SEANET

smarter fishing for industry

Annual Report – 2002/03

Natural Heritage Trust

Helping Communities
Helping Australia

An Australian Government Initiative

OCEANWATCH

FOR THE FUTURE OF OUR MARINE ENVIRONMENT

Contents

Images courtesy of: Ben Leslie, Denis Ballam, Elton Robinson, Carl Bevilacqua, Lauritz Photo Pty. Ltd., Ecofish and Aquatic Release Conservation.

Report produced by Emma Bradshaw.

Executive Overview

Since 1999, Ocean Watch Australia Ltd. has overseen the day to day operations and administration of the national SeaNet program funded by the Australian Government under the Natural Heritage Trust (NHT). The purpose of SeaNet is to deliver an environmental fisheries extension service to the Australian commercial fishing industry to facilitate the development and adoption of best practice in commercial operations.

Over the last four years, commercial fisheries management in Australia has undergone some dramatic changes following the introduction of the *Environmental Protection and Biodiversity Conservation Act* (EPBC) (1999) and adoption of *Australia's Oceans Policy* in 1998. As a result, it was recognised that improved communication between fishers, researchers, fisheries managers and other stakeholders would be required if the development and introduction of improved management approaches and industry practices was to be successful and ensure the long-term sustainability of Australia's fisheries resources.

Ocean Watch has a proud history of involvement with the commercial seafood industry since its establishment in 1989, and works to support its industry sponsors by undertaking activities and projects that focus on protecting aquatic habitats, improving water quality and promoting the development and uptake of improved fishing practices.

SeaNet is one such project, which after four years of operation continues to attract strong support from both government and industry alike. In particular, the continued funding support that has been provided by the Australian Government needs to be acknowledged, as this high level of support is assisting the important role of extension undertaken by SeaNet which is becoming more integrated as an effective component of improved fisheries management.

I am therefore proud to present, in collaboration with the Australian Seafood Industry Council (ASIC), the Australian Marine Conservation Society (AMCS) and SeaNet's funding bodies, the 2002/03 SeaNet Annual Report which details the continued developments and progress of SeaNet over the last 12 months.

Christine Soul
Executive Officer
Ocean Watch Australia Ltd.

SeaNet – Who We Are and Why

SeaNet is an environmental extension service to the Australian Seafood industry and provides information and advice on improved fishing gear, technology and fishing methods. Our primary objective is to work with the fishing industry to minimise the catch of non-target species (bycatch) and encourage environmental best practice for industry. SeaNet Extension Officers (SEO's) work with commercial fishers and researchers to

assist in developing and implementing effective and practical solutions to minimise the impact of fishing and improve the sustainability of Australia's commercial fisheries.

SeaNet Extension Officers are employed by Ocean Watch Australia Ltd. and are hosted by an industry organisation within their relevant State or fishery. Through partnerships with fishers, researchers and managers, SeaNet facilitates the development and adoption of fishing gear, technology and methods aimed at minimising bycatch and improving the ecological sustainability of fishing. For fishers, involvement with SeaNet is voluntary, however, after only four years of operation, SeaNet has gained wide ranging support and cooperation from members of the seafood industry as well as other industry stakeholders.

Since its establishment in 1999, SeaNet has continued to expand its network and now has extension officers located in Queensland, NSW, Victoria, South Australia and Western Australia.

Outlined below is a complete list of projects SeaNet has been involved with over the last 12 months.

Projects in 2003

Eastern Tuna and Billfish Fishery

- Monofilament Recycling Education.
- Turtle Education Research Project.
- De-Hooking and Line-Cutting Devices.
- Industry Code of Practice for Responsible Fishing.

Queensland

- Small Boat Hopper.
- Great Barrier Reef Marine Park Authority (GBRMPA) Cairns LMAC.
- Cape Grafton to Cardwell Inshore Mesh - Code of Conduct.
- Hinchinbrook Region Crab Fishery - Code of Conduct.
- Underwater Acoustic Alarms – Pingers.
- Evaluation of Hoppers for Bycatch Reduction.
- Wilksch Net for Tilapia Removal.
- Cairns Region Inshore Trawl - Code of Conduct.
- Reef Safe Anchor.
- East coast BRD's and TED's.
- Gulf of Carpentaria Commercial Fishermen's Environmental Management Strategy.
- Marine Mammal Tracking - Towed Acoustic Array.

- Coral Reef Line Fishery - Code of Conduct.
- Reef Line Fishery Management Plan.
- Sonic Beam BRD for Prawn Trawl Fisheries.
- Exotic Pest, Vannamei Prawn from Aquaculture in Eastern Indonesia.

New South Wales

- Discard Chute to Increase the Post Release Survival of Bycatch Species.
- Flathead Nets – Examining the Effects of Net Height and Mesh Size on Bycatch.
- Use of Haul Release Bags to Increase the Post-Release Survival of Bycatch Species.
- Use of Square Mesh Codends to Reduce Small Prawn Discards.
- Escape Panels in Fish Traps.
- Development of Shrimp Trawl BRD's.

Victoria

- Best Practice and Environmental Management Strategy Development for Victorian Bay and Inlets Fishers.
- South East Trawl Gear Development and Bycatch Reduction.
- Reducing Seal Bycatch Mortality in Commercial Fisheries.
- South-East Trawl Stakeholder Education Workshop on the "FTV Bluefin".
- Eastern Zone Abalone Industry Association - Code of Practice.
- Implementation of a Bycatch Action Plan in the Victorian Commercial Eel Fishery.
- Identifying Bycatch Reduction Strategies in the Victorian Inshore Trawl.
- Reducing Fish Bycatch Mortality in Wrasse Fisheries.
- Southern Squid Jig Fishery - Code of Practice.
- Bass Strait Scallop Fishery - Code of Practice.

South Australia

- Marine Scalefish Fishery Bycatch in the Haul Net and Set Net Fishery.
- Fishing Practices and Bycatch Issues in the Spencer Gulf Prawn Fishery - Fishing Methods to Minimise the Impact on Incidental Species.
- Marine Scalefish Fishery - Best Practices in Haul Net, Set Net and Longline Fisheries.
- Marine Scalefish Fishery - Environmental Management System .
- Lakes and Coorong Industry Best Practice Manual.
- Wilksch Net for Carp Removal.

Western Australia

- Western Tuna and Billfish Fishery - Code of Practice.
- Shark and Turtle Tagging Programs.

Organisational Structure

The day to day management and administration of SeaNet is provided by Ocean Watch Australia Ltd., a public company limited by guarantee. Ocean Watch is an environmental non-government organisation committed to the conservation of marine and estuarine environments. The Executive Officer of Ocean Watch reports directly to an independent Board of Directors.

Ocean Watch Board

- John Corkill OAM (Chair)
- Graeme Byrnes
- Philip March
- Kerry Strangas
- Lindon Coombes
- Peter Doyle OAM
- John Mangos
- Bruce Standen
- Allan Broadhurst
- Bryan Skepper (Company Secretary)

Steering Committee

- Stan Jarzynski (DAFF)
- Simone Retif (DEH)
- Russ Neal (ASIC)
- Christine Soul (Ocean Watch)
- Kate Davey (AMCS)
- Kylie Paulson (FRDC)
- Joanne Fisher (AFMA – Observer)

National Office Staff

- Christine Soul - Executive Officer (Ocean Watch)
- Nicole Middleton - National Program Manager
- Emma Brunsdon - Administration Officer, *part time*

SeaNet Extension Officers

- Denis Ballam - Queensland (Cairns)
- Elton Robinson - Eastern Tuna and Billfish Fishery (Mooloolaba)
- Ben Leslie – Victoria (Melbourne)
- Cherie Heyes - South Australia (Adelaide)
- Carl Bevilacqua – Southern and Western Tuna and Billfish Fishery (Perth)
- Daniel Johnson - NSW (Maclean)

SeaNet Host Organisations

- The Northern Professional Fishermen's Association (NPFA)
- NSW Seafood Industry Council (NSWSIC)
- ProFish NSW
- East Coast Tuna Boat Owners' Association (ECTBOA)
- QLD Seafood Industry Association (QSIA)
- ECOfish
- SA Fishing Industry Council (SAFIC)
- Seafood Council South Australia
- Seafood Industry Victoria (SIV)
- WA Pelagic Longline Association (WAPLA)

SeaNet Research Partners

- Marine and Freshwater Resources Institute (MAFRI)
- South Australia Research and Development Institute (SARDI)
- QLD Department of Primary Industries (QDPI)
- CSIRO Marine Laboratories - Division of Fisheries
- NSW Fisheries

Milestones & Performance Indicators

M1. Appointment of staff to the SeaNet program and continued work development.

PI 1. Total number of SeaNet positions.

- Nicole Middleton – National Program Manager (Sydney).
- Emma Brunsdon – Administration Officer (Sydney), *part time.*
- Denis Ballam – Queensland Extension Officer (Cairns).
- Elton Robinson – Eastern Tuna and Billfish Fishery Extension Officer (Mooloolaba).
- Ben Leslie – Victoria Extension Officer (Melbourne).
- Cherie Heyes – South Australia Extension Officer (Adelaide).

- Daniel Johnson – New South Wales Extension Officer (Sydney).
- Carl Bevilacqua – Southern and Western Tuna and Billfish Fishery Extension Officer (Perth), *part time.*

PI 2. Number of new contacts and number of total contacts involved with SeaNet.

Throughout 2003, SeaNet Extension Officers have worked in close collaboration with members of industry, research and management, and this year alone have established over 900 new contacts with stakeholders. This close affiliation has continued to enhance the level of cooperation between parties and opened up new and stronger channels of communication for the transmission of information, ideas and improvements to gear and methods of operation.

M2. Determination and review of priority issues for each State and fishery.

PI 1: Level of communication (i.e. number of meetings, field days, etc.) with State and national steering committees, industry and researchers.

SeaNet Extension Officers are in daily contact with their host industries and regular meetings with industry, managers and grass-roots fishers are imperative for projects to develop in a mutually acceptable direction. All stakeholders are kept up-to-date with the progress of SeaNet projects through the quarterly SeaNet Newsletter which covers project, funding and staff developments. SeaNet Officers employ a variety of communication approaches including port visits, participation in workshops and attending industry meetings. The national SeaNet Steering Committee meets annually and SeaNet Officers attend meetings with their local steering committee members on an as-needs basis.

PI 2: Documentation of work plans for each extension officer.

SeaNet Extension Officers continually refine and prioritise their work-plans in consultation with host organisations, research partners and Ocean Watch Australia. The Executive Officer of Ocean Watch and the SeaNet Program Manager continually audit staff training needs on both an individual and team basis.

This year, SeaNet training activities have included:

- Participation in the seafood industry leadership course;
- Practical media training;
- EMS training;
- Attendance at Seafood Directions 2003; and
- Training course incorporating extension, negotiation, problem solving, presentation skills and group management techniques.

M3. Provision of progress reports to funding bodies and national steering committee.

PI 1: Reconciliation of financial income and expenditure in line with reporting requirements.

With submission of each bi-monthly report, each SEO incorporates a full breakdown of all financial activities for the period. These include:

- expense claim forms;
- in-kind contributions by each industry organisation;
- credit card reconciliations;
- time sheets; and
- project funding expenditure.

PI 2: Submission of bimonthly reports and project progress reports.

Each SeaNet Officer submits bi-monthly reports to the Program Manager which detail each Officers activities and project developments. These are collated and incorporated into a SeaNet progress report submitted every four months to the Department of Agriculture Forests and Fisheries (DAFF), in accordance with reporting requirements.

M4. Actions taken to secure alternative sources of funding for the SeaNet Program.

PI 1: Level of communication and negotiation with 'other' stakeholders with respect to seeking contribution of funds to SeaNet.

Adequate funding for project development is a constant priority for SeaNet and therefore actively seeking alternative sources plays a large role in the organisation's

activities. Numerous funding applications have been prepared throughout the year for the opportunity to collaborate with research and management organisations in appropriate projects. SeaNet also explores opportunities to incorporate our extension services with numerous project proposals developed by other stakeholder groups and gain funding to further develop and diversify successful SeaNet projects.

PI 2: Number of projects and activities involving SeaNet generated from 'other' sources.

A total of thirteen projects have been successfully implemented by SeaNet this year with funding provided by outside agencies (i.e. not NHT funded). Examples include:

- Victorian Bay and Inlets Fishery Environmental Management Strategy;
- FRDC National Hopper Project;
- FRDC Marine Mammal Tracking Project;

- Turtle Educational Workshop for Long-Line Fisheries; and
- Small Prawn Bycatch Extension - NSW Fisheries.

M5. Facilitating the adoption of bycatch mitigation measures by fishers.

PI 1: Level of involvement with industry relevant to identifying and using bycatch mitigation measures.

A fundamental role of the SeaNet extension service is to work closely with fishers in developing their own bycatch mitigation measures which benefit their particular fishery and/or local conditions. This incorporates the trialing of methods developed by researchers and their modification, where necessary, to best suit the fishers specific requirements. Numerous projects in 2003 have worked with industry in this capacity, resulting in the development and adoption of more sustainable gears and fishing practices. Examples include:

- The evaluation of hoppers for bycatch reduction;
- Best practice extension and EMS development for Victorian bay and inlets fishers;
- South-east trawl stakeholder education workshop and demonstration on the FTV 'Bluefin'; and
- The Western tuna and billfish fishery Code of Practice.

The Nordmore grid, probably the most well known bycatch reduction device.

PI 2: Number of fishers associated with SeaNet developing, using or adopting improved practices and/or gears.

In 2003, over 1000 fishers from around the country have been involved with the development, use and adoption of improved fishing practices and gears (refer to the SeaNet III Progress Reports, 1, 2 and 3).

M6. Contributing to improved fishing practices and methods.

PI 1: Number and type of feedback and communication mechanisms used by SeaNet to improve links between fishers, researchers and other stakeholders (newsletters, workshops, fishing trips etc.).

SeaNet is pro-active in promoting effective communication networks between the broad range of stakeholder groups involved in developing sustainable fisheries. Utilising a range of methods of communication ensures the message is received and understood by every audience. Examples include:

- displays at conferences, community days and events such as Ocean Care Day;
- delivery and distribution of various industry Codes of Practice, environmental management strategies and best practice manuals, videos and CD roms;
- the SeaNet newsletter, distributed to over 360 stakeholders nationwide (see the Ocean Watch website at www.oceanwatch.org.au);
- the promotion of SeaNet's activities through industry publications and the wider media; and
- grass-roots involvement through port visits, wharf walks and workshops.

PI 2: Number of SeaNet facilitated EMS's prepared, implemented or reviewed by the commercial fishing sector.

During 2003, SeaNet was involved in 17 EMS projects, the majority of which were Codes of Conduct.

M7. Documented examples of industry testing and working with new innovations and technologies.

PI 1: Number of fishers (individual or associations) involved with SeaNet in designing, testing or implementing bycatch reduction innovations and technologies.

Over 200 fishers have been involved with trialing new gears and/or methods in association with SeaNet projects in 2003.

PI 2: Number of projects/reports involving SeaNet relevant to the designing, testing or implementing of bycatch reduction innovations and technologies.

25 projects.

Project Profiles

SEANET VICTORIA

OFFICER: *Ben Leslie*

INDUSTRY HOST: *Seafood Industry Victoria (SIV)*

LOCATION: *Melbourne*

TITLE: *South East Trawl Fishery Stakeholder Education Workshop on the 'FTV Bluefin'.*

SeaNet and the South East Trawl Fishing Industry Association (SETFIA) co-hosted key government and non-government stakeholders at sea for a two-day offshore fisheries workshop with commercial trawl skippers and researchers from the south east trawl. The workshop, held in October 2002, was conducted on the Australian Maritime College's 35 metre fisheries training vessel the 'FTV Bluefin', and departed from the southern NSW fishing port of Eden.

Workshop Participants

SeaNet and SETFIA were responsible for organising and running the workshop, with support from Ocean Watch Australia Ltd., the Australian Maritime College and the Fisheries Research and Development Corporation (FRDC).

Participants from a number of management agencies and conservation organisations attended the workshop, including Environment Australia; the Australian Fisheries Management Authority (AFMA); Agriculture, Fisheries and Forestry Australia (AFFA); World Wide Fund for Nature (WWF); NSW Fisheries, the Marine and Coastal Community Network (MCCN) and the Bureau of Rural Sciences (BRS).

Why Hold a Trawl Fisheries Workshop?

The workshop was designed to offer stakeholders valuable insight into the operation of trawl fishing gear, industry practices and some of the ecological interactions that can occur during trawling. A number of presentations on relevant research projects were provided by industry experts and researchers to complement the practical activities. Advances in research to develop more efficient trawl nets and reduce bycatch in the South East Trawl Fishery (SETF) were also extended to workshop participants through practical trawl demonstrations and research presentations.

Workshop Benefits

A series of trawl demonstrations were delivered over the two-day workshop, with stakeholders making use of this rare opportunity to experience first hand trawling practices at sea. Workshop participants were able to examine trawl nets up-close and assist with sorting the catch while holding discussions with industry skippers and researchers. This was an ideal way for all involved to build on their understanding of commercial fish species and the important issue of minimising bycatch.

The FTV 'Bluefin'.

An experimental 'trouser trawl' with twin codends was used throughout the workshop. This enabled a variety of codends with modified mesh to be employed. Subsequent catch comparisons on the "Bluefin's" deck demonstrated to stakeholders the selectivity of each mesh type.

Catches from 100mm diamond mesh and square mesh codends were compared with industry standard 90mm codends. These practical demonstrations were backed up by research presentations from fisheries scientist, Dr Ian Knuckey. Along with the significant reduction in bycatch from using modified codends, the potential impact of reduced commercial catches was highlighted to stakeholders.

Modified codends were developed as part of the Fisheries Research and Development Corporation' project 98/204 to reduce SETF bycatch. This was a partnership project between the Marine and Freshwater Research Institute (MAFRI), SETFIA and SeaNet delivering on the extension of research outputs including a newsletter and video. This sea-going workshop was an industry first, bringing together a diverse group of industry stakeholders for the benefit of sustainable management and conservation in the South East Trawl Fishery.

Participants inspecting the trawl content aboard the FTV 'Bluefin'

SEANET EAST COAST TUNA AND BILLFISH FISHERY
OFFICER: *Elton Robinson*
INDUSTRY HOST: *East Coast Tuna Boat Owners Association (ECTBOA)*
LOCATION: *Mooloolaba*
TITLE: *De-Hookers and Line-Cutters*

SeaNet recently secured funding from the Threatened Species Network (TSN) Community Grant for the project, *'*Increasing the uptake of de-hooking and line-cutting devices in the Eastern Tuna and Billfish Fishery (ETBF*)*'. The ETBF longlines for tuna and billfish and as in many other fisheries, bycatch is unavoidable. The project will demonstrate to fishers the use of various de-hookers and line-cutters to increase industry's awareness of their application with respect to improved handling procedures. The adoption of new de-hooking and line-cutting devices in the ETBF will reduce bycatch mortality and increase the operational efficiency.

Why?

De-hookers and line-cutters aid the quick and efficient release of hooked and/or entangled by-catch such as seabirds, marlin and sharks, thereby increasing their chances of post-release survival. Veterinarians confirm that the most important aspect of some species' survival is removal of the hook and at the very least, cutting the trailing line as short as possible.

As the embedded hook is retrieved, the unique shape of the de-hooker prevents the hook from re-engaging.

How De-hookers and Line-cutters Work

De-hookers are tools used to remove and retrieve hooks from externally and internally hooked animals. The beauty of the de-hooker is in it's ability to remove the hook without inflicting further injury As the hook is being removed, the point is protected by the offset bend and does not re-engage. The device allows much faster and easier removal of previously inaccessible hooks, the sooner the hook is removed, the greater the chance of survival. The different models of de-hooking devices allow for the removal of hooks from animals brought on deck and those too large to bring on board that must be tended to while still in the water. De-hooking devices have been tested by USA fishers in the north-east Atlantic with great success. During the US trials 97% of hooks were removed from the beak, tongue or mouth of 34 loggerhead turtles.

Line-cutters ensure the safe and effective removal (cutting) of monofilament line from entangled by-catch animals too large to be brought on board. The device is safe for both animal and operator as the blade is enclosed in a V-design. The line-cutter is comprised of 4' sections for adjustment to the desired length of 4, 8 or 12', depending on the freeboard height of the vessel.

Benefits Of The Devices

Using these devices not only benefits bycatch, but the fisher and financial bottom line. Fewer hooks and less monofilament line is lost, catch release time is less, as are the risks of injury from teeth, bills and beaks.

Positive public perception of the industry is a valuable asset and can be improved through the wider uptake and promotion of de-hookers and line-cutters across a range of commercial fisheries.

The Trial

During March 2004, the devices will be trialed by 12 selected operators whose experiences will be monitored, recorded and extended throughout the fishery. Best practice handling procedures will be identified and compiled as a guide to the most appropriate use and design(s) for the ETBF. Project outcomes will be communicated to other fishers by documentation and video.

Head of a line-cutter showing the protective 'V' shaped blade

SEANET QUEENSLAND

OFFICER: ***Denis Ballam***

INDUSTRY HOST: ***ECOfish/Queensland Seafood industry Association (QSIA)***

LOCATION: ***Cairns***

TITLE: ***Reducing the Incidental Capture of Dolphins in Fishing Nets with Alarms and Pingers***

Reduction of marine mammal bycatch has been addressed in various gillnet fisheries overseas using a variety of methods, including effort reduction, time-area closures, gear modifications, and passive and active acoustic devices. Bycatch reduction using an active acoustic alarm system is seen as the initial step, and perhaps the least disruptive, to reduce marine mammal deaths in fishing gear.

A LIEN (Cairns) Pinger

Role of Acoustic Devices

Alarms and pingers that emit signal pulses within the audible range of marine mammals are referred to as active acoustic devices and warn approaching mammals to the presence of the devices and the nets to which they are attached. In a range of fisheries where mammal bycatch levels were high, and where sufficient observer coverage was available, using alarms/pingers have reduced bycatch by statistically significant levels. Overseas examples where pinger use has significantly reduced bycatch levels include:

- Pingers reduced the bycatch of marine mammals by 93%, 92% and 85% in four European Community offshore fisheries.
- The predatory behaviour of dolphins toward fish in nets was significantly reduced in the Mediterranean on two occasions with different acoustic devices (2002 and 2003). While net damage was reduced, dolphin catch was also reduced and fish catch increased.
- Mammal bycatch was reduced by 95% in the Californian offshore gillnet fishery when pingers were introduced.

- Pingers reduced bycatch of Indo-Pacific humpbacked dolphins in Natal, South Africa. While resident dolphins appeared to be aware of the presence of nets without pingers, they hunted more actively around nets than they had before pinger attachment.

It should be acknowledged that there are no reports of acoustic devices achieving 100% success. While concerns have existed for mammals becoming habituated (de-sensitized) to the warning effect of acoustic devices, no evidence exists for it actually translating to increased bycatch.

Trialing Pingers in Australia

Queensland DPI, SeaNet and the University of Queensland received a National Heritage Trust grant from the Department of Environment and Heritage (DoEH) Australia, to examine the effectiveness of active acoustic devices to reduce marine mammal bycatch in gillnet fisheries.

- DPI and SeaNet constructed low frequency devices called LIEN (Cairns) alarms. Whales, dugongs and dolphins hear the alarms. SeaNet coordinated industry trials and distributed to industry for incorporation into normal fishery operations.
- DPI and SeaNet provided higher frequency pingers likely to be heard by dolphins, for trials with N9 and Queensland Gulf Joint Authority fishery gillnet operators. The N9 and FRDC Northern Shark Fisheries Observers monitored the pinger deployment. A major sounder transducer manufacturer makes these AIRMAR pingers.
- The University of Queensland conducted trials with alarms and pingers in Moreton Bay with Indo-Pacific humpbacked dolphins and dugong. The behavioural responses of the mammals to the devices were monitored, e.g. surfacing and underwater acoustic behaviour.

SEANET WESTERN TUNA AND BILLFISH FISHERY

OFFICER: *Carl Bevilacqua*

INDUSTRY HOST: *Western Australia Fishing Industry Council (WAFIC)*

LOCATION: *Perth*

TITLE: *The Southern and Western Tuna and Billfish Fishery Industry Code of Practice for Responsible Fishing*

SeaNet facilitated the development of an Industry Code of Practice for the Southern and Western Tuna and Billfish Fishery (SWTBF) in conjunction with the Western Australian Pelagic Longline Association (WAPLA). A species identification and handling guide was also produced to accompany the Code. It is a formal response to the requirements placed on industry in the By-catch Action Plan (BAP) for seabirds. The Code of Practice sets out the principles and standards of behaviour for responsible fishing in the SWTBF. It is a demonstration of this fishery's long term commitment to ensuring the SWTBF is fished in a sustainable manner.

The Code of Practice is to be distributed with the assistance of AFMA through their logbook program. The main document is designed to be kept in the wheelhouse, while the species identification and handling guides are printed on waterproof paper and have been designed to be able to withstand deck conditions.

The Code will be distributed to other fishing industry organisations by request, and will be accessible in a downloadable form from the SeaNet website www.oceanwatch.org.au.

The Code has been designed to be implemented, not just distributed. In order to ensure it's credibility, industry members will be contacted to determine the up-take of the Code. The monitoring of the code will be conducted under an agreed process and industry members are asked to cooperate with any such survey.

A Code of Practice is a 'living document' that will be updated and altered as fishing practices and regulatory standards evolve in the industry. The code will remain current until 2005 when a review will be conducted to make appropriate changes. This Code is voluntary, however parts of the Code have been taken from laws and regulations.

The Code of Practice will help to ensure yellow-fin tuna remains a viable resource.

The SWTBF at a Glance

The SWTBF is a multi-species and multi-method fishery targeting tuna and tuna-like species. The Southern and Western Tuna and Billfish Fishery (SWTBF) encompasses the combined areas of the Western Tuna and Billfish Fishery (WTBF) and the Southern Tuna & Billfish Fishery (STBF). Currently there are 124 permits employing a variety of methods to target tuna and billfish including longline, purse-seine and minor line, depending on their specific permit entitlements.

Extent of the Fishery

- The WTBF extends westward from Cape York Peninsula (142°30'E) off Queensland to 34°S off the west coast of Western Australia, seaward of the 200m isobath.
- The STBF extends eastward from 34°S off the west coast of WA, across the Great Australian Bight to 141°E at the South Australian/Victorian border.

Target Species

- Species taken in the WTBF include yellowfin tuna, bigeye tuna, broadbill swordfish and to a lesser extent, albacore tuna, skipjack tuna and longtail tuna.
- Species taken in the STBF include bigeye tuna, skipjack tuna and to a lesser extent, albacore tuna.

Industry Development

- 900% increase in catch over 5 years (371t to 3,322t);
- 1200% increase in effort over 5 years (500k to 6,174k hooks);
- Australia's largest swordfish fishery (2,135t in 2001);
- SWTBF GVP on the order of $50 million in 2002.

SEANET SOUTH AUSTRALIA
OFFICER: *Cherie Heyes*

HOST INDUSTRY: *South Australia Fishing Industries Council (SAFIC)*

LOCATION: *Adelaide*

TITLE: *Best Practice Guide to Reduce Interaction with Juvenile Mulloway, Crabs and Birds in the Lakes and Coorong Fishery of South Australia.*

In the Lakes and Coorong region of South Australia, fishers target carp, callop, bony bream, flounder, mulloway, cockles and yellow-eye mullet. Despite selective fishing methods, nets targeting yellow-eye mullet occasionally catch juvenile mulloway, depleting growing stocks of this commercially valuable species. The fishers approached the South Australian SeaNet Officer, Cherie Heyes for assistance in developing best practice guides to reduce the bycatch of juvenile mulloway and the predation on the catch by crabs and seabirds. In response, SeaNet SA, in association with Ocean Watch, developed a practical manual covering best practice measures which was distributed to fishers during 2002.

Interaction with seabirds is a common problem shared by many different fisheries.

Juvenile Mulloway

The most effective measures to reduce the capture of juvenile mulloway were identified as:

- Floating nets and reduced net depth. During the warmer months when food is abundant, mulloway feed on the sea floor while yellow-eye mullet remain mid-water and at the surface. By adding extra buoyancy, reducing lead line weight or reducing net depth, mulloway are avoided and the target catch maintained.
- Ensuring nets are slung correctly and the optimal mesh size and ply rating is used. These measures effectively reduce interactions with non-target species. An industry driven initiative to legislate a standard mesh size of between 2 and 2.5 inches has further reduced the capture of juvenile mulloway.
- The use of monofilament lines and heavy ply are also effective measures. Fishers maximise net efficiency with a high hanging ratio, which is also more selective in catching a limited size range of fish.
- Avoiding known areas with high bycatch. These areas have been identified as reef, rocky bottom and mud habitats.
- Timing the setting and hauling of nets. During the warmer months, mulloway feeding times peak at dawn and dusk. Fishers avoid these times to reduce bycatch, keep soak time to a minimum and check nets on a regular basis.

Crabs and Seabirds

Predation by crabs and seabirds is also a significant problem for the industry, resulting in the loss of catch value and quality. Best practice measures identified by SeaNet to reduce the loss of salable Yellow-eye mullet were identified as:

- Floating nets off the sea floor;
- Avoiding areas known to have high numbers of crabs and;
- Replacing lead weights with metal rings.

Bird activity is greatest during the day and full moon, and so some fishers set nets at night to avoid predation and damage to gear. Other measures include:

- Regular checking of nets (limited soak time);
- Avoiding bait schools which attract seabirds and;
- Avoiding setting nets close to critical bird habitats such as rookeries and colonies.

SEANET NEW SOUTH WALES

OFFICER: *Daniel Johnson*

INDUSTRY HOST: *Northern Professional Fishers Association (NPFA)*

LOCATION: *Maclean*

TITLE: *Reducing the Discarding of Small Prawns in NSW's Commercial and Recreational Prawn Fisheries*

NSW Fisheries has received funding from the Fisheries Research and Development Corporation (FRDC) to investigate methods of reducing the discard of small prawns in NSW's commercial and recreational prawn fisheries. As part of this funding, NSW Fisheries has incorporated the services of SeaNet to work in cooperation with fishers in the Clarence River prawn fishery to trial the effectiveness of modified gears developed from this research and extend to other relevant fisheries. SeaNet is also communicating the outcomes of these trials through various industry media, newsletters and the new Ocean Watch website.

Overview of Research Findings

Selectivity is the ability of a net to retain prawns of commercial size while limiting the capture of under and oversized prawns and unwanted species. This research identified a number of ways to improve selectivity, the easiest being to increase the size of openings in the codend by changing the hanging ratio, mesh size and size and shape of codends.

Diamond vs. Square Mesh Codends

In comparing the selectivity of regular diamond mesh and square mesh codends, the conventional minimum diamond mesh size of 40mm is inefficient, catching too many small, unsaleable prawns. The relatively simple change to square mesh codends significantly reduces the retention of juvenile prawns and other bycatch species without reducing the size of the commercial haul.

Unknotted vs. Knotted Mesh Codends

Unknotted compared to knotted square mesh improves selectivity of the catch, even with a smaller sized mesh. Slipping knots in a larger sized mesh during repeated trawls probably allowed a larger size range of prawns to escape. Further research is recommended to test larger unknotted mesh sizes for further improvement to catch selectivity.

How to Reduce Stress

Released prawn bycatch often dies following release due to physical damage and trauma which can increase mortality through an increased likelihood of infection. This research assessed whether square mesh codends reduced damage and stress levels of estuarine school prawns in repeated simulated trawls. It was found that stress levels, measured by concentrations of L-lactate, were not significantly higher amongst prawns which underwent a cycle of 10 simulated 'trawls' through a square mesh codend when compared to usual background levels of L-lactate in 'untrawled' prawns. These prawns

were also found to sustain minimal damage after repeated trawls. Other factors such as methods of operation, time spent in the trawl, and type and amount of other bycatch species can increase mortality, indicating that further investigations are required.

Trap Nets are Best

In comparing the selectivity of various fishing methods, anecdotal evidence from fishers that trap-netting is the most selective was supported by this research. The design of trap-nets and method of collection enlarges the mesh openings, allowing the optimum number of undersized fish and prawns to escape. Other methods such as otter trawls and stow nets hold the catch in codends, where crowding and restricted mesh openings reduce chances of escape. Larger mesh showed no real benefits, although more small prawns were excluded, so too were more prawns of commercial size.

Communication and Promotional Activities

- Launch of the Western Tuna and Billfish Fishery Code of Practice for Responsible Fishing during Seafood Directions, 2003 by Dr. Wendy Craik, Chair of the AFMA, September 18th, 2003.
- Launch of the Eastern Tuna and Billfish Fishery Code of Practice, by the Hon. Ian Macdonald, Minister for Fisheries, Forestry and Conservation, Mooloolaba, May 23rd 2003.
- The Hon. Ian Macdonald, Minister for Fisheries, Forestry and Conservation launched the continued funding for SeaNet in Cairns, November 2002 (pictured).
- SeaNet and Ocean Watch education trailer displays at numerous community events.

- Conference display at Seafood Directions, Perth, September 2003.
- Development and update of the new Ocean Watch/SeaNet website (www.oceanwatch.org.au)
- Distribution of the quarterly SeaNet newsletter to researchers, industry, management authorities and other stakeholders nationwide.
- Articles published in various industry and government magazines, newsletters and web-sites.
- Ocean Watch/SeaNet combined Christmas function at the Sydney Fish Market, December 2002.
- SeaNet stand at the Cairns Show, July 2003.

Workshops

- Education and extension workshop with commercial trawl skippers and researchers from the south east trawl for fisheries stakeholders aboard the 'FTV Bluefin', October 2002.
- Elton Robinson (ETBF Extension Officer) attended the International Fisheries Forum, Hawaii, November 2002.
- SeaNet steering committee, Canberra, December 2002.
- Government policy update presentations from DAFF, DoEH etc., Canberra, February 2003.
- EMS training, Sydney, August 2003.
- Media training, Sydney, August 2003.

Appendix I: Outcomes and Activities

The table below identifies the degree to which each SeaNet project has achieved the following Natural Heritage Trust outcomes through specific NHT determined activities.

Outcomes

1) A reduced environmental impact of commercial fishing activities to assist in ensuring the ecological sustainability of estuarine and marine fisheries in the long term;
2) The conservation of the biodiversity of aquatic systems;
3) Increased awareness, understanding and support among the fishing industry of the need for sustainable aquatic biodiversity conversation; and
4) Increased development and uptake of industry best practice and adoption of Environmental Management Systems within the commercial sector.

Activities

a) Facilitating the increased uptake of bycatch reduction devices (BRD's) within the commercial fishing industry;
b) Involvement with commercial fishers to design and implement bycatch reduction innovations;
c) The encouragement of fishing sectors to identify solutions to their own natural resource management issues;
d) Increased understanding by the fishing industry of sustainability in an environmental context;
e) Improved rate of transfer of research generated knowledge about new fishing gears and practices;
f) Development of feedback mechanisms to ensure stronger links between researchers, managers and fishers;
g) Education programs to reduce levels of marine pollution/debris from the commercial fishing industry;
h) Improved commercial fishing practices and methods;
i) Improved networks between commercial fishers, State environment officers and other stakeholders and;
j) Development of Environmental Management Plans and Codes of Conduct.

PROJECT	STATUS [8]	OUTCOMES				ACTIVITIES									
		1	2	3	4	a	b	c	d	e	f	g	h	i	j
Eastern Tuna and Billfish Fishery code of practice for responsible fishing.	C	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Monofilament disposal & recycling education brochure.	C	✓		✓				✓	✓	✓		✓	✓	✓	
Sea turtle research & education project.	U	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Increasing the uptake of de-hooking and line-cutting devices in the ETBF and WTBF.	U	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Protected species handling manual (PSHM) workshops.	D	✓	✓	✓				✓	✓	✓		✓	✓	✓	
Ongoing extension and support of CSIRO research.	U	✓	✓							✓	✓			✓	
Cairns region inshore trawl - code of conduct.	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Cape Grafton to Cardwell inshore mesh - code of conduct.	D	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓
Hinchinbrook region crab fishery - code of conduct.	D	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓
Underwater acoustic alarms – pingers.	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Evaluation of hoppers for bycatch reduction.	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Wilksch net for tilapia removal.	D		✓							✓	✓				
Small boat hopper.	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barnes hook.	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Reef safe anchor.	D	✓	✓		✓			✓	✓	✓			✓		
Great Barrier Reef Marine Park Authority (GBRMPA) Cairns LMAC.	D			✓				✓	✓	✓	✓			✓	
East coast bycatch reduction devices and turtle exclusion devices.	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Gulf of Carpentaria commercial fishermen's environmental management strategy.	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Testing of acoustic tracking system for whales around longline and gillnets fishing gear, and preliminary trials for depredation mitigation devices for longline fisheries.	U	✓				✓	✓	✓	✓	✓	✓		✓	✓	
Coral reef line fishery - code of conduct.	D	✓	✓	✓	✓			✓	✓			✓	✓		✓
Sonic beam BRD for prawn trawl fisheries.	P	✓	✓			✓	✓	✓	✓	✓	✓		✓		
Exotic pest, Vannamei prawn from aquaculture in eastern Indonesia	P									✓	✓			✓	
PROJECT	STATUS [8]	OUTCOMES				ACTIVITIES									

		1	2	3	4	a	b	c	d	e	f	g	h	i	j
Fishing practices and bycatch issues in the Spencer Gulf prawn fishery - fishing methods to minimise the impact on incidental species.	S	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Discard chute to ensure the post release survival of bycatch species.	C	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Flathead nets – examining the effects of net height on bycatch.	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Haul release bag.	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Reduction of small prawn discards.	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Escape panels in fish traps.	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Development of shrimp trawl BRD's.	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Marine scalefish fishery - best practices in haul net, set net and longline fisheries in South Australia.	S	✓	✓	✓	✓										✓
Reducing Marine scalefish fishery bycatch in the haul net and set net fishery.	S	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓		
Marine scale fishery - EMS	C	✓	✓	✓	✓										✓
Lakes and Coorong best practice manual.	C	✓	✓	✓	✓										✓
Wilksch net for carp removal.	S	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Best practice extension and EMS development for Victorian bay and inlets fishers.	C	✓	✓	✓	✓										✓
South-east trawl gear development and bycatch reduction project.	C	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Reducing seal bycatch mortality in commercial fisheries.	P	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
South-east trawl stakeholder education workshop on the "FTV Bluefin".	C			✓											
Eastern zone abalone industry association - code of practice.	P	✓	✓	✓	✓										✓
Implementation of a bycatch action plan in the Victorian commercial eel fishery.	P	✓	✓	✓			✓	✓	✓	✓	✓		✓	✓	

PROJECT	**STATUS**	**OUTCOMES**				**ACTIVITIES**									
		1	2	3	4	a	b	c	d	e	f	g	h	i	j
Identifying bycatch reduction strategies in the Victorian inshore trawl fishery.	S	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	

Reducing fish bycatch mortality in wrasse fisheries.	S	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Southern squid jig fishery - code of practice.	P	✓	✓	✓	✓										✓
Bass Strait scallop fishery - code of practice.	P	✓	✓	✓	✓										✓
Victorian rock lobster fishery - code of practice.	P	✓	✓	✓	✓										✓
Western tuna and billfish fishery - code of practice.	C	✓	✓	✓	✓										✓

✠ C = Completed; U = Underway; D = Under Development; S = Suspended; P = Proposed.

Appendix II: Financial Report

Account	Quarter to 31/12/02	Quarter to 30/03/03	Quarter to 30/06/03	Quarter to 30/09/03	Allocated Expended Funds	Year to Date
	$	$	$	$	$	$
Amount Received	$165,000.00	$0.00	$330,000.00	$0.00	$22,000.00	$517,000.00
Tax Remitted	$15,000.00	$0.00	$30,000.00	$0.00	$2,000.00	$47,000.00
Grants Received - SeaNet	$150,000.00	$0.00	$300,000.00	$0.00	$20,000.00	$470,000.00
Balance brought forward	$150,000.00	$52,894.65	-$39,749.73	$147,301.50	$40,902.70	
Starting Balance	**$150,000.00**	**$52,894.65**	**$260,250.27**	**$147,301.50**	**$60,902.70**	**$470,000.00**
Expenses						
Advertising and Promotion	$469.36	$0.00	$2,160.00	$9,835.92	$3,000.00	$15,465.28
Accountancy & Audit	$0.00	$0.00	$3,575.00	$0.00	$1,100.00	$4,675.00
Bank Fees and Charges	$58.89	$152.65	$32.40	$29.80	$10.80	$284.54
Conferences & Training Seminars	$1,176.06	$0.00	$500.00	$4,595.30		$6,271.36
Consultants Fees	$0.00	$0.00	$5,700.91	$2,446.82	$11,500.00	$19,647.73
Lodgement Fees	$94.00	$0.00	$0.00	$0.00		$94.00
Insurance - General	$0.00	$94.42	$0.00	$0.00		$94.42
Computer Expenses	$1,309.21	$1,299.95	$7,854.55	$2,154.54	$2,400.00	$15,018.25
Post, Print and Stationery	$829.48	$275.43	$664.02	$3,297.59	$495.51	$5,562.03
Telephone & Communications	$2,825.04	$2,489.35	$3,459.77	$7,395.48	$572.21	$16,741.85
Salaries Permanent	$61,750.06	$68,788.40	$68,508.93	$57,898.92	$29,962.98	$286,909.29
Superannuation	$5,557.51	$5,740.46	$5,566.18	$5,212.45	$2,963.37	$25,039.97
Workers Compensation Insurance	$956.73	$0.00	$1,411.69	$0.00		$2,368.42
Annual Leave Provision	$1,704.38	($2,649.96)	$2,936.06	-$1,528.19		$462.29

Subscriptions	$60.91	$0.00	$0.00	$95.45		$156.36
Technical Equipment	$472.02	$624.53	$444.70	$940.27	$193.64	$2,675.16
Publications	$31.82	$0.00	$10.57	$95.45		$137.84
Accommodation and Meals	$4,655.98	$2,962.83	$1,204.01	$3,453.45	$1,054.21	$13,330.48
Fares	$6,540.76	$3,258.74	$3,009.63	$2,607.56	$3,089.82	$18,506.51
Vehicle Hire and Costs	$7,570.26	$8,485.03	$5,003.62	$6,468.33	$4,129.60	$31,656.84
Taxis	$422.20	$666.86	$235.84	$70.55	$259.42	$1,654.87
General Travel Costs	$620.68	$455.69	$670.89	$1,329.11	$171.14	$3,247.51
Total Expenses	**$97,105.35**	**$ 92,644.38**	**$112,948.77**	**$106,398.80**	**$ 60,902.70**	**$ 470,000.00**
Unexpended Grant	$52,894.65	-$39,749.73	$147,301.50	$40,902.70	$0.00	$0.00

Appendix III: Glossary

AFFA	Agriculture, Forestry and Fisheries Australia (now the Department of Agriculture, Forestry and Fisheries).
AFMA	Australian Fisheries Management Authority.
AMCS	Australian Marine Conservation Society.
ARC	Aquatic Release Conservation.
ASIC	Australian Seafood Industry Council.
BRD's	Bycatch reduction devices.
BRS	Bureau of Rural Sciences.
DAFF	Department of Agriculture, Forestry and Fisheries (formerly Agriculture, Forestry and Fisheries Australia - AFFA.
DEH	Department of Environment and Heritage (formerly Environment Australia - EA).
ECTBOA	East Coast Tuna Boat Owners' Association Ltd.
EMS	Environmental Management Strategy.
ETBF	Eastern Tuna and Billfish Fishery.
FRDC	Fisheries research and Development Corporation.
FTV	Fisheries Training Vessel.
GBRMPA	Great Barrier Reef Marine Park Authority.
LMAC	Local Management Advisory Committee.
MAC	Management Advisory Committee.
MAFRI	Marine and Freshwater Resources Institute.
MCCN	Marine and Coastal Community Network
MFMA	Master Fish Merchants Association.
NGO	Non-Government Organisation.
NPFA	Northern Professional Fishermen's Association.
NSWSIC	New South Wales Seafood Industry Council.
PIRSA	Primary Industry Resources - South Australia.
PSHM	Protected Species Handling Manual.
QDPI	Queensland Seafood Industry Association.
SAFIC	South Australia Fishing Industry Council.
SARDI	South Australia Research and Development Institute.
SEO	SeaNet Extension Officer.
SETFIA	South East Trawl Fishing Industry Association.
SIV	Seafood Industry Council of Victoria.
TED's	Turtle exclusion devices.
TSN	Threatened Species Network.
WAPLA	West Australian Pelagic Longline Association.
WTBF	Western tuna and billfish fishery.