Private Bag 129 Hobart
Tasmania 7001 Australia
Phone +61 3 6226 2959
www.imas.utas.edu.au

IMAS
INSTITUTE FOR MARINE AND ANTARCTIC STUDIES

UTAS

Comments

On pubic campaigns against fishing by NGOs

Fisheries science is often lost in public campaigns against fishing with topical examples being campaigning for MPAs, opposition to small pelagic harvesting by the MV Margiris, and commentary by the Tasmanian Conservation Trust to this committee. That submission was essentially an attack against IMAS fisheries science so before speaking on broader issues we'd like to respond to some of their specific comments.

Their claim is that the commercial rock lobster fishery is unsustainable, that it is destroying the reef habitat around Tasmania, and that this is threatening the existence of other fisheries including commercial abalone and recreational fisheries. They say this is a direct result of fisheries research being focused on rock lobster stocks as a single species, and the use of modeling approaches to develop harvest strategies. They say the research is too aligned with commercial industry rather than acting for the public good.

To provide background, climate change has led to extension and strengthening of the East Australian Current off eastern Tasmania so that this area is one of the fastest warming marine environments of the southern hemisphere. This change affects marine species present off eastern Tasmania, including reduced abundance of rock lobsters because the East Australian Current is unsuitable for their larvae. Other species are favored and are extending their distribution into Tasmania from northern regions. IMAS monitors this with the community science project "REDMap", which involves the public recording species that are changing their distribution (several of the submissions referred to this). One species that has successfully extended its range into Tasmania is the long-spined sea urchin. This urchin can reach high population densities which overgraze reef, stripping all encrusting animals and macroalgae so that the reef becomes bare "urchin barrens". These are less productive for fisheries. Rock lobsters are one of the known predators of urchins so increasing their biomass is one of the management options for addressing urchin barrens.

The scale of the potential barren formation has been estimated by Prof. Johnson of IMAS as around 50% of the east coast above Tasman Peninsular as a worst case scenario. This would represent a loss of Tasmanian annual production of rock lobsters of ~ 50 tonnes (4.5% of the total) and a loss of abalone production of ~190 tonnes (8% of the total) (Tisdell et al. 2011. The

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cost effectiveness of culling long-spined sea urchins off the east coast of Tasmania). Urchin barrens are clearly a problem and action is required, but the rhetoric by the TCT about the implications is excessive.

In attempting to support their claim, the TCT submission makes many claims that require correcting:

1) *That there was recruitment failure.* Recruitment did not fail, it was below average from 2003-2009. It has been above average in 2010 and 2011.
2) *That a CSIRO study (Bruce et al., 2007) showed that there was significant level of self-recruitment of lobster larvae in Tasmania (ie the larvae released in Tasmania return to Tasmania). Hence low recruitment could be attributed to poor management in Tasmania.* We were co-investigators on the project. There was not significant larval contribution from eastern Tasmania. It was 4%!
3) *That the quota has been reduced by an inadequate amount in response to falling recruitment.* The quota in 2012 constrains the catch to lower levels than at anytime since at least 1950. Recruitment has been above average. This combination will lead to stock rebuilding. The effect of the constraint on the commercial fishery can be seen by vessels forced out of the fishery (~10 in the last year) and record high payments by lease fishers for quota.
4) *The modeling process fails to estimate the effect of environmental changes on recruitment so prediction is overly optimistic.* We don't estimate the effect of environmental change on recruitment because we measure recruitment directly and base our expectations on this (why estimate when you can measure). In 2011 we collected information from around 30,000 lobsters sampled from almost 12,000 potlifts.
5) *The modeling process is overly optimistic, which leads to bad decisions.* The modeling process is like weather prediction, which is usually about right, but rarely exactly correct. We use modeling to explore the effect of different management decisions, such as a higher or lower quota. Recently our model-based expectations have been a little pessimistic with stock rebuilding occurring faster than predicted.
6) *IMAS assume future recruitment will be the average of what was seen over the last 10 years.* Without going into technical details this is wrong.
7) *That research has focused on single species research and ignored ecosystem interactions. That urchin research was conducted by School of Zoology with no support from the then Tasmanian Aquaculture and Fisheries Institute (TAFI), now part of IMAS.* This is wrong. Prof. Craig Johnson who conducted the research in question was a staff member of TAFI

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at the time. His research project was supported by TAFI, with 81% of the in-kind contribution of staff and vessels costs coming from the TAFI fisheries program. TAFI made substantial investment in other ecosystem research for example through over 20 years of monitoring fished and unfished areas to support management and many projects dealing with specific ecosystem interactions with the lobster fishery.

In summary, this illustrates a significant challenge facing management of Australian fisheries, which is mis-information campaigning by some NGOs (we'd emphasize that this is not the rule, for example the WWF submission to this committee appears excellent). While the TCT submission makes many points that we'd agree with, it is also riddled with errors. The approach is adversarial and anti-science. In this particular fishery, IMAS research showed in 2009 that harvest rates were too high to maximize economic yield. We showed that profits could be increased by reducing the quota. This led to change with industry voting for a 20% cut in their catch. The quota was later cut further due to low recruitment, but the point here is that science was used to develop a management change that simultaneously increased profits and met the ecosystem objective of higher biomass of target species. We have further developed methods to rebuild stocks with the translocation of rock lobsters from slow growth to high growth areas. This was applied commercially in 2012 with industry funds. It produces stock rebuilding equivalent to a further 15% cut in commercial catch and helps east coast areas where there are urchin barrens.

Moving to more general issues facing Australian fisheries:

MPAs

Marine protected areas are topical with recent announcements but it needs to be empahsised that these large-scale closures have limited value in the context of fisheries management (they may have value for other reasons). We presented research at AMSA two weeks ago reiterating that parks do not increase biomass of target species unless the existing management is inadequate and the stock is heavily overfished.

In relation to protection of biodiversity, proportionally few of Australia's threatened species are marine, for example of 1601 listed species in the commonwealth, only 35 or 2% are marine. Across all jursidictions there are 92 listed threatened species that spend some part of their life cycle in or on the sea or coast. Of these, only 20 move over sufficiently small distances that they could be affected by spatial closures. Of these only 2 are directly impacted by fishing either through targeting or as bycatch (black cod and maugean skate). The point here is Australia's

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threatened species problems are mainly on land and where we do have issues in the sea, there is a need for direct action on specific threats. Broadscale MPAs don't address this need.

Supplying seafood for Australian consumers

Our submission summarized options for expanding seafood production but we note many submissions make an error when dealing with supply / demand for seafood. This is that they omitted the effect of price and assume the seafood market is not dynamic. For example, there were comments that Australia faces future lack supply of seafood because we rely on imports and these may be retained in Asia as their consumption grows. However, we need to understand that demand affects price which affects supply. To illustrate: Chinese grass carp production in 2011 was around 30 million tonnes. Around 6 million tonnes was lost through disease for which vaccines have been developed. Farmers haven't adopted the vaccines because the cost of delivery exceeds the cost of lost production and their profits are squeezed because price has not increased for 50 years. Real price has fallen because growth in supply has outstripped demand. But consider if demand increased. Price would increase, fish disease could be treated and production could increase by 6 million tonnes, sufficient to feed an additional 430 million people. So the seafood production market is dynamic and has greater capacity to respond to demand than was apparent in many submissions.

Societal benefit from seafood production

Our submission discusses the use of bioeconomic modelling as a developing area in fisheries science. We also note the need for greater legislative guidance on objectives for fisheries management. This is relevant to many of the submissions, which generally assume societal benefit from Australian seafood production is through provision of food and sometimes employment. However most of our fisheries are for export and luxury markets. So the benefit to the community from most fisheries is not through food or employment but through economic rent ("super profit"). A problem for fisheries science is that legislative objectives for fisheries don't distinguish between fisheries such as the SE trawl where the main societal benefit is to supply food vs the abalone fishery where almost no product is eaten in Australia and the societal benefit is through economic rent.

Education and training

The need for training especially in quantitative fisheries science was emphasized by many submissions including from the chief scientist. We note that IMAS is active in this area and has a particularly successful model involving collaboration with CISRO and AAD where staff at these

organizations take a co-supervisory in developing future fisheries scientists.

The Commonwealth Small Pelagic Fishery

Management

- SPF is a Commonwealth managed fishery – management plan was recently finalised and is output based (TACs and ITQs)
- Main species are jack mackerel, redbait and blue mackerel.
- Two management zones – East (from southern Tas to Qld) and West (southern Tas to WA)
- ITQs are species and zone based (ie the Seafish allocation of 18,000 t is comprised of 6 components)

SPF Harvest Strategy

- underpins the management and operation of the fishery– based on a tiered approach.
- Tier 1 – for stocks with spawning biomass estimates that are no more than 5 years old (spawning biomass based on the fishery independent Daily Egg Production Method, a method that has been applied internationally for small pelagics). Harvest rates set at between 10-20% spawning biomass, the actual harvest rate declining as the 'age' of the biomass estimate increases.
- Tier 2 – either set at a maximum of 7.5% of the most recent DEPM spawning biomass for the stock, or what is considered a conservative best estimate in the absence of biomass estimates. Fishery and biological information reviewed annually to monitor for any signs of stock stress that would warrant TAC reduction.
- Tier 3 – for species for which virtually nothing is known, TACs not to exceed 500 t for the species.

SPF Resource Assessment Group (SPFRAG)

- Comprised of scientists (SARDI, IMAS, ABARES reps), management (AFMA and Grant Pullen), industry, conservation (Jon Bryan) and recreational (Graeme Pike) representatives
- tasked with providing research and assessment advice, including an annual fishery assessment and recommendations regarding TACs (by species and management zone).

Fishery history

- Under Tasmanian management, a purse seine fishery (in state waters) for jack mackerel developed in the mid-1980s with annual catches fluctuating between about 5-40K tonnes per year up until 2000 when fishing ceased (total catch for the period of over 260Kt, av annual catch 16Kt).

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- Mid-water trawl operations commenced in the early 2000s off Tasmania (Commonwealth waters) with redbait the main target species – annual catches of up to around 12Kt of redbait and jack mackerel were taken until fishing ceased in 2009.
- Elsewhere there have been minor catches of mainly blue mackerel off southern NSW and off SA.

Research

- SARDI lead a project to assess the potential for the DEPM to estimate spawning biomass for blue mackerel (2002-2003) – estimates were produced for western and eastern zones and because of the age of the estimates these are now the basis for current Tier 2 TACs for the species.
- IMAS (Pancho) revisited the blue mackerel egg surveys conducted off NSW to examine jack mackerel eggs present and was able to produce provisional spawning biomass estimates for jack mackerel east (Neira 2011). Adult parameters required for the model had to be borrowed from other similar species. Indicative biomass estimates were produced (2011) providing a plausible range of spawning biomass estimates - this new information was adopted by SPFRAG and the 7.5% spawning biomass criterion applied when recommending the jack mackerel east TAC for 2012/13 (increased from 5000 t in 2010/11 to 10100 t).
- IMAS lead a project to estimate the feasibility of using the DEPM approach to estimate the biomass of redbait off Tasmania, reliable estimates are available to 2005 and 2006 and are the basis for the redbait east TAC (Neira et al 2008).
- CSIRO completed a review of stock structure information and recommended that the two management zones were appropriate for most of the SPF species (Bulman et al 2008).
- CSIRO have undertaken ecosystem modelling to determine the role of small pelagics in the marine system– while small pelagics play an important role in the system the mesopelagics more strongly influenced the dynamics of the modelled systems (Bulman et al 2011).
- ABARES conducted an MSE study investigating the performance of the Harvest Strategy, the main conclusion was that the SPFHS was conservative and sustainable.

General statement on the harvest rates (from the SPF HS)

The maximum sustainable yield for low trophic level (forage) species, such as SPF quota species, is typically achieved at depletion levels of up to ~60%, or 40% of unfished biomass. However, harvest strategies for fisheries for these species also need to consider potential impacts on biodiversity and ecosystem health. Biomass levels above 75% of the unfished level have been identified as achieving a balance between protecting ecosystem function and biodiversity and providing for food production and economic development of low trophic level species (Smith et al 2011).

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Although I haven't seen the documents I understand that the maximum harvest rate that can be applied in this fishery (20%) is more conservative than that recommended by the MSC for forage species

Current situation

- Margiris will be flagged as an Australian vessel
- It will operate within a managed Commonwealth fishery and subject to the rules of the fishery
- Seafish has 18000 t of allocated quota (across 3 species and two zones) though may lease additional tonnage from other quota holders.
- Product is primarily destined for human consumption in Africa – frozen whole on board.
- AFMA observers will be on board to monitor TEP interactions, bycatch etc – note previous mid-water trawling experience suggests minimal bycatch – mainly barracouta and spotted warehou. Operators will have to cover any bycatch of managed species (eg spotted warehou) with SEF quota.
- Vessel will have VMS
- Vessel will have to develop a seabird management plan
- Vessel will have a seal excluder device in place.
- Seafish will be fully funding a DEPM survey (almost $400K) scheduled for October 2012 to assess spawning biomass estimates for redbait east and jack mackerel east (SARDI to lead, IMAS to be involved). The fishery independent estimates will be used to revise the 2013/14 TACs for these species.
- Given the conservative approach to the setting of TACs, commitments to update these assessments (note there is an expectation that early next year DEPM surveys will be conducted in the Western zone), the huge area available to the fishery and the underpinning of a management plan there would appear to be low risk to the target stocks and ecosystem function.

General personal comments

- Short-term localised depletions resulting from intense fishing within a small area represents a potential risk, with immediate (short term) flow-on impacts to associated predator species (eg tunas, seals) – this is an issue that could be managed through the implementation of a code of practice (ie a move on rule)
- Interactions with other fishing sectors (incl gamefishers) could be reduced by timing fishing operations to avoid areas and time of high recreational activity.