Report to the Commonwealth Department of the Environment and Energy: Annual Performance Report (2018) against the Enlarged Cotter Dam Fish Management Plan Version 3

Version 1.00, 5 April 2019

Document management

Document summary

Title	Report to the Commonwealth Department of the Environment and Energy: Annual Performance Report (2018) against the Enlarged Cotter Dam Fish Management Plan Version 3
Version	1.00
Document status	Final
Date of issue	5 April 2019

Document development

	Name	Position	Date
Prepared by	John Hyam	Senior Environmental Scientist	02/04/2019
Reviewed by	Tim Chaseling	Team Leader Catchment Protection and Land Management	03/04/2019
Approved by	Benjamin Bryant	Manager Environment and Sustainability	05/04/2019

Version control

Version	Author	Date	Description	Approval
1.00	John Hyam	02/04/2019	Final	Benjamin Bryant

Contents

Introduction

This performance report outlines Icon Water's performance against Version 3 of the Enlarged Cotter Dam (ECD) Fish Management Plan (FMP) V3 as required under the Commonwealth Department of the Environment and Energy's conditions of approval:

'*The person taking the action must implement the Plan. Every year the person taking the action must submit to the Minister a report covering performance against the Fish Management Plan. The date of the first report must be provided on 19 January 2011, with each subsequent report to be provided 12 months from the date of the previous report'*

Icon Water has completed all the requirements of the ECD FMP V3 and associated sub-plans throughout the reporting period (2018 calendar year). This performance report is structured against each of the sub plans.

This Performance Report should be read in conjunction with the ECD FMP Version 3 available on Icon Water's public website at:

http://www.iconwater.com.au/~/media/files/icon-water/key-publications/enlarged-cotter-dam-fish-management-plan_version-3.pdf?la=en&hash=8166F464DB7A275154A9F9260F14AEB3D1C0BB4F

Note that the ECD FMP Version 3 has been superseded by the Commonwealth approved ECD FMP Version 4, which will be reported against in the 2019 report, due in 2020.

Background

As a condition of approval for Icon Water to construct and operate the ECD, the Commonwealth Environment Minister directed Icon Water to manage the potential environmental impacts to five threatened native aquatic species in the Cotter River system, particularly the threatened species protected under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* (EPBC Act). The specific fish and crayfish species to be managed are listed below.

Table 1 - EPBC Listing Status

Species	EPBC Act Listing Status
Macquarie Perch (*Macquaria australasica*)	Endangered
Trout Cod (*Maccullochella macquariensis*)	Endangered
Murray Cod (*Maccullochella peelii*)	Vulnerable
Two-spined Blackfish (*Gadopsis bispinosus*)	-
Murray River Crayfish (*Euastacus armatus*).	Endangered

Icon Water's approach to minimise and manage threats to threatened aquatic species is documented through a series of ECD Fish Management Plans and projects as shown in **Figure 1**. To date three versions of the ECD Fish Management Plan have been completed. The final plan (ECD Fish Management Plan V4) has been approved by the Department of the Environment and Energy and will be the subject of the next performance report due in April 2020.

Version 1 of the Fish Management Plan (FMP) documented the projects that provide information required for the management of threatened aquatic species. Version 2 of the FMP provided information and measures, based on the results of Version 1 projects, to help protect aquatic communities in the Reservoir and Cotter River during the construction of the ECD. Version 3 of the FMP, valid since November 2013, has focused on the ongoing management of threatened aquatic species during the filling and operational phase of the ECD.

The objective of FMP V3 is "*To ensure that the filling and operation of the Enlarged Cotter Reservoir does not compromise the maintenance and rehabilitation of native fish and crayfish species*." The FMP (and associated sub-plans) is:

- designed to prevent or mitigate risks to threatened aquatic fauna and their habitats arising from the construction and operation of the enlarged Cotter Dam
- scientifically based, using adaptive management
- robust in terms of stakeholder involvement, peer review and public transparency
- timely and updated on the basis specified in the approval conditions
- developed as part of the overall requirements of the Enlarged Cotter Dam, and
- effective in terms of use of resources and expertise whilst at the same time ensuring the protection of threatened species.

The sub plans and key activities of the FMP are:

- Barriers and spawning habitat identification (project 8)
- ECD Fish Monitoring Program (project 9)
- Management of Macquarie perch during the Filling Phase Plan
- Alien Fish Management Plan (project 6)
- EHN Management & Response Plan (project 4)
- Macquarie perch translocation (project 5).

The delivery of the FMP V3 is overseen by the FMP Steering Committee and Working Group, chaired by Icon Water and comprising representatives and experts from the Commonwealth Government, ACT Government and the University of Canberra.

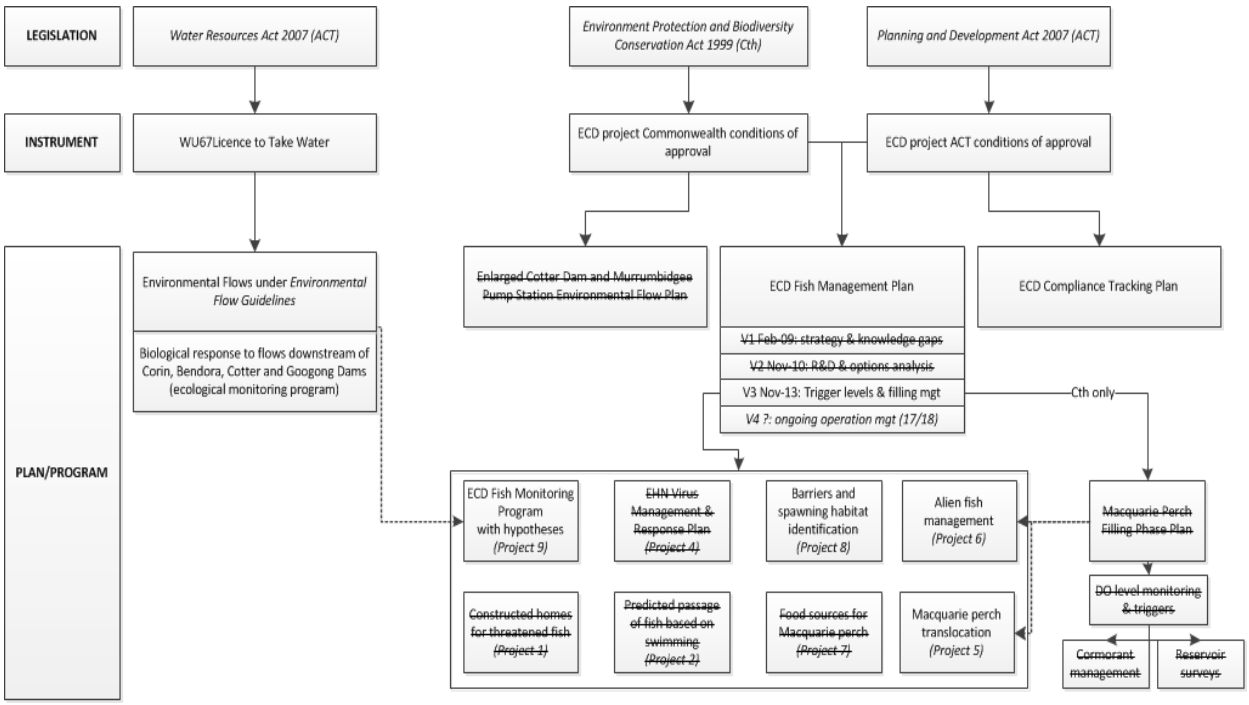

Figure 1. ECD FMP Framework[1]

[1] Strike-through means completed or achieved.

Fish Steering Committee and Working Group

Icon Water has continued to meet with and report to the Fish Steering Committee and the Working Group. During the reporting period, the Fish Working Group has met once. The Commonwealth is an invited member to the meeing.

Barriers and spawning habitat characterisation projects

In 2018, Icon Water funded a third year of research with the University of Canberra to determine the timing and extent of Macquarie perch movements. This consists of capturing and tagging a further 20 Macquarie perch to supplement the 15 surviving tagged fish from the 2017 project. Movements of the fish upstream was then tracked using six listening stations in the Cotter Reservoir in the upstream river reach. At the time of writing this performance report, the final report from this project was not yet available. Initial observations from the research were that 16 fish had been detected by the upstream reservoir receiver and seven of those had moved upstream of the medium barriers in the river which is a positive indicator for a good spawning season. These results are better than the previous year (2017) which was considered to be a moderately successful spawning year. The success of the 2018 spawning season can only be confirmed once fish monitoring has been completed in Autumn 2019. Refer to the *ECD Fish Monitoring Program* section below.

In 2018, Icon Water also funded a second year of research to determine the characteristics and exact location of critical Macquarie perch spawning sites in the Cotter River upstream of the Cotter Reservoir. The recommendation from the first moniting report to increase the number of quadrats and transects per riffle was adopted. Results from this project are not yet available.

ECD Fish Monitoring Program

The ECD Fish Monitoring Program is a key requirement of the ECD FMP V3. The Fish Monitoring Program focusses on 10 management questions (**Annexure 1**) that aim to:

- determine the impact of the filling and operation of ECD on populations of the two focal species (Macquarie perch and Two-spined blackfish) and potential threats (predators and competitors) in the ECD and river upstream
- inform management actions to minimise and/or mitigate the impact to those populations.

A team from the University of Canberra and the Australian National University undertake the monitoring program on behalf of Icon Water. The Enlarged Cotter Reservoir Ecological Monitoring Program, Technical Report 2018, presented to the FMP Working Group describes the results of the monitoring conducted in 2017/2018.

The monitoring year of 2017 / 2018 was relatively dry and river flows below Bendora Dam were largely regulated. The ECD remained stable at full supply level (FSL) or within 0.5 m of FSL for the entire monitoring year. The only discernible changes detected in the population of Macquarie perch in the ECD between the monitoring phases (baseline, filling, operational), relate to adult abundance and adult condition. Since peak abundances in 2015, adult relative abundance has been in decline whilst adult lengths have been increasing. It appears this may be related to capture efficiency differences between sizes of Macquarie perch, with the gill nets deployed more effectively sampling smaller adults. It was recommended that a trial of increased effort to capture larger size classes of Macquarie perch be implemented as well as trialling night time boat electrofishing. These recommendations have been adopted for the 2018/19 monitoring program.

Encouragingly successful recruitment to juveniles was detected in 2018 for the second consecutive year, a positive result given that this population had not successfully recruited in 2014, 2015 and 2016. Macquarie perch recruitment was detected at three of five riverine sites as well in 2018. It is still not

clear whether the reservoir population of Macquarie perch will continue spawning when the reservoir is drawn down during operation for drinking water supply to the Canberra and Queanbeyan communities.

Abundance and distribution of Macquarie perch in the Cotter River upstream of the ECD remains relatively stable since monitoring began in 2010.

Two-spined blackfish continued to be rare in the ECD, with only a few individuals being detected in the newly inundated section of the reservoir in the five years following the commencement of filling and operational phase monitoring so far. It is likely that this species is persisting in the newly-inundated section of the reservoir, though to date there is no evidence to suggest that a recruiting population has established in the reservoir.

Abundance and size of Rainbow trout in Cotter reservoir and Cotter River in 2018 was not significantly different to any other year of monitoring. Relative abundance of Brown trout captured in Cotter reservoir has increased in the past three years. This is a concern although a suspected increased predation on Macquarie perch by Brown trout has not been verified.

Alien species other than trout continue to be detected in the ECD, with Goldfish accounting for the vast majority of captures.

Piscivorous birds have been relatively stable in their species composition and abundance in the ECD since filling commenced, though some subtle differences in distribution have occurred. Cormorant thresholds have been revised to encompass the increase in shoreline of the ECD.

Monitoring of new macrophyte beds has not yet formally commenced as the reservoir was filling and no macrophytes have been observed whilst conducting other fieldwork around the perimeter of the reservoir. Macrophytes may establish now that the reservoir has filled.

Food resources of Macquarie perch (primarily decapods and microcrustaceans) showed small differences between baseline and filling and operational phases with a decrease in decapod abundance between baseline and filling phases.

Alien Fish Management Plan

The Cotter Dam Enlargement Fish Risk Assessment identified a likely increase in alien fish numbers in the Cotter reservoir following construction of the ECD and identified the importance of managing trout and Redfin perch impacts on Macquarie perch and Two-spined blackfish

The risk assessment also identified the need for an Alien Fish Management Plan (under the ECD Fish Management Plan), which was consequently developed (November 2013) and includes management and mitigation measures to ensure predation risks to native fish are managed. The development and implementation of the adaptive Alien Fish Management Plan ensures Icon Water meets its regulatory obligations with regard to the management of alien fish species in the Cotter reservoir and upstream Cotter River.

The Alien Fish Management Plan identifies the need for monitoring of alien fish numbers in the Cotter reservoir and river. This work was undertaken in 2018 though the ECD Fish Monitoring Program (specifically related to management questions 4, 5, 6 and 7). Refer to the summary of the monitoring results related to these questions in the ECD Fish Monitoring Program section above.

Should alien fish numbers increase to unsustainable levels, options to address the issue will be discussed further at the FMP Working Group and Steering Committee meeting(s) in 2019 in order to better understand the environmental, social and financial implications of their implementation. Several management options have already been proposed for more detailed consideration, and include:

- Targeted netting of trout spawning runs for consequent removal the Cotter River directly upstream of Cotter reservoir
- A trout trap on the Cotter River immediately upstream of Cotter reservoir, designed to trap spawning trout for consequent removal from the Cotter system

- Targeted angling efforts during trout spawning season for consequent removal from the Cotter system
- Targeted riverine electrofishing in the Cotter River directly upstream of Cotter reservoir.

EHN Management & Response Plan

Epizootic Haematopoietic Necrosis (EHN) Virus is a native ranavirus, a member of the Iridoviridae Family, and is associated with sudden high fatality rates in fish (especially during spring and summer). The Macquarie perch is a species known to be highly susceptible to EHN mortality.

Icon Water operates within the Cotter catchment, where EHN Virus and vectors are not known to be present. While Icon Water was constructing the ECD, the risk of transporting the virus into the reservoir and catchment was far greater than during standard operations; and consequently, rigorous protocols and mitigation measures were applied throughout the construction period. It is accepted that Icon Water's operations post construction of the ECD are not a major contributor to the risk of EHN Virus entering the catchment in contrast to other land management practices and recreational pressures. In order to ensure appropriate mitigation of the risk, Icon Water has established the EHN Management and Response Plan to ensure that the risk is monitored and managed.

The EHN Management and Response Plan requires Icon Water to monitor for signs of EHN Virus infection in fish in the Cotter reservoir and upstream river. This requirement was fulfilled via the Cotter Fish Monitoring Program in 2018. During the course of the 2018 monitoring, all fish collected were inspected for signs of EHN infection (e.g. bleeding near the fins or gills, swelling of the stomach and erratic swimming near the surface of the water). No evidence of the virus was detected in the fish samples collected.

Icon Water has developed a work instruction for staff and contractors working near or in waterways in the Cotter catchment. This work instruction includes measures to be taken to avoid the spread of the EHN Virus and is a mandatory induction requirement for staff and is included in contractors' contract conditions.

Icon Water is also required to notify the ACT Government of any suspected EHN Virus infections, however no signs of infection were identified in 2018.

It is noted that Icon Water's controls are not exhaustive, considering the Cotter catchment is largely open to the public, and only apply directly to Icon Water staff and contractors. The primary responsibility to prevent introduction of the EHN Virus to the catchment is the responsibility of the land managers of the area (ACT Parks and Conservation Service).

Fish Management Plan V4

The enlarged Cotter Reservoir reached Full Supply Level (FSL) of 550.8m on 7 July 2016. The Cotter Reservoir was used for water supply in 2018 and the water level was 549.6 m on 31/12/2018.

Icon Water completed the development of Fish Management Plan Version 4 (FMP V4) to address the ongoing operational requirements for the Cotter reservoir and any outstanding or ongoing activities required to minimise and/or mitigate the impact to the protected fish populations. FMP V4 was approved by the Commonwealth Department of the Environment and Energy on 13 February 2019.

References

Broadhurst, B. T., Clear, R. C., Fulton, C. and Lintermans, M. (2018). Enlarged Cotter Reservoir ecological monitoring program: technical report 2018. Institute for Applied Ecology, University of Canberra, Canberra

Annexure 1

The 10 management questions that underpin the Enlarged Cotter Reservoir Ecological Monitoring Program are:

1. Has there been a significant change in the abundance and body condition of Macquarie perch in the enlarged Cotter Reservoir (Young-of-Year, juveniles and adults) as a result of the filling and operation of the ECD?
2. Has there been a significant change in the abundance, body condition and distribution of the Macquarie perch in the Cotter River above and below Vanity's Crossing as a result of the filling and operation of the ECD?
3. Have Two-spined blackfish established a reproducing population in the enlarged Cotter Reservoir and are they persisting in the newly inundated section of the Cotter River?
4. Has there been a significant change in the abundance, distribution and size composition of adult trout in the enlarged Cotter Reservoir as a result of the filling and operation of the ECD?
5. Has there been a significant change in the abundance and size composition of trout in the Cotter River upstream of the enlarged Cotter Reservoir as a result of the filling and operation of ECD?
6. Are Two-spined blackfish and Macquarie perch present in trout stomachs in the Cotter River?
7. Has there been a significant change in the abundance and distribution of non-native fish species in the enlarged Cotter Reservoir as a result of the filling and operation of the ECD?
8. Has there been a significant change in the abundance, distribution and species composition of piscivorous birds in the vicinity of the enlarged Cotter Reservoir as a result of the filling and operation of the ECD?
9. Have macrophyte beds re-established in the enlarged Cotter Reservoir?
10. Are there adequate food resources (particularly decapods) for the Macquarie perch following the filling and operation of the enlarged Cotter Reservoir?

Talk to us

E talktous@iconwater.com.au

T 02 6248 3111

@iconwater

GPO Box 366,
Canberra ACT 2601

iconwater.com.au