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## RECOMMENDATION KEY THREATENING PROCESS

### INTRODUCTION OF FISH TO FRESH WATERS WITHIN A RIVER CATCHMENT OUTSIDE THEIR NATURAL RANGE

The Fisheries Scientific Committee, established under Part 7A of the *Fisheries Management Act 1994* (the Act), has made a recommendation to list the Introduction of Fish to Waters Within a River Catchment Outside their Natural Range as a KEY THREATENING PROCESS in Schedule 6 of the Act.

Listing of Key Threatening Processes is provided for by Part 7A, Division 2 of the Act.

The Fisheries Scientific Committee has found that:

1. At least seven non native species currently have self-sustaining populations somewhere within the waterways of N.S.W. These include brown trout (*Salmo trutta*), rainbow trout (*Onchorynchus mykiss*), carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), oriental weatherloach (*Misgurnus anguillicaudatus*), mosquitofish (*Gambusia holbrooki*), and European perch or redfin (*Perca fluviatilis*). The brook trout/char (*Salvelinus fontinalis*) and tench (*Tinca tinca*) have been taken in N.S.W. waters in the past, but may not have self-sustaining populations at present. Atlantic salmon (*Salmo salar*) are also stocked into N.S.W. water but are not thought to have self sustaining populations. It is possible that roach (*Rutilus rutilus*) and tilapia (*Oreochromis mossambicus*) also have access to NSW waterways and may establish self-sustaining populations in the future. Discarded and/or escaped aquarium fish also have the potential to establish self sustaining populations.
2. Introduced species can impact upon the native fauna and flora in a number of ways. The most obvious is by direct predation, in which brown trout, rainbow trout, mosquitofish, and European perch have all been implicated. Trout are known to have caused a decline in native *Galaxias* populations, mosquitofish predate on eggs and larvae of native fishes, as well as nip fins, and European perch is known to eat the young of all native species with which it co-occurs. Predation by the latter species has been considered one of the potential factors in the decline of Macquarie perch, (*Macquaria australasica*) which is listed as vulnerable in the *Fisheries Management Act 1994*.
3. Introduced fish compete with native fish for food, spawning localities, and habitat. Competition by European perch has been suggested as one of the factors in the

- decline of the endangered Trout cod, (*Maccullochella macquariensis*). Based on the known diet, competition for food by European perch has also been implicated in the decline of Macquarie perch (*Macquaria australasica*).
4. Habitat degradation by introduced carp, through uprooting vegetation and disturbance of sediments, has long been considered deleterious to many native fish species. The spread of carp beginning in the 1960s coincides with the decline of a number of Murray River drainage fish species.
  5. Introduced fish can promote the spread of disease in native species. European perch is a known carrier of Epizootic Hematopoietic Necrosis Virus (EHNV), which can spread to several native fish species. This virus is a possible causative factor in the declines of Macquarie perch (*Macquaria australasica*) and the threatened Silver perch (*Bidyanus bidyanus*).
  6. Introducing native fish species into areas outside their natural range has the potential to have similar outcomes as introducing non native species, because they did not co-evolve with the local species.
  7. Introduced fish species have been included as a possible threatening process in the recommended listing of the Aquatic Ecological Community in the Natural Drainage Systems of the Lower Murray River Catchment as an Endangered Ecological Community in N.S.W..
  8. Introduction of fish adversely affects several species that are listed as vulnerable and or endangered under the *Fisheries Management Act 1994*. These include the following Endangered species: Murray hardyhead (*Craterocephalus fluviatilis*), Eastern freshwater cod (*Maccullochella ikei*), Trout cod (*Maccullochella macquariensis*), Oxleyan pygmy perch (*Nannoperca oxleyana*); Vulnerable Species: Macquarie perch (*Macquaria australasica*), Silver perch (*Bidyanus bidyanus*), and Southern pygmy perch (*Nannoperca australis*); and Vulnerable Populations of: Olive perchlet (*Ambassis agassizi*) and Purple spotted gudgeon (*Mogurnda adspersa*).
  9. The introduction of live fish into waters within a Victorian river catchment in which the taxon has not been present prior to the year 1770 has been listed as a Potentially Threatening Process under the *Victorian Flora and Fauna Guarantee Act, 1998*.
  10. In light of the above, the Fisheries Scientific Committee is of the opinion that the introduction of fish into fresh waters of a river catchment outside their natural range adversely affects two or more threatened species, populations or ecological communities and could cause species, populations or ecological communities that are not threatened to become threatened. Therefore, the process qualifies for inclusion in Schedule 6 of the *Fisheries Management Act 1994* as a KEY THREATENING PROCESS.

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Fisheries Scientific Committee