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Audit and Review of the Trout Cod Recovery Plan - 2022

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Introduction

The Trout Cod Recovery Plan makes provisions for a major statutory review every 10 years and for Audit and Reviews every three years. A detailed statutory review of the Trout Cod Recovery Plan was completed in 2017 and is available at www.dpi.nsw.gov.au/fishing.

This document comprises an Audit and Review of the Trout Cod Recovery Plan and tracks the progress in implementing recovery actions under each program area since completion of the Statutory Review in 2017.

The overall objective of the Trout Cod Recovery Plan is to ensure the recovery and natural viability of Trout Cod populations in their former range in the Murray-Darling Basin. Specific objectives of the recovery plan are to:

- Ensure the security of the remnant Trout Cod population in the Murray River by maintaining, protecting, and improving the aquatic habitat values in that locality
- Establish and protect additional stocked populations of Trout Cod at selected locations throughout the species former range
- Reduce fishing related mortality of Trout Cod by setting appropriate regulatory controls and maximising angler compliance
- Improve our understanding of the population size, distribution, ecological requirements, and genetic status of Trout Cod
- Improve our understanding of the threats to the survival of Trout Cod, and contribute to management actions to ameliorate these threats
- Coordinate and initiate new community awareness and education programs relating to Trout Cod
- Coordinate and support appropriate actions by the community and government to provide a strategic, regional approach to Trout Cod survival and threat abatement
- Increase community awareness of the status of and threats to Trout Cod to improve support for recovery actions
- Assess the outcomes of past and current recovery actions and the species' conservation status

The recovery plan will be judged a long-term success in NSW if the status of Trout Cod is revised from 'endangered' to 'vulnerable' and eventually removed from the schedules of the *NSW Fisheries Management Act 1994* within 15 years.

Audit and Review of Recovery Action Program Areas

The Trout Cod recovery plan includes seven program areas:

- National recovery plan
- Habitat protection and restoration
- Reduce the impact of illegal fishing and incidental capture
- Minimise risks from inter-specific competition and introduced species
- Establish new self-sustaining populations through stocking
- Research and monitoring
- Enhance community understanding, involvement, and support

Implementation details for recovery actions progressed since the 2017 Statutory Review are outlined under the program areas listed below. For information about recovery actions implemented prior to 2017 consult the Statutory Review of the Trout Cod Recovery Plan on the DPI website at www.dpi.nsw.gov.au/fishing/species-protection/what-current/endangered-species2/trout-cod/review-of-the-trout-cod-recovery-plan

Program Area: National Recovery Plan

The 2017 Statutory Review identified that most of the recovery actions under the National Recovery Plan Program Area were ongoing except for continuing membership of the National recovery team, which was disbanded by the Commonwealth with the expiration of the 2nd version of the National Plan.

Ongoing cooperation with other State/Territory agencies is maintained where possible to assist with the implementation of the National Trout Cod Recovery Plan objectives.

In 2019, a national assessment of Trout Cod across its range (NSW, ACT and Victoria) using the IUCN Red List of Threatened Species criteria assessed the species as Vulnerable based on its restricted distribution in south-eastern Australia (Koehn et al. 2019). The assessment was part of a large assessment of Australian freshwater fish, has no legal basis and does not affect its current listing status in NSW. Also, the assessment was prepared using data prior to the severe drought conditions experienced during 2019/20. It is unknown if recent drought impacts on Trout Cod would influence the outcome of a further national assessment.

Program Area: Habitat Protection and Restoration

The 2017 Statutory Review identified that all the recovery actions under the Habitat Protection and Restoration Program Area had commenced or were complete. Most recovery actions under this section require ongoing implementation effort as they relate to minimising habitat degradation by, for example, applying environmental planning and impact assessment procedures, and promoting and supporting habitat protection and rehabilitation initiatives for Trout Cod on an ongoing basis.

Stakeholders including local councils are required to comply with NSW DPI's Policy and Guidelines for Fish Habitat Conservation and Management, as well as the Policy and Guidelines for Fish Friendly Waterway Crossings regarding any development that occurs in or

around waterways in NSW. DPI regularly updates Trout Cod advisory materials such as Primefacts, brochures, distribution maps, signage etc. to ensure that stakeholders are aware of the location of important areas for Trout Cod, and to support appropriate environmental planning and impact assessment processes.

Several grant funded projects have directed funding to on ground actions to improve Trout Cod habitat since 2017. For example, Dubbo's Macquarie River Bushcare Group was granted \$250,000 from the NSW Environmental Trust to protect, repair, and connect priority sites within a 100 km reach of Trout Cod habitat. The six-year project that concluded in 2018, focused on weed removal, revegetation, re-snagging and fencing to exclude stock from the riverbank. Educational signage was also installed along local stretches of the Macquarie River promoting Trout Cod protection.

In 2021/22, the Habitat Action Grant (HAG) program awarded \$38,350 to Murrumbidgee Landcare as well as a range of other partners, to expand areas of riparian and instream habitat available to native fishes in Columbo Creek with a specific focus on Trout Cod, Murray Cod and catfish. Other HAG funded projects likely to benefit Trout Cod include those involving the removal or modification of barriers to fish passage, re-snagging, removal of exotic vegetation and bank stabilisation works. The full list of HAG funded projects is available on the DPI website.

In 2020, DPI worked with Murray Local Land Services and the Soil Conservation Service on a Trout Cod habitat restoration project at Lighthouse Crossing Reserve to reinstate more than 65 large snags sourced from fire impacted trees from roadsides in the Towong Shire after they were deemed unsafe to remain in place. DPI has commenced monitoring at this site to document the effects of the re-snagging on Trout Cod.

Further on ground works completed by the Soil Conservation Service between 2017-2020 contributing to improving Trout Cod habitat in the Murray River includes log/rock revetment riverbank protection works, riparian revegetation and fencing at various sites between Hume Dam to Lake Mulwala, and at three sites in the upper Murray.

Program Area: Reduce the Impact of Illegal Fishing and Incidental Capture

The 2017 Statutory Review identified that all the recovery actions in the Illegal Fishing and Incidental Capture Program Area had commenced and were ongoing. NSW DPI maintains the annual three month fishing closure (September to November) in the Trout Cod Protection Area (TCPA) along the Murray River between Yarrawonga Weir downstream to the Tocumwal Road Bridge, to protect the species during its breeding season. The possession of fishing gear in, or adjacent to the closed waters is also an offence.

The TCPA is very popular with anglers and campers and is heavily fished when open by large numbers of anglers who infrequently visit the area (Lyon et al 2018). DPI Fisheries Officers undertake regular patrols in this area during the closed fishing season and the number of angler citations of non-compliance remains stable since the 2017 Statutory Review.

Unpublished DPI data from the TCPA shows that between 2017 to 2021 approximately 90% of offenders were Victorian, while 9.6% of offenders were NSW residents, and the remainder from the ACT, Queensland, South Australia, and Western Australia.

In 2021, to maximise compliance with the three month total fishing closure DPI Fisheries Officers trialled the use of variable message sign (VMS) boards for the first time at several

locations over the Melbourne Cup long weekend, a time when historically compliance operations detect large numbers of non-compliant fishers. The key message displayed on the VMS boards located on major roads was "Murray River closed to Fishing from Yarrowonga to Tocumwal during the months of September, October and November". Fisheries Officers subsequently conducted 42 campsite inspections where all people were found to be compliant (approximately 160), with several individuals stating to Fisheries Officers that they brought fishing gear with them but then observed the VMS boards regarding the closure. Overall, Fisheries Officers reported only 16 offenders fishing in the closed waters over the November long weekend. By comparison, in 2018 Fisheries officers reported 46 offenders in the TCPA over the same period.

A range of other community awareness raising activities were carried out by DPI where possible including at outdoor industry events in NSW and Victoria to assist the public to correctly identify Trout Cod, comply with fishing regulations, and to encourage community reported sightings of the species. NSW DPI promotes and encourages members of the public to report suspect illegal activities at the nearest Fisheries Office, or via the Fishers Watch Phonenumber (1800 043 536) or online reporting form at www.dpi.nsw.gov.au/fishing/compliance/report-illegal-activity. NSW DPI has also developed social media strategies for providing feedback on enforcement actions including via Facebook and Twitter.

A total of 165 Trout Cod advisory signs were produced between 2017 to 2020. The signs were distributed to areas inhabited by the species throughout NSW and installed at priority sites as required.

Program Area: Minimise Risks from Inter-Specific Competition and Introduced Species

The 2017 Statutory Review identified that all the recovery actions in this program area had commenced and were ongoing. All freshwater fish stocking is conducted in accordance with the Freshwater Fish Stocking Fishery Management Strategy to prevent significant impacts from stocking on native species including Trout Cod.

DPI encourages community identification and reporting of introduced species using the Aquatic Pest and Disease Reporting hotline (1800 675 888) and via the Aquatic Biosecurity email address (aquatic.biosecurity@dpi.nsw.gov.au).

Monitoring of non-endemic fish species at key sites has reduced since the 2017 Statutory Review. In particular, the sampling interval of the Murray Darling Basin Fish Monitoring Survey has been reduced from annual to biennial sampling and at only a subset of locations. Currently, only a single site occupied by Trout Cod in NSW is sampled every second year.

Funding for full implementation of the Basin Plan Environmental Outcomes Monitoring (BPEOM), which provided annual data on pest fish populations associated with the remnant Trout Cod population and all stocking locations, ended in 2018/2019. Monitoring may recommence in 2021/2022 (funding pending).

The National Carp Control Plan assesses the feasibility of using the carp virus, Cyprinid herpesvirus 3, as a biological control agent for carp control in Australia. Ongoing research designed to augment and cross-check previous scientific work is currently being completed

and will be integrated into the plan and provided to Government in 2022 (Source: <http://carp.gov.au>).

No new pest eradication/control programs or research into the impacts of non-endemic fish species on Trout Cod have been implemented anywhere in NSW since the 2017 Statutory Review.

Program Area: Establish New Self-Sustaining Populations Through Stocking

The 2017 Statutory Review identified that all recovery actions under this program area had commenced and were ongoing. NSW DPI continues to support the Trout Cod conservation stocking program in NSW. All proposed freshwater fish stocking events must be assessed, approved, and conducted in accordance with the Freshwater Fish Stocking Fishery Management Strategy.

Since 2017, the Trout Cod stocking program has continued in all years except for 2019 when drought and low flow conditions prevailed throughout NSW. The stocking program was conducted in the upper Macquarie River between 1991 and 2018 and in the lower Macquarie from 1998 to 2004. The limited data available for stocking locations in the Macquarie River suggests that this stocking has not resulted in the establishment of a self-sustaining population (Miles, 2022) and consequently stocking at this location has ceased.

Currently DPI is concentrating the conservation stocking program for Trout Cod in the upper Murrumbidgee River. 20,000 Trout Cod fingerlings were released in December 2021 to add to the 16,000 Trout Cod released at this location in late 2020. Stocking the upper Murrumbidgee will continue until 2025 with the aim of enhancing the existing population of Trout Cod in this region. The fish are produced at the Narrandera Fisheries Centre using wild broodfish sourced from the Murray River. Stocking in the upper Murrumbidgee area will take several years for any natural recruitment to occur and for the success of this recovery action to be detected (Miles, 2022).

DPI also stocks a proportion of the Trout Cod fingerlings produced at the Narrandera Fisheries Centre into Talbingo Dam for the purpose of catch and release recreational fishing. Since 2017, an additional 23,000 Trout Cod fingerlings have been released into the dam.

DPI ceased marking all stocked Trout Cod and now uses genetic parentage testing to determine if wild-caught fish originate from a hatchery or the wild. Fin-clip samples are collected from broodfish as well as from wild-caught young-of-year. Fin-clips from the broodfish and wild-caught fish are screened across a single-nucleotide polymorphism specific for Trout Cod. If there is a match between a pair of broodfish and a wild-caught fish, the latter is confirmed as stocked.

Funding restrictions have fragmented monitoring programs leading to a reduced capacity to evaluate Trout Cod stocking effectiveness at several locations. The MDB Fish Survey Program has been reduced to sampling every second year and at only a subset of locations, none of which are currently within Trout Cod stocking areas. Additionally, funding for full implementation of the Basin Plan Environmental Outcomes Monitoring (BPEOM), which provided annual data from all Trout Cod stocking areas ended in 2018/2019. Monitoring may re-commence in 2021/22 (funding pending). All other departmental monitoring programs undertaken since 2017 are largely outside the distribution of the natural remnant and previously and currently stocked populations.

Program Area: Research and Monitoring

The 2017 Statutory Review identified that all recovery actions in the Research and Monitoring Program Area were ongoing. Since 2017 there have been several research studies on Trout Cod including for example, work to improve the interpretation of telemetry tracking data, the impacts of cold-water pollution on aspects of the species biology, and the linkages between instream woody habitat and Trout Cod population characteristics, with several publications resulting (Bird et al. 2017, Michie et al. 2020 and Tonkin et al. 2019). There was also a study looking at the misidentification of Trout Cod and implications of fishing related mortality (Lyon et al. 2018).

A comprehensive analysis of the status of Trout Cod populations in NSW was completed in June 2022 and is included at Appendix A. The report found that based on the latest scientific data, Trout Cod populations have not recovered and are showing a slight decrease in overall abundance across NSW. Although recovery is apparent in some areas (such as the lower section of the Murray River), the failed reintroductions and reliance on stocking in other areas confirms that the species listing of 'endangered' remains warranted (Miles 2022).

Program Area: Enhance Community Understanding, Involvement and Support

The 2017 Statutory Review identified that most of the recovery actions under this program area were ongoing. Since 2017, DPI has produced and/or updated several Trout Cod advisory materials including Primefacts, a Trout Cod guide for fishers and land managers, distribution maps and signage. These advisory materials have been distributed via district fisheries offices and at events such as the Melbourne Fishing Show, the Sydney Boat Show and other outdoor recreation workshops. Advisory materials and summary information on current Trout Cod projects (e.g. stocking events, habitat rehabilitation) are made available on the DPI website.

Fishcare volunteers have actively engaged with the community across NSW emphasising aquatic conservation priorities relevant to the location where they are based. As part of this program, DPI included Trout Cod issues in the Murray, Murrumbidgee, and Macquarie River catchments in all the western training sessions for new Fishcare nominees in all years from 2017 to present. The Department also worked with children to increase stewardship in the management of threatened species via hatchery fishing workshops, schools Get Hooked it's fun to Fish Program, and major events such as field days and DPI Gone Fishing days.

In 2020, consideration of Aboriginal cultural heritage and consultation was formally included in the decision-making framework for the threatened species conservation stocking approval process. Prior to any stocking event DPI notifies the relevant local Aboriginal communities including any native title holders of the proposed activity, release location and provides an opportunity for relevant parties to comment on or to attend the stocking event.

Since 2017 an additional 165 Trout Cod advisory signs were produced. The signs were distributed to relevant areas throughout NSW and installed at priority sites as required.

In 2021 DPI commissioned an independent study by Taverner Research Group (formerly Iris Research) into the social and economic implications of the three-month fishing closure in the TCPA during September to November each year (see Appendix B). This was undertaken following concerns from some local anglers that the closure was no longer required due to the perception that Trout Cod (and Murray Cod) had recovered, and that there was a significant negative impact from the seasonal closure on local residents and businesses. The

socio-economic study involved telephone surveys of 250 local residents and 100 local businesses and an online survey of 475 licensed recreational fishers living within 200kms of the Murray River. Focus groups and in-depth interviews were also held with fishers, local businesses, local government, business chambers and ecological groups. Among the key results of the socio-economic study were:

- Awareness of the three month fishing closure was high amongst residents (74%), businesses (70%) and fishers that had fished in the closure zone in the past year (75%).
- The most common view among residents (68%), businesses (51%) and fishers (48%) were that the three month fishing closure should remain unchanged.
- Of the businesses aware of the three month fishing closure, most (77%) reported the closure made no impact on revenue during the closure period. There was also virtually no impact on staff retention/recruitment, trading hours, overdraft/borrowings and access to good and services from the seasonal closure.
- Almost all (97%) residents stated that the three month fishing closure had no effect on their household income.
- Overall, there was little evidence of economic disadvantage specifically attributable to the three month fishing closure.
- 92% of residents stated that the three-month fishing closure made little difference to their friendships, social life, health and overall life.
- Fishers most frequently fished in the closure area between December 2020 to February 2021, after the closure period had ended. One in five (20%) of these fishers fished in the closure area more than ten times. Of all fishers surveyed 74% indicated they had fished elsewhere outside of the closed area in the past year but not due to the fishing closure.
- Predictably, among all fishers surveyed reducing the closure period would lead to additional fishing trips. 12% estimated they would make five or more trips if the closure was abolished.

Conclusions

Since the 2017 Statutory Review there has been ongoing effort to implement Trout Cod recovery actions wherever possible with actions implemented in all program areas. The severe drought conditions experienced during 2019/20 limited the Department's ability to implement several recovery actions, such as those related to habitat rehabilitation and stocking, due to the unsuitable conditions. During this time significant resources were also diverted to responding to fish kill events and emergency fish rescue operations related to drought and bushfires.

The conservation status of Trout Cod in NSW is kept under constant review by the independent Fisheries Scientific Committee (FSC), and forms part of their legislative review responsibility carried out every 1-2 years in accordance with s.220NA of the FM Act. The latest FSC review for Trout Cod resulted in the Committee recommending that no change be made to the listing status of Trout Cod in NSW.

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Appendix A –

Trout Cod Summary of Data and Population Trends 2022

Appendix B -

Murray River Fishing Socio-Economic Study 2022