

# Research for Action fisheries & ecosystems

Research for Action 2009-2013

## Wild Fisheries

The wild fisheries resources of NSW are diverse and the recreational and commercial fisheries that exploit them are complex and valued in excess of \$500 million per annum. The species involved are also extremely difficult to study as they are invisible to most forms of observation and move a lot.

The NSW Government is responsible for the monitoring and management of these valuable publicly owned resources and Industry & Investment NSW (I&I NSW) has a range of research projects that support the development of management policies and strategies for the sustainable harvesting and conservation of these resources. Our research forms the basis of our management advice which underpins the regulations and legislation governing how our fisheries are managed.

## Aquatic Ecosystems

The aquatic environment in NSW is a highly valued public resource. It is very diverse and extends from three nautical miles offshore to the rivers in the far west of NSW. Valued at over \$17 billion per year, the state's oceans, estuaries, coastal rivers and 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 of aquatic resources is a key challenge for I&I NSW.

Our research activities are centred, therefore, around the health of aquatic species, habitats and ecosystems. If these remain healthy, it is a good indication that aquatic resources are being managed sustainably and that they will be available for the enjoyment of future generations. Research on aquatic ecosystems provides the scientific underpinning for management initiatives and policy development for these valuable resources.

Our research in both the above areas involves increasing development of new remote sensing techniques for monitoring changes in the extent and condition of habitats, state-of-the-art acoustic tracking devices to assess the movement patterns of fish and the latest infrared cameras and sonar devices to automatically identify and count fish species underwater.



Photo: Amy Smoothery



Photo: Darryl Bullock

**I&I NSW – PROFITABLE, ADAPTIVE AND  
SUSTAINABLE PRIMARY INDUSTRIES IN NSW**

## Forests & Rangelands

Our research in the state's terrestrial forests and rangelands is aimed at maintaining or enhancing biodiversity and natural resource condition within production systems that meet economic objectives. Our research in forests underpins the management systems for planted and native forests that maximise biodiversity within the current commercial, environmental and regulatory framework. We provide specialist knowledge of terrestrial vertebrates and forest plant taxa and develop appropriate strategies for monitoring the ecological sustainability of forestry operations to meet State Plan targets.

Our research in the state's rangelands is aimed at progressively refining the scientific basis for 'tactical grazing' and 'precision pastoralism', including the development of tools to assist seasonal risk management from both production and resource conservation perspectives, and the identification of grazing management strategies that will ensure that rangelands are used within their capability. The activities support the adaptation of extensive grazing industries to climate change, and conservation of biodiversity within these systems.

## Research for Action – fisheries & ecosystems

### OUTCOME

Primary industries have appropriate access to natural resources

### Strategies

1. Research to underpin the regulations and legislation governing how our commercial and recreational fisheries are managed.
2. Investigate the biology and ecology of key fish and invertebrate species.
3. Surveys of recreational and commercial catches.
4. Surveys of populations of key fish and invertebrate species.
5. Evaluate the impacts of fishing and provide stock assessments of harvested species.
6. Assess the success of different fisheries management practices.
7. Determine the biology and ecology of economically important and dangerous species of sharks throughout NSW's waters.
8. Undertake research and surveys in native forests to ensure that logging operations are compatible with protection of biodiversity.

### OUTCOME

Primary industries adapt to climate change and contribute to mitigation of its impact

### Strategies

9. Build models to better understand ecological linkages in aquatic systems and use them to predict future scenarios arising from such things as climate change.
10. Evaluate the capacity of rangeland ecosystems to adapt to climate change under commercial levels of grazing.
11. Support the adaptation of extensive grazing industries to climate change, and provide a means to conserve biodiversity within these systems.



## OUTCOME

Primary industries achieve improvements in natural resource and environmental management

### Strategies

12. Monitor the condition of marine, estuarine and riverine systems.
13. Assess the status of threatened aquatic species.
14. Develop innovative ways to recover threatened species – such as an artificial uterus for the rearing of grey nurse shark pups in captivity.
15. Evaluate the effectiveness of management changes in the aquatic environment – such as removing floodgates on coastal rivers or building new fishways along our rivers.
16. Advise fisheries managers on how to better target their fish stocking activities in rivers and impoundments.
17. Develop new ways of restoring aquatic habitats that have been badly degraded.
18. Develop new remote sensing techniques for monitoring aquatic habitats, acoustic tracking devices to document fish movements and infrared cameras and sonar devices to automatically identify and count fish underwater.
19. Develop environmentally-friendly fishing gears and practices that improve the survival of non-target and released organisms.
20. Conduct research to underpin management systems for planted and native forests that maximise biodiversity within the current commercial, environmental and regulatory framework.
21. Provide specialist knowledge of terrestrial vertebrates and forest plant taxa.
22. Develop appropriate strategies for monitoring the ecological sustainability of forestry operations to meet State Plan targets.
23. Develop tools to assist pastoralists to manage seasonal risk from both production and resource conservation perspectives.
24. Identify management strategies that will promote the regeneration of degraded rangelands and ensure that rangelands are used within their capability.
25. Refine the scientific basis for tactical grazing of rangelands and precision pastoralism.

## Research for Action – fisheries & ecosystems

# Research for Action 2009-2013

### OUTCOME

Risks posed by pests, diseases, and chemicals to the economy, environment and human health are excluded, eradicated or effectively managed

### Strategies

26. Undertake surveillance for new aquatic pests in NSW rivers or estuaries.
27. Develop control techniques for harmful pests that are already well established – such as *Caulerpa* in estuaries and carp and redfin perch in inland waterways.

© State of New South Wales through Department of Industry and Investment (Industry & Investment NSW) 2009. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute Industry & Investment NSW as the owner.

**Disclaimer:** The information contained in this publication is based on knowledge and understanding at the time of writing (October 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Industry & Investment NSW or the users independent adviser.