

## NSW GOVERNMENT RESPONSE TO THE LEGISLATIVE COUNCIL SELECT COMMITTEE ON RECREATIONAL FISHING REPORT

December 2011

### Terms of Reference:

That a select committee be appointed to inquire into and report on the benefits and opportunities that improved recreational fisheries may represent for fishing licence holders in New South Wales, and in particular:

- (a) the current suite of existing regulatory, policy, and decision-making processes in relation to the management of recreational fisheries in New South Wales, including the process for the creation of Marine Protected Areas and Marine Parks and the efficacy of existing Marine Protected Areas and Marine Parks,
- (b) the effectiveness and efficiency of the current representational system of trusts and advisory committees that advise government departments and statutory authorities,
- (c) the value of recreational fisheries to the economy in New South Wales,
- (d) the gaps in existing recreational fishery programs, including the number and location of Recreational Fishing Havens, and
- (e) ecologically sustainable development issues related to improving recreational fisheries.

**Recommendation 1: p 39 - That Industry and Investment NSW ensure that as soon as practicable compliance activity is undertaken to enforce compliance with the rules governing the use of meshing nets, particularly in the Clarence River.**

### Response

NSW Department of Primary Industries (NSW DPI) fisheries officers continually focus on illegal netting activity with a number of commercial fishers charged with offences recently. A number of netting offences were detected by fisheries officers in the Clarence District over the past summer months including the over-setting of meshing nets and the use of nets by illegal methods. Meshing nets and an illegal hauling net were seized from the alleged offenders. In one case, NSW DPI fisheries officers also seized a quantity of fish valued at \$500 from one commercial fisher. Penalty notices up to \$500 were issued for a number of these matters whilst the more serious offences are being dealt with by court attendance notices. Annual district compliance plans are developed each year by NSW DPI, which outline specific strategies to address fisheries issues in a particular area. These plans include compliance action to address the potential impact of commercial fishers using meshing nets during winter and the unintentional by-catch of Australian bass in all major rivers including the Clarence, Hawkesbury, Hastings, Manning and Shoalhaven.

Fisheries officers will continue to plan for and target illegal netting activity and information from concerned individuals is invited by using the recently developed on-line reporting form or through the Fisher's Watch freecall number on 1800 043 536.

**Recommendation 2: p 46 - That the NSW Government, as a high priority, provide appropriate funding to ensure the design and implementation of a statistically robust survey that will provide as accurate as possible assessment of recreational fishing catch and effort throughout NSW, and that this survey is undertaken once every five years.**

**That the NSW Government consider funding and commissioning an Environmental Impact Statement (EIS) to review and evaluate the recreational fishing catch and effort in NSW waters.**

### **Response**

Currently the only reliable and accurate state-wide information on recreational catch and effort is available from the National Recreational and Indigenous Fishing Survey, which was undertaken in 2000/01. The main challenge throughout the world is how to obtain representative estimates of recreational catch and effort in a cost-effective way over large geographical scales. However, recognizing the need for updated state-wide information, NSW DPI hosted a workshop in November 2010 involving international and national scientists which identified the most appropriate and cost effective state-wide survey methodology for NSW. The NSW Government has subsequently funded the implementation of a state-wide survey of recreational fishing, which will commence in early 2012. Contributing funding is being provided from the Recreational Fishing Trusts. The survey methodology will use a phone/diary system and will include NSW and ACT residential households. The survey will also sample a proportion of Victorian residents that have a NSW one or three year recreational fishing fee receipt in an attempt to determine their level of catch and effort. The survey will be carried out using the most appropriate and up to date survey methodology and provide statistically robust estimates of State-wide recreational catch and effort that are directly comparable to the National Fishing and Indigenous Fishing Survey carried out in 2000/01. This work will underpin the future management of recreational fisheries.

Commercial fisheries in NSW use a range of technologies and large scale gear to harvest our fisheries resources. These fishers play a key role in the industry to supply fresh seafood to communities across the State, as well as to interstate and overseas markets. Environmental impact statements and fishery management strategies have been prepared for each of the major commercial fisheries in NSW to help ensure they are managed in a sustainable way. These fisheries are managed using a range of controls such as zoning, minimum size limits, fishing gear specifications, spatial and temporal closures, and restrictions on the capture of by-product species.

The NSW Government is not proposing to undertake an EIS for recreational fishing activities. Compared to commercial fisheries, recreational fishers are regulated to use very limited amounts and types of gear in NSW. A comprehensive suite of minimum size limits, bag and possession limits and closures further restrict recreational fishing activities. Anglers typically catch and retain sufficient fish for their immediate needs only and many fishers practise catch and release. A major review of recreational fishing rules has now commenced. Environmental assessments, however, have been undertaken for major fisheries enhancement projects, including freshwater fish stocking and offshore artificial reefs. NSW DPI is also currently preparing an EIS for a marine stocking program in NSW.

**Recommendation 3: p 61 - That the Recreational Fishing Trust Funds provide a greater allocation of available funds to rehabilitation and restoration of aquatic habitat and establish formal Memoranda of Understanding and funding arrangements with relevant Catchment Management Authorities to undertake inland river, estuary and coastal pollution reduction programs.**

**Response**

The NSW Government has increased funding from the Recreational Fishing Trusts in 2011/12 and 2012/13 for fish habitat rehabilitation projects to a total of \$700,000 per year, following advice from the Advisory Council on Recreational Fishing (ACoRF). Around \$350,000 for aquatic habitat protection management is also being provided by the NSW Government from the Trusts. The latter program facilitates thorough assessment of any works that harm marine vegetation; involve dredging or reclamation; obstruct fish passage; construct or modify barriers to fish passage; harm spawning areas for certain fish; use explosive substances in waters; or involve aquaculture developments.

Formal agreements with Catchment Management Authorities (CMAs) for funding arrangements are also being negotiated as part of the development of the NSW DPI Fisheries Habitat Action Plan and the review and updating of Catchment Action Plans.

**Recommendation 4: p 63 - That the NSW Government prepare and publish a Plan which sets out the current and proposed actions across government that will be taken to address the threats to marine biodiversity, including fish stocks.**

**Response**

The Government will work to ensure that the threats to marine biodiversity are being effectively addressed and that its programs are evidence based and deliver tangible results. The effectiveness of current actions to conserve marine biodiversity will be reviewed and advice sought on how threats can be most effectively addressed as part of the Government's Independent Scientific Audit of Marine Parks. This evidence base and thorough consultation will inform the Government's future plans in this area.

**Recommendation 5: p 88 - That the Marine Park Authority continue to publish information identifying the location of the various categories of reef habitat within each park for the use of the marine park users and to continue to publish information on the seabed mapping program as it progresses.**

**Response**

Information from the NSW Habitat Mapping Program, which includes the mapping of reef and other habitats within marine parks, will be published progressively. The report 'Seabed habitat mapping of the continental shelf of NSW' was recently published and is accessible from the environment website ([www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)).

**Recommendation 6: p 102 - That the Marine Park Authority place statistics and explanatory information regarding the number and type of cautions and penalty notices issued on either its public website or on each individual marine park's public website.**

**Response**

Information and statistics on enforcement actions for marine park offences including written cautions, penalty notices and prosecutions will be published on the marine parks website ([www.mpa.nsw.gov.au](http://www.mpa.nsw.gov.au)) on an annual basis starting from the 2010/11 reporting year.

**Recommendation 7: p 105 - That the Department of Environment, Climate Change and Water finalise negotiations with software providers with a view to developing a means by which marine park zone boundaries can be displayed on GPS systems used by recreational fishers.**

**Response**

The Government is committed to improving awareness about zoning arrangements and recognises that the vast majority of recreational fishers want to comply with the zoning plans. Work will continue with commercial GPS navigation software providers with a view to ensuring up to date marine park zoning information can be displayed on GPS navigation systems. Options for providing free and easy access to zoning plan boundary information for upload and use on handheld GPS capable devices will also be explored.

**Recommendation 8: p 107 - That agendas and minutes of marine park advisory committees be published on the Marine Park Authority's website.**

**Response**

Meeting summaries including agendas and outcomes are now available on the marine parks website ([www.mpa.nsw.gov.au](http://www.mpa.nsw.gov.au)).

**Recommendation 9: p 109 - Marine Park Authority, with the assistance of the NSW Environmental Protection Agency, identify land based licensed and unlicensed point source and non-point source discharges and pollution into marine protected areas and prioritise them in terms of need for remedial action, and continue to provide funding to assist local councils in remediating these discharges.**

**Response**

The Government is concerned about the impact of point and diffuse pollution on the marine environment including marine protected areas and has recently commenced the largest hazardous facilities audit program in NSW targeting industries across the state that pose a high risk of environmental harm. Initially, the audit will focus on 42 major hazard facilities that store toxic, hazardous or dangerous substances in large quantities or volumes; including oil refineries, chemical processing plants, large chemical and gas storage depots and large chemical warehouses.

The Independent Scientific Audit of Marine Parks will review current actions to conserve marine biodiversity and make recommendations on how these can be most effectively addressed. In this context, the threat posed by pollution and the effectiveness of current point and diffuse source pollution reduction initiatives will also be considered.

It is anticipated that the outcomes of these audits will help inform Government decisions as to how pollution reduction initiatives including those undertaken by the Environment Protection Authority, local government and catchment management authorities are prioritised, resourced and delivered.

**Recommendation 10: p 113 - That as the primary objective of NSW marine parks is to conserve the biological diversity and maintain the ecological processes responsible for the operational management of marine parks should continue to be appropriately led by the Department of Environment, Climate Change and Water. Responsibility for the declaration of and management of marine parks should be vested jointly with the Minister for Environment, Climate Change and Water and the Minister for Primary Industries.**

#### **Response**

Responsibility for administration of the *Marine Parks Act 1997* including the declaration and management of marine parks remains the joint responsibility of the Minister for Primary Industries and the Minister for the Environment. The Department of Environment, Climate Change and Water no longer exists and the Government transferred operational management of marine parks and catchment management authorities to NSW DPI in April 2011. The Independent Scientific Audit of Marine Parks in NSW is investigating how the threats to marine biodiversity can be effectively addressed and which bodies or agencies are most appropriate to address them.

**Recommendation 11: p 113 - That the NSW Government maintain the concurrence role for the Minister for Primary Industries in the Marine Park Act and remove any concurrence requirements that do not directly relate to fisheries management issues or legislative mandates.**

#### **Response**

The Act remains jointly administered by the Minister for Primary Industries and the Minister for the Environment who are identified as the 'relevant Ministers' given their responsibility for the *Fisheries Management Act 1994* and the *National Parks and Wildlife Act 1974* respectively. The relevant Ministers are required to take action jointly or decide matters jointly in accordance with section 5(2) of the Act.

**Recommendation 12: p 132 - That a 100-metre from shore habitat protection zone be implemented within suitable current sandy ocean beach sanctuary zones until a review of the utility of such sanctuary zones is completed.**

#### **Response**

The Government has committed to maintaining the existing zoning plans as in place at February 2011, pending the outcome of the Marine Parks Independent Scientific Audit. Recent amendments to the *Marine Parks Act 1997* have enacted this commitment. Section 17B(5) of the Act imposes a temporary moratorium on the alteration of existing marine park sanctuary zones, for a period of up to five years, unless a shorter moratorium period is imposed by order of the Governor. The Act requires the Ministers to initiate an independent scientific audit of marine parks and to consider and respond to the audit report in writing before the moratorium can be lifted. The Audit is now underway and is considering amongst

other issues, the effectiveness of marine parks in protecting different habitat types and recommend further action and/or alternative management approaches as necessary.

**Recommendation 13: p 135 - That at least one fishable zone within each marine park be selected to trial restricted fishing access, with each site to be monitored to determine the impact of this restricted access on biodiversity, habitat and ecological processes, compared to a fully restricted sanctuary zone, in consultation with recreational fishers.**

**Response**

The Government has committed to initiating a trial of environmentally friendly recreational fishing techniques and this project will be informed by the outcomes of the Marine Parks Independent Scientific Audit.

**Recommendation 14: p 138 - That the NSW Government provides sufficient funding to ensure the effective and timely implementation of the twenty-four recommendations contained within the December 2009 report Marine Park Science in NSW – an Independent Review.**

**Response**

Marine Park Science in NSW – an Independent Review, and the former Government's response - the Marine Parks Strategic Research Framework 2010-15 will be considered during the independent scientific audit of marine parks. The Government is seeking advice on ways to address the most significant information gaps hindering robust, evidence based decision making on marine parks and anticipates that this will influence the resourcing and direction of future marine park research and monitoring programs.

**Recommendation 15: p 138 - That the NSW Government not create any new marine park until the next five-year marine park research plan is completed.**

**Response**

The Government has enacted a temporary moratorium on the creation of any new marine parks for a period of up to five years, unless a shorter moratorium period is imposed by order of the Governor via recent amendments to the *Marine Parks Act 1997*. The Act requires the Ministers to initiate an independent scientific audit of marine parks and to consider and respond to the audit report in writing before the moratorium can be lifted.

**Recommendation 16: p 143 - That Industry & Investment NSW undertake a review, including any legislative constraints, of the structure, membership and operation of the Advisory Council on Recreational Fishing.**

**Response**

The NSW Government is considering current consultative arrangements with the Advisory Council on Recreational Fishing to ensure its ongoing effectiveness for providing quality advice to Government on recreational fishing matters. The Government is also undertaking an independent review of NSW commercial fisheries management, policy and administration, which will identify potential mechanisms for consulting jointly with the recreational, commercial and Indigenous fishing sectors.

NSW DPI is also developing a communications strategy for recreational fishing outlining existing recreational fisheries publications and new strategies and methods to further promote education and advisory of recreational fishing rules, responsible and sustainable fishing practices, safe fishing and Trust programs. It will also include a communication strategy for ACoRF and focus on making information more readily available for recreational fishers.

**Recommendation 17: p 147 - That the NSW Government investigate the sufficiency of expenditure on recreational fishing compliance officers and that both Industry and Investment NSW and the fishing trusts establish a shared funding arrangement for funding compliance with regulatory controls.**

### **Response**

A review of fisheries compliance officer structure was undertaken by DPI in 2007 and implemented in January 2008 following an extensive consultation process with staff and stakeholder representatives.

The discussion on the restructure at all times focused on addressing OH&S issues (in particular the issue of one-person districts) and making the most strategic use of the resources available.

The changes included that:

- all districts would have a minimum of two staff, and wherever possible three staff;
- Fisheries officer positions will be located at Coffs Harbour and Batemans Bay to assist in the management of the two large offshore patrol vessels;
- Fisheries Officer Grade 3 positions (positions which include a supervisory role) would be created at each of the three main training districts at the Central Coast (Narara), Sydney North (Wollstonecraft) and Sydney South (Sans Souci) to assist in the training of fisheries officer recruits and assist in the overall management of the respective districts;
- conservation compliance outcomes would continue to be managed by the Fisheries Conservation Officer positions on the north, central and south coasts and be supplemented by an additional position based at Narrandera (to coordinate inland conservation/aquaculture compliance activities); and
- the Fisheries Investigation Unit would have three regionally-based, two-person mobile squads which will spend 50% of their time on recreational issues and 50% of their time on post-harvest, black-marketing and targeting high-risk offenders.

NSW DPI works strategically on targeted programs to maximise voluntary compliance and create effective deterrence. The outcome pursued is to optimise compliance with fisheries laws whilst ensuring the cost of enforcement is reasonable without risking the sustainability of the fisheries resource.

Eighteen fisheries officers are funded using funds from the Recreational Fishing Trusts to optimise compliance with the recreational fishing rules and in recreational fishing havens in NSW. The remaining 73 officers are funded by DPI.

NSW DPI continues to regularly report to recreational fishing advisory bodies on compliance effort and outcomes in the recreational fisheries programs, and engages in dialogue to ensure that the funding balance meets the objectives of the recreational fishing sector while also meeting other program service requirements.

**Recommendation 18: p 156 - That Industry & Investment NSW in consultation with recreational fishing organisations, Indigenous fishing representatives and other relevant bodies review the current structure of the Advisory Council on Recreational Fishing.**

**That ACoRF develop a communication strategy so that current information can be made available in a timely manner to the wider fishing community.**

#### **Response**

The NSW Government is considering current consultative arrangements with the Advisory Council on Recreational Fishing to ensure its ongoing effectiveness for providing quality advice to Government on recreational fishing matters. The Government is also undertaking an independent review of NSW commercial fisheries management, policy and administration, which will identify potential mechanisms for consulting jointly with the recreational, commercial and Indigenous fishing sectors.

The Advisory Council on Recreational Fishing (ACoRF) currently meets 3 times a year and outcomes from meetings are published on the NSW DPI website for the information of all stakeholders. The NSW DPI Recreational Saltwater and Freshwater Fishing Guides 2011 also provide information about the role of Council for the fishing public. Recreational fishers and members of the public can contact ACoRF to raise any major issues relating to recreational fishing in NSW via email: [acorf.enquiries@industry.nsw.gov.au](mailto:acorf.enquiries@industry.nsw.gov.au) or post to: ACoRF, c/-, Department of Primary Industries, PO Box 21, CRONULLA NSW 2230.

NSW DPI is also developing a communications strategy for recreational fishing outlining existing recreational fisheries publications and new strategies and methods to further promote education and advisory of recreational fishing rules, responsible and sustainable fishing practices, safe fishing and Trust programs. It will also include a communication strategy for ACoRF and focus on making information more readily available for recreational fishers.

**Recommendation 19: p 170 - That Industry & Investment NSW immediately commence on-going research on the broader ecosystem and recreational fish stocks within each recreational fishing haven, with information updated at least every five years.**

#### **Response**

NSW DPI has completed scientific surveys of recreational fishing in Lake Macquarie, St Georges Basin and Tuross River. The project involved interviewing recreational fishers and surveying their catches in each waterway between March and May 2011. The catch and effort data collected for Lake Macquarie and Tuross will be compared against similar data collected in 1999 before the waterways were made recreational fishing havens and in 2004 immediately after they were declared havens. This is the first time a survey has been done in St Georges Basin. The data will identify whether there have been further improvements in recreational fishing and the broader ecosystem in the estuaries since they were first made havens. These three estuaries provide a representative sample of the 30 havens and the previous survey data provides important reference points for comparison. Previous research had shown that the average size of some key species such as flathead had increased since the havens commenced. Undertaking scientific surveys in all 30 havens is not considered necessary and is currently cost prohibitive.



In addition, NSW DPI has been conducting scientific research surveys of fish populations since 2008 in seven estuaries in NSW, including Lake Macquarie and St Georges Basin. The data from these surveys is currently being analysed and, in particular, comparisons will be made of fish populations in estuaries that are recreational havens and those that are not havens. Additional biological and demographic work on five key fish species is also being done in these estuaries which are contributing to the department's fisheries resource assessments.

**Recommendation 20: p 173 - That Industry & Investment NSW, in consultation with recreational and professional fishers, investigate and identify the locations and circumstances in which limited commercial access to recreational fishing havens could be considered.**

#### **Response**

The NSW Government notes that the Select Committee Report acknowledges the concerns of the commercial fishing sector regarding the loss of fishing access during the creation of the recreational fishing havens and the implementation and review of marine parks.

The NSW Government does not have immediate plans to change fishing arrangements in the 30 recreational fishing havens. However, adjustments to existing havens have been previously made. For example, in the Richmond River haven, local commercial fishers developed a proposal to re-open a small area in Shaws Bay to allow mullet hauling to resume, noting that sea mullet are not targeted in large numbers by recreational fishers. Following extensive consultation with recreational fishers, the area was re-opened to sea mullet hauling and in exchange, 27 km of the Richmond River upstream from Tatham Bridge was closed year round to commercial netting, which represented a win-win situation for both sectors.

The NSW Government will consider any proposals from the recreational, commercial and Indigenous fishing sectors regarding adjustments to the current havens on a case-by-case basis.

**Recommendation 21: p 175 - That the NSW Government commission research to determine the impact of recent government developments on the Botany Bay recreational fishing haven with a view to determining what mitigating actions and remediation programs can be established in proximity to the Botany Bay RFH to maintain or improve recreational fishing opportunities.**

#### **Response**

There have been a number of significant infrastructure projects undertaken in Botany Bay, including construction of the Sydney Desalination Plant by Sydney Water and the Port Botany Expansion undertaken by the Sydney Ports Corporation. The Botany Bay Cable Project is also currently being implemented by Ausgrid. To improve environmental outcomes, NSW DPI negotiated several habitat offsets associated with these projects, including transplanting seagrass, reconstruction of saltmarsh areas and development of an estuarine system that was designed to encourage re-establishment of seagrass beds. There has also significant development of artificial rock reef around the Third Runway as an offset for the construction of vertical concrete walls on the port facilities. These offsets will have flow-on benefits to the local environment as well as recreational fishing. The Sydney Ports Corporation also set up a

consultative forum with recreational fishers and has constructed a new car park, boat ramp and fish cleaning tables to replace the fishing facilities at Penrhyn estuary.

In 2006, NSW DPI deployed a number of small pilot artificial reefs in six locations in Botany Bay to improve recreational fishing opportunities. Following two years of detailed monitoring, NSW DPI commenced expansion of the pilot reefs with the deployment of an additional 200 artificial reef modules in water depths ranging from 8 to 16m. Phase 3 of the artificial reef construction was completed in May 2011, with an additional 200 modules deployed at the site, making a total effective reef area of around 2,000m<sup>2</sup>. NSW DPI has undertaken ongoing monitoring of the artificial reefs in Botany Bay since 2006 and this information will be used to help guide ongoing mitigation and remediation programs that may be required in the future to ensure quality recreational fishing opportunities are maintained.

**Recommendation 22: p186 - That the Marine Parks Authority identify at least one location within each marine park where an artificial reef could be deployed without negatively affecting nearby sanctuary zones.**

#### **Response**

The NSW Marine Park Authority has a published policy relating to the deployment of artificial reefs in marine parks. The policy provides guidance to proponents of artificial reefs or fish aggregating devices (FADs) within marine parks. The policy also enables proposals for artificial reefs and FADs in marine parks to be appropriately assessed and managed. The policy also ensures artificial reefs and FADs have minimal negative impacts on the marine environment, natural and cultural heritage values of marine parks and minimal negative impacts on other users of marine parks. The NSW Government is willing to consider proposals from stakeholder groups regarding artificial reefs in marine parks.

**Recommendation 23: p 191 - That Industry & Investment NSW investigate increasing the involvement of the recreational fishing sector in research and information gathering on the population and health of fish stocks.**

#### **Response**

NSW DPI currently has a number of ongoing research programs which directly involve recreational fishers. The Game Fish Tournament Monitoring involves sampling angler catch and effort directly from club-based fishers at game fishing tournaments along the NSW coast. Information on key pelagic species such as billfish, tuna and sharks is gathered. The Basscatch program commenced in 1988 and is a similar project which collects catch and effort information from Australian bass fishing events along the coast. Information from these two programs is used in scientific assessments of our fisheries resources. The NSW DPI Game Fish Tagging program has been running since 1973 and is the largest program of its kind in the world. Tags are provided to hundreds of anglers each year who tag and release a wide range of species. Upon recapture, important scientific information is gathered on movement and growth of tagged fish.

The Greater Sydney recreational fishing survey was completed in 2009 and involved surveying anglers at boat ramps about their catch. More recently current recreational fishing surveys were undertaken in Lake Macquarie, St Georges Basin and Tuross Lake between March and May 2011 which also involved surveying anglers to obtain information on their catch and effort.

Anglers have been encouraged to participate in these research programs as it is a way they can provide information to help manage their fisheries resources. Typically anglers have been supportive of their involvement in research programs and response rates in previous programs have been excellent. Where scientifically appropriate, NSW DPI will continue to involve anglers in research programs.

In addition to these surveys, anglers have been and will continue to be involved in the studies of fish movements in which anglers assist researchers catching and tagging fish in NSW. Several very successful field days have been held in the Hawkesbury, Shoalhaven and Clyde Rivers by NSW DPI over the past 3 years and has involved many anglers from several fishing clubs. Anglers have also greatly assisted with several research fishing tournaments in marine and freshwaters to assess the survival of fish following capture and release. This angler-involved research will continue to 2015.

**Recommendation 24: p 197 - That the allowance of four attended lines, with a maximum distance of 100m allowable to the fisher be reinstated, this issue should be revisited during the review of fishing rules that will follow the 2011 review.**

#### **Response**

Fishing rules in NSW general inland waters allow for two attended rods to be used by a recreational fisher. The maximum distance that a fisher may be from these attended lines is 50 metres. The NSW Government notes that this recommendation in the Select Committee Report is referring to the reinstatement of four unattended lines, rather than four attended lines.

Four unattended lines are currently permitted in saltwater fishing areas. Many fishers have traditionally used set/unattended lines. Recent research studies done by NSW DPI has shown that undersized, threatened fish or non target species, such as platypus and turtles, hooked on unattended lines have a much lower chance of survival as these lines may not be checked for several hours. Any set lines that are lost or mistakenly left behind after fishing can continue to "ghost fish" for a long time, that is, hooked fish will not be able to escape. Research has also shown that compared to actively fished lines, unattended lines (i.e. slack-line fishing) can increase the chances of deep hooking a fish and these fish have a much lower chance of survival if re-released after the hooks are removed.

Unattended set lines can also create compliance problems in that they are easier to hide, can be set in large numbers, and ownership of a particular line is more difficult to prove.

A discussion paper reviewing recreational bag and size limits in NSW waters was released for comment in 2005. The discussion paper included a proposal to prohibit set lines in NSW waters. A majority of responses supported the prohibition on the use of set lines and these changes were introduced in 2007. The number of attended lines was also increased to 2 and the distance a fisher may be from an attended line increased to 50m as practical measures to enable anglers to continue to enjoy fishing and camping on our inland rivers.

It is considered that these changes are now helping to ensure that the quality of the fishery is maintained and improved in the long term, and these rules are consistent with jurisdictions such as Victoria.

**Recommendation 25: p 204 - That Industry & Investment NSW produce a summary brochure of key recreational fisheries rules. These summary brochures should be distributed with renewal notices for recreational licences.**

**Response**

DPI has a wide range of recreational fishing advisory materials which are distributed free of charge to anglers every year via Fisheries Officers, Fishcare Volunteers, recreational fishing licence agents and at various community events such as trade shows and field days. Popular publications include the annual comprehensive saltwater and freshwater guides, sticky ruler measuring devices with fishing rules and tri-fold brochures with summaries of freshwater and saltwater fishing rules and regulations. These latter summary brochures represent a quick reference, easy to read summary for anglers. DPI will send these summary brochures to recreational fishing licence holders enclosed with their licence renewal notices.

**Recommendation 26: p 205 - That Industry & Investment NSW develop an email address database of recreational fishing licence holders with a view to using this as a means of direct communication and interaction with the recreational fishing sector.**

**Response**

In addition to the media described in the response to recommendation 25, NSW DPI has a comprehensive and informative website, which includes regional fishing guides on 26 districts throughout NSW. The NSW DPI recreational fishing newsletter titled 'Newscast' is produced regularly and published on the NSW DPI website and sent to the 'Newscast' email distribution list.

Since 2008 NSW DPI has been collecting email addresses from licence holders on a database when anglers have paid the recreational fishing fee online. When purchasing online, anglers are able to provide their email address to receive recreational fishing information (note: the email address field is a non-mandatory field). It is not feasible to collect angler email addresses from other sales channels such as licence agents and the phone because of extended transaction times.

The NSW DPI database of email addresses from online licence purchases currently has over 40,000 addresses and will be used to send the 'Newscast' publication and other important recreational fisheries information to anglers on a regular basis. Recreational fishers, including fishers exempt from the fee, and the broader public will also be able to subscribe to the broadcast email newsletter. An implementation strategy is currently being developed. This will greatly enhance the information and advisory services for anglers throughout NSW.

**Recommendation 27: p 206 - That Industry & Investment NSW investigate, with a view to developing, a fishing licence registration scheme for all licenced fishers other than exemptees.**

**Response**

NSW DPI currently collects the details of all persons who pay the recreational fishing fee. NSW DPI notes the Select Committee Report recognises a need for the collection of fisher details from exempt fishers including the large pensioner fishing sector to increase communication and for resource management purposes. This need may also extend to other exempt categories such as people under the age of 18 and Aboriginal people.

Although the possible benefits of a registration system for all recreational fishers is acknowledged, it would be onerous to extend registration to all recreational fishers who are currently exempt from the fee. The costs associated with the extra administration of potentially another 500,000 anglers would exceed the amount that could reasonably be collected under a nominal fee arrangement. Such a registration scheme may also be seen as creating unnecessary red tape.

The NSW DPI state-wide survey of recreational fishing, which will commence in early 2012, will also provide updated estimates of fishing effort for scientific resource assessments and fisheries management purposes.

**Recommendation 28: p 211 - That Industry & Investment NSW undertake a review of the staffing of compliance officer positions in view of the need for extra compliance officers.**

**Response**

Eighteen fisheries officers are funded using funds from the Recreational Fishing Trusts to optimise compliance with the recreational fishing rules and in recreational fishing havens in NSW. The remaining 73 officers are funded by NSW DPI.

NSW DPI continues to regularly report to recreational fishing advisory bodies on compliance effort and outcomes in the recreational fisheries programs, and engages in dialogue to ensure that the funding balance meets the objectives of the recreational fishing sector while also meeting other program service requirements.

Please also refer to the response provided to Recommendation 17.

**Recommendation 29: p 212 - That fin clipping for all recreational fish be investigated.**

**Response**

The NSW Advisory Council on Recreational Fishing council has previously recommended that DPI investigate the feasibility of implementing fin clipping requirements for recreational fishers to minimise opportunities for the illegal sale of fish and black marketing, particularly for high value saltwater and freshwater recreational species.

Currently there are requirements for a number of high-value fish species caught on charter boats to be fin clipped before being removed by recreational fishers from a charter boat. DPI is currently undertaking a review of recreational fishing rules and the feasibility of extending fin clipping requirements to all recreational fishers will be considered as part of this review.

**Recommendation 30: p 220 - That Industry & Investment NSW fill the two vacant recreational fishing access officer positions.**

**Response**

Historically recreational fishers have enjoyed widespread access to creeks, dams, estuaries and ocean waters via numerous access points across NSW. However, over time some access points have been lost through foreshore development, road closures and changes to land use plans. NSW DPI currently has two dedicated access managers who facilitate the maintenance and enhancement of current recreational fishing access through liaison with state agencies and key stakeholders, negotiating access arrangements on behalf of

stakeholders and developing management solutions, including Crown Land important for angler access. These positions are currently filled and are funded using funds from the Recreational Fishing Trusts.

The NSW Government notes the Select Committee report recognises a need to increase the resources for the access program and that an 'empowered body' could contribute to the program (p220). The Government recently provided funding from the Recreational Fishing Trusts for the Recreational Fishing Alliance of NSW to implement the Angler Access Project in January 2011 to complement the existing NSW DPI program.

The aim of the Angler Access Project is to identify parcels of Crown Land adjacent to important recreational fishing locations and to establish reserves for recreational fishing purposes under the Crown Lands Act 1989. The project is working closely with NSW DPI. Plans of management for the reserves will also be developed in collaboration with stakeholders to manage the areas on an ongoing basis.

The Angler Access Project is enabling anglers to take a proactive role in maintaining and improving access to freshwater and saltwater fishing locations on Crown Land. It will also provide opportunity for local recreational fishing clubs and organisations to play a role in the ongoing stewardship of the crown reserves. NSW DPI will continue to work with the Recreational Fishing Alliance to facilitate delivery of the program:

**Recommendation 31: p 222 - That the Minister for Water consider the impacts of recreational fishing on water storage impoundments with a view to determining the types of fishing activities that could be permitted, in particular at the Prospect Reservoir on a trial basis.**

#### **Response**

Recreational fishing is permitted in the majority of regional water supply impoundments across NSW. Many of these dams have multiple uses for agriculture, electricity generation and drinking water supply.

Within the Greater Sydney area, major impoundments are mostly managed by the Sydney Catchment Authority. In particular, Prospect Reservoir was completed in 1888 to store water fed by gravity from the dams of the Upper Nepean system, via the Upper Canal. Water has been transferred from Warragamba Dam to Prospect Reservoir since the 1940s making Prospect Reservoir an integral part of the water supply system. The filtration plant at Prospect can draw water directly from Prospect Reservoir if required, providing greater flexibility in sourcing the best quality water.

The Sydney Water Inquiry in 1998 highlighted the need for an alternate water supply to Sydney should there be a water quality event in Warragamba Dam. To enable Prospect to be used as an alternate supply a 1400ML/day raw water pumping station was commissioned in 2007 to access up to 28,000 ML, an amount capable of providing Sydney's water supply for at least three weeks.

Prospect Reservoir remains an integral part of Sydney's drinking water supply and has been used to supply water to the Water Filtration Plant on a number of occasions since the commissioning of the raw water pumping station, most recently in December 2010. It is required in times of high demand for water and during times of poor water quality at

Warragamba. It is also a supplementary supply during planned and unplanned maintenance shutdowns of the Warragamba to Prospect pipelines. While supply from the Prospect Reservoir is intermittent, it needs to be available at all times to enable a rapid response and flexibility in the sourcing of water.

Prospect Reservoir and the adjacent lands are designated as a Schedule 1 Special Area under the Sydney Water Catchment Management Regulation (2008). Under the regulation Schedule 1 lands are no entry, that is, human access is prohibited unless with consent from the Sydney Catchment Authority (SCA). Under the Sydney Water Catchment Management Act 1998, the purposes of the special areas are:

- (a) protecting the quality of stored waters, whether intended for use for drinking or other purposes,
- (b) maintaining the ecological integrity of an area of land to be declared to be a special area in a manner that is consistent with the SCA's objectives.

Restricting access to catchments is a well established mechanism for protecting drinking water quality. This was recognised by the Sydney Water Inquiry and reaffirmed by the 10 year review of the Sydney Water Inquiry recommendations. It is part of a multi barrier approach to protect Sydney's drinking water supplies.

In September 2010 the Western Australian Parliamentary Standing Committee on Public Administration reported on its Inquiry into Recreation Activities within Public Drinking Water Source Areas. The Committee found that the objectives of providing safe water and achieving the health and safety benefit of interaction with natural environments are not compatible in the same geographical area and that public water source areas are best committed to the single purpose of providing source water. The inquiry also found that humans recreating in source areas pose an unacceptable risk to drinking water quality and that the protection of drinking water sources remains the paramount consideration.

Relevant considerations in the Committee's conclusion that dual use of public drinking water source areas is untenable included:

- That human pathogens remain the most significant threat to water quality
- That human presence in the catchments has cumulative, adverse ecological impacts potentially affecting water quality
- The recreational benefits of activities in natural environments can be achieved in locations other than public drinking water source areas.

Different recreational activities generate varying risks to drinking water quality. Some activities may not pose a significant risk at all. However, the associated campsites, vehicle access, rubbish disposal, human waste and control of inappropriate behaviour do pose a real risk to water quality and public health.

Within the Greater Sydney area, recreational fishing is permitted on Schedule 2 Special Area Lands under the Sydney Water Catchment Management Regulation (2008). This currently includes Tallowa Dam and Fitzroy Falls Reservoir which are part of the Shoalhaven Scheme and initially built to augment Sydney's water supply in times of drought. Water is not extracted directly from these storages, which are a considerable distance from Sydney, unlike Prospect

Reservoir which can directly supply water to the Prospect Water Filtration Plant that treats over 80 per cent of Sydney's water.

The NSW Government will consider any proposals for new access opportunities to impoundments. Any new proposals will need to take account of the potential risks to water quality supply and include a detailed risk assessment.

**Recommendation 32: p 238 - That Industry & Investment NSW investigate a block licensing system for Aboriginal commercial fishers that will allow their family and community members to assist in beach hauling.**

#### **Response**

DPI is currently developing an Aboriginal cultural fishing policy in consultation with the NSW Aboriginal Fishing Advisory Council (AFAC). In extension to this, consideration is to be given to viable economic opportunities for Aboriginal communities associated with the fisheries resource. Existing commercial fishing arrangements form part of the considerations and in recognition that there are Aboriginal families currently involved in commercial fishing operations, how the current rules sit with the cultural aspects of community and family life will be further discussed. Importantly, development of future policy will be done in a consultative way and aspects around commercial fishing will include AFAC. Also, Aboriginal people currently or in the past involved in commercial fishing will be encouraged to participate in developing opportunities.

**Recommendation 33: p 238 - That Industry & Investment NSW should also investigate the suitability of the licensing system to be inherited by a family member along traditional lines without the family members having to apply for a new licence. These licences should be issued with comparative rights for the member inheriting the licence.**

#### **Response**

The Aboriginal cultural fishing policy referred to above will consider viable economic opportunities for Aboriginal communities associated with the fisheries resource. Existing commercial fishing arrangements form part of the considerations and in recognition that there are Aboriginal families currently involved in commercial fishing operations, how the current rules sit with the cultural aspects of community and family life are in frame for further discussion. Importantly, development of future policy will be done in a consultative way and aspects around commercial fishing will include AFAC. Also, Aboriginal people currently or in the past involved in commercial fishing will be encouraged to participate in developing opportunities.

**Recommendation 34: p 255 - That Industry & Investment NSW examine the potential for use by spearfishers of Recreational Fishing Havens, FADs and artificial reefs on a temporal or spatial basis.**

#### **Response**

The NSW Government promotes responsible recreational fishing practices at all times, including sharing of access to our fisheries resources. Recreational fishers are encouraged to adopt the NSW DPI responsible fishing guidelines to minimise impact on the environment and other members of the community, including being considerate of all user groups such as other fishers, swimmers and boaters and to act responsibly in their presence.



NSW DPI is not aware of any conflict issues associated with the use of estuarine artificial reefs and havens by anglers and spearfishers. Many NSW estuaries are closed to spearfishing to ensure public safety and safe navigation. Poor water visibility in some estuaries will also limit access for spearfishers. DPI has also recently deployed the State's first offshore artificial reef off Sydney to improve recreational fishing opportunities. It stands 12 metres high, weighs around 42 tonnes and has been deployed at a depth of 38m. Although this depth will restrict access for many spearfishers, a primary objective of deploying large purpose built reefs in ocean waters is to ensure stability in a high energy environment. These stability requirements can only be achieved by deployment in relatively deep waters.

The NSW DPI fish aggregating devices program was implemented in 2003. There were some initial reports of conflict around FADs between anglers and spearfishers. The Department subsequently developed a FADs code of conduct in 2004 to encourage ethical and responsible sharing of the facilities. Since the development of the code of conduct, reports of conflict have been minimal. There is potential for additional FADs to be deployed in high use regions. For example, five FADs are currently deployed in the greater Sydney region. However, the deployment of FADs for a specific user group, such as spearfishers or anglers only, or spatial restrictions has the potential to increase conflict between recreational user groups and there would also be associated advisory and enforcement issues.

**Recommendation 35: p 264 - That the Water Safety Advisory Council investigate the most appropriate type of lifejacket for rock fishers and publicise this information and further investigate the possibility of introducing mandatory use of life jackets for rock fishers particularly at high risk fishing sites.**

#### **Response**

Rock fishers make up a small sector of the recreational fishing community. Some fishing can be done safely from the rocks, especially in sheltered bays, inlets and protected headlands. However some rock platforms, especially on more high energy exposed coastline where large waves can break unpredictably, can be more dangerous for rock fishers.

A series of rock fishing safety programs have been implemented over the years by various organisations, including NSW DPI, to educate and assist rock fishers in NSW to help keep them safe, including:

- the Angel Ring program;
- the NSW 'Don't put your life on the line' rock fishing safety awareness program (involving production and distribution of rock fishing safety folder and DVD);
- the Asian Awareness Project (involving rock fishing safety advertising); and
- a series of rock fishing safety workshops especially for people of a non-English speaking background, the Multilingual Safety Information Program (involving safety information distribution to recreational fishing licence holders).

The mandatory use of life jackets for rock fishers has previously been identified by various groups, including the NSW Water Safety Advisory Council, as a means to address safety and drowning concerns. It is generally acknowledged that there are a number of complexities associated with the proposal which require detailed investigation.

NSW DPI is currently implementing recommendations from two Coronial Inquiries into a total of 14 rock fishing deaths at North Bondi in 2009 and 2010.

### **Glebe Coroners Court recommendations from 25 February and 13 May 2011**

1. That research be undertaken under the authority of the Department to:
  - identify the demographic groups most likely at risk of drowning related to fishing fatalities, and
  - identify and assess the effectiveness of all educational, enforcement and engineering safety methods currently used to prevent such fatalities.
2. That the results of such research be used to develop a rock fishing safety program for NSW.

### **Newcastle Coroners Court recommendations 11 August 2011**

In addition to the recommendations handed down in the Glebe Coroners Court, the following specific issues should be considered by NSW DPI when developing an enhanced rock fishing safety program for NSW:

- consider whether the time taken for local government authorities and other relevant agencies to approve the erection of appropriate warning signs and the provisions of safety devices in relevant locations is an acceptable time period. Consider what steps can be taken to speed up the process involved in approving the erection of such warning signs and flotation devices;
- consider what is the most appropriate portable flotation device that should be carried by those involved in rock fishing. Consider whether or not it should be compulsory for any such device to be in the possession of a person who engages in rock fishing; and
- consider whether the level of funding available to organisations such as the Alliance and Surf Life Saving NSW for education campaigns about the dangers of rock fishing, particularly for campaigns directed at Australians of a non Anglo-Celtic background is sufficient.

The enhanced, coordinated rock fishing safety program will take into account both sets of recommendations from the Inquiries.

**Recommendation 36: p 269 - That Industry & Investment NSW in consultation with recreational fishers and other relevant bodies, investigate and identify locations and circumstances in which limited commercial access can be maintained.**

#### **Response**

The NSW Government does not have immediate plans to change fishing arrangements in the 30 recreational fishing havens. However, adjustments to existing havens have been previously made. For example, in the Richmond River haven, local commercial fishers developed a proposal to re-open a small area in Shaws Bay to allow mullet hauling to resume, noting that sea mullet are not targeted in large numbers by recreational fishers. Following extensive consultation with recreational fishers, the area was re-opened to sea mullet hauling and in exchange, 27 km of the Richmond River upstream from Tatham Bridge was closed year round to commercial netting, which represented a win-win situation for both sectors.

The NSW Government will consider any proposals from the recreational, commercial and Indigenous fishing sectors regarding adjustments to the current havens on a case-by-case basis but changes will only be made where there is strong consensus to do so.

**Recommendation 37: p 277 - That Industry & Investment NSW publish information on the discarded by-catch in NSW.**

**Response**

NSW DPI is among the leaders in the world in quantifying and mitigating discarded bycatch. NSW DPI scientists are regularly invited to, and chair, international meetings, conferences and workshops associated with this topic. Most recently, the NSW DPI Fisheries Chief Scientist was approached and employed by the United Nations to develop International Guidelines on exactly this issue. Research surveys have been done in NSW commercial fisheries over the past three decades, which has provided extensive information on bycatch and discards. A comprehensive list of these published studies is provided in Appendix 1 and they are also available on the Department's website.

NSW DPI recently completed research surveys between 2007-2009 of retained and discarded catches from commercial line fishing, using independent observers. These observers accompanied commercial fishers during normal fishing operations and collected scientific data on the retained and discarded components of their catches. This was done according to a scientifically rigorous sampling design over the two-year period. A scientific report on this survey is in the final stages of preparation, and elements have been released and discussed with external stakeholders. Observer surveys on the retained and discarded catch of large sharks by commercial line fishermen is continuing.

In addition, a similar two year observer based survey will commence shortly on the ocean trap and line fishery in coastal waters of NSW. This will provide updated information about retained catches and levels of interaction with grey nurse sharks and other species.

NSW DPI is committed to continuing its very successful, and world-leading, research on bycatch mitigation, which involves the development and testing of more selective fishing gears and fishing practices in commercial and recreational fisheries.

**Recommendation 38: p 282 - That the NSW Government establish, and provide ongoing support for, a permanent forum for the commercial and recreational fishing sectors to meet on a regular basis to discuss common issues.**

**Response**

The NSW Government is considering current consultative arrangements with the Advisory Council on Recreational Fishing to ensure its ongoing effectiveness for providing quality advice to Government on recreational fishing matters. The Government is also undertaking an independent review of NSW commercial fisheries management, policy and administration, which will identify potential mechanisms for consulting jointly with the recreational, commercial and Indigenous fishing sectors.

## Attachment 1

### Observer-based research in NSW commercial fisheries – publication list

#### Scientific papers in refereed journals and books:

- Henry, G.W.** 1984. Commercial and recreational fishing in Sydney estuary. NSW Department of Agriculture – Fisheries Bulletin No. 1. 47 pp.
- Kennelly, S.J., Kearney, R.E., Liggins, G.W. and Broadhurst, M.K.** 1992. The effect of shrimp trawling by-catch on other commercial and recreational fisheries - an Australian perspective. In, R.P. Jones (editor), International Conference on Shrimp By-catch, May 24-27, 1992, Lake Buena Vista, Florida. Southeastern Fisheries Association, Tallahassee, Florida, pp. 97-114.
- Andrew, N.L., Jones, T., Terry, C. and Pratt, R.** 1995. Bycatch from an Australian stow net fishery for school prawns (*Metapenaeus macleayi*). Fish. Res. 22: 119-136.
- Kennelly, S.J.** 1995. The issue of bycatch in Australia's demersal trawl fisheries. Reviews in Fish Biology and Fisheries. 5: 213-234.
- Liggins, G.W. and Kennelly, S.J.** 1996. By-catch from prawn trawling in the Clarence River estuary, New South Wales, Australia. Fish. Res. 25: 347-367.
- Liggins, G.W., Kennelly, S.J. and Broadhurst, M.K.** 1996. Observer-based survey of by-catch from prawn trawling in Botany Bay and Port Jackson, New South Wales. Mar. Freshwater Res. 47: 877-888.
- Liggins, G.W., Bradley, M.J. and Kennelly, S.J.** 1997. Detection of bias in observer-based estimates of retained and discarded catches from a multi species trawl fishery. Fish. Res. 32: 113-147.
- Kennelly, S.J. and Tokai, T.** 1998. Solving by-catch issues in the prawn trawl fisheries of New South Wales, Australia: observer programmes and selective gear research. Nippon Suisan Gakkaishi 64(2): 317.
- Kennelly, S.J., Liggins, G.W. and Broadhurst, M.K.** 1998. Retained and discarded by-catch from ocean prawn trawling in New South Wales, Australia. Fish. Res. 36: 217-236.
- Gray, C.A.** 2001. Spatial variation in by-catch from a prawn seine-net fishery in a south-east Australian coastal lagoon. Mar. Freshwater Res. 52: 987-993.
- Gray, C.A., Kennelly, S.J., Hodgson, K.E., Ashby, C.T.J. and Beatson, M.L.** 2001. Retained and discarded catches from commercial beach-seining in Botany Bay, Australia. Fish. Res. 50: 205-219.
- Gray, C.A.** 2002. Management implications of discarding in an estuarine multi-species gill net fishery. Fish. Res. 56: 177-192.
- Kennelly, S.J. and Broadhurst, M.K.** 2002. Bycatch begone: changes in the philosophy of

fishing technology. *Fish and Fisheries* 3: 340-355.

**Broadhurst, M.K., Gray, C.A., Young, D.J. and Johnson, D.D.** 2003. Relative efficiency and size selectivity of bottom-set gillnets for dusky flathead *Platycephalus fuscus*, and other species in New South Wales, Australia. *Arch. Fish. Mar. Res.* 50(3): 287-300.

**Gray, C.A. and Kennelly, S.J.** 2003. Catch characteristics of the commercial beach-seine fisheries in two Australian barrier estuaries. *Fish. Res.* 63: 405-422.

**Gray, C.A., Kennelly, S.J. and Hodgson, K.E.** 2003. Low levels of bycatch from estuarine prawn seining in New South Wales, Australia. *Fish. Res.* 64: 37-54.

**Gray, C.A., Johnson, D.D., Young, D.J. and Broadhurst, M.K.** 2004. Discards from the commercial gillnet fishery for dusky flathead (*Platycephalus fuscus*) in New South Wales, Australia: spatial variability and initial effects of change in minimum legal length of target species. *Fish. Man. Ecol.* 11:323-333.

**Gray, C. A., Johnson, D.D., Broadhurst, M.K. and Young, D.J.** 2005. Seasonal, spatial and gear-related influences on relationships between retained and discarded catches in a multi-species gillnet fishery. *Fish. Res.* 75: 56-72.

**Macbeth, W.G. and Gray, C.A.** 2008. Differences in Catch Composition among Types of Commercial Penaeid-Seining Operations in an Australian Estuary. *Asian Fish. Sci.* 21: 339-353.

**Macbeth, W.G., Millar, R.B., Johnson, D.D., Gray, C.A., Keech, R.S. and Collins, D.** 2011. Assessment of the relative performance of a square-mesh codend design across multiple vessels in a demersal trawl fishery. Submitted to *Fish. Res.*

#### **Theses:**

**Kennelly, S.J.** 1998. The empirical study of marine biological resources. D.Sc. thesis, The University of Sydney.

**Liggins, G.W.** 2001. Discarded catch in a multi-species trawl fishery. Ph.D. thesis, The University of Sydney, 191 p.

#### **Other scientific papers and reports:**

**Kennelly, S.J., Liggins, G.W. and Broadhurst, M.K.** 1992. Bycatch from prawn trawling in the Hawkesbury River: interactions with juvenile mulloway. *Newsl. Aust. Soc. Fish Biol.* 22(2): 37-38.

**Kennelly, S.J.** 1993. Study of the by-catch of the NSW east coast trawl fishery. Final report to FRDC, Project No. 88/108. ISBN No. 0-7310-2096-0. 520 pp.

**Andrew, N.L., Jones, T. and Terry, C.** 1994. A review and evaluation of the set pocket net prawn fishery in New South Wales. Final report to FRDC, Project No. 89/15. 87 pp.

**Liggins, G.W.** 1996. The interaction between fish trawling (in NSW) and other commercial

and recreational fisheries. Final report to FRDC, Project No. 92/79. ISBN No. 0-7310-9402-6. 40 pp.

**Gray, C.A. and Kennelly, S.J.** 2001. Development of discard-reducing gears and practices in the estuarine prawn and fish haul fisheries of NSW. Final report to FRDC, Project No. 1997/207. NSW Fisheries Final Report Series No. 37. ISSN No. 1440-3544. 151 pp.

**Stewart, J. and Ferrell, D.J.** 2001. Mesh selectivity in the New South Wales demersal trap fishery. Final Report to FRDC, Project No. 98/138. NSW Fisheries Final Report Series No. 35. ISSN No. 1440-3544. 86 pp.

**Gray, C.A., Johnson, D.D., Young, D.J. and Broadhurst, M.K.** 2003. Bycatch assessment of the estuarine commercial gill net fishery in NSW. Final Report to FRDC, NSW Fisheries Final Report Series No. 55. ISSN 1440-3544.

**Macbeth, W.G., Johnson, D.D. and Gray, C.A.** 2008. Assessment of a 35-mm square-mesh codend and composite square-mesh panel configuration in the ocean prawn-trawl fishery of northern New South Wales. NSW DPI - Fisheries Final Report Series No. 103. ISSN 1449-9967.

**Macbeth, W.G., Geraghty, P.T., Peddemors, V.M. and Gray, C.A.** 2009. Observer-based study of targeted commercial fishing for large shark species in waters off northern New South Wales. Industry & Investment NSW - Fisheries Final Report Series No. 114. ISSN 1837-2112.

**Macbeth, W.G. and Gray, C.A.** Observer-based study of commercial line fishing in waters off New South Wales. Industry & Investment NSW - Fisheries Final Report Series No. XXX. ISSN 1837-2112. *In preparation.*