ACTEW WATER

Report to the Commonwealth Department of the Environment:

Annual Performance Report (2014) against the Enlarged Cotter Dam Fish Management Plan Version 3

Version number 1 I Effective date: January 2015

ACTEW WATER

Certificate of approval for issue of documents

Title	Report to Commonwealth Department of the Environment: Annual Performance Report (2014) against the Enlarged Cotter Dam Fish Management Plan Version 3.
Revision	1
Document status	Final
Date of issue	8 January 2015

	Position	Name	Signature	Date
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Approved by	Group Manager Safety & Business Solutions	Chris Webb		9 Jan 2015

Document revision control

Version	Author	Date	Description	Approval
1	Chris Pulkkinen	6 January 2015	Preparation of *Report to Commonwealth Department of the Environment: Annual Performance Report (2014) against the Enlarged Cotter Dam Fish Management Plan Version 3.*	9 Jan 15

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1 Introduction

The construction and operation of the Enlarged Cotter Dam (ECD) raised environmental issues relating to the management of five threatened native aquatic species. These are:

- Macquarie Perch (*Macquaria australasica*)
- Trout Cod (*Maccullochella macquariensis*)
- Murray Cod (*Maccullochella peelii*)
- Two-spined Blackfish (*Gadopsis bispinosus*)
- Murray River Crayfish (*Euastacus armatus*).

In order to minimise and manage threats to threatened aquatic species, a series of ECD Fish Management Plans are being prepared by ACTEW Water. To date three versions of the ECD Fish Management Plan have been completed (required total of four).

The first version of the Fish Management Plan (FMP) documented projects which would provide information required by ACTEW Water for the management of threatened aquatic species. The second version of the FMP provides information, from the projects documented in Version 1, to help protect aquatic communities in the Cotter Reservoir and the Cotter River during the construction and operation of the ECD. The third and current version of the FMP (November 2013) focuses on the ongoing management of threatened aquatic species during the filling and operational phase of the ECD.

The overarching objective of the 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 ECD
- 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 ECD
- effective in terms of use of resources and expertise whilst at the same time ensuring the protection of threatened species.

This performance report has been prepared in response to the Commonwealth Department of the Environment's approval condition placed on the ECD project:

> *'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'*

This report outlines ACTEW Water's performance against the ECD FMP V3. The Enlarged Cotter Dam Fish Management Plan is an umbrella document that defines ACTEW Water's objectives for threatened fish and crayfish species in the Enlarged Cotter Dam; and identifies specific sub-plans that implement the require management measures. The sub plans are:

1. ECD Fish Monitoring Program
2. Management of Macquarie Perch During Filling Phase Plan
3. Alien Fish Management Plan
4. EHN Virus Management & Response Plan

ACTEW Water has completed all the requirements of the Enlarged Cotter Dam Fish Management Plan V3 and associated sub-plans throughout the reporting period (2014). This performance report is structured against each of the sub plans identified above.

This Performance Report should be read in conjunction with the Enlarged Cotter Dam Fish Management Plan Version 3 (available on ACTEW Water's public website).

2 ECD Fish Monitoring Program

The Enlarged Cotter Dam (ECD) Fish Monitoring Program is a key requirement of the ECD Fish Management Plan V3. The Fish Monitoring Program focusses on 10 management questions 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.

The 10 management questions that underpin the ECD Fish 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 Vanitys 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 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?

The monitoring work was undertaken in 2014. The draft report (soon to be finalised and published on ACTEW Water's public internet site) outlines the following analyses.

No discernable change was detected in the population of Macquarie perch in the ECD between phase 1 (2010-2013) and Phase 2 (2014 onwards), with one important exception being the absence of young-of-year in the in the first year of filling. This indicates spawning or early recruitment failure in the lower catchment. At the time of the 2013 spawning season (late spring/early summer) the filling ECD headwaters were situated in the middle of a series of large impassable natural barriers. These barriers have likely precluded Macquarie perch from reaching suitable spawning habitat resulting in spawning failure for 2013/2014.

Only a single young-of-year Macquarie perch was captured in the Cotter River upstream of the ECD, which may suggest a catchment wide phenomenon occurred, and not a response directly to the enlarged Cotter Reservoir (relatively localised as young-of-year were detected in the reference site on the upper Murrumbidgee River). As Macquarie perch are a long-lived species failure to recruit to the population for a single year is of little conservation concern and doesn't warrant a targeted management response. However, multiple years of failure may result in more serious effects on the population.

Two-spined blackfish continued to be rare in the ECD, with only a single individual being detected in the newly inundated section of the reservoir. It is too early to determine whether or not this species has persisted in the newly inundated section of the reservoir, or whether a recruiting population will establish in the ECD. Continuation of targeted monitoring over the coming years will provide further insight into these aspects of the population of Two-spined blackfish in the ECD.

Abundance, distribution and size of adult trout, both in the river and in the reservoir habitat showed no discernable difference since reservoir filling commenced. Brown trout are still a rare capture in the catchment, with Rainbow trout comprising the majority of all trout captures. Predation of Two-spined blackfish and Macquarie perch was not detected. At this stage, filling of the ECD has not resulted in any discernable change in the trout population, though a change (if any) would be expected over the course of multiple years.

Alien species other than trout continue to be detected in the ECD, with Goldfish accounting for the vast majority of captures. Abundance of Goldfish has increased since filling commenced, most likely in response to increased availability of food resources. Although Goldfish themselves probably pose little threat to Macquarie perch and Two-spined blackfish, the effects of increases in their abundance on increasing the size and abundance of potential predators and competitors could be of concern if it Goldfish abundances continue to rise.

Piscivorous birds have been relatively stable in their species composition, abundances and distribution in the ECD since filling commenced. Cormorant abundance exceeded the thresholds in the Cormorant Management Plan and cormorant nesting occurred in the Cotter Catchment for the first time on record in 2014. Breeding colonies of cormorants have far higher energetic requirements than non-breeding colonies and the establishment of a breeding colony of cormorants in the ECD could increase predation pressure on adult Macquarie perch. Management action in response to the nesting event and increased abundance was undertaken in 2014 with positive results.

Analysis of macrophyte beds was not undertaken as the reservoir is in a filling phase. Once the reservoir stabilises at level, macrophyte re-establishment has the potential to occur (which will then trigger the monitoring to take place).

Food resources of Macquarie perch (primarily decapods and microcrustaceans) showed small differences between phase 1 and 2 monitoring. Decapods were in low abundance in spring of the phase 1 monitoring but were totally absent from spring 2013 monitoring. However there was no discernable difference in autumn decapod abundance between phase 1 and 2. There were small increases in the abundance of microcrustaceans both in the edge samples and the tow samples during phase 2, and a reduction in the number of individuals of other taxa captured compared to the phase 1.

3 Management of Macquarie Perch During Filling Phase Plan

The *Management of Macquarie Perch During Filling Phase* Plan (under the ECD Fish Management Plan) describes the management actions and mitigation measures to be undertaken in the enlarged Cotter Reservoir to manage the potential impacts of adverse dissolved oxygen conditions on the Macquarie perch population.

During 2014 actions triggered under the *Management of Macquarie Perch During Filling Phase* Plan were implemented. These included:

- Reservoir inspections – required to assess the numbers of cormorants present/nesting in the Cotter Reservoir perimeter. The cormorants are a known predator of Macquarie perch, particularly under low dissolved oxygen conditions (when Macquarie perch rise closer to the reservoir surface). Reservoir inspections were undertaken in January, February, October and November 2014.

- Cormorant management– certain actions are required to be implemented upon certain trigger points being reached. These protocols range from more intensive cormorant monitoring, through to cormorant disturbance and further to initiate lethal take. Triggers points were reached and intensive cormorant monitoring and cormorant disturbance activities were initiated (harassment by boat) by ACTEW Water (via contractors) in February, October and November 2014. Destruction of some cormorant nests was also undertaken by the ACT Government.

The *Management of Macquarie Perch During Filling Phase* Plan also identifies emergency translocation as a last resort management measure should water quality in the Cotter Reservoir become inhabitable. Emergency translocation was not required during 2014.

4 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 (*Macquaria australasica*) and Two-spined blackfish (*Gadopsis bispinosus*).

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 the risks to native fish are managed. The development and implementation of the adaptive Alien Fish Management Plan ensures ACTEW 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 2014 though the Cotter Fish Monitoring Program (specifically management questions 4, 5, 6 and 7).

In 2015, an options analysis will be undertaken to determine what management measures could be implemented should alien fish numbers increase to unsustainable levels. Several management options have already been proposed for more detailed consideration, and include:

- Targeted netting and consequent removal of trout spawning runs in 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.

These options will be examined in more detail in 2015 in order to better understand the environmental, social and financial implications of their implementation. Additional options may also be identified for examination.

5 EHN Management & Response Plan

Epizootic Haematopoietic Necrosis (EHN) Virus is a rana virus and is a member of the *Iridoviridae* Family. The EHN Virus is associated with sudden high fatality rates in fish (especially during spring and summer). Macquarie perch are known to be highly susceptible to EHN mortality. ACTEW Water operates within the Cotter catchment, where EHN Virus is not known to exist.

While ACTEW Water was constructing the ECD, the risk of ACTEW Water transporting the virus into the reservoir and catchment was far greater than during standard operations; and consequently, rigorous protocols and mitigations measures were applied throughout the construction period. While it is accepted that ACTEW Water's operations post construction of the ECD are not a major contributor to the risk of EHN Virus entering the catchment (for example in contrast to land management practices and recreational pressures), ACTEW Water must still have in place a management and response plan (the EHN Management & Response Plan under the ECD Fish Management Plan) to ensure that the risk, albeit small, is monitored and managed.

The EHN Management & Response Plan requires ACTEW 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 2014. During the course of the 2014 monitoring, all fish collected were inspected for signs of EHN infection (e.g. bleeding near the fins or gills, swelling of the stomach) and observed for erratic swimming near the surface of the water. No disease symptoms were detected in 2014.

ACTEW Water also implemented an employee awareness and training program in March 2014. Delivery was via a toolbox mechanism for employees who undertake work in the Cotter catchment. ACTEW Water has also progressed investigations into formally prescribing EHN Virus protection requirements for all of its contractors working in the Cotter catchment.

ACTEW Water is also required to notify the ACT Government of any suspected EHN Virus infections; however no signs of infection were identified in 2014.