

# Fishing for answers to marine depletion

'No-fishing' reserves are generally recognised to be pillars of marine conservation efforts, but now it seems they may sustain surrounding fisheries as well.

At a Marine Harvest Refugia Workshop at Coffs Harbour last year, fishery scientists explored the notion that 'no-take' reserves benefit fisheries by providing areas for recruitment of surplus adults and juvenile larvae. However, they agreed that more research on the topic was needed.

As part of a study on the effects of prawn trawling, (see 'Studying the effects of fishing', *Ecos* 78), CSIRO and Queensland's Department of Primary Industries are examining the effects that closures in the northern section of the Great Barrier Reef have on the benthos (bottom-dwelling plant and animal communities).

The project will determine the time-frame of recovery for disturbed or depleted species and associations between fish and habitat, both of which have strong implications for fisheries outside closed reserves.

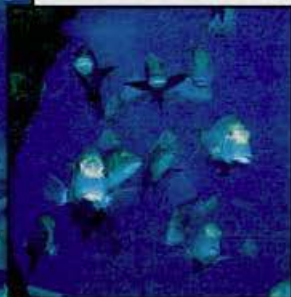
Dr Ian Poiner, program manager of Tropical Fisheries Resources at CSIRO's Marine Laboratories, is coordinating the wide-ranging project, which is now into the fourth of its five years. Long-term monitoring will continue after 1996.

During the first year (1992), scientists performed a descriptive baseline survey of a cross-shelf closure area (coast to outer reef) and adjacent areas to the north and south open to trawling. The following year involved comparing zones open and closed to fishing.

Offshore benthic communities were considerably richer in the Green Zone: only three taxa were significantly more abundant in the fished zone. For the 23 most abundant fish species, the mean catch rate was 62% higher in the Green Zone. However, comparing



Scientists are investigating the value of marine reserves as a means of sustaining surrounding fisheries.



Great Barrier Reef Marine Park Authority

areas open and closed to fishing should not be interpreted as a comparison of trawled with untrawled areas, because of factors such as illegal trawling in the Green Zone.

Hence the past year was spent setting up plots to allow simulated heavy trawling in 'lightly trawled' areas of the zone. During the next two years, 24 control and impact plots will be sampled before and after experimental trawling over 100% of the treatment plots. The plots measure about three square kilometres. Sampling of deep and shallow water during wet and dry seasons will control depth and seasonal factors.

The results will be keenly awaited by those who attended the workshop, which was sponsored by the Commonwealth Government's marine conservation strategy, Ocean Rescue 2000. Several international scientists at the workshop presented supporting evidence for the use of refugia to enhance fishery management.

Dr Gary Davis from the United States National Biological Survey reported that refuges for juvenile and adult lobsters have managed to sustain an intensive fishery in Florida. He said that reserves could act as nursery areas which exported both larvae and juveniles as well as surplus adults.

However, further proof is needed, such as confirmation of a recent watershed monitoring program conducted inside and outside coral reef reserves in the Philippines.

The study's author, South-East Asia's pre-eminent marine biologist Dr Angel Ancala, concluded that 'protective management for 10 years was responsible for maintaining high fish yields from the non-reserve'.

Contact: John Giles, CSIRO Division of Fisheries, PO Box 120, Cleveland, Qld 4163, (07) 286 8290, fax (07) 286 2582.

John van Tiggelen

## Around CSIRO

CSIRO's research divisions and institutes are listed below. Inquiries may be directed to the appropriate division or institute, or to CSIRO Information Network offices.

### CSIRO Information Network

Sydney: (02) 413 7528 fax (02) 413 7632  
Melb: (03) 662 7116 fax (03) 662 7140  
Adelaide: (08) 303 9116 fax (08) 303 9200  
Perth: (09) 387 0710 fax (09) 387 7894  
Darwin: (089) 22 1720 fax (089) 22 1714  
Brisbane: (07) 377 0390 fax (07) 377 0387

### Institute of Minerals, Energy and Construction

105 Delhi Road, North Ryde, NSW  
PO Box 93, North Ryde, NSW, 2113  
(02) 887 8222 fax (02) 887 8197  
Division of Building, Construction and Engineering

### Division of Coal and Energy Technology

Division of Exploration and Mining  
Division of Petroleum Resources  
Division of Mineral and Process Engineering  
Division of Mineral Products

### Institute of Natural Resources and Environment

Limestone Avenue, Canberra, ACT  
PO Box 225, Dickson, ACT 2602  
(06) 276 6240 fax (06) 276 6207

### Division of Atmospheric Research

Division of Fisheries  
Division of Oceanography  
Division of Water Resources  
Division of Wildlife and Ecology  
Centre for Environmental Mechanics  
CSIRO Office of Space Science and Applications (COSSA)

### Institute of Animal Production and Processing

105 Delhi Road, North Ryde, NSW  
PO Box 93, North Ryde, NSW 2113  
(02) 887 8222 fax (02) 887 8260  
Division of Animal Health  
Division of Animal Production  
Division of Food Science and Technology  
Division of Human Nutrition  
Division of Tropical Animal Production  
Division of Wool Technology

### Institute of Information Science and Engineering

105 Delhi Road, North Ryde, NSW  
PO Box 93, North Ryde, NSW 2113  
(02) 887 8222 fax (02) 887 2736  
Division of Information Technology  
Division of Mathematics and Statistics  
Division of Radiophysics

### Institute of Plant Production and Processing

Limestone Avenue, ACT  
PO Box 225, Dickson, ACT 2602  
(06) 276 6512 fax (06) 276 659  
Division of Entomology  
Division of Forestry  
Division of Forest Products  
Division of Horticulture  
Division of Plant Industry  
Division of Soils  
Division of Tropical Crops and Pastures

### Institute of Industrial Technologies

PO Box 53, Parkville, Vic. 3052  
(03) 662 7136 fax (03) 662 7153  
Division of Applied Physics  
Division of Biomolecular Engineering  
Division of Chemicals and Polymers  
Division of Manufacturing Technology  
Division of Materials Science and Technology