



AUSTRALIAN SOCIETY FOR FISH BIOLOGY

Incorporated Society Reg No A0030371C
ABN 51 446 372 430

5th November 2019

Submission on Snowy 2.0 Main Works Environmental Impact Statement

The Australian Society for Fish Biology (ASFB) is a professional, independent, non-profit, non-commercial and non-aligned organisation. With over 400 members, ASFB promotes research, education and management of fish and fisheries in Australasia and provides a critical forum for the exchange of information. The Society contains several committees, including a Threatened Fishes Committee (TFC) and an Alien Fishes Committee (AFC). Both committees are comprised of State and Territory representatives involved with fish research, management and conservation, and draw on expertise from the large membership base of fish biologists as professionals in their field.

Given our collective knowledge and experience we offer the following comments in the form of a submission for consideration of the Snowy 2.0 Main Works Environmental Impact Statement. This submission is focused specifically only on publicly available information in the EIS document. A limitation in preparing this submission was the absence of the primary research reports known to be commissioned by Snowy 2.0. Without these reports it was not possible to transparently scrutinise the scope, design and suitability of mitigation options examined (e.g. fish screening options); the potential for live fish or pathogen transfer and survival; and the scientific methodology used for any of these investigations.

This Snowy 2.0 Main Works EIS was recently raised and discussed at our Annual General Meeting of our members. A majority vote occurred in support of making a submission. We note however, that some of our members abstained from the vote. In particular, employees of the New South Wales Government who are representatives on the TFC or AFC, abstained from making any comment on this issue to avoid any perceived or potential conflict of interest.

Members of both committees are apprehensive about several aspects of the proposal for Snowy 2.0 scheme which would transfer water between Talbingo and Tantangara reservoirs. These concerns span both threatened and invasive fish issues, and can be summarised as:

1. Potential for significant impact on three listed threatened fish species both under EPBC and NSW Fisheries Management Act
2. Potential spread of pest and non-native fish species known to detrimentally impact native species
3. Potential transfer of a major pathogen suspected as having significant impacts on native species

The Tumut and Upper Murrumbidgee River Catchments have several listed threatened fishes both under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) and the *NSW Fisheries Management Act 1994* (FM). Both Macquarie perch (*Macquaria australasica*) and Trout cod (*Maccullochella macquariensis*) are listed as endangered under the EPBC Act and the NSW FM Act, and Stocky galaxias (*Galaxias tantangara*) and Murray crayfish (*Euastacus armatus*) are listed as Critically Endangered and Vulnerable (respectively) under the FM Act. Stocky galaxias has also recently been listed on the Finalised Priority Assessment Lists for the EPBC, with an assessment due to be completed by October 2020. As a NSW endemic species, it is likely that the EPBC assessment will result in the same status as in NSW (Critically Endangered). Macquarie perch are now highly fragmented with only a few self-sustaining populations remaining. The upper Murrumbidgee population is considered a relative stronghold of the species. Kosciuszko National Park contains the only population of the Stocky galaxias; now restricted to a single 3 km stream segment of the headwaters of Tantangara Creek. Hence, the entire global population of Stocky galaxias and significant populations of Macquarie perch and Murray crayfish could potentially be impacted by the construction and operation of Snowy 2.0.

We consider that the construction of a large tunnel and the transfer of water between Talbingo and Tantangara may cause a number of detrimental habitat and ecosystem level impacts. Our primary concerns relate to:

a) **Transfer of a declared notifiable invasive species, Redfin perch (*Perca fluviatilis*), via water transfers between Talbingo and Tantangara reservoirs.**

Redfin perch, declared a notifiable species in NSW under Schedule 1 of the Biosecurity Regulation 2017, are present in Talbingo Reservoir but absent from Tantangara Reservoir. The pumping of water via Snowy 2.0 from Talbingo to Tantangara is likely to transfer this species. Redfin perch is a known predator of small-bodied native fish and crayfish, and may also impact conservation efforts for the threatened Stocky galaxias. If established in Tantangara, Redfin perch are also likely to spread downstream into the upper Murrumbidgee River. The EIS only refers briefly to this biosecurity issue and provides little evidence on the extent of this threat nor how it could be mitigated.

b) **Transfer of EHN virus in previously virus free locations.**

The Snowy 2.0 Main Works EIS notes that epizootic hematopoietic necrosis virus (EHNV) has not been recorded from Talbingo Reservoir, based on “*limited testing undertaken for this project*”. However, this virus can be extremely difficult to detect, and we believe that this requires further consideration.

If the virus appears in Talbingo during construction of Snowy 2.0 (i.e. the next decade) and is transferred to Tantangara, the spread of the virus from Tantangara downstream to the upper Murrumbidgee River is almost certain, as both Rainbow trout (*Oncorhynchus mykiss*) and Redfin perch are known hosts of this virus. The upper Murrumbidgee River downstream of Tantangara contains a significant population of the EPBC-listed Macquarie perch, which is documented to experience widespread and rapid mortality when exposed to EHNV.

The Snowy 2.0 Main Works EIS identifies that a ‘Weed, Pest and Pathogen Management Plan’ will be prepared and implemented to minimise and manage the spread of weeds, pest fish and pathogens, but there is no detail on what biosecurity measures are proposed, or whether they are in place now. This plan is critical to mitigation of these risks, and needs careful consideration and strong enforcement.

c) Transfer of Climbing galaxias via water transfers between Talbingo and Tantangara reservoirs.

Climbing galaxias (*Galaxias brevipinnis*) is present in the Yarrangobilly River and likely Talbingo Reservoir. This species is native to the coastal drainages of eastern Australia but was transferred into the Murray-Darling Basin via the original Snowy scheme. Climbing galaxias is suspected as having detrimental impacts on other native fish species when translocated, and the species is listed as a threat to Stocky galaxias by the NSW Fisheries Scientific Committee. It therefore has a moderate to high risk of being able to be transferred from Talbingo to Tantangara. The Snowy 2.0 Main Works EIS proposes that a mitigation measure is to construct a barrier to prevent Climbing galaxias invading the sole remaining habitat for Stocky galaxias. However, the EIS gives no detail on what the design specifications for the barrier are, whether such a barrier has been previously constructed, or if so, whether the barrier was successful and over what time period such assessment of success has occurred. This issue requires further investigation.

d) Loss of potential habitat to recover the critically endangered Stocky galaxias.

The Stocky galaxias is currently confined to a single 3 km stream segment of Tantangara Creek, and is, therefore, at extreme risk from stochastic events such as wildfire or other localised impacts that result in habitat loss. To mitigate such localised threats, it is necessary to establish additional populations of the species in streams other than Tantangara Creek. However, if Climbing galaxias becomes established in Tantangara Reservoir and invades upstream tributaries, then there will be little availability of potential new sites to establish additional populations of Stocky galaxias. While the construction of the proposed barrier to Climbing galaxias invasion may protect the existing population of Stocky galaxias, the lack of other streams free of invasive species (both trout and Climbing galaxias) will likely severely compromise Stocky galaxias conservation efforts.

e) Transfer of other non-native fish species.

Water transfer between Talbingo and Tantangara provides a mechanism for the establishment of non-native species (e.g. Goldfish (*Carrasius auratus*) and Eastern gambusia (*Gambusia holbrooki*), and any associated pathogens and parasites) currently present in Talbingo but absent from Tantangara. The total absence of mitigation measures to prevent primary fish transfer at Talbingo (e.g. fish screens or equivalent) also means that any future changes in the fish community in Talbingo must be dealt with in the receiving waters of Tantangara using measures not designed or necessarily applicable for such future changes. Control and eradication of introduced non-native fishes is costly and usually ineffective. There appears to be little consideration of these issues in the Snowy 2.0 Main Works EIS.

f) Loss of habitat from disposal of tunnel spoil in Talbingo Reservoir.

The large quantity of tunnel and dredge spoil being disposed in Talbingo will likely impact Murray crayfish habitat in the reservoir by disturbing their shallow littoral habitats. The disposal of spoil may also result in prolonged changes to water quality through decreased water clarity and may impact aquatic vegetation, another key habitat feature for Murray crayfish. We acknowledge the Snowy 2.0 Main Works EIS proposes to relocate Murray crayfish away from the disturbance area in the reservoir. However, the details are not outlined and the fate or success of such relocations is unknown.

We thank you for the opportunity to provide comment on the Snowy 2.0 Main Works EIS. The ASFB, and its Threatened Fishes and Alien Fishes Committee's would be pleased to provide additional professional advice or comment should this be desired.

Yours faithfully



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