

MAJOR PROJECT ASSESSMENT THE NSW MARINE FISH STOCKING PROGRAM

PROGRAM BACKGROUND

Historically, individual marine (or more specifically estuarine) fish stocking activities have been undertaken by various groups such as cultural and conservation groups, and fishing clubs.

Since 2004, the Department of Primary Industries (DPI) has undertaken research to provide information on the dynamics and 'productive capacity' of estuaries in NSW. This research has aimed to ensure that appropriate food and habitat would be available to support the release of hatchery reared fish into such estuaries.

- In addition, the feasibility of marine fish stocking in NSW has been aided by advances in aquaculture technology, improved knowledge of species life history, cost-effective tagging techniques and quantitative estimations of appropriate stocking densities.

DPI now considers that there is sufficient understanding of the potential impacts of fish stocking to justify a viable and strategic Program of marine fish stocking in NSW. DPI considers such a Program would contribute to long term socio-economic benefits to local communities by enhancing fishing opportunities and expenditure on fishing related items and services.

Whilst DPI expects to continue to receive individual fish stocking proposals in the future, where feasible, these fish stocking proposals would be assessed and authorised in accordance with the guidelines contained within the draft Fisheries Management Strategy (FMS) for the proposed Marine Fish Stocking Program (the Program).

The Program would provide the strategic framework for marine fish stocking in NSW, and would allow for adaptive management, including the management of unforeseen risks should they arise.

PROGRAM NEED

- In December 2000, the NSW Government changed the way that fisheries in NSW are managed, placing a greater emphasis on ensuring that fishing activities are environmentally sustainable, in accordance with the objectives of the *Fisheries Management Act 1994* (FM Act). Since this time, comprehensive Fishery Management Strategies have been prepared by DPI for 'designated fishing activities' including freshwater fish stocking and the following major commercial fisheries:

- Estuary General Fishery;
- Estuary Prawn Trawl Fishery;
- Ocean Hauling Fishery;
- Abalone Fishery;
- Ocean Trap & Line Fishery;
- Ocean Trawl Fishery; and
- Lobster Fishery.

Each FMS outlines the management goals, objectives, strategies for achieving the objectives, performance indicators and the monitoring programs that apply to a fishery or activity to ensure that it is managed in a sustainable way.

The proposed NSW Marine Fish Stocking Program is the final 'fishery' to be strategically assessed by DPI.

PROPOSED PROGRAM

The Department of Primary Industries (DPI) is proposing a strategic marine fish stocking program that would potentially be implemented across the estuarine areas of the entire NSW coastline. DPI considers that the Program would reduce pressure on wild populations from recreational fishing and enhance estuaries that are currently recruitment limited. Fish stocking would only occur in estuaries where it can be demonstrated that there is enough habitat to support the additional native individuals.

The proposed species for stocking are:

- Yellowfin bream (*Acanthopagrus australis*);
- Mulloway (*Argyrosomus japonicus*);
- Dusky flathead (*Platycephalus fuscus*);
- Sand whiting (*Sillago ciliata*);
- Eastern king prawn (*Melicertus plebejus*);
- Giant mud crab (*Scylla serrata*); and
- Blue swimmer crab (*Portunus pelagicus*)

The proposed Program would be enabled through the use of funds from the Recreational Fishing Trust (anglers fees). The species produced for stocking would be sourced from accredited hatcheries with protocols and procedures in place to ensure the genetic integrity of wild stocks in receiving waters.

The Department notes that the proposed Program does not cover stocking for conservation purposes however it is recognised that these stockings may need to be undertaken as part of future conservation activities.

THE EIS AND DRAFT FMS

DPI has prepared an EIS for the Program that contains a comprehensive description of the proposed activity (fish stocking) and the risks involved with the activity. The EIS has identified that eighty (80) of the 158 estuaries in NSW are potentially suitable for fish stocking, but not all estuaries are suitable for all species. Detailed analysis has been undertaken to determine which estuaries are suitable for stocking and which species are suitable for specific locations.

The draft FMS provides the strategic framework for the assessment and authorisation of future fish stocking activities. (Note that the approval of the draft FMS does not enable individual fish stocking activities to be undertaken).

The draft FMS has the following four key goals:

1. To manage marine fish stocking in a manner that minimises impacts on ecological sustainability and aquatic biodiversity and improves knowledge around fish stocking and the ecosystems in which it would be undertaken;
2. To enhance fishing opportunities through sustainable fisheries resources;
3. To ensure the consistent production and release of appropriate quality stock; and
4. To support the Program through efficient administrative services, education and support services, information management and reporting systems.

The key components of the draft FMS are outlined in Table 1 below, and detailed in Chapter E of Volume 2 of the EIS.

Table 1: Key Components of the draft FMS

Key components of the draft FMS	Description
Species	Seven (7) species are proposed to be stocked within specified geographical ranges in order to ensure they are not incorrectly placed.
Location	80 estuaries have been identified, but further analysis of these estuaries is required prior to any individual fish stocking events.
Stocking rate	A Generalised Predatory Impact Model (GPIM) provides estimated stocking rates (maximum number of individuals released per hectare of suitable habitat) and estimated harvest (total tonnes of stocked species to be harvested from the estuary), to minimise potentially negative ecological effects and lower the risk of overstocking, for the 7 target species.
Stocking Review Guidelines (SRG's)	A tool for the assessment and determination of specific proposed stocking events. It includes a review of the source and quality of the stock, the appropriateness of the intended release site, the permitted stocking rates, the annual stocking cap and the risk of disease transfer to the local environment.
Research Plan	Provides information that will lead to continuous improvement in the way fish stocking activities are undertaken, reducing much of the uncertainty identified by the risk assessment by assessing the 'actual' rather than 'potential' environmental impacts of fish stocking. The proposed research topics have been categorised depending on the relevance to the risks identified in the EIS and the information required to support the goals outlined in the draft FMS. The categories are: • Level 1: (initial research): scheduled to commence within one year of the approval of the draft FMS and reviewed within five years of commencement of the Program. • Level 2: (supportive research): scheduled to commence within three years of the approval of the draft FMS and reviewed within five years of commencement of the Program.
Performance monitoring and review	The performance of the draft FMS would be measured against the four goals (detailed above), through the use of performance indicators and associated trigger points. A review of a particular activity is required when a 'trigger point' reaches a certain level that suggests there is a problem.
Management of Hatcheries	All fish produced for stocking would be sourced from accredited hatcheries under the Hatchery Quality Assurance System (HQAS), reared with protocols and procedures in place to ensure: • the genetic integrity of wild stocks in receiving waters; and • that disease is not carried from hatcheries to the receiving waters.

STATUTORY CONTEXT

The activity of fish stocking in NSW is a 'designated fishing activity' under Schedule 1A of the *Fisheries Management Act 1994*.

In accordance with Part 5, Section 115J of the *Environmental Planning and Assessment Act 1979* (EP & A Act), DPI has prepared an Environmental Impact Statement (EIS) for the Program, as it considers that the stocking of marine estuaries with hatchery reared fish has the potential to result in significant environmental impacts. The EP&A Act requires the preparation of a FMS for any designated fishing activity that is the subject of an EIS.

The Minister for Primary Industries is responsible for the determination of designated fishing activities in accordance Section 115O of the EP&A Act. However, under Section 115P of the EP&A Act, the Minister for Primary Industries is not to make a final determination without the approval of the Minister for Planning and Infrastructure.

In addition, under Section 115L(5) of the EP&A Act, the Director-General may examine, or cause to be examined the environmental impact statement (EIS) and any relevant representations, and forward to

the Minister for Primary Industries a report containing the findings of that examination together with any recommendations. The Director-General is then required to make that report public.

CONSULTATION

The EIS for the proposal was publicly exhibited by DPI between 23 November 2011 and 31 January 2012. The EIS was advertised in accordance with the *Environmental Planning and Assessment Regulation 2000*.

The EIS was made available for inspection during office hours at the following locations:

- DPI (Fisheries) offices;
- The head office and all regional offices of the Department of Planning and Infrastructure;
- the Sydney office of the Environment Centre; and
- principal council offices of local government areas in which the proposed activity may take place (i.e. coastal Council's).

DPI received 22 submissions on the Program from the public and relevant stakeholder groups including:

- four (4) Councils – Port Stephens, Gosford, Hornsby and Sutherland;
- the Office of Boating Safety within Transport NSW;
- Southern Rivers and Northern Rivers Catchment Management Authorities;
- Cape Byron Marine Park Authority;
- four (4) Fishing and Boating Clubs,
- the Nature Conservation Council; and
- individual members of the public.

Nine submissions (9) supported the Program, however ten (10) provided detailed comments and/or concerns about the Program. Three (3) submissions from individuals were strongly opposed to the Program. None of the Council submissions objected to the Program, however two Councils and the Nature Conservation Council raised strong concerns. DPI has considered and addressed issues and concerns in its Preferred Strategy Report (PSR). Where relevant the PSR includes specific changes to be made to the draft FMS.

KEY ISSUES

Due to the level of expertise required, the Department has commissioned Dr Daryl McPhee of Bond University, Queensland to undertake a technical assessment of the key issues of the Program in accordance with Section 115M of the Act. Dr McPhee has previously reviewed other strategic fisheries proposals for the Department.

Overall, Dr McPhee has found the EIS documentation, including the risk analysis, of a high standard. The relevant guidelines have been addressed as required and the selected species are appropriate. In addition, Dr McPhee considers that the management framework detailed in the draft FMS is sufficiently flexible to factor in responding to uncertainties.

Dr McPhee has assessed the merits of the Program and all relevant documentation (EIS, FMS, submissions, PSR), and has specifically considered the following issues in detail in his report at **Tag B**:

- disease risks;
- genetic impacts;
- the assessment of potential impacts on threatened species and species of conservation significance, including trophic and habitat impacts;
- locations and timing(s) of stocking;
- the justification for the proposed stocking and the alternatives; and
- the risk analysis within the EIS.

Dr McPhee has noted that the proposed research topics included in the EIS have been prioritised to address significant information gaps. The conditions of approval prepared by Dr McPhee have been proposed to strengthen these research commitments. Dr McPhee's report and recommendations are provided at **Tag B**. The Department has summarised the key issues and Dr McPhee's recommendations below.

Disease

- Three (3) submissions raised concerns in relation to this issue.
- The risk of disease transfer from stocked fish to native populations is a potentially high risk if left unmanaged.
- Dr McPhee noted the lack of basic biological information on pathogens and parasites for a number of species that are proposed to be stocked. This lack of knowledge was also identified and discussed in the EIS.
- To address these information gaps, DPI is proposing to undertake research to identify parasites and pathogens of all species for stocking in the locations where broodstock is obtained and where fingerlings are released.
- In addition, DPI intends to obtain fingerlings for stocking from hatcheries accredited under the Hatchery Quality Assurance Scheme (HQAS). These hatcheries have strict monitoring and quarantine practices in place to prevent the spread of disease.
- Dr McPhee supports these commitments made by DPI, and due to their importance, Dr McPhee has recommended that these commitments are included in the Department's recommended conditions of approval. ✓
- As a further precautionary measure, Dr McPhee has recommended an additional condition that requires DPI to develop an Emergency Disease Response Plan, drawing on the provisions of the existing Australian Aquatic Veterinary Emergency Plan (AQUAVETPLAN) to document actions that would be taken should a disease occur in either stocked or wild fish following release. ✓
- Dr McPhee is satisfied that should a disease outbreak occur (irrespective of the hatcheries disease management plan), appropriate emergency response procedures would be implemented in accordance with the AQUAVETPLAN technical response and control guidelines.

Genetic impacts

- Two (2) submissions raised concerns about the potential impacts of the Program on the natural genetic diversity within native populations.
- Broodstock for the Program would be sourced from the estuaries into which juveniles would be stocked, until more detailed information on species and genetics is obtained through the proposed research.
- The EIS concluded that the risk to the genetic integrity of wild populations is low to moderate and no significant genetic impacts would be expected as a result of the Program.
- Dr McPhee considers that the proposed research plan in the draft FMS is appropriate and appropriately prioritised.
- However, Dr McPhee has recommended an additional condition of approval that requires DPI to cease plans to stock any estuaries if the number of individuals in the native population of a species drops to below 100. Where this occurs, a revised genetic rescue stocking strategy is required to be implemented to restore the genetic population of that species. (Dr McPhee noted that this commitment was made in the EIS but it was not included in the draft FMS). ✓
- Dr McPhee is satisfied that with the implementation of the proposed management measures and research included in the EIS and revised FMS, DPI would adopt the best possible approach to minimising the risk to genetic diversity in existing populations.

Trophic impacts

- Four (4) submissions discussed and highlighted the importance of understanding the structure of estuarine food webs and the potential for fish stocking to affect a range of components within estuaries.
- The PSR highlights that the main disruption to trophic dynamics and food webs would be through 'overstocking'.
- Suitable stocking rates are expressed as the 'maximum number of individuals released per hectare of suitable habitat'.
- DPI has undertaken modelling that has demonstrated that a defined conservative stocking rate of 5% of the estimated productivity of any one estuary represents a precautionary approach that would be unlikely to disrupt the ecological balance of an estuary.
- Notwithstanding, in response to submissions, the PSR has proposed a re-prioritised Research Plan that would further ensure that reliable data regarding food chain interactions between stocked fish and the aquatic environment would be obtained as an immediate priority within proposed stocking locations.

- Dr McPhee is satisfied that the previous marine fish stocking activities undertaken by DPI have been undertaken at a reasonable scale, have been thoroughly researched and published in peer reviewed literature. Dr McPhee therefore agrees with the conclusion that DPI's prior research provides a solid foundation for the understanding of trophic impacts in receiving waters.

Risks to threatened species, habitats and conservation areas

- A number of submissions raised concerns in relation to impacts on threatened species (2), habitat (4) and conservation areas (1). Concerns have been raised that stocking may affect existing species through competition for food and habitat and food chain interactions (i.e. natural predation).
- Dr McPhee considers that the risks to threatened species, habitats and conservation areas is less likely to be related to the activity of stocking itself, but to an increase in localised fishing effort that may be encouraged by stocking activities i.e. fishing placing pressure on wild stocks, and habitat impacts such as trampling of sea grasses and litter.
- DPI is proposing to collect data to measure changes in recreational fishing effort as a result of actual stocking activities, and if necessary, has proposed to stop any fish stocking activity where negative impacts on threatened species, habitats and conservation areas are identified.
- Dr McPhee is satisfied with DPI's response and no further conditions of approval were considered necessary.

Timing of Stocking

- Three (3) submissions raised concerns in relation to the potential stocking of Intermittently Closed and Open Lakes and Lagoons (ICOLLS).
- The EIS uses available information to determine which locations are potentially suitable for stocking, but this does not guarantee that all locations would be stocked.
- Dr McPhee agrees that the timing of stocking in ICOLLS is critical for its success, and is also important in terms of the potential for trophic impacts in them.
- As such, Dr McPhee has recommended a condition requiring DPI to consider temporal changes in productivity if a stocking event is proposed in an ICOLL.

Locations for Stocking

- One (1) submission expressed concern about fish stocking in control/reference systems that are involved in long term ecological monitoring.
- Dr McPhee considers that such monitoring programs should not preclude potential stocking activities because they may significantly aid the assessment of any broader impacts of stocking activities at the monitored locations.
- Notwithstanding, Dr McPhee has recommended a condition of approval that requires DPI to notify any groups or agencies undertaking long-term ecological monitoring in a timely fashion prior to stocking events.

Need for the Program and alternatives

- Five (5) submissions identified that better alternatives existed and one also considered that the need for stocking was not well established in the EIS.
- The EIS itself recognises the value of other options for achieving fisheries (and other) objectives i.e. habitat restoration, and clearly identifies that they are not mutually exclusive with respect to the Program.
- Dr McPhee considers that the best available relevant information has been considered in regard to recreational fishing demographics, and that in the future, recreational fishing demand will increase, placing greater demands on native fish stocks.
- Further, expenditure associated with recreational fishing in NSW estuaries is substantial with concomitant flow-on benefits to regional communities and employment. Not stocking may see these benefits fail to grow or in part be forgone.
- Dr McPhee is satisfied that DPI has adequately demonstrated the need for the Program.

RECOMMENDED CONDITIONS OF APPROVAL

The Department agrees with Dr McPhee's recommended conditions of approval, which have been proposed to ensure the environmental performance of the Program is acceptable.

Following detailed discussion, on 17 October 2013 Dr McPhee, the Department and DPI agreed on the conditions of approval. These final conditions are attached in the instrument of approval (**Tag C**).

CONCLUSION

Dr McPhee has provided the Department with an independent assessment of the Marine Fish Stocking Program. As a result of this assessment, Dr McPhee made a number of recommendations for DPI in the finalisation of the draft FMS.

Issues regarding marine fish stocking are particularly complex with a diversity of views existing on a number of issues. In making his recommendations, Dr McPhee has considered the future economic viability of recreational fishing, the environmental risk posed by marine fish stocking, and the costs to government for the implementation of the Program. Dr McPhee's recommendations were developed with detailed consideration to public submissions, the EIS and the PSR.

Following consideration of these matters, the Department agrees with Dr McPhee's recommendations and considers that it is appropriate for the Minister for Primary Industries to proceed to make a determination on the Program under Part 5 of the Act.

Attached (at **Tag C**) are the Department's conditions which shall apply to the proposal should it proceed.

RECOMMENDATION

It is RECOMMENDED that the Minister:

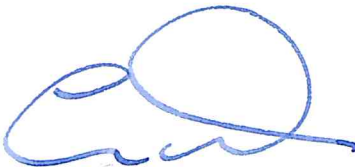
- **consider** Dr Daryl McPhee's report (**Tag B**);
- **approve** the Program and draft FMS subject to the amendments outlined in the PSR and the Department's conditions; by **signing** the instrument of approval (**Tag C**); and
- **sign** the letter to the Minister for Primary Industries recommending that the Program be approved subject to the Department's conditions (**Tag D**).

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