



**Marine
and Coastal**

National Environmental Science Program



RESEARCH OVERVIEW 6.

Threatened species and ecosystems

Governments in Australia play an important role in promoting and managing the recovery of threatened species and ecological communities.

They need timely conservation advice in order to assess nominations for threatened category listings and recovery actions, and determine policies to mitigate threats.

Marine and Coastal Hub projects bring people together to share knowledge, identify research needs, and collect data through surveys, tagging, mapping, citizen science, sampling and experimentation.

Project co-design, participation and delivery supports First Nations peoples' cultural connections and growing involvement in research leadership and management of Country.

MITIGATING THREATS

Hub researchers are assessing the potential impacts of offshore wind farm development on priority species and providing advice on monitoring and mitigation.

Collaborative research with commercial fishers is enabling satellite tracking of sawfish in northern Australia and building capacity for effective sawfish and sea-snake bycatch reporting.

Outcomes for research users

- Improved capacity to identify and mitigate offshore wind farm environmental risk.
- Increased capacity for sawfish and sea-snake species identification and reporting to improve monitoring, population estimation and conservation.

INDIGENOUS LEADERSHIP AND COLLABORATION

Hub researchers are aligning Indigenous-led feral animal control in northern Australia with economic co-benefits that enable access to environmental and carbon markets.

Indigenous rangers are deploying drones to monitor the movement of dugongs and the abundance of seagrass in the Kimberley and Thursday Island.

Indigenous rangers are being trained and equipped to monitor sawfish in the southern Gulf of Carpentaria.

Indigenous rangers and hub researchers are working together to tag and survey Australian sea lions and white sharks in SA and WA.

Indigenous knowledge is being gathered on cultural connection to southern right whale, humpback whale, orca, dolphins and sharks in south eastern Australia.

Outcomes for research users

- Indigenous-led feral ungulate control that significantly improves turtle hatchling success and wetland condition.
- Indigenous cultural connections to sea-kin strengthened.
- Knowledge and skills for Indigenous-led sawfish monitoring, and conservation of Australian sea lions and white sharks.



Vinay Udyawer

Scaling up sea snake reporting

Interactions with fisheries cause of mortality for Australia's three Critically Endangered sea snake species. Hub research is improving the effectiveness of fishery crew member observer programs. Observers gathered data for the first full season of bycatch research in Shark Bay and Exmouth Gulf. The new program yielded ~1000 photo-verified species records and improved the quality of reporting. Sea snake distribution and the rates and outcomes of fisheries interactions are now better understood and improved handling is reducing bycatch mortality.



CSIRO

Sharpening skills for sawfish

Effective monitoring of sawfish populations depends on trust and collaboration between scientists, fishers and Indigenous rangers. A hub workshop connected 50 participants from 24 organisations, half of them fishing industry representatives. It established relationships and set a clear research pathway. Ongoing industry engagement has enabled tissue sampling for population assessment. Fishers and Traditional Owners have been trained in species identification and handling and 50 satellite tags have been deployed to track sawfish movements and behaviour.



STATUS, TRENDS AND HABITAT USE

Hub projects are conducting aerial surveys and genetic analyses for dugong population assessment and developing dugong research techniques for use in northern Australia sea Country.

Satellite telemetry is being used to track sawfish in WA.

Satellite tracking and aerial surveys are monitoring southern right whales and identifying aggregation areas, and data flows are being improved to enable population assessment.

Drones and underwater cameras are being used to identify and assess critical Australian sea lion habitat and investigate risks to population recovery.

The eastern Australian grey nurse shark abundance and trend estimate is being refined and understanding of aggregation areas for this species is being improved.

Uncertainties surrounding white shark population structure, pupping areas and adult movements are being addressed to allow updated population estimates.

Next generation genetic sequencing and novel imaging survey tools are being applied to estimate the Macquarie Harbour Maugean skate population.

Hub surveys have enabled the assessment of black rockcod size structure and population abundance.

National trend analyses have been updated for 15 migratory shorebird species to assess conservation actions and population recovery. Ongoing work is monitoring migratory shorebirds to help assess the risk of High Pathogenicity Avian Influenza (HPAI) incursion into Australia.

Outcomes for research users

- Knowledge for sustainable dugong management, including Indigenous-led monitoring and management.
- Knowledge for conservation of Australian sea lions including recovery planning and healthy Country management.
- Knowledge to support the implementation and review of recovery and conservation plans and actions for dugong, sawfish, southern right whales, grey nurse sharks, white sharks, the Maugean skate and black rockcod in Australian waters.
- Evidence for threatened species listings and reviewing conservation actions for migratory shorebird species.
- Improved capacity for HPAI disease risk management, biosecurity preparedness and prediction of species vulnerabilities and responses to global change.



David Harasti

Small hope for black rockcod

After 40 years of protection, the black rockcod shows little signs of recovery. This species grows slowly and cannot breed until it reaches about 70 cm in length and 12 years of age. These biological traits make it extremely vulnerable to fishing. A broadscale hub survey in 2023 recorded a 40% decline in black rockcod numbers since the previous survey 15 years ago. Positive findings were the observation of more black rockcod in 'no take' zones, and an increase in the number of individuals old enough to breed. Given its biology, low numbers and fishing pressures, recovery of the black rockcod will take a very long time.



Roger Kirkwood

Sea lions wearing cameras and trackers map new habitats

Hub researchers attached underwater cameras and GPS loggers to eight Australian sea lions from two colonies in South Australia. They identified important habitats including kelp and invertebrate reefs, bare sand plains and dense sponge gardens. Almost 90 hours of video footage was analysed to develop a model and predict habitat across more than 5000 square kilometres of previously unexplored seafloor. This information will be crucial to conserving and managing populations of the Endangered Australian sea lion into the future.

Top images from left: David Harasti, Christophe Cleguer, Graeme Edgar, Joshua Smith, Nathan Angelakis



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