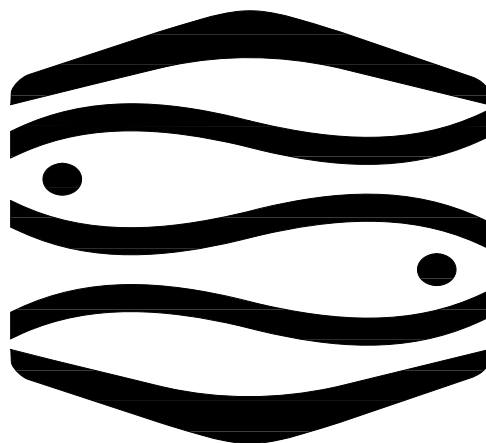


Proposal for the Introduction of a Seasonal Angling Closure on the Ovens River



**NATIVE FISH
AUSTRALIA**

**Native Fish Australia
(Victoria) Inc.**

May 2014

www.nativefish.asn.au/

Summary

Native Fish Australia (Victoria) Inc. proposes the introduction of a seasonal angling closure in the Ovens River downstream of Myrtleford (Buffalo River junction) and consideration of a number of other waters for potential seasonal closures. The rationale behind the proposed closures is to promote the recovery of native fish populations in these waters, to accelerate the introduction of angling for two threatened species, Trout cod and Macquarie perch and support the long term sustainability of the recreational fishery.



Macquarie perch caught in the Yarra around Warrandyte

NFA believes there is sufficient evidence to suggest that in the Ovens River recreational angling activity during the native fish closed season from September to November may be having a negative impact on the sustainability of the fishery, and that it be prudent management to introduce a seasonal angling closure. NFA believes that a good case can be made to place a seasonal closure on a relatively short section of the Goulburn River between the Goulburn Weir and the Murchison Road Bridge. Merit also exists for the introduction of seasonal closures on short sections of the Yarra and Mitta Mitta Rivers to protect spawning Macquarie perch.

Background

Historically many recreational fisheries around the world have included a total closure of the fishery during the spawning season of fish and Victoria has been no different. Soon after the introduction and establishment of trout in the state the Victorian Parliament enabled regulations prohibiting the taking of trout during a closed season. This was later extended to a total prohibition of fishing during this time to protect spawning fish. Due to concerns about the decline in native fish populations regulations were introduced prohibiting all angling in waters gazetted as 'Murray Fish' waters from September to November each year, and for waters south of the Great Dividing Range gazetted as 'Blackfish' waters from May to November.

The introduction of seasonal closures for trout and native fish was founded on the general belief that disturbance of fish during the spawning period could be detrimental to reproductive processes. In addition there was evidence that the fish were more susceptible to angling during this time and that with limited enforcement resources a seasonal angling closure was more effective at preventing illegal take than possession regulations. Originally included in the Murray fish seasonal closure was the Ovens River downstream of the Rocky Point Bridge as well as significant sections of the Broken, Kiewa, Goulburn, Loddon and Mitta Mitta Rivers (VPC, 1958).

In 1974 the Victorian Fisheries and Wildlife Division of the Ministry for Conservation, while maintaining a closed season for the possession of trout, removed the seasonal closure of trout streams to all forms of angling citing angler support (VPC, 1974). At a number of public forums officers from the Division suggested that another factor in removing seasonal closures was the presence of significant numbers of Redfin perch and European carp. They suggested that anglers wanted access to these species at this time and that angling would help control their populations as both were considered deleterious to trout fisheries. In subsequent years the seasonal closure of streams to fishing of gazetted blackfish and Murray fish waters were removed primarily due to the fact that native fish populations had declined to the point where they were a minor component of angler's catches. By the 1980s no seasonal closures remained in place for inland waters.

During the 1990s the Victorian Piscatorial Council, supported by a number of trout angling groups, lobbied the Fisheries and Wildlife Division for the return of seasonal closures on some trout streams based on their observations that the quality of the trout fishery had declined in some areas. They argued successfully that in a number of rivers subject to intense angling pressure spawning trout were being excessively disturbed and that widespread illegal take was occurring. In addition they suggested that trout anglers missed the anticipation and social activities associated with the opening of the season and that for those that wanted to fish during this time that there were many alternative destinations. As a consequence significant sections of the Goulburn (Eildon to Trawool), Mitta Mitta (Dartmouth to Tallandoon), Tanjil (Blue Rock Dam to Lake Narracan) and Kiewa (Falls Creek to Keegans Bridge) Rivers as well as some tributaries were classified as 'tailrace rivers' and closed to all hook and line fishing during the trout seasonal closure. The seasonal closures amount to hundreds of kilometres of water and remain in force up till the present.

Since the 1990s significant progress has been made in restoring native fish recreational fisheries and populations of the endangered Trout cod in a number of rivers. In the Ovens River and the lower reaches of its tributaries downstream of Myrtleford native fish comprise the major component of angler catches with Murray cod being the primary target of many anglers. A similar situation exists in the Goulburn River downstream of the Goulburn Weir. Both rivers, due to quality of the available angling now experience significant angling pressure particularly the Ovens River (Gary Daws, pers. comm.). At the current time the only water containing native fish in the state subject to an angling closure is a 14 km section of the Seven Creeks (closed all year) to protect Trout cod and Macquarie perch. NSW Fisheries introduced a seasonal closure in the Murray River between Yarrawonga Weir and Barooga in 1993 (Douglas *et al*, 1994) to facilitate the recovery of Trout cod which was extended downstream to Tocumwal in 1997 (NSW DPI, 2006). This closure, introduced to increase the Trout

cod population, is widely considered to have assisted in a significant increase in the Murray cod population downstream of the closure attributed to the improved recruitment of juvenile cod.

NFA does not and will not advocate the return to the past with widespread seasonal closure of waterways to angling. It has a long track record of promoting angling for native fish and has consistently advocated that the best means for recovering populations of threatened species such as Trout cod and Macquarie perch is through the development of recreational fisheries. There is no 'hidden agenda' to restrict angling opportunities for philosophical reasons but simply the desire to ensure sustainability of existing fisheries and enhance angling opportunities through the creation of new ones. NFA believes that, as in the case of the trout tailrace fisheries, in the presence of significant angling pressure the health of the cod fishery in the Ovens River in the long term may be dependent upon a seasonal angling closure. While the Ovens River is the focus of this document a number of other waters are identified as having merit for a seasonal closure. In identifying these additional waters NFA is being entirely transparent in its thoughts and presents them as a means for reassuring anglers that widespread restrictions on the activities of anglers are not its intention.



Murray Cod caught by a NFA member

Rationale for Seasonal Closure

The use of a seasonal closure of the Ovens River to recreational fishing downstream of Myrtleford can be justified because a number of specific conditions exist:

1. The native fish of concern namely Murray cod and Trout cod are the species most frequently captured by anglers in the Ovens River. A comprehensive angler survey conducted by the then DPI estimated the total annual catch of native fish (excluding Trout cod) in 2006-8 to be 3,000 fish compared to 360 Redfin perch and 2704 carp (Brown, 2008). Since that time the prevalence of Trout cod in angler's catches has increased (Gary Daws, pers. comm.).
2. Murray cod are the primary target of anglers in this section of the Ovens River with Trout cod being valued as a by-catch. Redfin perch are also targeted by some anglers and to a much lesser degree European carp. Golden perch were targeted by anglers in the past (Brown, 2008) but since the cessation of stocking of this species have become scarce and are now less significant to the fishery. The Ovens River downstream of Myrtleford experiences the second highest angler activity directed at native fish for any Victorian river (estimated at 65,584 hours in 2006) being only exceeded by the lower Goulburn River (Brown, 2008). Observations of local residents have suggested that angling pressure is increasing as the reputation of the fishery continues to grow.
3. Native fish exhibit increased susceptibility to angling during the closed season increasing the risk of illegal take, disturbance to reproduction and hook injury. Evidence presented to three Commissions of Inquiry into the Murray cod fishery in 1880, 1903 and 1929 reported that large catches of cod by commercial fisherman took place during early spring. While commercial fishermen often used nets, line fishermen reported that prior to the introduction of the closed season this was the time in the year when they took the most cod (NSW Government 1880, 1907, 1930).

Early attempts at the artificial reproduction of cod using wild fish proved difficult as immediately prior to spawning male cod became more difficult to catch. Modern research has identified that male cod take up residence at a spawning site prior to and after spawning. As they do not leave the site to feed this explains the phenomenon of the cod caught at this time being predominantly female (Rowland, 1998). This has significant implications if female cod are most likely to be captured by recreational anglers during this period.

Macquarie perch are well documented as forming aggregations prior to spawning and becoming highly susceptible to angling at this time (Cadwallader & Rogan, 1977; *Argus*, 3 December 1921). Observations of NFA members, who source Macquarie perch brood stock from the Yarra River during the closed season under a DEPI permit, indicate that catch rates are highest at this time of year. During most of the year a typical catch is one or two Macquarie perch per angler per day. During the spawning season it is not unusual to take six or even up to ten fish per angler. At the present time DEPI have a major initiative to re-establish Macquarie perch in the Ovens River through the stocking fingerlings as well as the translocation of sub-adult fish from Lake Dartmouth. A seasonal closure will eliminate the risk of illegal take and hook mortality at a time when the species is most vulnerable enhancing the prospects for re-establishment.

4. Murray cod and Trout cod are no longer stocked into the Ovens River their populations being largely dependent upon natural recruitment. If populations of either species declined they could be presumably recovered through stocking. The long term economic feasibility of maintaining cod fisheries in rivers through ongoing stocking is unclear. Given that the Ovens River at the present time contains recruiting populations of the two cod species it is desirable

to take advantage of the opportunity to manage the river as a self-supporting wild fishery rather than as an artificial 'put and take' fishery with the associated economic disadvantage.

5. There is good evidence to indicate that incidental capture of native fish during the reproductive season could have a significant detrimental impact on spawning and recruitment through three different mechanisms:
 - (a) Evidence exists of a significant risk of capture through angling initiating spawning failure in female cod due to breakdown of ova prior to spawning. Stress in many animals is known to impair the reproduction of females by reducing the quality of ova and in severe cases resulting in the breakdown and absorption of ova, i.e., in fish complete spawning failure. The degree of stress required to initiate spawning failure in female fish as expected varies between species, some being resilient to stress while others showing high susceptibility (Iwama, 1997). In fish capture stress and the associated panic frenzy has been in some cases reported to result in the initiation of the breakdown of ova within twenty four hours (Corrierio *et al*, 2011). Detailed Australian research on the spawning of snapper (*Pagrus auratus*) reported that female fish captured by handline angling showed significantly reduced egg quality and spawning success (Cleary *et al*, 2002).

In the case of Murray cod, Rowland (1988) reported that all females captured from the wild during July and August placed in hatchery ponds resorbed their ova though did not provide details on the method of capture. He also reported the capture of two hatchery held females from a pond using gill nets which when examined two weeks later had commenced breakdown of their ova which was not evident in the other females in the pond. While these observations do not relate directly to the effects of angling they clearly identify that Murray cod could experience spawning failure if sufficient stress is experienced during capture by this means.

Lake (1967) also documents how after handling brood Murray cod in October 1962, several attempts to induce spawning were unsuccessful, and it was thought that handling prior to spawning may have some inhibiting effect.

An insight into the susceptibility of female cod to angling stress has been provided by unpublished observations of Will Trueman who worked with Mary River cod (*Maccullochella mariensis*) in Queensland hatcheries during the 1980s. At that time to assess the maturity of female golden and silver perch (*Macquaria ambigua* & *Bidyanus bidyanus*) fish were routinely angled with lures from hatchery ponds, examined without removal from the water, and released unless required for spawning, i.e., the minimum stress likely to be experienced from angling. Over the course of several seasons no cases of stress-induced breakdown on ova was observed in either species despite individual fish being angled a number of times in a season (Trueman, unpublished obs.).

In the case of Mary River cod three females angled from a pond in early September when examined a few weeks later were found to be resorbing their ova whilst other females in the pond were successfully spawned (Trueman, unpublished obs.). The observations with golden and silver perch should be reassuring to recreational anglers but the experience with Mary River cod suggests that cod are much more susceptible to spawning failure from angling stress. It is understood that Gerry Cook at the Lake McDonald hatchery observed similar outcomes when female Mary River cod experienced brief handling during the reproductive season and the protocol now adopted is that Mary River cod are not disturbed in hatchery ponds in the breeding season (Simpson & Jackson, 1996).

- (b) In Eastern freshwater cod (*Maccullochella ikei*) paternal care of eggs and larvae has been documented as lasting up to 24 days and a similar situation is likely to exist in the other cod species. While male cod do not leave the nest to hunt food they will defend it against

potential predators of the eggs and larvae. During the time they are away from the nest a significant threat exists to the eggs and larvae through predation and experiments with lures indicate that they will leave nests to attack them (Butler & Rowland, 2009). Overseas studies of nest guarding fish have reported that after catch and released angling some fish have reduced capacity to defend nests and may abandon nests. This has been linked to population declines in waters experiencing high angling activity even when no take has been permitted and alleviated through the introduction of seasonal sanctuaries (Suski *et al.*, 2002; 2003).

Despite total protection due to the risks associated with incidental angling capture of Eastern freshwater cod such as breakdown of ova, reduced nest defence and nest abandonment a total closure to all angling for three months has been introduced in key waterways containing the species (Butler & Rowland, 2009);

- (c) NFA has extensive experience in the capture and survival of native fish. In general both cod species and Macquarie perch have high survival rates post angling if hooked in the upper mouth but survival is reduced if hooks are swallowed deeply. Angling activity directed at species other than cod through the reproductive season increases the risk of native fish mortality. Anglers targeting species such as golden perch, Redfin perch and European carp generally employ lures and bait hooks which are smaller than those used to target Murray cod. As a consequence there is a higher risk of hooks being deeply ingested and a higher risk of hook mortality.
6. Enhancing spawning and recruitment of Trout cod and Macquarie perch will accelerate the introduction of recreational fisheries for these two species in the Ovens River. NFA's desire is to see the introduction of regulated take fisheries for these two species in the Ovens River at the earliest opportunity and the key to this is demonstrating ongoing strong recruitment.

It is NFA's contention that given the precedent established in having seasonal closures on key trout streams experiencing high angling pressure that a similar closure should be introduced in the Ovens River: It also experiences high angling pressure, is a wild fishery and contains threatened species. Introducing a seasonal closure on the Ovens River downstream of Myrtleford will contribute to the long term sustainability of the Murray cod fishery, could accelerate the introduction of a take fishery for Trout cod and enhance the potential of re-establishing Macquarie perch in the river providing an additional recreational angling opportunity.

The response by anglers to date about NFA's proposal has been positive with many recognising the potential benefits and supporting it. It has been suggested that the King River remain open to angling to provide a nearby alternate destination. It has also been suggested that a reach of the Ovens River encompassing the City of Wangaratta not be included in the closure so that young anglers and those with disabilities can have easy access to angling. These are sensible, practical suggestions which NFA is happy to embrace. A number of people have suggested that the seasonal closure should be extended into the lower reaches of the Buffalo River as far upstream as the Nug Nug Bridge given the presence of good numbers of cod in this reach of river. This to us appears to have merit, and should be considered, but is not essential to the overall proposal.

It has been suggested that the proposed closure be restricted to either upstream or downstream of Wangaratta but not the entire Ovens River downstream of Myrtleford. NFA has considered this suggestion but concluded that it might be counterproductive to the overall objectives. Both cod species are present upstream and downstream of Wangaratta with evidence of them reproducing in both reaches though possibly in greater numbers downstream. Macquarie perch are most likely to establish and reproduce upstream of Wangaratta. It is therefore hard to identify either reach as

being more important to native fish and the simplest and most effective action is therefore to introduce the seasonal closure proposed.

NFA considers that serious consideration should be given to the introduction of a seasonal closure in Goulburn River between the Goulburn Weir and Murchison Road Bridge. The Goulburn River downstream of the weir was identified as experiencing the highest native fish angling pressure and take of any Victorian river (Brown, 2008). NFA proposes the closure of this relatively short section as research has demonstrated spawning and recruitment of both cod species occurs in it as well as another threatened species the catfish (*Tandanus tandanus*) (Koster *et al.*, 2012). This reach would leave a large length downstream open to angling.

Two other waters should also be considered for seasonal closure during the months of October and November encompassing the Macquarie perch spawning season when they are most vulnerable to angling and illegal take. These are the Mitta Mitta River between the Gibbo River junction and Taylors Crossing and the Yarra River downstream of Yarra Glen to the Warrandyte Road Bridge. These are key spawning areas for the species in the last habitats in the state where they remain abundant. The proposed closures are relatively short in length with extensive adjacent areas remaining accessible to anglers.

In addition NFA considers that the lower boundary for the Goulburn River trout tailrace fishery should be moved from its present location at the Trawool Road Bridge upstream to the junction of the Yea River. The present boundary no longer reflects the management of the Goulburn River downstream of Yea which since 2011 has been classified as a water for native fish and is being actively stocked with Trout cod, Macquarie perch and Murray cod. Amending the boundary in line with contemporary management will not have any negative impact on the upstream trout fishery. Given that a review of angling regulations for native fish such as cod are currently taking place the amended boundary can be introduced concurrently with other changes.



Releasing a Trout cod

References

- Brown, P., 2008. *Sustainability of recreational fisheries for Murray cod: creel surveys on the Goulburn, Ovens, and Murray rivers*. Victoria Department of Primary Industries Milestone Report.
- Butler G and Rowland SJ (2009) Using underwater cameras to describe the reproductive behaviour of the endangered eastern freshwater cod *Maccullochella ikei*. *Ecol Freshwater Fish* **18**, 337-349.
- Cadwallader, P. L. & Rogan, P. L., 1977. The Macquarie Perch, *Macquaria australasica* (Pisces: Percichthyidae), of Lake Eildon, Victoria. *Australian J Ecology*, **2**: 409-418.
- Cleary, J.J., Battaglene, S.C., and Pankhurst, N.W. 2002. Capture and handling stress affects the endocrine and ovulatory response to exogenous hormone treatment in snapper, *Pagrus auratus* (Bloch & Schneider). *Aquaculture Res.* **33**, 1-10.
- Corriero, A. Zupa, R. Bello, G Mylonas C. C, Deflorio, M. Genovese S, Basilone G, Buscaino G, Buffa G, Pousis C, De Metrio G, & Santamaria, N. 2011. Evidence that severe acute stress and starvation induce rapid atresia of ovarian vitellogenic follicles in Atlantic bluefin tuna, *Thunnus thynnus* (L.) (Osteichthyes: Scombridae). *J Fish Dis.* Nov;**34**(11):853-60.
- Douglas, J.W., Gooley, G.J. and Ingram, B.A. 1994. *Trout Cod, Maccullochella macquariensis* (Cuvier) (Pisces: Percichthyidae), *Resource Handbook and Research and Recovery Plan*. Department of Conservation and Natural Resources, Victoria.
- Iwama, G. K. (ed) 1997. *Fish stress and health in aquaculture*. New York : Cambridge University Press
- Koster, W., Crook, D., Dawson, D. and Moloney P. 2012. *Status of fish populations in the lower Goulburn River (2003 – 2012)*. Report prepared for the Goulburn Broken Catchment Management Authority, Shepparton
- Lake, J.S. (1967) Rearing experiments with five species of Australian freshwater fishes: I Inducement to spawning *Australian Journal of Marine and Freshwater Research.* **18**, 137-53.
- NSW DPI, 2006. *Trout cod (Maccullochella macquariensis) recovery plan*. NSW Department of Primary Industries
- NSW Government, 1880. *Report of the Royal Commission, appointed on the 8th of January, 1880, to inquire into and report upon the actual state and prospect of the fisheries of this colony: together with the minutes of evidence, and appendices*. Sydney: Government Printer.
- NSW Government, 1903. *Murray Cod Fisheries. Extracts of Evidence collected by the South Australian Authorities during October 1900 with Notes*. New South Wales Department of Fisheries.
- NSW Fisheries Reports, 1930. *Report on the Fisheries of New South Wales for the Year 1930*. Sydney: New South Wales Legislative Assembly.
- Rowland, S.J. 1988. Hormone-induced spawning of the Australian freshwater fish Murray cod, *Maccullochella peelii* (Mitchell) (Percichthyidae). *Aquaculture* **70**: 371–389.
- Rowland, S.J. 1998. Aspects of the reproductive biology of Murray cod, *Maccullochella peelii peelii*. *Proceedings of the Linnean Society of New South Wales* **120**: 147–162.

Simpson, R. & Jackson, P. 1996. *The Mary River Cod Research and Recovery Plan*. Queensland Department of Primary Industries, Fisheries Group

Suski, C.D., Phelan, F.J.S., Kubacki, M.F. & Philipp, D.P. 2002. *The use of sanctuaries for protecting nesting black bass from angling*. In: Philipp, D.P. & Ridgeway, M.S., eds. *Black bass: ecology, conservation and management*. Bethesda, MD: American Fisheries Society, pp. 371–378.

Suski, C.D., Svec, J.H., Ludden, J.B., Phelan, F.J.S. & Philipp, D.P. 2003. The effects of catch-and-release angling on the parental care behaviour of male smallmouth bass. *Transactions of the American Fisheries Society* **132**: 210–218.

Victorian Piscatorial Council, 1958/1974. *The Anglers Handbook*. VPC: Melbourne