



# Enlarged Cotter Reservoir (ECR) Emergency Inspection and Translocation Plan

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## Document management

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### Document summary

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## Table of Contents

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|  |           |
|--|-----------|
| <b>List of tables and figures</b> .....                | <b>2</b>  |
| <b>List of figures</b> .....                           | <b>2</b>  |
| <b>1. Purpose of the Plan</b> .....                    | <b>3</b>  |
| <b>2. Mitigation Responses</b> .....                   | <b>4</b>  |
| 2.1. ECR Reservoir Inspections.....                    | 4         |
| 2.2. ECR Macquarie perch Emergency Translocation ..... | 5         |
| Background.....  | 5         |
| Methods .....  | 5         |
| Reporting .....  | 9         |
| <b>3. References</b> .....                             | <b>10</b> |

## List of tables and figures

---

|  |   |
|--|---|
| Table 1: Trigger levels and management responses for consideration in the emergency translocation of Macquarie perch in the Enlarged Cotter Reservoir (ECR). ..... | 3 |
|--|---|

## List of figures

---

|  |   |
|--|---|
| Figure 1: Identified locations of potential translocation sites on the Cotter River (Icon Water, 2012). .. | 8 |
|--|---|

## 1. Purpose of the Plan

The purpose of this plan is to guide the emergency inspection and translocation of Macquarie perch (*Macquaria australasica*) to alternative locations from the Enlarged Cotter Reservoir (ECR).

The emergency inspection and translocation of Macquarie perch may commence following the detection of EHN Virus in the reservoir, or dissolved oxygen trigger levels in the reservoir being reached.

Dissolved oxygen trigger levels were proposed by a sub-committee of the FMPWG to guide (not dictate) the initiation of proposed mitigation actions during the filling phase of the ECR. These were amended during the development of the operational Fish Management Plan (Version 4) in 2018 to address the reduced number of monitoring buoys within the ECR during the operational phase opposed to the filling phase (3 operation buoys during filling phase to 2 operational buoys). The proposed trigger levels and response of Icon Water did not change during this revision and is summarised below in Table 1.

**Table 1:** Trigger levels and management responses for consideration in the emergency translocation of Macquarie perch in the Enlarged Cotter Reservoir (ECR).

| Stage | Depth | Triggers                                   |                    | Response   |
|-------|-------|--|--------------------|--|
|       |       | DO   | Duration           |  |
| 1     | 3m    | Between 4.5 - 6mg/L at 2 or more locations | 7 consecutive days | <ul style="list-style-type: none"> <li>Undertake Cotter Reservoir weekly field inspections. These inspections involve looking for signs of distressed fish and taking water quality spot measurements at specific habitat locations (habitat and edge locations). Continue to implement for minimum 1 week after DO level returns to above trigger level.</li> <li>Consider implementation of cormorant control options as per the <i>ECD Cormorant Management Program</i> (Appendix G)</li> <li>Consider increasing the operation of the destratification units as per the <i>Destratification Operation Plan</i> if not already at full capacity.</li> </ul> |
| 2     | 3m    | Between 3 – 4.5mg/L at 2 or more locations | 4 consecutive days | <ul style="list-style-type: none"> <li>Undertake Cotter Reservoir thrice weekly field inspections. These inspections involve looking for signs of distressed fish and taking water quality spot measurements at specific habitat locations (habitat and edge locations). Continue to implement for minimum 1</li> </ul>  |

|   |    |  |                    |   |
|---|----|--|--------------------|---|
|   |    |  |                    | <p>week after DO level returns to above trigger level</p> <ul style="list-style-type: none"> <li>Consider implementation of cormorant control options as per the <i>ECD Cormorant Management Program</i> (Appendix G)</li> <li>Consider release of additional water from Bendora Reservoir or release of water from Cotter Reservoir<sup>1</sup></li> <li>Prepare to initiate translocation as described in Section 2. Mitigation Responses in this plan</li> <li>Continue to operate the destratification units at full capacity as per the <i>Destratification Operation Plan</i> (Appendix F) where practical</li> </ul>   |
| 3 | 3m | Less than 3mg/L at 5 locations or more | 3 consecutive days | <ul style="list-style-type: none"> <li>Undertake Cotter Reservoir daily field inspections. These inspections involve looking for signs of distressed fish and taking water quality grab samples at specific habitat locations (habitat and edge locations). Continue to implement for minimum 1 week after DO level return to above trigger level.</li> <li>Consider implementation of cormorant control options as per the <i>ECD Cormorant Management Program</i></li> <li>Continue to operate the destratification units at full capacity as per the <i>Destratification Operation Plan</i></li> <li>Consider implementation of translocation program as described in <i>Section 2. Mitigation Responses</i> of this plan</li> </ul> |

Note 1: Release of water from Bendora Reservoir to assist in remediating low DO conditions in the Cotter River/reservoir would be in addition to the required environmental flows as per the *Environmental Flow Guidelines 2018*. The FMPWG, would be convened to provide management and technical advice to Icon Water on the health of the Macquarie perch in the Cotter Reservoir and would need to determine whether the benefits to the Macquarie perch would outweigh any detrimental effects to Cotter River ecology.

## 2. Mitigation Responses

### 2.1. ECR Reservoir Inspections

Should dissolved trigger levels in the reservoir be reached as per Table 1, surveys of the ECR should be undertaken. The Fish Management Plan Working Group (FMPWG) will provide

oversight of the reservoir program with daily duties conducted for the survey undertaken by an organisation or business that has the approval of the FMPWG.

The reservoir survey will be undertaken by boat and will aim to collect information on the following:

- Distressed fish: Visual surveys for distressed (gulping or moribund) fish undertaken around the perimeter of the ECR. Visual surveys will be undertaken by a certified professional ecologist in a boat performing a slow circumnavigation of the reservoir.
- Water quality: At Stage 3 Dissolved Oxygen Trigger level (Table 1), water quality grab samples from three key habitat and edge locations in the reservoir should be undertaken at three metre depth to determine DO levels.

A field observation report will be prepared and provided to the FMPSC within 24 hours of the completion of the survey. The field observation reports will be tabled with the FMPSC and will include the following information:

- Date and time(s) of survey
- Surveyors names
- Recent and current weather conditions
- Sketch route of survey
- Location of water quality grab samples
- Results of water quality grab samples
- Report on evidence and location of distressed fish

## 2.2. ECR Macquarie perch Emergency Translocation

### Background

Should dissolved oxygen trigger levels in the ECR be reached as per Table 1, emergency translocation of Macquarie perch may commence.

The FMPWG will provide oversight for the translocation program and daily duties of collection, holding transport, release and the later dissemination of information will be undertaken by an organisation or business that has the approval of the FMPWG.

Following the decision to undertake the emergency translocation program via the FMPWG, the relevant authorities will be notified. Notification will include the start date of the collection and the proposed translocation sites and will be delivered via both phone and email. Relevant authorities to be informed include, but are not limited to:

- Icon Water
- ACT Parks and Conservation
- ACT Conservation Planning and Research

A key stakeholder in the translocation is ACT Conservation Planning and Research and it is understood that they may be able to provide assistance in an emergency translocation through the provision of equipment and technical expertise.

The Emergency Translocation will be undertaken as per the methods outlined below.

### Methods

#### *Fish Collection*

A suite of net types will be used to collect Macquarie perch for translocation. A fleet of 10-15 gill nets (stretched mesh sizes of 75, 100 and 125mm, both short and long drop) and 15 single-winged fyke nets (stretched mesh 13mm, 5 m wing) will be spaced approximately evenly around the perimeter of the reservoir. Gill nets will be set and checked hourly from 15:00 – 21:00. All Macquarie perch and any by-catch will be removed each check. Fyke nets will be set at 15:30 and retrieved the following day after 7:30.

Alien by-catch fish from both net types will be destroyed upon capture and appropriately disposed of at a waste management facility. Adult Macquarie perch (>165 mm total length (TL)) will be pit tagged to allow for individual identification and to assess survival at the site of translocation release. Macquarie perch smaller than 165mm TL will be marked by removing a small piece of the bottom corner of the caudal fin. Any Two-spinned blackfish captured during collection will be held with Macquarie perch and released into the Cotter River at Vanity's crossing.

Fish will be collected and tagged under the appropriate fast-tracked licence and approvals from the ACT Government.

#### *Size classes of Macquarie perch targeted*

The focus of the translocation will be Macquarie perch older than 12 months (>100mm TL), though if captured, young-of-the-year (0+ years) Macquarie perch will also be retained and translocated.

#### *Number of fish to be collected*

Collection of Macquarie perch will continue until captures of the species become sparse. Specifically, collection will continue until captures of Macquarie perch drop below 0.1 fish per net night for gill nets and one age 1+ (>100mm TL) fish per net night for fyke nets. Provision for the continuation of fyke net collection may be made if large numbers (e.g. 10 fish per net night) of 0+fish (<100mm TL) are still being captured.

#### *Onsite fish holding*

Captured Macquarie perch will be transported to a field holding station where they will be held overnight in the case of Gill net captured fish, or for a few hours in the case of fyke net caught fish in black tubs to reduce stress, and will be salted (5ppt NaCl) to aid in the prevention of fungal infection due to handling and capture. Tubs will also be aerated (12V 4 bulb bubblers) with the water changed (1/3) every two hours. Macquarie perch will be held in two groups based on size (<165mm TL and >165mm TL) to reduce the likelihood of aggressive interaction between large and small individuals whilst in holding.

#### *Fish transport and release*

Each day Macquarie perch caught from the previous night will be transported in black plastic transport tubs to reduce stress, that will be salted (5ppt NaCl) and aerated (12V 4 bulb bubblers, or oxygen cylinder) before being loaded into the rear tray of a 4WD vehicle. Upon reaching the translocation site, river water will be incorporated into the holding tubs at a rate of ¼ tub per 15 minutes until holding tub temperature equilibrated to within 2°C of the river water temperature (or at least 2 changes if tub and river temperatures are within 2°C upon arrival), to allow for acclimatisation of Macquarie perch to the river water at the release site. This will reduce release stress and maximise post release survival. At natural release sites (i.e. those in the Cotter River) fish are to be released into pools (preferably deep pools) with some structural cover.

#### *Potential release sites*

There are a number of potential release sites for translocation of Macquarie perch. It is preferred that release sites be in the Cotter River to maintain genetic integrity and diversity. Once Macquarie perch are removed from the Cotter River catchment they cannot be returned to the Cotter River catchment for fear of introducing EHN virus.

There are two potential release sites on the Cotter River between Bendora Reservoir and Vanitys Crossing; Spur Hole and Pipeline Rd. Crossing (Figure 1). The advantages of these sites are that they are relatively close to the ECR collection location; Macquarie perch already inhabit these sites so they appear naturally suitable; and recruitment has been detected at the downstream of the two sites (Spur hole; Figure 1; Broadhurst et al. 2012).

A third site on the Cotter River is upstream of Corin Reservoir (Figure 1) between Lick Hole Track crossing and Gallipoli Flats Gauging Station. This reach is already an established Macquarie perch translocation site and survival of translocated individuals to this area has been confirmed. This site, though further away than the other sites, has the advantage that it is located in an unregulated section of the Cotter River. All three proposed translocation sites lie within or immediately adjacent to Namadgi National Park and fishing is prohibited from the site upstream of Corin Reservoir.



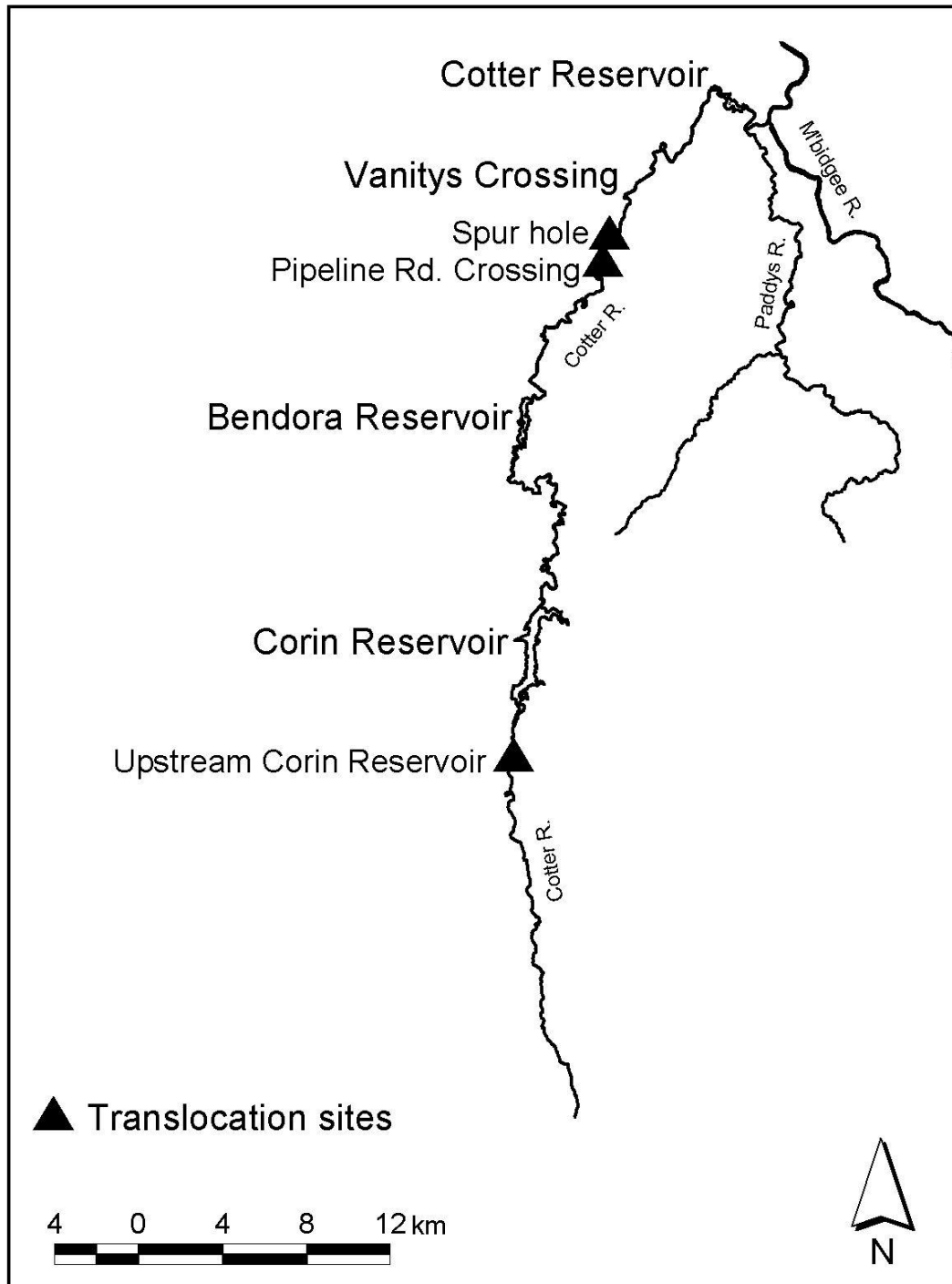


Figure 1: Identified locations of potential translocation sites on the Cotter River (Icon Water, 2012).

#### *Post-translocation assessment*

To assess success of translocation, a follow up assessment will be undertaken two weeks after the completion of the translocation. The follow up assessment will comprise electrofishing 500 m of River (250 m either side of the release pool) and fyke netting for 2 nights of the release pool and 2 adjacent pools. Fyke nets will be set from shore at 15:30 and retrieved the following morning at 7:30. All fish (including alien species) will be measured and released unharmed at the site of capture for reporting.

#### **Reporting**

Following the translocation a short interim report will be delivered to the FMPWG for review and approval. The report will outline the survey effort undertaken, the number of species captured, the number of Macquarie perch successfully released at the translocation site, and any mortalities of the species.

A final report of the translocation consolidating content from the interim report and the results of the follow up assessment will be prepared.

Fish tagged as part of emergency translocations will also be reported within ongoing ECD Fish Monitoring Reporting to identify the success and ongoing survival of translocated individuals.

All reporting will be approved by the FMPWG before being formally tabled with the Fish Management Steering Committee.

### 3. References

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Broadhurst, B.T., Ebner, B.C., & Clear, R.C. 2012. A rock-ramp fishway expands nursery grounds of the endangered Macquarie perch (*Macquaria australasica*). *Australian Journal of Zoology* 60, 91 – 100.

Icon Water. 2012. *Management of Macquarie perch during filling phase report*. Internal Icon Water Documentation.