



Challenges and opportunities in conserving the indigenous freshwater fishes of Australia.

Adelaide Zoo, 23rd – 25th November 2009

Background and Introduction

Australia spans a wide longitudinal and latitudinal area and consequently is characterised by a variety of habitats and biogeographical zones (Unmack 2001); from high snow fields and glacial lakes in Tasmania; temperate coastal and inland systems in the south eastern and south western mainland (including the expansive Murray-Darling Basin); rich wet and wet-dry tropics across northern Australia; subterranean systems in the north west; and extensive areas of desert through the interior.

This array of habitats translates to a relatively high diversity of freshwater fishes, including a high proportion of endemic species. They play a number of ecological roles, and therefore support several different ecosystem services. Some are important for commercial fisheries (e.g. barramundi; total recorded fishery production in 2006 was 3464 metric tons caught in 2003, FAO FishSTAT). They can be indicator species for aquatic health and they are of cultural and recreational importance. However, many species are poorly known and/or highly threatened (ASFB 2001; Hammer *et al.* 2007).

According to Allen *et al.* (2002) at least 302 species of fishes belonging to 59 families are recognised to occur in Australian freshwaters. Twenty-two species are introduced, non-native fishes. Of the 280 native fishes, 206 are almost entirely freshwater species, 61 are estuarine species and 10 species occur in both fresh and marine waters. Furthermore, it is recognised that there is a backlog of undescribed species, with several new taxa likely to be described, particularly in the gudgeons (Eleotrididae) and the gobies (Gobiidae).

The freshwater fishes of Australia are particularly threatened by habitat degradation and introduced species. Ninety-five percent of Australia's original wetland areas have been degraded or lost entirely through both urban and rural development. Aquatic habitats are severely affected through interlinking processes such as changes to natural flow regimes, changes in land use and plant landcover in the river catchment (causing changes in shade cover near to the rivers, and quality and quantity of run-off to the rivers from the surrounding region), increased sediment loads (especially from agriculture), salinisation, alteration of river bed and bank structure (including de-snagging), reduced water quality from sedimentation (noted above) and pollution, and artificial barriers to fish movement. Currently, brown trout (*Salmo trutta*) and gambusia (*Gambusia holbrooki*) appear to be the introduced species of most threat to native fishes (Wager and Jackson, 1993; Schofield *et al.*, 2000) and northern Australia tilapia are becoming a problem.



Furthermore, since Australia is renowned as the driest inhabited continent on Earth, the projections of climate change are of considerable relevance. A reliance on water for survival places fishes in direct conflict with humans, particularly in the driest state of South Australia (Hammer *et al.* 2007).

The importance of Australia's freshwater fishes and aquatic habitats is recognised nationally at least among scientists and there are a number of major regional initiatives currently in progress which are attempting to address conservation needs. The proposed forthcoming meeting will bring together leading Australian freshwater fish experts to discuss the issues and to collate a summary of the current state of knowledge and thereby provide information and guidance for the international community. Furthermore, the collation of this information will be widely disseminated to raise national and international awareness of the issues amongst government authorities and non-scientists.

Meeting information

Adelaide Zoo, Chester Zoo, the IUCN / Wetlands International Freshwater Fish Specialist Group (FFSG) and the Ramsar Convention on Wetlands are convening a meeting entitled 'Droughts, deserts and water resources: challenges and opportunities in conserving the indigenous freshwater fishes of Australia', to be held at Adelaide Zoo, 23rd – 25th November.

The meeting will bring together 20 national and international experts to review and discuss key the current state of knowledge and key strategic and tactical conservation issues relating to Australia's indigenous freshwater fishes.

Aims and Objectives

- ❖ Bring together a unique network of experts related to the conservation of Australian freshwater fishes prior to the IUCN SSC Australian Freshwater Fish Red List workshop.
- ❖ Clarify and summarise the issues surrounding the conservation of Australia's indigenous freshwater fishes.
- ❖ Identify mitigation measures that integrate biodiversity conservation with human economic development.
- ❖ Raise the profile of and concern for freshwater fishes, other freshwater biodiversity and freshwater habitats by translating our current state of knowledge into the public arena.
- ❖ Bring key issues to the attention of politicians and other key stakeholders.
- ❖ Translate our current state of knowledge into wider international fish conservation strategies.
- ❖ Internationally publicise and promote Australia's expertise regarding climate-related issues that may need to be deployed to other regions and in other contexts over time.
- ❖ Identify roles that zoos and aquariums can play in conserving native freshwater fishes (and other species) and identify priority actions.



Outputs

- ❖ A summary position statement, recommendations and suggested actions endorsed by IUCN, WI, FFSG and Ramsar.
- ❖ A compilation of concise, technical information that can be used in international fundraising efforts for conserving and researching freshwater fishes.
- ❖ Position statements targeted at various key audiences from general public and zoo and aquarium visitors to policy and decision makers.
- ❖ A draft stakeholder 'tool-kit' comprising essential facts mitigation measures and recommendations concerning the impacts of droughts, deserts and water resource issues on freshwater fish biodiversity, which can be integrated into other countries environmental management policies.

References & further reading.

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