

Aquatic Ecosystems Unit

– Winter 2011

INTRODUCTION

The aquatic environment in NSW is a public resource that is greatly valued. It is very diverse, extending from three nautical miles offshore to the rivers in the far west of the state. The state's oceans, estuaries, coastal rivers & streams, inland rivers and freshwater wetlands all have their own unique biodiversity, habitats and ecosystem processes. Conserving these features, while also allowing for sustainable fishing and other uses, is a key challenge for NSW DPI.

Research activities within the Aquatic Ecosystems unit focus around the health of aquatic species, habitats or ecosystems. If these remain healthy, it shows that aquatic resources are being managed sustainably and that they will be available for the enjoyment of future generations. Research on aquatic ecosystems provides scientific information to underpin management initiatives and policies for these valuable resources, as required under the NSW Fisheries Management Act (FMA).

RESEARCH CAPABILITIES

- » Staff are based at 5 locations – Port Stephens, Cronulla, Batemans Bay, Narrandera and Grafton.
- » Major collaborators and funding partners include the Commonwealth, Catchment Management Authorities, the Murray Darling Basin Authority, the NSW Dept of Environment & Heritage, the NSW Office of Water, Sea World, water authorities, energy companies and several local councils.
- » We focus on ensuring our research is actually adopted. This is achieved through close collaboration with extension colleagues and primary producers.
- » The Unit is a key participant to the NSW Monitoring, Evaluation & Reporting (MER) program for natural aquatic resources in the state.
- » The unit is the Australian leader in sampling freshwater

fish assemblages. We also use cutting edge techniques to map estuarine habitats, photograph sharks underwater, track fish movements using acoustic tags and rehabilitate areas of damaged habitats.

PROJECT UPDATES

FINDING THE ACHILLES HEEL FOR REDFIN PERCH (2010–2011)

INTRODUCTION: Controlling alien fish species is a key action of the Native Fish Strategy for the Murray Darling Basin and finding a way to control redfin perch is a high priority in NSW where it is listed as noxious under the FMA.

FINDINGS: Initial trials of physical control methods for this pest fish have been promising, including the use of innovative attractants such as laser lights. Acoustic tagging and tracking is also being used to understand their movements, map the habitats they use and investigate bio-control options. The current research will inform future management of this unwanted alien.

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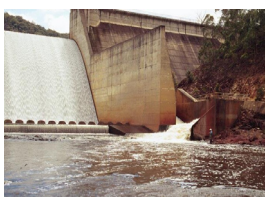
CONTACT US

For more information on our full portfolio please contact Dr Bob Creese (02) 4916 3806 or bob.creese@industry.nsw.gov.au

IMPROVING FISH PASSAGE IN THE SHOALHAVEN RIVER (2009–2012)

INTRODUCTION: Until recently, Tallowa Dam, situated on the Shoalhaven River, restricted native fish from accessing 75% of their original upstream habitats. A newly constructed 'fish lift' now allows congregating fish below to be transported over the dam wall. This project will assess the effectiveness of this high dam fishway in providing upstream fish passage as well as restoring upstream fish communities.

FINDINGS: Several native (adult and juvenile) fish species, including some species previously considered extinct above Tallowa Dam have been recorded using the new lift, indicating a substantial improvement in fish passage. The timing and frequency of fish migrating upstream differs among species, often with new arrivals 'boarding' the fish lift when river flow increases



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AERIAL SURVEYS OF ROCKY REEF HABITATS IN NSW (2009– ONGOING)

INTRODUCTION: A large scale photographic survey of NSW rocky reefs is underway, its aim is to capture an accurate picture of how human activities may be affecting coastal habitats. By comparing the types and numbers of species growing on rocky reefs in heavily disturbed locations like Sydney and Newcastle to the types and numbers of species growing in less populated areas, we can test predictions about impacts of humans.

FINDINGS: A unique sampling method has been developed to take photos from a helicopter hovering over the rocks when there are no breaking waves obscuring the habitats. Images of 42 sites from Byron Bay to Merimbula were taken annually (commenced in 2009) to enable tests for human impacts on rocky reefs. Sampling has already detected new populations of large seaweeds 400 km north of their previously known range.



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ECOLOGICAL RISK ASSESSMENT OF HUMAN ACTIVITIES ON HABITATS IN THE HAWKESBURY ESTUARY (2010– 2011)

INTRODUCTION: A healthy estuary is vital in supporting the economic, social and natural values that we depend on, such as fishing and boating. In the Hawkesbury estuary many human activities occur that can negatively affect these habitats. This project determined what the risks are from human activities to habitats within the estuary.

FINDINGS: Seagrass in Cowan, Berowra, Mooney Mooney and Mullet Creeks and mangroves in Cowan and Berowra Creeks were not greatly impacted. In Pittwater and Patonga Creek, seagrass had very high risk levels largely related to aquatic recreational activities and foreshore development. Hornsby Shire Council is using the results to protect the good quality habitats and improve management of recreational boating.

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DOWNSTREAM MORTALITY OF NATIVE FISH (2008-2011)

INTRODUCTION: Two major weir designs, undershot and overshot, exist in NSW. Overshot weirs spill water over the crest but were progressively being replaced by undershot weirs which create stronger flow velocities and associated pressures. There was concern that this change in design might harm native fish as they moved downstream.

FINDINGS: Results from many trials showed that undershot weirs caused substantial injuries and death to small fish. Overshot weirs were far safer, with most fish successfully moving past the structures. This work has resulted in new river infrastructure incorporating overshot technology to minimise impacts on fish, and this has greatly improved the recruitment of native freshwater fish.

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PIS&R PROJECT UPDATES