

Tuning in to **grey nurse** conservation

New tracking technologies developed by CSIRO scientists may help prevent the disappearance of grey nurse sharks from Australia's eastern coast.

Using automated receiving stations and acoustic transmitters, Dr John Stevens and Barry Bruce of CSIRO Marine Research, together with Dr Nick Otway of New South Wales Fisheries, hope to determine the daily and seasonal movements of grey nurse sharks (*Carcharias taurus*) around colony sites and during feeding excursions. This information will allow managers to identify the minimum effective size for protected areas around grey nurse colonies.

'Grey nurse sharks off New South Wales have been protected since 1984, but their numbers have continued to decline,' Stevens says.

'It has been estimated that there are less than 1000 animals left in eastern Australian waters, so there's an urgent need to find management measures that will allow the population to recover. Areas around the colonies may have to be closed, so we need to know how big these areas need to be.'

The scientists aim to tag 10 sharks with acoustic transmitters at each of two colony sites along the New South Wales coast.

Receiving or 'listening' stations will then be deployed at each site. Each time a shark swims within range of a receiver, a signal unique to each tag will be detected.

'The sharks will be individually recognised by their unique code and the receivers will automatically log the time, date and duration that tagged sharks visit the site,' Bruce says.

This information will give the scientists an idea of how long the sharks remain in the colony, what time they leave and how long they remain away.

'We know grey nurse sharks aggregate at colony sites, but we don't know how long they spend within colonies, on a daily basis,' Stevens says. 'They're likely to move away from colony sites to feed, and this is when they're most vulnerable to incidental capture, their primary threat.'

To find out where and how far the sharks go when they leave the colony, the team will use another type of acoustic transmitter to track individual sharks for up to 48 hours.

The acoustic transmitter, which sounds the familiar 'ping' common in submarine movies, will allow the scientists to follow the shark from their boat. The transmitter also

has a depth sensor, providing information about the shark's swim depth.

'These tracks will provide information on the distance the sharks forage away from their colony site during the night, and their depth and swimming behaviour during those periods,' Stevens says. 'This will identify the critical area that grey nurse sharks require around colonies to ensure their protection.'

The results of the study, however, may not provide an instant solution.

'It may be that the area used by the sharks is so big that it's not practical to close,' Bruce says. 'But at least we will have defined some of the parameters. So the people who make decisions about how to protect the sharks can see if the option is viable or if some other solution is required.'

The research, which is funded by Environment Australia's Natural Heritage Trust, is being conducted with the help of dive groups to retrieve and re-deploy the listening stations, and visually confirm the presence of tagged sharks.

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Despite their ferocious appearance, grey nurse sharks are generally non-aggressive. They feed primarily on fish.

One fish, two fish

AUSTRALIA hosts no more than a handful of freshwater sharks, sawfish and rays, several of which are thought to be endangered. Among them is the spear-tooth shark (*Glyphis* spp).

In the past 20 years, some 20 spear-tooth sharks have been recorded in the rivers of Queensland and the Northern Territory. But there have been no systematic surveys of their numbers and little study of their life cycle.

Dr John Stevens and Dr Peter Last of CSIRO Marine Research hope to learn more about the distribution and ecology of these species

The survey and population assessment, funded through Environment Australia's Natural Heritage Trust, will involve CSIRO, the Museum and Art Gallery of the Northern Territory, the Northern Territory Fisheries Division, the University of Western Australia, the Queensland Department of Primary Industries, Murdoch University and the Queensland National Parks and Wildlife Service.

Stevens says a better understanding of the ecology of these freshwater animals and their numbers will underpin future conservation decisions.