

Attachment:

List of organisations providing submissions received during the public exhibition period of the Marine Fish Stocking Environmental Impact Statement

	Organisation	Date
1	Port Stephens Council	23/11/11
2	Les Joliffe	02/12/11
3	Cape Byron Marine Park	21/12/11
4	Dennis Brown	21/12/11
5	Gosford Council	09/01/12
6	Club Taree Fishing	16/01/12
7	Office of Boating Safety, Transport NSW	25/01/12
8	Empire Bay Fishing Club Inc.	25/01/12
9	Ettalong Memorial Bowling Club Fishing Club	26/01/12
10	Stephen Harcourt	29/01/12
11	Nature Coast Marine Group Inc	30/01/12
12	Urunga Amateur Angler Club	30/01/12
13	Southern Rivers Catchment Management Authority	31/01/12
14	Shaun Reynolds	31/01/12
15	Hornsby Shire Council	31/01/12
16	Sutherland Shire Council	31/01/12
17	Martin Angle	31/01/12
18	Northern Rivers Catchment Management Authority	31/01/12
19	Nature Conservation Council of NSW	31/01/12
20	Mark Robinson	31/01/12
21	Sea Bees Boating Club Inc.	31/01/12
22	Ken Cowden	01/02/12



TRIM: INW12/1850 - Comments on Marine Fish Stocking

Amy Spadaro to: fishstocking.eis

Cc: "Sally Whitelaw"

23/11/2011 12:23 PM

From: "Amy Spadaro" <Amy.Spadaro@portstephens.nsw.gov.au>
To: <fishstocking.eis@industry.nsw.gov.au>
Cc: "Sally Whitelaw" <Sally.Whitelaw@portstephens.nsw.gov.au>

Good morning

Unfortunately Council does not have the time resources or expertise to properly review the EIS. We have not read carefully through it. However we submit:

- Rather than rolling out fish stocking in ~80 estuaries at the same time, we **recommend a pilot program where a small number of estuaries are stocked to begin with.** (This may already be built into the proposal, and we just have not read it thoroughly)
- Such a pilot would enable a better understanding of any unexpected impacts. There might be changes in abundance of different components of the estuarine ecosystem. Food webs are complicated. It is difficult to determine the likely changes within an ecosystem when you introduce juveniles in the manner proposed.
- We note that Port Stephens, being a Marine Protected Area will not form part of the activity. The Hunter River will, and this is relevant to Port Stephens Council area.

We very much appreciate that the material was distributed to us. Thank you for the opportunity to comment.

Regards

Amy

Amy Spadaro

Environmental Officer

Port Stephens Council

Phone: 02 4980 0139 Fax: 02 4987 3612

Email: amy.spadaro@portstephens.nsw.gov.au

Web: www.portstephens.nsw.gov.au

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TRIM: INW12/1852 - over netting in Macleay River

jalcon1942 to: fishstocking.eis

02/12/2011 08:57 AM

We are not in favour of re stocking in the Macleay as it would be a waste of money . What we believe to be the problem is the over netting of the river by as many as 18 proffesionals . There are proffesionals coming from as far south as Taree to Coffs Harbour to the north and included is the count are the Queenslanders that come for the spawning runs every year . Our river is the only system left open to this trade. Re stocking will do little if any good as the pros will clean them out in no time.

The last letter that was sent explained this over netting problem and this is the crux of matter we have.

What is going to be done to allieviate this over exploitation ?

Yours truly

Les Joliffe



TRIM: INW12/1853 - Comment on the Environmental Impact Statement for the Marine Fish Stocking Program (NSW Coastal Waters, SO9_00068)

Page Andrew to: fishstocking.eis@industry.nsw.gov.au

21/12/2011 01:50 PM

Cc: Maguire David, "graeme.white@industry.nsw.gov.au"

Hi Sarah

Thanks for the invitation to comment on the Environmental Impact Statement for the Marine Fish Stocking Program (NSW Coastal Waters, SO9_00068). The EIS appears to be comprehensive and the exclusion of the waters of marine parks from the program is supported. In addition, it is recommended that stocking be excluded from a suitable buffer area around a marine park to prevent any likelihood of the possible spread of diseases from stocked organisms to wild populations in marine parks.

If you require further information or any aspects of this correspondence require clarification do not hesitate to contact me.

Regards, Andrew

Andrew Page | Manager | CapeByronMarinePark

NSW Department of Primary Industries

Arakwal Depot | Tallow Beach RdByronBay| PO Box127| Byron Bay NSW 2481

T: 02 6620 9305 | **M:** 0439 485 266 | **F:** 02 6620 9333

E: andrew.page@environment.nsw.gov.au | **W:** www.mpa.nsw.gov.au

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TRIM: INW12/1854 - Fwd: Fwd: Fwd: Fish stocking FMS, EIS, & Impact statement.

Denis Brown to: fishstocking.eis

21/12/2011 04:55 PM

History:

This message has been forwarded.

Sarah

Please delete the email submission as sent previously & replace with this updated one (I omitted another point).

----- Original Message -----

Subject: Fish stocking FMS, EIS, & Impact statement.

Date: Wed, 21 Dec 2011 16:28:16 +1100

From: Denis Brown <trogan1@bigpond.net.au>

To: fishstocking.eis@industry.nsw.gov.au

Hi Sarah

Having reviewed the proposal and its Draft FMS, & EIS I submit the following.

1.

It must be clearly understood that any organism released into the public waters of NSW are the "property" of the State and the party releasing such an organism has no proprietary interest in the organism once it enters public waters.

2.

The Impact assessment provided in Vol II is inadequate.

- the assessment of impact is inadequate in that it fails to address

significant impact potential

- the FMS & Departmental policy is inadequate in that it fails to

prescribe mitigation measures for potential impacts not assessed in Vol

II of the EIS.

Vol II - G2.2.2.2 - Resource sharing:

Impacts on resource sharing extends well beyond the direct impacts of conflict.

It extends into the fundamental resource sharing and management of the resource user sector groups

i)

whilst a broad resource sharing arrangement is not formalised the

Commercial Fishery Share Fisheries are managed with limited entry & resource access proportionate to share (when applied)

ii)

the Commercial Fishery , whilst limited by share is not provided a formalised share of sustainable harvest.

iii)

whilst the commercial fishery has been subjected to a criteria period

and relative equity established amongst the stakeholders in the

Commercial Fisheries they have not been provided any equity relative to

other users of the common resource.

The State population grows & recreational fishing effort is not managed

within any concept of equitable share of the common stocks within their

sustainable harvest.

The value & resource access provided by the shares in the limited

entry commercial fishery cannot be ascertained nor is security over their

right achieved until a broad resource sharing policy is implemented by

NSW DII and provided in legislation.

iv)

whilst the Recreational Fishery is not subject to any formalised share

of resources and relative equity in the common stocks established any

concept of utilising a criteria period after the implementation of fish

stocking based on harvest levels by the recreational sector at that time

will bias harvest levels to the recreational sector as the intended

beneficiaries of the stocking program.

This would be an unacceptable outcome for the general public under the

public benefit test.as the Commercial fishery is a service industry to

the general public, & the general public accesses the fish resources of

the state primarily thru the distribution networks of the fish wholesale

& retail network.

Surveys conduct identify the following baseline data

- 17% of the public recreationally fish at least once per year.

- <5 % of the recreational fishers catch the vaast majority of

the

recreationally caught fish

- >95% of recreational fishers also purchase fish from the retail trade.

- very few recreational fishers utilise their catch as the primary

source of the fish component of their subsistence diet.

- recreational fishing is primarily about sport, relaxation and not

primarily as a food source.

The EIS impact assessment needs to be amended to identify this impact.

The Recreational Fishery & Fish Stocking FMS must be amended to reflect

a resource share of common resources appropriate to the public benefit

test & management actions consistent with that identified share within

performance indicators.

Vol II - G 2.2.2.3 - Aquaculture

The potential impact on aquaculture operations and the policy approach

to any impacts on a sector of the Aquaculture industry

affected by

predation increases due to artificial stocking densities from a stocking

program must be provided a compensation package for losses incurred in

a policy statement

References to consultation with those stakeholders is inadequate .

The policy framework must provide a compensation framework in the relevant

legislation .

(talk is cheap , legislation is security & certainty that a pathway is

available in policy & principle) .

The stocking FMS must acknowledge that stakeholders suffering commercial

impact from stocking programs are entitled to compensation & the

mechanism for that compensation.General Conclusions:

The Fish stocking FMS & EIS must not be finalised and approved until

these actions have been completed and implemented in the relevant

legislative instruments.

The overall duty of care and provision of rights administered by DII

regarding the management of both sustainable harvest of common

fishstocks and the security of rights issued by DII, to the commercial fisheries , as prescribed in the intent of the Fisheries Management Act (1994) and subsequent Share Fishery ammendments,are deficient at law until these matters are addressed.

Please provide an itemised response to the matters identified in this submission.

Regards
Denis Brown



Telephone (02) 43047658

Please Quote 10799115
Tim Macdonald:tm
9 January 2012

Gosford City Council

49 Mann Street
Gosford NSW 2250
PO Box 21
Gosford NSW 2250
DX 7211 Gosford

Telephone: 02 4325 8222
Facsimile: 02 4323 2477
goscity@gosford.nsw.gov.au
www.gosford.nsw.gov.au
ABN 78 303 458 861

Sarah Boyd
3/556 Macauley Street
ALBURY NSW 2640

Dear Sarah

NSW Marine Fish Stocking Program EIS

Council would like to thank the NSW Government for the opportunity to provide comment on the proposed NSW Marine Fish Stocking Program EIS. Further, Council is in support of the proposed activities as outlined in the comprehensive Environmental Impact Statement developed by NSW Department of Primary Industries.

The Gosford area is extremely popular with residents and visitors for recreational fishing. Whilst little data is available on recreational fishing pressure on specific estuaries, the 2002 NSW Fisheries *Survey of Recreational Fishing in New South Wales Interim Report* highlighted that the Sydney region (which includes Gosford and adjacent waterways) has substantially the highest number of recreational fishers in NSW.

A project undertaken under the Recreational Fishing Trust investigated expenditure of Sydney anglers in regional NSW. Expenditure by Sydney anglers for day trips and overnight trips to the Gosford region were estimated to be in the order of \$2.6 million in 2002. The popularity of fishing is highlighted by the running of a Fishing Expo at Gosford Showground and the existence of a number of amateur fishing clubs in the area. In January 2004, the Brisbane Water Bream Fishing Classic was held and attracted fishers from across NSW.

In reviewing the documentation provided, the program has identified a number of estuaries which are linked to the Gosford Local Government Area. The estuary selection methodology applied assessed a range of stocking locations including Brisbane Water, Hawkesbury River, Wamberal Lagoon, Terrigal Lagoon, Avoca Lagoon and Cockrone Lagoon (with the latter excluded due to it draining dry when open).

Council are encouraged that local estuaries rated highly in the suitability assessment process and would like to provide the following comments in relation to the estuary locations considered suitable for the marine fish stocking program in NSW. Further, Council supports to species selected for a marine stocking program, however questions why Yellowfin Bream are included in estuarine assessments despite there being no intention to stock them south of the Manning River to minimise the risk of genetic swamping of Black Bream.

Brisbane Water was one of the first waterways in NSW to be closed to commercial fishing and as a result, Brisbane Water provides some of the best recreational fishing in Australia.

Recreational fishing is a very popular activity in Brisbane Water, but no specific information has been collected on the number of anglers and catch sizes at an estuary level. Species commonly targeted at Brisbane Water are bream, whiting, luderick, flathead, mulloway, mullet, mud crabs and blue swimmer crabs.

A number of biological studies were undertaken as part of the Brisbane Water management planning process in order to understand ecological processes occurring in the estuary. The majority of these studies investigated spatial and temporal patterns of distribution and abundance for the flora and fauna of Brisbane Water. Other studies investigated processes to explain these patterns. Collectively, these studies demonstrate links between catchment and estuarine processes and ecological phenomena.

Despite having extensively modified catchments and foreshores Brisbane Water is a relatively healthy estuary which supports considerable expanses of seagrass (including *Posidonia australis*), mangrove and saltmarsh habitat. Maintaining ecological interconnectivity between habitat types is a key goal of the management process and it is hoped that the NSW Government recognise the value in supporting on-ground habitat enhancement projects including foreshore rehabilitation, establishment of artificial reef sites and improved water quality outcomes.

Council, are now looking to work with key stakeholders to implement management options which assist in conserving and, where possible, enhancing ecological health of the estuary.

The high ranking of Brisbane Water within the NSW Marine Fish Stocking EIS is supported by Council as it will serve to improve social, environmental and economic outcomes for this important estuary.

The Gosford LGA also interlinks with a number of ICOLLs including Wamberal, Terrigal, Avoca and Cockrone Lagoons. Each of these was included in the NSW Marine Fish Stocking Program EIS with Cockrone Lagoon not considered suitable under the identified criteria. Each of these lagoons is under recreational fishing pressure, particularly during peak holiday periods and following entrance openings.

Similarly to research undertaken in Brisbane Water, the coastal lagoons management planning process included a number of detailed scientific studies on habitats and faunal abundance/assemblages.

The University of Newcastle undertook a study of the estuarine fish communities which includes a comparison with historic data provided by NSW Fisheries (DPI) for the purposes of the Gosford Lagoons Processes Study. The sampling aimed to assess the process of recruitment of fish to the lagoons and describe changes in fish assemblages over time. Generally Terrigal Lagoon was found to have the highest diversity of fish, whereas Wamberal the greatest abundance. Numbers of Sand whiting (*Sillago ciliata*), Trumpeter (*Sillago maculata*) and Dusky Flathead (*Platycephalus fuscus*) were all found to have declined between 1986 and 2008.

Research also suggests that an improvement in the recreational value of fishing in these lagoons would require considerable effort in regard to the encouragement and the maintenance of the fish stocks.

The results of the 2007/08 survey of recreational anglers in the Hawkesbury River highlighted that Yellowfin Bream, Dusky Flathead, Blue Swimmer Crab, Mulloway and Sand Whiting were all in the top 10 most popular catches amongst surveyed recreational fishers on the Hawkesbury (being 64.3% of the total catch).

The commercial industry through the Estuary General Fishery, poses additional pressures on fish stocks within the Hawkesbury with six of the species included in the Marine Fish Stocking Program EIS within the top ten species caught by weight.

For these reasons Council also supports the information provided within the EIS and the inclusion of the Hawkesbury within the Program.

Council is working on a range of planning activities which aim to provide a balanced long-term management framework for the ecologically sustainable use of our coast and estuaries.

Revised and improved Management Plans are currently being prepared for Brisbane Water and Gosford's Coastal Lagoons to compliment the Lower Hawkesbury Estuary Management Plan adopted in 2009. Council uses the latest scientific information, combined with community and stakeholder feedback, to develop plans which aim to:

- Protect, rehabilitate and improve the natural estuarine environment
- Manage the estuarine environment in the public interest to ensure its health and vitality
- Improve the recreational amenity of estuarine waters and foreshores
- Recognise and accommodate natural processes and climate change
- Ensure ecologically sustainable development and use of resources.

As Council is working to minimise anthropogenic disturbances in estuaries (such as land clearing, pollution from stormwater, sewage overflows and petroleum spills, reclamation and the construction of seawalls) we welcome external agency efforts in contributing to our management outcomes.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Macdonald', enclosed within a large, thin, horizontal oval loop.

Tim Macdonald

Snr Environment Planning Officer Integrated Planning



C/ - TAREE R.S.L. and GOLF CLUB LIMITED

Wingham Road, Taree N.S.W 2430

PLEASE ADDRESS ALL CORRESPONDENCE TO FISHING CLUB
SECRETARY

P.O. BOX 40 TAREE N.S.W. 2430

10th January 2012

ATTENTION SARAH BOYD

NSW DPI
3/556 Macauley Street
ALBURY NSW 2640

Dear Sarah,

Re: Marine Fish Stocking Program (NSW Coastal Waters)
(S09_00068)
Exhibition of Environmental Impact Statement

Club Taree Fishing fully supports the proposal of restocking estuaries along the NSW coastline.

Club Taree Fishing is a recreational fishing club that has been running for the last 40 years within the Manning region. At present we currently have 40 senior, 8 junior and 8 life members. We are a very family and community orientated fishing club. Over the last 40 years we have raised considerable amounts of money for various charities including Westpac Helicopter, Manning Base Hospital etc.

In recent times we have noticed the decline of estuary species within our local area. As a fishing club we felt it was our duty to change our bag limits per outing to coincide with the decline. By restocking the estuaries will benefit not only the fishing club but the local community for generations to come. We feel by giving our full support to your program, will help improve fishing stock levels as well as improving the environment in general.

Should you require any further assistance in relation to this matter please do not hesitate to contact us.

Yours Sincerely
Greg Chick. Secretary

A handwritten signature in blue ink that reads 'Greg Chick'.

For and on behalf of Club Taree Fishing



**Transport
for NSW**

NSW DEPT. OF
25 JAN 2012
PRIMARY INDUSTRIES

17 January 2012

EIS Submissions
NSW Department of Primary Industries
3/556 Macauley Street
ALBURY NSW 2640

Dear Sir/ Madam

I refer to your correspondence of 11 November 2011 regarding the exhibition of the Environmental Impact Statement (EIS) for the proposed marine fish stocking program in NSW coastal waters.

As you may be aware, the newly-formed Office of Boating Safety within Transport for NSW provides policy and strategic advice on boating-related safety and environmental issues within the state. Day-to-day operational matters are now handled by Roads and Maritime Services (RMS), which has taken the place of the former NSW Maritime and Roads and Traffic Authority.

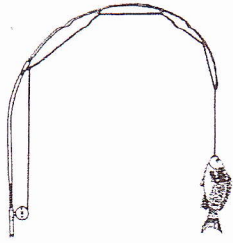
The Office of Boating Safety recognises the importance of angling as an activity to a large proportion of recreational boat users, and I commend your department for its detailed and extensive work in assessing the possible environmental impacts and risks associated with marine fish stocking in NSW waters.

In terms of the possible risks related to boating use, increased vessel wash may be an issue (particularly in terms of shoreline erosion) in the smaller waterways should particular stocking events attract significantly greater numbers of boat-based anglers. To address this, I suggest that boating traffic levels and shoreline condition be monitored in the relevant areas in consultation with the local RMS Boating Safety Officers, who will be able to advise on appropriate follow-up measures should the monitoring detect any significant impacts.

If you require any further information, please do not hesitate to contact Mr Jack Hannan, Policy Officer, Office of Boating Safety, on 9364 2013.

Yours sincerely

Howard Glenn
General Manager
Office of Boating Safety



Empire Bay Fishing Club Inc.

NSW DEPT. OF
25 JAN 2012
PRIMARY INDUSTRIES

EMPIRE BAY FISHING CLUB INC.

INCORPORATION NO: Y01186-02

23RD JANUARY 2012

FISHERIES MANAGER
MARINE FISH STOCKING
NSW DPI
3/556 MACAULEY ST
ALBURY 2640

PROJECT 509 00068

GREETINGS.

THE EMPIRE BAY FISHING CLUB WELCOMES THE
CONCEPT OF FISH STOCKING BRISBANE WATER AND WISHES
TO OFFER ASSISTANCE TO THIS PROJECT BY AT LEAST
ASSIST RELEASE OF JUVENILES AND OTHER USE OF "TINNIES"

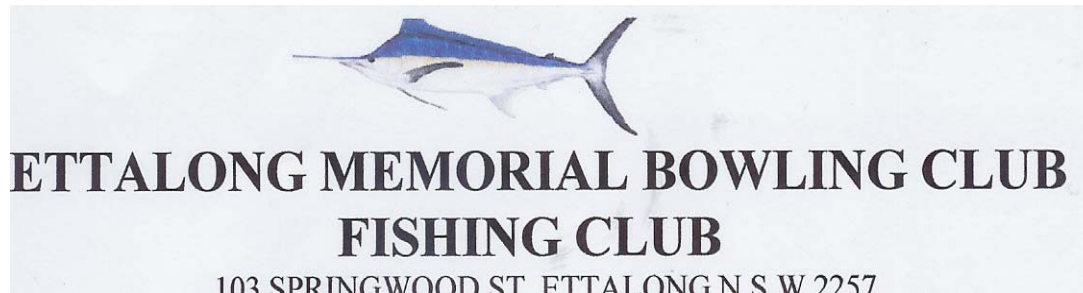
THE COMMITTEE FEELS THAT THIS WILL HELP OUR CLUB
MEMBERSHIP BY SHOWING COMMUNITY SPIRIT AND HAVING
MORE FISH AT WRIGHT IS.

MORE PERSONALLY I HAVE NOT FINISHED STUDYING THE FIS
BUT CAN SO FAR SEE NO OBJECTIONS.

ALSO AS ONE OF THE FEW REMAINING OYSTER FARMERS
I DO NOT OBJECT TO JUVENILE RELEASES OCCURRING
IN OR NEAR MY LEASES.

HOPING TO BE OF ASSISTANCE

A. D. FERGUSON
PUBLIC OFFICER EMPIRE BAY FISHING CLUB INC
LOT 15 EMPIRE BAY DRIVE
EMPIRE BAY 2257
(02) 43695339



Assessment of Environmental Impact of Marine Fish Stocking – S09_00068

We are one of the largest fishing clubs on the Central Coast with over 220 members. We have introduced our own measures to help with sustainability of fish stocks via halving the NSW Fisheries bag limits and restricting length of some species in our fishing competitions.

EMBCFC fully supports enhancing recreational fishing stocks and improving recreational fishing opportunities through the proposed marine stocking program.

We believe a very high priority should be given to stocking Brisbane Waters with all seven nominated species given this estuary meets all the criteria outlined in the report.

While not in a position to fully understand the statistical modelling outlined in the report, it is important to consider that:

1. The Central Coast is home to a population of 316,000 and is one of the fastest growing regions in NSW.
2. It is reasonable to assume that the state wide average of 17.1% of the population participating in fishing, would be much higher on the Central Coast, perhaps as high as 25-30%, given the easy access to many estuaries and large coast line.
3. Also, given that the Central Coast has long been a retirement destination, the data used in the report based on fishing licenses issued, would underestimate the number fishing, as seniors are exempt.
4. The fishing stock is not only targeted by residents but by the large number of visitors to the region. According to the National Visitors Survey published by Tourism Research Australia, the Central Coast, over a year, receives 1.2 million overnight visitors with 61% coming from Sydney. Once again, it would be reasonable to assume that a much higher proportion of these visitors would be involved in fishing activities.
5. Brisbane Waters is dedicated to recreational fishing usage and accessibility is high given existing fishing infrastructure and amenities.

We also believe in resource sharing and to complement any stocking program of Brisbane Waters, it is also important to consider the migratory nature of some of the species as they move in and out of Brisbane Waters through a narrow channel between Little Box Head and Lobster Beach.

At the present time, we understand that commercial fishing is allowed to operate south of a line from the western extremity of Little Box Head to the easterly extremity of Green Point (just south of Pearl Beach). The impact of a stocking program in Brisbane Waters would be much higher if the boundary was changed back to a line between Box Head to Green Point as it was prior to the May 1987 changes to the Fisheries and Oyster Farms (Amendment Bill). This would allow the species to move in and out of Brisbane Waters more freely.

Of course changing the boundary would make any stocking program more effective but the critical issue is that stocking of Brisbane Waters should proceed (with or without a change in the commercial fishing boundary) given the extent of existing recreational fishing usage of the estuary and the anticipated increase in this usage.

Yours sincerely

Fred Parker
Secretary

26 January 2012



TRIM: INW12/2428 - Submission
Stephen Harcourt to: fishstocking.eis

29/01/2012 02:18 PM

Dear sir/madam
I support the proposed activity for marine stocking in full.
The eis is indeed
very comprehensive (probably overdone but that is probably not
a bad
thing) and has certainly identified and addresses all potenial
risks.
In many cases the proposed risks are very low It is a very
responsible
approach. I am amazed that victoria dpi have just done an
estuary
perch stocking without any risk assessment. The nsw program
will
greatly improve recreational fishing.
Yours sincerely
Steve harcourt
Sydney

The Nature Coast Marine Group Inc (NCMG)

30 January 2012

By email : fishstocking.eis@industry.nsw.gov.au



Submission by the Nature Coast Marine Group (NCMG) to NSW Department of Primary Industries (DPI) in relation to proposed stocking of marine species into NSW estuaries for recreational fishing purposes.

The need for restocking has not been established. The Environmental Impact Statement (EIS) prepared by Cardno Ecology Lab on behalf of DPI, takes for granted the need for restocking in the first place. According to the NSW Government response to the Legislative Council Select Committee on Recreational Fishing (December 2011), the only accurate state wide information on recreational catch and effort is the National Recreational and Indigenous Fishing Survey conducted more than 10 years ago in 2000/01.

The first step in restocking should be establishing if the need even exists. This should be based on actual field survey, and not wholly rely in fishers' perceptions. DPI plans to re-survey recreational fishers' by phone and diary in 2012 without doing field work. It is important to note that about 5% of recreational fishers account for about 90% of the recreational catch. Although a small number, these fishers' have a large impact and an unrepresentative political influence. Phone and diary surveys of this cohort would be unreliable.

Before any restocking occurs, field surveys must be carried out to determine existing stock levels, trophic interactions and nutrient recycling within estuaries. The release of large number of herbivores, piscivores and detritivores can alter food availability to other species and affect water quality. Biodiversity can be decreased due to increased competition for food and habitat, if selected species are artificially increased. Surveys need to include multiple sites within and between estuaries and occur over at least one year in each season to determine the ecological connections. Importantly, these surveys must be preceded by pilot studies that inform the size of the larger sampling. The pilot study should assist in determining the level of ecological significance. The power of the analysis should be predetermined before commencing sampling. For example, a study that didn't show any significant effect until algae declined by 90% would be biased. For power analysis a $\alpha:\beta$ ratio of 0.5 favours neither side in an environmental analysis.

Should restocking occur, it should first be on a limited basis that would allow proper surveying to be done. Surveys would need to include an adequate number of sites in both stocked and unstocked estuaries (control and impact sites) to eliminate pseudoreplication. As above, surveys must be conducted over time to include natural seasonal variations.

There are many environmental risks and problems with aquaculture. The EIS states that there will be no increase in job opportunities in DPI, and only private HQAS accredited hatcheries will be able to supply stock. There are only nine listed HQAS hatcheries in NSW (http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0009/355248/Fish-hatcheries-in-NSW.pdf). However, all of these hatcheries only produce freshwater species. One company,

The Nature Coast Marine Group Inc

The Secretary, PO Box 1010, Moruya NSW 2537

Website www.ncmq.org.au

Email info@ncmq.org.au

Aquablue Hatchery also has a limited run of marine species. It is not simply a matter of changing the water to salt and adding broodstock. Marine hatcheries require a different expertise to freshwater hatcheries. Unless DPI is hoping that closing the Cronulla Fisheries Laboratory will force sufficient marine scientists into the private industry, the knowledge required is not available in the NSW private sector.

The translocation of species from one region to another can spread disease. Broodstock caught in northern NSW would have different immunities, and be carriers of different diseases, than broodstock from southern NSW. It would require an investment in veterinarians with fish expertise to properly monitor the health of fry before and after release.

Diets of cultured species are problematic, in that they consume more marine protein than is produced. The main source of marine protein for aquaculture diets, despite experiments with plant proteins such as lupins, comes from *Anchovetta*, which are harvested along the Chilean and Peruvian coasts. The fishery for this species has in the past collapsed due to overfishing and over capacity. Larval diets are dependant upon overseas supply of *Artemia* (brine shrimp), especially the Great Lakes of the USA. However, overharvesting of *Artemia* for aquaculture purposes has negatively affected species that feed on *Artemia* in other parts of the world. Despite intensive experiments, aquacultured species remain a net consumer of marine protein, and not a net supplier of sea food. The ethics of damaging ecosystems, not just in Australia but in other countries, merely for recreational purposes needs to be considered.

Broodstock from wild stocks are typically hard to induce to spawn. Subsequent generations are selected on fecundity and used for future seed supply, reducing genetic diversity. Over only a few generations, cultured fry can be less able than wild fry to adapt to environmental changes. This genetic drift is passed over to wild stock when they spawn with cultured stock, and can reduce wild stock genetic diversity. Maintaining large numbers of broodstock, supplemented by wild caught broodstock to eliminate genetic drift requires significant investment and knowledge.

In conclusion, the EIS does not establish the need for restocking. Restocking of estuaries by aquacultured species can potentially introduce disease and reduce the genetic fitness of local species. Cultured species are net consumers of marine protein. Marine hatcheries require significant investment and knowledge, not present in the private sector in NSW.

Should it be decided that restocking is to go ahead, it should at first be on a limited basis. Research needs to be done before any restocking and should be preceded by a pilot study that informs the power analysis. It is difficult to see where sufficient scientific staff will be found to adequately sample and monitor restocking, given the impending closure of NSW Fisheries laboratories in Cronulla.

Chris Nimmo

Bachelor Marine Science
Southern Cross University

Grad. Dip. Marine Fishery Hatchery Management
Challenger TAFE, Fremantle, WA

For the Secretary

Urunga Amateur Anglers Club Inc.

Application Number – S09_00068

Dear Sir / Madam,

On behalf of Urunga Amateur Fishing Club we as a club support the stocking program of our two river systems, project application number S09_00068.

In June 2002 these two river systems were declared recreational fishing havens.

Being the largest system closest to the city of Coffs Harbour, and the fact we rely on tourism within the Bellingen Shire and our own fishing community, the Kalang and Bellinger rivers are heavily fished. We are sure that both visitors and locals when fishing like to catch a fish or a crab. If they are not stocked they could be depleted very quickly with the possible result being a loss to our tourism industry.

A healthy and vibrant fish population also generates a healthy river system.

Urunga Amateur Anglers Club supports and commends the D.P.I. on this initiative.

Yours Sincerely

Ray Warwick

Secretary Urunga Amateur Anglers Club

26 Hammond Street

Bellingen 2454

31/01/2012

EIS Submissions
Fish Stocking
3/556 Macauley Street
Albury NSW 2640

Dear Sir/Madam

**RE: PROJECT APPLICATION SO9_00068. Submission to the Department of Primary Industry
Marine Fish Stocking in NSW Environmental Impact Statement 2011**

Southern Rivers Catchment Management Authority (CMA) welcomes the opportunity to provide input into the Marine Fish Stocking in NSW Environmental Impact Statement 2011.

Southern Rivers CMA supports local people to undertake innovative, adaptive and sustainable activities to secure healthy and productive landscapes. Southern Rivers CMA is particularly engaged in the protection, conservation and rehabilitation of our aquatic biodiversity and habitats including fisheries resources. The jurisdiction of the Southern Rivers CMA includes significant aquatic areas including:

- 40% of the NSW coastline and includes the waters offshore to 3 nautical miles, from Stanwell Park in the north to the Victorian border.
- 2,972 km² of ocean of which 33% within Marine Protected Areas (MPA's)
- 55% (102) of NSW's estuaries - 5 embayments, 1 drowned river valley, 24 barrier rivers and lakes (generally open) and 72 creeks and lagoons (intermittently open entrances)
- 25% of the total estuarine area in NSW and 15% of the total estuary catchment area.

Southern Rivers CMA recognises that recreational fishing is important culturally, economically and socially to people and communities in the Southern Rivers region, with many sectors of coastal economies dependent on recreational fishing. Future population growth predictions for the coast indicate that demand for seafood and quality recreational fishing opportunities will continue to grow. With aquatic ecosystems under pressure from a range of factors including climate change, maintenance of healthy, productive ecosystems will be a significant challenge into the future, particularly for vulnerable estuarine ecosystems such as intermittently closed and open lakes and lagoons (ICOLLs)

Southern Rivers CMA also recognises that recreational fishing opportunities and the industries that are dependent on recreational fishing are best supported through the conservation of healthy productive aquatic ecosystems and habitat. Effective fisheries management is a key strategy in achieving this

outcome. Southern Rivers CMA advocates that conservation and fisheries management and strategies are based on sound science and appropriate risk management. Specifically, Southern Rivers CMA is concerned that with our limited knowledge of ecosystem function of ICOLLs and the response of these highly variable ecosystems to marine fish stocking, the identified risks have not been managed to an acceptable level.

In this context, Southern Rivers CMA has reviewed the EIS and raises a number of issues and comments, listed in the attached document.

Should you require further information regarding this submission, please contact Martine Fraser on (02) 4224 9717 or martine.fraser@cma.nsw.gov.au.

Yours sincerely,



Chris Presland
Landscape Manager Illawarra/Shoalhaven



Attachment: Southern Rivers CMA comments on Department of Primary Industry Marine Fish Stocking in NSW Environmental Impact Statement 2011

1. Appropriateness of ICOLLs for marine fish stocking

Thirty six ICOLLs in the Southern Rivers region have been selected as suitable for marine fish stocking (Section E-251). The geomorphology of ICOLLs results in environments that are particularly sensitive to natural and anthropogenic disturbance, raising major environmental concerns about their sustainable management (Roy et al. 2001). ICOLLs have high variability in entrance conditions, dilution capacity, flushing times and hence water quality response and ecological processes (Roper et al. 2011). Therefore there is limited evidence to support a sustainable large scale marine fish stocking program in ICOLLs.

There are a number of data sources that provide regional and state comparisons of estuarine type, processes and their condition. Classifications made by the NSW Healthy Rivers Commission Coastal Lakes Inquiry (HRC 2002), National Land and Water Resources Audit (NLWRA 2000), Vulnerability Assessments of estuaries in the south coast region for the Illawarra and South Coast Regional strategies (Department of Planning 2007a + b) will be discussed.

The Healthy Rivers Commission (HRC) Coastal Lakes Inquiry (2002) systematically assessed and classified coastal lakes, lagoons and their catchments for the entire NSW coastline. Each coastal lake was classified according to its natural sensitivity, condition of the water body and catchment, recognised ecosystem and resource conservation values, and other significant socio-economic factors. Of the 36 estuaries that have been selected in the EIS within the Southern Rivers region for fish stocking, three of those were classified as requiring '*comprehensive protection- all natural ecosystem processes restored and preserved*', and ten as requiring '*significant protection - critical natural ecosystem processes restored and preserved*'. DLWC (1999) and DNR (in prep) carried out vulnerability assessment to provide a relative ranking of estuaries and ICOLLs of the south coast, and these were used in the setting of constraints in the Illawarra Regional Strategy and South Coast Regional Strategy (DoP 2007). The assessment uses a range of factors that influence the water and nutrient balances of an estuary and therefore its biological productivity. Eighteen of the thirty six ICOLLs selected for fish stocking are listed in the South Coast Regional Strategy as either high value estuaries vulnerable to land use changes or as containing significant regional habitats. The regional strategies state these estuaries should have their condition maintained or improved, downstream impacts on significant biodiversity habitats avoided, and that within coastal waterways oyster growing areas, fish nursery and habitat areas will be protected and managed. Southern Rivers CMA believes that marine fish stocking is not an appropriate activity for those listed in the Illawarra and South Coast Regional Strategies.

Furthermore Southern Rivers CMA recommends that marine fish stocking not take place in the ten ICOLLs in the Southern Rivers region that have been determined through the State of the Catchment

Southern Rivers Catchment Management Authority

Level 1, 84 Crown Street, Wollongong NSW 2500 | PO Box 3095, Wollongong East NSW 2520
Telephone: 02 4224 9700 | Facsimile: 02 4224 9669 | Website: www.southern.cma.nsw.gov.au



report 2009 as being in very good condition or in poor condition. Those estuaries that have been given a very good condition rating should have these ecosystems maintained with no risk of causing harm to their estuary health. The ICOLL given a poor condition rating that has been selected for marine fish stocking (Barragoot Lake) is of particular concern, given that one of the reasons it was given a poor rating is due to the very poor condition of the seagrass habitat. There is a high risk that there is not enough habitat or food supply for stocked fish, and this ICOLL should not be used for marine fish stocking.

Southern Rivers CMA recommends that marine fish stocking not occur in those estuaries listed in the Illawarra and South Coast Regional Strategy as high value estuaries or containing significant regional habitats, until there is better information and management of the risks to these sensitive and variable ecosystems. Marine fish stocking should also not be undertaken in those estuaries listed in the State of the Catchments Report 2009 as in very good or poor condition.

2. Impact on the State Monitoring, Evaluation and Reporting Program.

State of the catchments (SOC) 2010 reports on the condition of estuaries in New South Wales and the pressures influencing their condition. This information aims to improve the confidence of government in deciding how to prioritise investment and to better manage and protect estuary health. The condition of estuaries is determined through the Monitoring, Evaluation and Reporting (MER) program which uses ecological indicators to determine estuary health, of which fish assemblages is an indicator sampled by DPI (Roper et al. 2011). Four of the estuaries selected for fish stocking on the south coast are used as reference systems for the MER program, and two estuaries are used as control systems. Eleven of the estuaries selected for marine fish stocking are part of the MER sampling program (2008 and 2012 sampling events). The fish assemblage indicator uses parameters such as species abundance and number, nursery function and trophic integrity, and the introduction of fingerlings of four fish species would have an impact on the data obtained. There is no mention in the EIS of how the fish stocking would impact on the data for the MER program.

Southern Rivers CMA recommends that the marine fish stocking not take place in the control and reference systems used in the MER program

3. Unacceptable levels of risk

From the table of environmental risks identified in the EIS risk assessment (Section A-18), there are thirty environmental aspects that have been determined a **high risk** due to the proposed activity. With mitigation and management strategies twenty of these high level risks were downgraded to only moderate. Southern Rivers CMA considers this an unacceptable level of risk for ICOLL environments and

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there are concerns that the large number of high risks will not be adequately managed. The EIS does not consider the pressures that are on these systems already and the cumulative impact and risks that marine fish stocking will have on these already vulnerable estuaries. Furthermore, no consideration is given to the impact that climate change will have on the environmental risks from the proposal, and a revised risk assessment should be undertaken that takes into account climate change impacts on the proposed activity and associated environmental risks.

Southern Rivers CMA suggest the costings and resources required for the appropriate scale of monitoring and evaluation, and research have been under estimated (pg. 672), and this will impact on the effective management of the environmental risks identified.

4. Inadequate information and research

Robust, credible and accurate data is essential for policy makers and managers to successfully manage fisheries resources and their habitats. For fisheries, this data includes assessment of fish stocks and habitats, fishing activities and attitudes of fishers. Currently there is no comprehensive species level value or catch data available for the recreational sector. In NSW, assessment of catch and effort of recreational anglers have been targeted to a specific fishery using on-site surveys in specific location for a certain reason e.g. before and after the introduction of a Recreational Fishing Haven. There has been no State-wide survey of recreational fishing since the National Recreational and Indigenous Fishing Survey. Given that best estimates indicate that recreational fishers are the major harvesters (more than 70% of total harvest) of species such as bream, mullet, dusky and blue spotted flathead, it is essential that recreational harvests are incorporated into the resource assessments of such species.

There is no evidence to suggest that these ICOLLs are recruitment limited, or suffering fish species decline. In a three year study by Jones and West (2005) of six ICOLLs in southeast Australia 37 commercial and recreational species were captured. The ICOLLs were considered moderately species rich and comparable to other similarly intermittently open systems, such as the Peel-Harvey and Moore river estuary in southwestern Australia, and were even similar to other estuarine systems in NSW that are permanently open, such as the Clarence River (Jones and West 2005). A number of the estuaries selected for marine fish stocking are mostly open (Pambula Lake), and even permanently open (Lake Illawarra, Shoalhaven River) and hence are very unlikely to be location-based recruitment limited.

The statement within the EIS that "Based on the risk assessment and mitigation as identified within the draft FMS, the overall risk to wild populations, trophic dynamics, estuarine habitat and adjacent coastal areas posed by marine stocking is considered to be mostly low with no significant impacts expected" (Section A-9) seems largely unfounded and based on inadequate research and information.

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The distinct geomorphology and hydrological conditions of southeastern Australian ICOLLs, combined with large scale regional climatic events, play a major role in structuring their fish assemblages (Pollard 1994, Griffiths and West 1999, Jones and West 2005). The introduction of stock fish could have negative consequences for fish populations, particularly on the trophic structure of the ecosystem. This is particularly relevant for ICOLLs, where evidence has shown that the trophic structure and food availability changes in conjunction with entrance closure and opening (Bally et al., 1985). Little is known of the long-term consequences of opening and closing regime of ICOLLs on food web dynamics, but it is likely that unique dietary compositions and food webs may exist in these systems (Mazumder 2004). It has been reported that food sources such as zooplankton and zoobenthos are higher in abundance when the estuaries are closed, and that when these estuaries are breached the available habitat and food sources are drastically reduced due to loss of plankton and prolonged exposure of the benthos (Whitfield 1980, Blaber et al. 1984). Furthermore, the timing and spawning of recreationally important fish species has been found to be linked to the hydrological cycle and the subsequent successional series of the zooplankton, and hence food supply (Rissik 2008). In light of the large number of ICOLLs and the paucity of information on these systems, an increased understanding of the ecology and trophic interactions within these systems is required to ensure sustainable management of NSW estuarine fisheries and ecosystems.

It is important to understand the existing structure of estuarine food webs and how altering a specific component of the food web (e.g. by stocking) has potential to affect other components of the system, particularly for those systems that are dynamic in nature due to changing entrance conditions, and hence have altering trophic structures and food availability. This has not been thoroughly investigated in the EIS and without this information, Southern Rivers CMA believes that a large-scale marine fish stocking program is not a valid proposal and the risk to ecosystem function is too high.

Whilst there have been some studies investigating the ecology and diets of commercially and recreationally important fish species, very little is known of the productivity of these ecosystems (Mazumder 2004). In the EIS the CSIRO Simple Estuarine Response Model (SERM) was used to provide integrated estimates of benthic and pelagic primary productivity. The use of the CSIRO Simple Estuarine Response Model (SERM) is inherently flawed and not appropriate for determining primary productivity of an individual estuary and hence where stocking may occur. The SERM model is a national based model and hence is at a coarse scale, and not necessary designed for NSW estuaries. Moreover, this model was not designed to determine the primary productivity of an estuary, but as its name suggests, rather to look at estuary responses to nutrient and sediment enrichment. The grouping of all NSW estuaries into either a coastal lagoon or riverine lagoon with either high or low productivity is woefully inadequate. Estuary specific modeling is required, based on information from NSW estuaries, particularly given the possible ecosystem effect introducing multiple fish and crustacean species into a system.



The research and monitoring that has been detailed for the stocking program is appropriate but it is research that needs to be carried out on a small-scale stocking program before the larger program proposed in the EIS commences. It seems illogical that large scale marine stocking will precede research that may resolve many of the uncertainties and risks, such as gaps related to genetics, disease management and the impacts fish stocking (Section E.2.8.2). Research proposals described in the EIS include determining the impact of stocking activities on the biodiversity of native populations, determine potential trophic impacts through food chain interactions, and interactions between stocked fish, threatened species and area of conservation. Southern Rivers CMA believes the results of this type of research is needed in order to determine that the large scale marine fish stocking program is indeed not having a significant effect as stated in the EIS (Section A-9). Without this research information prior to the marine fish stocking program commencing the risk in carrying out the current proposal is unacceptably high for the ICOLLs on the south coast. Given the lack of knowledge about ICOLL productivity and food web trophic interactions, it seems prudent that the research be carried out in small-scale stocking experiments/program prior to the suggested program across the whole of NSW. As noted in the EIS, the successful use of stock enhancement relies on a responsible and cautious approach, and only by knowing the dynamics and productive capacity of the target ecosystem will species stocked be sustained by the environment (Taylor et al. 2005).

Summary and recommendations

Southern Rivers CMA recognises that recreational fishing is important culturally, economically and socially to communities in the Southern Rivers region. The EIS has stated that the proposed fish stocking program is not specifically conservatory in nature and does not target threatened or vulnerable species, and the benefits associated with this would be low (pg 243). Given that the proposed program is purely the enhancement of recreation fishing quality, Southern Rivers CMA proposes that the risks to sensitive ICOLL environments on the south coast are of an unacceptable nature. Southern Rivers CMA is also concerned of the required resources and institutional capacity to carry out such a program, the management of environmental risks and the monitoring, evaluation and research required.

Southern Rivers CMA recommends:

- Marine fish stocking not take place in those estuaries listed in the Illawarra and South Coast Regional Strategies.
- Marine fish stocking not take place in those estuaries used as reference and control systems for the NSW MER program, and those listed as having very good or poor condition by the NSW State of the Catchments report 2009.
- A small-scale marine fish stocking program should be undertaken before a large-scale program is implemented. This would ensure that the research and monitoring required to evaluate the potential ecosystem impacts on ICOLLs from marine fish stocking is undertaken, and hence have

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a higher chance of reducing the level of environmental risks.

Furthermore Southern Rivers CMA recommends that the maintenance and improvement in the condition of estuaries and their catchments, and the habitats within estuaries is a better management tool for the sustainability of fishery resources. Southern Rivers CMA recommends funds from the NSW Recreational Saltwater Fishing Trust should be geared towards such projects, and the education of recreational fishers on the sustainable management of the fishery resource and on the protection of the health of the estuary on which the fish depend upon. Consideration should be given to providing mechanisms which facilitate engagement of recreational anglers with NRM organisations (e.g. by requiring assessment/linkage of projects under the NSW Saltwater Trust with regional/sub-regional NRM priorities). Consideration should also be given to develop strategic list of projects/sites per region that recreational anglers and NRM organisations can work towards collectively, so that projects of an adequate scale can be delivered which will ensure recreational angling is protected and improved.

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To:
Cc:
Bcc:
Subject:

From: Shaun Reynolds
To: FishStocking EIS/DII/NSW@NSW
Date: 31/01/2012 03:30 PM
Subject: Assessment of Enviromental Impact of Marine Fish Stocking Public Exhibition (S09_00068)

Hello

Please find as follows my response in regards to project application number (S09_00068): which is in relation to the future proposal Marine Fish Stocking of numerous key species.

It is noted that Wallis Lake may be included possibly in the future as stocking release site for such species.

As both Fisheries Officer working in this District and a keen angler who pays the recreational Fishing fee I believe I have the right to make an informed comment on this proposal .

The idea of re stocking Marine species is I believe a waste of time, money and resources for this waterway .

I am opposed to the re- stocking of these marine fish stocks including , juvenile mullet , Eastern king prawns, dusky flathead, yellowfin bream, blue swimmer crabs and giant mud crabs.

It is of my understanding that Industry and Investment has its own mechanisms and triggers in place to safeguard and monitor the take of species , their possible decline rate and management strategy's for their recovery if needed.

In this district currently there are close to 55 commercial fishers that use Wallis Lake , Wallingat , Wallamba, Wang Wauk and the Coolooloolook River systems in the Estuary General Fishery .

With allowable fishing methods that commercial fishers can use over a working week Monday to Friday this could equate to.

- A possible 79.750 kilometres of Meshing net that can be used by setting either for 3 hours or all night set (depending on the time of year) or alternatively with a reduction in length of the meshing net used by the method splashing all throughout the year.
- 1650 Commercial crab and fish traps used in combination
- Hauling nets of 500 meters in length endorsements held by numerous commercial fishers.
- Set pocket prawners numerous endorsement holders .

Interested to know what possible environmental concerns there would be when releasing foreign fish into a clean waterway such as Wallis Lake.

It doesn't make sense to me and I'd like to see my resources go to better projects than this .

Regards

Shaun Reynolds



Sarah Boyd
Fisheries Manager – Marine Stocking
EIS Submissions
NSW DPI
3/556 Macauley Street
ALBURY NSW 2640

Dear Sarah

Comments: Marine Fish Stocking Program NSW Coastal Waters – EIS (S09-00068)

Thank you for the opportunity to provide comment on the EIS for a proposed marine fish stocking program in NSW Coastal Waters. Hornsby Shire Council supports efforts by NSW DPI to enhance recreational fishing opportunity; however Council has concerns regarding the level of risk and uncertainty involved with the proposed stocking program.

Please accept these brief comments regarding the Marine Fish Stocking in NSW Environmental Impact Statement.

Volume 1 page A-2 a key objective of the proposal is to enhance recreational fish stocks and improve recreational fishing opportunities by stocking NSW estuaries with native fish that are recognised as recruitment limited. It is also acknowledged that the recruitment of species may be limited due to overfishing. It may be more appropriate to achieve this objective through the protection and improvement of habitat quality and changes to fisheries regulations. Encouraging recreational fishing effort in estuaries where it is acknowledged that species are recruitment limited due to overfishing does not promote a sustainable recreational fishing industry.

Volume 1 page A-7 discusses the biophysical impacts which might occur in relation to the ecology of the area associated with stocking events. The statement is made 'there is uncertainty about whether the increased abundances of stocked species displace wild conspecifics or other species with similar food or habitat requirements'.

A further comment is made as follows, 'the current modelling is, however, a first step and further empirical data would be obtained through out the stocking program to test and improve the accuracy and effectiveness of the model and to further develop the standard formula for use in the future'.

If an understanding of the potential impacts of the stocking event on the associated ecology is not well understood the precautionary principle comes into play and such events should not occur until some certainty about the impact is obtained. To contend that data will be collected during the program to understand its impacts on the ecology will only serve to inform after some deleterious effect has occurred.

Volume 1 page A-13 Disease parasites and pests. The likelihood of cultured species transmitting disease to wild stocks must be avoided at all costs. Wild stocks are currently under huge pressure from decreasing water quality and increased disease due to these stressors. If there is any potential that disease transfer could occur the program should not continue.

Volume 1 page A-36 Alternatives considered. Only lip service is dedicated to the concept that recreational fishing stocks can be enhanced by habitat restoration. More information should be included here about habitat restoration projects currently underway and the linkages between habitat restoration projects and the proposed Marine fish stocking program.

Volume 1 page B-45 All estuaries in which the entire estuary is an MPA were excluded as MPAs are not included in the proposed activity. The question needs to be asked why are MPAs not included in the proposed activity? Is this because the risks to the ecology of undertaking the programme are too great?

Volume 1 page B-46 Water quality. It is recommended that local water quality be ascertained on individual estuaries prior to making any decisions regarding the fish stocking program.

A final comment revolves around the technology available to conduct such a marine fish stocking program. For example, a justification for the ability to stock Blue Swimmer Crabs in New South Wales is put forward by quoting a Japanese paper and implying that the Japanese have been conducting such stocking programs for many years. Please note a recent paper (2011) titled "*A review of seed production and stock enhancement for commercially important Portunid crabs in Japan*". Aquaculture International. Volume 19. Issue 2. Page 217-235. This paper states, "to achieve reliable mass seed production technologies, measures for controlling disease and the nutritional condition of larvae in seed production tanks are required to be developed".



We have not looked into any other species rearing technology but it would seem that more research needs to be conducted into the literature supporting hatchery production of all the proposed species listed in the EIS. This is needed so expectations are not raised only to be dashed later when it is realised that the needed technology is not completely developed and that years of future research are required before such stocking can take place.

Yours sincerely,

Dr Ross McPherson
Manager Water Catchments
Hornsby Shire Council

31 January 2012



Assessment of Environmental Impact of Marine Stocking S09_00068

BNoel

to:

fishstocking.eis

31/01/2012 04:13 PM

Hide Details

From: BNoel@ssc.nsw.gov.au

To: fishstocking.eis@industry.nsw.gov.au

I have reviewed the Marine Fish Stocking in NSW Environmental Impact Statement Vol I-III and would like to contribute the following:

- Although, as this EIS references, many stocking events have occurred of fish/prawns/crabs and other aquatic-marine organisms of commercial and recreational interest in Australia and overseas it seems that there are many risks associated with the practice of breeding, raising and releasing hatchery bred species into estuaries.
- Many of the potential risks have been discussed and some procedures and practices proposed to reduce the risks which is positive.
- It seems that there could be significant value in releasing certain species that have a commercial, cultural and ecological value, however it is questionable that releasing species that are primarily of recreational interest solely for the purpose of recreational fishing is worth the potential risks identified in length within the EIS.
 - Some of the many risks include: introduction of disease, damage to localities due to increased usage, competition of hatchlings with wild born organisms, alteration/destruction of habitat, alterations to wild population genetics, potential impacts to threatened species and many more.
- Under section C.5 Responsible Approach to Marine Stocking indicates an approach for marine stock enhancement and management. In Stage 1 point 3. the dot points indicate a list of things that need to be considered and conducted to ensure that any release of marine stock contributes to biological, economic, social and institutional management objectives of fisheries. This proposed release does not seem to consider anything but recreational.
- At the time of the production of the EIS it would be envisaged that Responsible Approach to Marine Stocking Stage 1 in section C.5 would have been conducted if not parts of Stage 2. The EIS does not indicate that this is the case. No mention of habitat enhancement or clear impacts on commercial industry including cost effectiveness of the project (from a commercial sense) have been provided.
- As many of the risks have been identified and certain management strategies suggested to reduce the risk it is likely that a Marine Stocking program would be of great importance economically, culturally and even ecologically in certain populations, however the primary purpose of this program is clearly not commercial or ecological and therefore I believe that reconsideration of the purpose of the stocking should be undertaken. Economics and ecology, not recreation would likely have the most benefits to society and the environment and therefore should be the primary drivers. If recreational fishers benefit from Marine Stocking that targets commercial fishers and the environment then this Marine Stocking project may have economic, ecologic, social and cultural benefits instead of just social and cultural.
- Considering the multiple references to previous releases of aquatic/marine organisms into the wild there probably should be more solid data to base a lot of the decisions surrounding the risk management. It appears that the Draft Fishery Management Strategy details the research that is still required to inform a project such as this however it would be more assuring if those studies had already been conducted or

extrapolated from similar releases conducted previously as surely they would have had monitoring components.

-
-

Regards
Beth Noël
Environmental Scientist (Water Quality)
Environmental Science and Policy Unit
Sutherland Shire Council
Locked Bag 17 Sutherland 1499 Australia
Tel: 61 2 9710 0686
Fax: 61 2 9710 0108
Email: bnoel@ssc.nsw.gov.au
Web: <http://www.sutherlandshire.nsw.gov.au>

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To:
Cc:
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Subject:

From: Martin Angle
To: fishstocking.eis@industry.nsw.gov.au
Date: 31/01/2012 04:48 PM
Subject: marine stocking eis submission

Sarah,

I wish to note some concerns i have regarding the marine fish stocking proposal.

I limit my comments here to the aim and need of the proposal (more detailed comment restricted by present time constraint):

I note the principal aim is to enhance recreational fishing, and fish stocks, with 'recruitment limited' species (being: 'species based' > a product of stock overfishing; and location based > an indicator of insufficient resources eg: habitat).

It is my opinion that this aim indicates a clear failure of current fisheries management practices, and it is these issues that need to be addressed in the first instance before exploring the possibilities of marine stocking.

The socio-economic needs of the fishing community can and should be met by enhancement of existing management regimes. If stock is being overfished, improved research, regulation and compliance responses are required. If the habitat of a location is degraded, additional resources need to be allocated to addressing that issue, eg habitat protection and restoration. I believe these two options would provide for far more effective and efficient, long-term, stock enhancement outcomes.

Inter-generational equity demands that we look after the resources we have now by addressing such issues as overfishing and habitat degradation. Marine fish stocking is a second-best, 'band-aid' option, in my opinion. Community resources earmarked for stocking would be better spent on improving existing management practices.

Lastly, Wallis Lake is intensively fished by both commercial and recreational interests. It would seem inequitable that commercial fishers will benefit to a large degree from a recreational funded program.

thanks for the opportunity to comment.

rgds

Martin Angle



Contact: Peter Corlis
Phone: 02-6653 0115
Fax: 02-6652 3936
Email: peter.corlis@cma.nsw.gov.au

EIS Submission

Fish Stocking

3/556 Macauley Street

Albury NSW 2640

31st January 2012

Subject: Submission on Fish Stocking EIS

The Northern Rivers Catchment Management Authority (NRCMA) is responsible under the Catchment Management Authorities Act (2003) for the development of partnerships with local, state and federal government and the community to develop on ground works and interest in, best practise natural resource management across the region.

The Northern Rivers Catchment Action Plan Management Target B5 relates directly to the sustainable management of fisheries resources, and states that:

'By 2016, secure 500,000 ha of native terrestrial and aquatic ecosystem under sustainable resource management'.

The mechanism to achieve this target is the promotion and facilitation of sustainable resource management practises, both at the management and activity level across priority industries.

EIS methodological approach

It is acknowledged that the EIS is an extensive report that identifies many issues in a very complex environmental and biological setting across a large spatial scale, indeed few EIS in NSW cover such a vast extent. Despite this, it is instructive to consider how the EIS (Blount et al, 2011a,b,c) method conforms to aspects of best practice for impact assessments.

Quantitative Data

It has been repeatedly recommended for environmental impact assessment that "*...wherever possible undertake investigations with sufficient scientific rigour that may contribute to a quantitative baseline to allow testing of predicted impacts after the project is initiated*" (Lincoln Smith, 2003, section 2.5; references therein)(see other papers that discuss the integration and utilisation of baseline assessment data that informs latter monitoring [Lincoln Smith, 1991, pg610; Fairweather, 1991, pg 557]).

The EIS (Blount et al, 2011a,b,c) does not collect quantitative data on any estuary proposed for marine stocking and subsequently does not inform latter monitoring (see below) or assist in determining associated impacts. There are experimental designs that are available in the

absence of before data (e.g. Beyond BACI, Underwood, 1994) however for this EIS there has been no perceived attempt to collect baseline data and its lack of collection undermines the rigour of the EIS.

This lack of data has been recognised throughout the EIS (see attachment 1 for examples) and thus limits this EIS considerably to conform to the “*Responsible Approach*” to stock enhancement as advocated by Lorenzen *et al* (2010; cited by Blount *et al*, 2011) where ‘*rigorous science*’ is used to promote ‘*effectiveness and accountability*’.

Models & Frameworks Utilised in EIS

SERM

The EIS utilises the Simple Estuarine Response Model (SERM) developed by CSIRO (Baird *et al*. 2001; cited in Blount *et al*, 2011b; pg E-312) to determine integrated estimates of benthic and pelagic primary productivity from biomechanical and mechanistic descriptors of key ecological processes in each estuary shortlisted for stock enhancement. These findings were then used to determine the productivity and therefore specific numbers of fish that could be stocked in each shortlisted estuary. However CSIRO has stated that the model should not be used to replace detailed local modeling studies in developing and assessing management strategies for individual estuaries. CSIRO also states that it is not possible to recommend specific management actions for each individual estuary because:

- there is no detailed data for most estuaries to allow specific investigations;
- any examination of specific estuaries would have to be carried out in close collaboration with responsible State managers;
- the time and cost to run models for a large number of specific cases would be prohibitive;
- Higher trophic levels, including fish, are not represented explicitly in this model (Australian Government 2002)

Predatory Impact Model

The EIS (Blount *et al*, 2011b; Appendix E.5) has adapted Taylor & Suthers (2008) Predator Impact Model developed for Mulloway (*Argyrosomus japonicus*) however those authors make key assumptions that limit the strength of their model. The limitations are:

1. That prey resources required by stocked fish as they grow larger are present in the ecosystem (Taylor & Suthers, 2008. pg130), and
2. “Former commercial catch in recreational fishing havens can give an indications of the abundance of potential available resources in the system” (Taylor & Suthers, 2008. pg130),

Assumption 1 is speculative and cannot be considered with confidence and only the collection of quantitative data (see above) can provide the rigour needed for accountability in the decision making process (Lorenzen *et al* 2010). The second assumption in Taylor and Suthers (2008) model is also speculative as fishery dependent data to assess harvested stocks of fish and invertebrates is quite limited (Rotherham *et al*, 2007).

Additionally neither Taylor and Suthers (2008, table 1) or the EIS model (Blount *et al*, 2011b; Appendix E.5) consider the presence of other predatory fish that compete with the stocked fish (either on introduction or as they grow) and as such is a considerable flaw in the model.

Ecological, environmental and economic considerations

In relation to the EIS for marine stocking in NSW, NRCMA submits the following comments:

1. The EIS does not adequately address 'bottom up' trophic impacts on associated species. The EIS addresses 'top down' or predatory impacts on prey species of a stocked fish through the Generalised Predator Impact Model but no information has been provided to describe potential impacts and ways of mitigating that impact on the ecology of an aquatic system from the perspective of species or species that may predate on stocked fish. The potential flow on impact of having an increase in predator species can have a direct influence on the relationship between predator and prey biomass, food web integrity and the ecological balance of an ecosystem (Pace *et al* 1999).
2. The EIS does not adequately consider alternatives to the 'no stocking' option. The EIS does not empirically compare the economic and ecological viability of stock enhancement versus habitat restoration with regard to the recruitment of proposed species. The enhancement of salmonid rivers in the Republic of Ireland found habitat rehabilitation was at least 15 to 30 times more effective in improving fish numbers than stocking. There were also significant flow on effects of such activities such as improved habitat for terrestrial fauna and improved productivity for primary producers that share that part of the landscape (O'Grady, 1995).

A presentation by Dr O' Grady to the Conservation Action Unit of NSW Fisheries discussed that Europe has moved away from stock enhancement in favour of habitat repair due to the poor recruitment and survival characteristics of hatchery reared fish.

The Maroochy Estuary fish-stocking program (Qld) is the largest marine scale fish stocking program undertaken in Australia to date, where 432,000 sand whiting (*Sillago ciliata*) and dusky flathead (*Platycephalus fuscus*) were released over three years (Butcher *et al.*, 2000). Cost-benefit analyses indicated that the estimated cost of each fish caught was about 680% of the retail value, and the project failed to show any increase in population size over the numbers estimated prior to stocking.

The NRCMA do have partnership with the community on a significant number of river reach and estuary action plans that focus on aquatic habitat remediation. These plans provide an opportunity for positive community and environmental outcomes while also providing the physical mechanism for an increase in fish recruitment and abundance.

3. The EIS does not empirically justify the need for stock enhancement in proposed estuaries. NRCMA does not agree that the location and number of stocked fish should be determined solely on the basis of models as they are not specific to an individual estuary to the extent required and do not allow for temporal or spatial variance between each system.

NRCMA therefore requests that the designation of a system as being recruitment depleted and the number of fish to be stocked for each system be determined through appropriate baseline and replicate surveys in each respective estuary.

4. The EIS also does not empirically describe the potential improvements to the recruitment of wild stocks that could be made by the reduction of bag limits and increases in size limits and therefore whether these management methods are at an appropriate level. The EIS should identify if current bag and size limits are sustainable for both wild and stocked fish. Status Of Fisheries Resources NSW 2008-09 describes that most of the species being targeted for stock enhancement are at either the 'Fully Exploited' or 'Overfished' status (NSW Fisheries, 2010). NRCMA suggests that stock enhancement cannot solve the problem of overexploitation by stocking; there must be a reduction in fishing pressure first (Hilborn 1998) and that for bag limits to be effective they must be at levels which actually limit the catch (McPhee *et al.*, 2002).

5. The EIS raises concern about the possible genetic impacts of stocking yellowfin bream (*Acanthopagrus australis*) in estuaries where black bream (*A. butcheri*) occur and proposes a 50km buffer zone to mitigate against the possible risk of hybridisation. This recommendation is limited in that such a rigid decision rule does not consider any population shifts with environmental change. For example, about 30% of Tasmania's inshore fish species have thought to have major distributional shifts as the result of climatic factors (Last et al, 2011).
6. The conservation of biological diversity is a key element of Ecological Sustainable Development [ESD] that is recognised in the objectives of the Fisheries Management Act 1994. A key facet of biodiversity is ecosystem diversity (DEST, 1994) however throughout the EIS it is clear that there is a limited recognition of the value of ICOLLs. ICOLLs are one of the three broad types of estuaries (Roy et al, 2001) and are very dynamic environments e.g. water levels, opening regimes, salinity levels etc (see Haines, 2008) and this can structure their biological assemblages (e.g. fish; species Jones & West, 2005). Despite their widespread occurrence across SE Australia (Roy et al, 2001; Haines, 2008) there has generally been very little research determining their ecological function and structure and the effects of human disturbances (Hadwen & Arthington, 2006).

It appears in the EIS that ICOLLs are a resource to exploit for fisheries stocking and that the natural process that characterise ICOLLs (e.g. sometime closure of entrance) is noted as a limitation to recruitment (e.g. Blount et al, 2011a, A-2; B-40; C-84; Blount et al, 2011b, E-257, E-258). However this perspective ignores the role ICOLLs have in adding to ecosystem diversity of estuarine habitats. The fact that ICOLLs are sometimes closed should be viewed as a natural phenomenon and adds complexity to the biological assemblages found in this dynamic environment. It has been argued that artificial opening ICOLLs or installing training works should be avoided as the effects on the fish assemblage is unpredictable (Jones & West, 2005) even though such interventions would negate the narrowly perceived "recruitment limitations" articulated in the EIS. Similarly, the introduction of fish stock would have disruptive effects on the fish assemblage and cannot be supported in this data poor proposal (see above).

In NSW ICOLLs are predominately south of Sydney (Haines, 2008) and there are considerably fewer in the NRCMA (see Figure 1 in Haines et al, 2006) including several that have been selected for fish stocking (Blount et al, 2011a, figures B-4, B-5). The proposed fish stocking in these estuaries is of concern as the ecological integrity of these variously conditioned ICOLLs will most likely be compromised by the proposal.

NRCMA thanks you for the opportunity to comment on this EIS and looks forward to working with NSW DPI (Fisheries) in the future. If you have any queries please contact Peter Corlis on 66530115.

Yours sincerely



Peter Corlis on behalf
Ian Simpson
A/General Manager
Northern Rivers CMA

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Attachment 1: Examples of data deficiencies recognised in EIS

- “There is **little experimental data** to support an increase in inter-specific competition between hatchery reared individuals and other species in marine environments” (Blount et al, 2011a, pg C-96)
- “Many of these diseases may not have been recorded for the seven species proposed for stocking, however, this is likely to be a result of a general **lack of data** regarding the host specificities and vulnerabilities” (Blount et al, 2011a, pg C-107)
- “There are, however, few (if any) reported incidences of marine pests being translocated as a result of stocking activities. This may be a result of data **deficiency** rather than lack of issue” (Blount et al, 2011a, pg C-109)
- “Theoretically, the need for, and benefits flowing from, a marine stocking program... this type of analysis is impractical in regard to most recreational fisheries as data of this type is typically **unavailable**” (Blount et al, 2011a, pg C-116; Blount et al, 2011c; Specialist report B, pg 3)
- “The life history of the eastern king prawn and one allozyme study suggests a single east coast population, however, this data is considered **insufficient** to draw a final conclusion on genetic structure” (Blount et al, 2011a, pg C-152)
- “Blue swimmer crabs occurring north of Port Stephens are therefore regarded as a single stock, however, as no samples were taken south of Port Stephens **further data** is considered **necessary** to confirm a single east coast population” (Blount et al, 2011a, pg C-152)
- Table D.14: Relative condition of estuaries in the NSW coastal region (14 estuaries with **no data**)
- “All fisheries that use ecological risk assessment to assist in formulating their fishery management plans require a qualitative risk assessment method because data **deficiency** of one or more ecological components is a common feature of almost all fisheries. Therefore, qualitative methods, i.e. those that use attributes or properties of an ecological component rather than exact numerical measurements are needed to assess all major ecological components of **data deficient** fisheries” (Blount et al, 2011b, pg E-256)
- “Confidence in the model simulations conducted here is **limited** by availability of **data** to calculate key model parameters for the species in the regions specified in this document. This is exacerbated by the **lack of empirical data** to determine trophic relationships and the **lack of quantitative data** on fine-scale habitat use for most of the species” (Blount et al, 2011b, pg E-313)
- “As **data** on food conversion and growth efficiency were **lacking** for the invertebrate species...” (Blount et al, 2011b, pg E-318)
- “The model required empirical determination of the proportion of major prey items in the diet, and variation with length or age; these values were determined from published studies or estimated where **no data** was **available**” (Blount et al, 2011b, pg E-318)
- “Table E.18 shows the model parameters used, and highlights that for **many** of the **models**, **no data** was available and the parameter used simply reflects an estimate by the project team” (Blount et al, 2011b, pg E-319)
- “Although it was not possible to establish the precise monetary benefits from the marine stocking proposal (due to **data limitations**)...” (Blount et al, 2011b, pg F-330)

- *“The draft FMS recognises that there are **limitations** to the **data** used to calculate key model parameters for the selected species and estuaries proposed for marine stocking.” (Blount et al, 2011b, pg G-347)*
- *“The **data** available in regards to fishing effort and success of capture within NSW is **insufficient** to undertake a standard quantitative cost-benefit analysis which would typically be reported as part of an Environmental Impact Statement (EIS)” (Blount et al, 2011c; Specialist report B, pg ii)*
- *“The quantitative assessments undertaken adopted a series of simplifying and conservative assumptions to account for the **lack** of available **data** while still providing indicative results as to the positive economic outcome associated with a fish stocking program” (Blount et al, 2011c; Specialist report B, pg iii).*
- *“This study does not aim to provide an economically rigorous valuation of the cost and benefits associated with a fish stocking program as would typically be undertaken for an Environmental Impact Statement (e.g. development of a quantitative demand models or scenario analysis). Similarly, the study does not attempt to quantitatively evaluate environmental and social impacts (environmental impacts and social impacts are addressed independently in Sections H.2 and G.2.2 of the EIS respectively). Such a study was not undertaken due to:*
 - *The **lack of available data** in regards to recreation estuarine fishing utilisation;*
 - *The **lack of available data** in regards to the fish populations within estuaries;”*
(Blount et al, 2011c; Specialist report B, pg 1)
- *“Although defined in broad terms due to the **data limitation**, the findings of this cost benefit analysis will reflect the nature of likely impact of fish stocking and can be utilised as a decision making tool to guide which species are economically feasible to stock and in which location the stocking will generate the greatest net benefits” (Blount et al, 2011c; Specialist report B, pg 2)*
- *“With regard to the potential for fish stocking within NSW there is a significant **lack** of **data** preventing accurate quantitative evaluation of the economic costs relating to marine fish stocking” (Blount et al, 2011c; Specialist report B, pg 7)*

Sarah Boyd
Fisheries Manager, Marine Stocking
Department of Primary Industries
3/556 Macauley St Albury NSW 2640

31 January, 2012

Submission from the Nature Conservation Council of NSW to the Marine Fish Stocking Program (NSW Coastal Waters) Environmental Impact Statement

Dear Ms Boyd,

The Nature Conservation Council of N.S.W. would like to provide the following comments in response to the EIS for marine fish stocking (NSW coastal waters) (S09_00068). There is currently not a clear relationship between the selection of species for inclusion in the restocking program and their respective fish stock status. Restocking does not reflect a best practice response in fisheries management. As the biological and genetic risks to wild populations are not insignificant, restocking should be seen as a management measure of last resort. If restocking is being proposed to enhance recreational fishing opportunities, this intention should be clearly articulated to the public as well as its potentially limited impact upon stock recovery.

The target species suggested for stocking are overfished and fully fished according to the report "Status of Fisheries Resources in NSW 2008/2009" and are in need of appropriate management responses to ensure the long term sustainability of these species. Increased sustainability of stocks should be achieved through fisheries management measures that are known to achieve long term recovery. The benefits of restocking to longer term stock sustainability are at best unknown and could be detrimental to wild stocks. Given the costs associated with a restocking program such as this, NCC believes that the limited funds available for fisheries would be better spent on more reliable fisheries management interventions that are more likely to secure long term improvements to stock sustainability.

There are other methods that would benefit the environment as well as the species considered for fish stocking within NSW estuaries, such as increasing the minimum legal size catch (total length) as well as the decreasing the bag limit per person for NSW. Nearly all of the species chosen for stocking have undersized minimum length limits as well as high bag limits. The Yellowfin bream (*Acanthopagrus australis*), Sand whiting (*Sillago ciliata*) and the Blue swimmer crab (*Portunus pelagicus*) all have bag limits of 20 and the Dusky flathead (*Platycephalus fuscus*) has a bag limit of 10. These relatively high bag limits could be a contributing factor to their fully fished status (Status of Fisheries Resources in NSW, 2008/2009). Given the impending review of recreational bag and size limits in NSW, it is suggested that this review is given priority as a management response for addressing the stock sustainability issues facing NSW's more popular recreationally targeted species.

Issues with fish stocking, ranked in order of concern:

1. Overstocking within the location would lead to an increase in competition (both intra and inter-specific) resulting in a decrease in resource availability (eg. decrease in habitat requirements and food). Overstocking is a major concern as it has a large number of potential indirect affects upon the associated ecosystem including impacts to trophic levels, abundance and distribution of fish species as well as increased exposure from injuries, disease and parasites within the population.
2. Alteration and modification of genetics within the species population can occur, lowering the gene pool and the transfer of gametes through generations, increasing susceptibility to diseases and parasites in the population.
3. Trophic levels may be altered, creating a cascading effect throughout the ecosystem whereby the increased abundance of one species will decrease the abundance of another species as well as the food source and resources they consume. The stocked fish would replace or alter the trophic flow of the natural system.
4. Potential for The Ryman-Laikre effect (a reduction in the fitness of natural population as well as a decline the size of the population due to introduction of a species) to occur, resulting in detrimental effects throughout the system.
5. The translocation of diseases, stocked species and parasites to other areas can significantly affect adjacent environments.
6. Stocked fish breeding with the natural population can create loss of gametes between the generations as well as the offspring not being fully adapted to survive in the natural habitat (introgression).
7. There could be a modification to the size of species within the natural population with a high potential of smaller fish sizes due to the introduced stocked fish (less food availability and increased stress from the stocked fish may result in smaller size within the location).
8. The environmental requirements may not be known for each specific fish species, and may not be known until after the fish stocking event as there has been no previous study in NSW. There are five types of estuaries within NSW, each comprising of different geological and hydrological characteristics. This could create a major loss in economics and time if stocked fish fail to survive in the environment they are introduced to.
9. Higher volumes of recreational fishing activities could lead to an increase in anthropogenic impacts (litter, pollution, trampling, boating activities, etc) on the surrounding environment. Trampling and vehicle traffic can also increase the spread and introduction of weed species on the terrestrial environment.
10. The increase use of hook and line fishing methods may affect threatened species. Injuries or mortality can occur when hooked with secondary infections, or tearing to the esophagus or stomach. If there is an increase in fishing pressure because of fish stocking there could be potential the threatened species to be negatively affected through there fishing practices.

11. Hatcheries would need to be effectively monitored for their potential impacts on pollutant loads in adjacent water bodies, as any wastewaters produced could be high in nutrients resulting from artificial feeds. Hatcheries would need to have appropriate wastewater treatment processes to reduce their impact on surrounding water bodies.
12. Significant conservation areas could be affected by the introduction of non-endemic species.

References:

Rowling K, Hegarty A and Ives M (eds.) *Status of fisheries resources in NSW 2008/09, NSW Industry & Investment*, Cronulla, 392 pp. (2010)

Yours sincerely,

Pepe Clarke
Chief Executive Officer
Nature Conservation Council of NSW.

520 South Arm Road
Via Urunga
NSW, 2455
Date: 31st January 2012

EIS Submission
Fish Stocking
3/556 Macauley Street
Albury NSW 2640

Re: Feedback per Marine Fish Stocking EIS

The following comments address the following aspects of the EIS (Blount & others, 2011):

- Proposed Overexploitation of ICOLLs
- Suggestion for MCA of estuaries
- Lack of quantified data
- Flawed Models

Proposed Overexploitation of ICOLLs

Blunt & others (2011) demonstrate a narrow understanding of ICOLLs and their complexity and their contribution to the diversity of coastal environments. Throughout the EIS, Blount & others (2011) perceive ICOLLs as environments that are to be exploited for fishery stocking purposes and use ‘limited recruitment’ as the catch-cry as a rationale for their exploitation.

Blout & others (2011a; pgC-83) cite Taylor [2010] definition as “...where the supply of new recruits (i.e. larvae or juveniles) is insufficient to fully utilise the resources available in a particular system”. Adopting this narrow definition clearly demonstrates the exploitive nature of the proposal and does not consider or acknowledge the role or potential role that the ‘available’ resources have for other biota (e.g. birds), fish that have colonised prior to closure or are extant in the ICOLL (see Pollard, 1994a) or even that post opening, that these ‘available’ resources are locally exported into the adjacent coastal waters (see Gaston & others, 2006; re small river though it is expected that ICOLL post opening events may also have this function).

Blount & others (2011a pg C-84) describe that “recruitment limitation” can be “...location based environmental constraint where the waterway is intermittently closed of to the ocean by a sand berm.” However the irregular closing and opening of ICOLLs is a natural process that dynamically influences the environmental condition of the waterbody (e.g. salinity, water levels, Pollard, 1994b) and add another complexity that influences the biotic assemblage present (e.g. fish, Pollard, 1994a;

Jones & West, 2005) and promotes ecological diversity across NSW coastal environments. The fact that ICOLLs restrict entry to fish when closed cannot be considered an issue for any species management intervention but simply acknowledged as part of the ecological character of ICOLLs (neither 'good' nor 'bad' but simply just 'is').

A study in WA highlights that estuaries can increase genetic subdivision of near shore fishes (even if they use marine habitats) compared to those restricted to marine habitats (Watts & Johnson, 2004) so its possible that ICOLLs, especially when closed for extended periods (see Roy *et al*, 2001) may facilitate genetic subdivision as particular cohorts are reproductively isolated from effective populations external to the closed ICOLL. Though the latter point is speculative, it has to be recognised that there is an absence of reliable ecological data that limits the design and implementation of sustainable ecological management actions (Hadwen & Arthington, 2006). The proposed introduction of predatory fish, especially into sometime closed estuaries as ICOLLs, may well disrupt the fish assemblages with unknown consequences (see Jones & West, 2005 re artificial opening of ICOLLs & disruption to the fish assemblages).

Blount & others (2011b, pgE-257) provide "Recruitment limiting criteria" that includes that described above (re location based environmental constraint) however they also propose that research be conducted to

"...improve understanding in any of the following key areas;

- To increase knowledge of a species i.e. the species stock status, through demonstrating recruitment limitation by increasing the number of recruits within the system.*
- To improve our understanding of the impacts of releasing fish into estuarine fisheries and ways to mitigate or minimise these impacts*

It is expected that for a marine fish stocking event to be approved under the research criteria that it would form part of a formal research program".

However such research is a low priority when other key elements of ICOLL and fish biology are needed e.g. dispersal of wild stock within and between estuaries. Arguably, such research to be given priority when so little is known about ICOLLs (& other estuary types) and the function and structure of biotic assemblages (see Hadwen & Arthington, 2006) is scientifically ethically bankrupt.

Suggestion for MCA of estuaries

Blount & others (2011a; A-10) stipulate that no stocking will occur in areas they have identified as of "Conservation Significance" such as:

- Ramsar Wetlands
- Marine Protected Areas
- WHA
- Listed Critical Habitats
- Wilderness areas
- National Parks & Nature Reserves with aquatic component

Arguably estuarine wetlands listed for NSW in *Directory of Important Wetlands in Australia* (Adam, 2001) are of conservation significance and should be included in Blount & others (2011) Multi-criteria Analysis.

Please note that some of the estuaries identified as suitable for stocking by Blount & others (2011a) include wetlands that are “*National Parks & Nature Reserves with aquatic component*” thus the MCA did not exclude all those wetlands as intended. For example, Lake Wollumboola is largely surrounded by NP and is nationally significant wetland (Adam, 2011). Furthermore, NSW DECCW (2011) have identified that this wetland also satisfies Ramsar criteria and the PoM have as a ‘high’ criteria the active advancement to list Lake Wollumboola as a Ramsar wetland (NSW DECCW, 2011; pg 55). Accordingly this wetland needs to be excluded and a review of the conservation significance criteria for wetlands needs to be undertaken including for those allegedly assessed by proposed criteria e.g. Lake Wollumboola..

Lack of quantified data

This EIS covers a wide array of topics but there is no quantitative data collected to inform the EIS and peppered throughout Blount & others (2011) is the repeated identification of data limitations. The lack of quantified and rigorously collected data does not facilitate confidence in the “Responsible Approach to Marine Stock Enhancement” advocated by Lorensen & others (2010).

Conclusion

Due to, but not limited to, the above reasons, the proposal to enhance fish stock in coastal NSW should not be considered further. Revision of wild fish stock management of the select species by reducing the bag limit and increasing in size limits for those species that are “Overfished” (it could be argued that DPI [Fisheries] have not effectively managed the fisheries if they reach “overfished” status) and that habitat restoration should be a priority. Remember “*Habitat make fish happen*”

Yours sincerely

A handwritten signature in black ink that reads "Mark Robinson" followed by a small smiley face ":)".

Mark Robinson

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Sea Bees Boating Club Inc.



P.O.Box 2498
Carlingford NSW
2118
Web - seabeesboating.com

Sarah Boyd

Fisheries Manager
Recreational and Indigenous Fisheries
NSW Department of Primary Industries
3/556 Macauley Street
Albury, NSW 2640
E: sarah.boyd@industry.nsw.gov.au

Draft EIS for Marine Stocking in NSW

The Sea Bees is a fishing club located at Carlingford (Sydney) which mainly fishers from small trailable boats. The Club visits many NSW country and coastal locations throughout the year therefore contributing towards the financial support of these smaller communities.

Any opportunity to provide improved fishing opportunities by stocking within NSW is welcomed and is an initiative supported by the Sea Bees Club. Our fishing experiences enable us to make a financial contribution to cancer research each year.

We were initially disappointed that those estuaries located in Marine Parks were not included in the EIS, however we understand there will be an opportunity to consider these locations at a future date. We do acknowledge there are many other estuaries that are included in the EIS.

To avoid any potential conflict with commercial fishers we suggest the Recreational Fishing Havens (RFH's) and other locations not commercial fished be considered for the highest priorities once stocking commences.

The Sea Bees Club is supportive of the proposed EIS marine stocking initiative and we look forward to further updates and developments in the future.

Yours Sincerely
Max Castle (life member) for
Ken Martin – Secretary Sea Bees
31.1.12

January 27, 2012

*EIS Submission
Fish Stocking
3/556 Macauley Street
Albury NSW 2640*

To whom it may concern,

I send this submission in strong support for the proposed marine fish stocking program. I have worked in the field of fish production and restocking for many years, including the Maroochy estuary stocking trial in Queensland, and have seen firsthand the many positive results that can be achieved from stocking areas where juvenile recruitment/spawning success is low. I am also aware of the risks attached to stocking open waters, where fish can interact with wild populations, and I believe the EIS has addressed these comprehensively and has recommended appropriate safeguards.

Some specific comments on the EIS, the FMS and the proposed methodology are listed below:

- The number of species and estuaries proposed will require a substantial hatchery infrastructure which is not in place in NSW at this time. There is a limit to how much the PSFI can supply. The demand will no doubt bring about new investment in the hatchery sector which is long overdue, but will take time.
- The only species proposed which may present production difficulties from a hatchery perspective is the mud crab, which requires specialist knowledge and skill. This is clearly demonstrated by the slow progress of hatchery technology in Australia over the last 15 years, which is only now reaching viability.
- It seems that some sectors of the commercial fishing industry will stand to benefit from the stocking plan but there does not seem to be any proposal for them to contribute. Rather than excluding them from these estuaries, perhaps a mechanism whereby they contribute should be developed.
- In my experience mortality of released fingerlings can be extremely high, and will largely determine the success of the program. Predation at the release site itself can be extreme. In freshwater impoundments being stocked with barramundi in Queensland it was not uncommon to capture predatory fish in the vicinity of the release point with over sixty 40mm fingerlings in their stomach. For this reason alone I think it would be very difficult to over-stock any waterway, and I think the proposed numbers to be stocked are conservative.

- Some consideration could be given to releasing very large individually-tagged juvenile fish from time to time as part of the program (eg. 200mm). These fish, even if tagged with the old T-bar tags, can be readily identified and reported by the public.
- The importance of post-release monitoring cannot be overstated, and I believe in time will be used to show that not only is no environmental harm coming from the stocking, but that the predicted positive socio-economic impacts are real. Southern Cross University has a large pool of postgraduate research students which would be ideal for involvement in collaborative research and monitoring tasks.

Thankyou for providing the opportunity to comment.

Note this is an individual submission and does not necessarily reflect the views of Southern Cross University.

Regards,

Ken Cowden

National Marine Science Centre
PO Box 4321
Coffs Harbour
NSW 2450
Ph 6648 3916.
Ph 04