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Inquiry into the Role of Science for Fisheries and Aquaculture

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Submission to the Inquiry into the Role of Science for Fisheries and Aquaculture. from Associate Professor Rob Day and Dr. Tim Dempster.

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Summary: We focus on problems associated with implementation of the National Fisheries and Aquaculture RDE strategy.
1. Strategic research cannot always be provided at a distance, and provision needs to be made for local research knowledge and industry needs.
2. The implementation of this strategy by various agencies appears to be leading to a loss of expertise and risks increased costs and/or reduced quality of research. Many state agencies appear to be shedding expertise and reducing support for research and training, without any increased collaboration with researchers elsewhere. Economic incentives will drive this further. Consequent reduced opportunities for university collaboration and training will lead to a reduction in the quality and quantity of new researchers in many fisheries and aquaculture fields.
3. The concentration of funding to particular institutions has diminished the opportunities to address identified gaps in research capability.
4. Strategic marine environment and ecosystem management research is a longer-term investment, so that the funding of this area should be controlled by bodies with secure control and an incentive to produce a long term legacy.

The body of this submission addresses terms of Reference b) , c) and particularly e). The importance of scientific knowledge for fish stock sustainability (TOR a) we regard as obvious, but with the proviso that this knowledge must be communicated to and understood by fishery stakeholders and managers. Too often this is not the case. Governance arrangements (TOR d) appear often inadequate to protect resource sustainability, but unfortunately do not get the public scrutiny they deserve, and thus we note there is little apparent incentive for responsible ministers or their delegates to ensure long term sustainability. Despite this, some obviously have done good work, and Australia has had an enviable reputation in fisheries management relative to the rest of the world.

A National Fishing and Aquaculture Research, Development and Extension strategy was distributed in 2010, developed as a component of the National Primary Industries Research, Development and Extension Framework, generated by the Australian primary Industries Ministerial Council. We contend that this strategy (and perhaps the Framework more generally) has serious shortcomings, which have already led to a diminution of Australia's research capacity in Fisheries and Aquaculture.

1. The Framework embraces the idea that basic and strategic fisheries and Aquaculture research can be provided at a distance. We contend that this is not always the case, and there should be provision in the National System to cover this. Fisheries and aquaculture problems that require strategic research (not 'regional adaptive development' or 'local extension') are often specific to local areas.

An example is the spread of black urchins in Tasmania and Victoria. In Tasmania, research has shown the spread may be a result of a lack of large lobsters that eat urchins (together with increased spatfall as a result of climate change effects on currents and water temperatures). But in Victoria, there has never been a large population of lobsters in the areas where these urchins are now increasing, and it is clear that other factors have controlled their abundance in the past. A different set of strategic research questions needs to be addressed here.

Biosecurity problems such as invasive marine pests present very different issues in different states of Australia. We need to have distributed expertise to undertake the research required when new threats appear in particular places.

An aquaculture example is the recent rise of the invasive hydroid *Ectopluera crocea* in Port Philip Bay, which is a serious pest for the Victoria's mussel farming industry. This invader is presently not problematic across the other mussel farming states in southern Australia. The hydroid overgrows the mussels, which results in reduced production levels.

The Victorian state government agencies currently have no programs in place to systematically monitor marine invaders, thus they are unable to rapidly detect and deal with new problematic invaders as they arise. The invasive hydroid was detected by a University of Melbourne PhD student during her studies and is now the focus of a University of Melbourne led Fisheries Research and Development Corporation grant to reduce its levels on Victorian mussel farms. Such biosecurity problems should be realm of the state-based agencies. However, this requires capacity building and retention of state-based expertise in marine biosecurity.

2. We contend that while the strategy may have laudable objectives, the implementation of this strategy by various agencies has not been done with an appreciation of the risks of loss of expertise and diminution of competition between research providers and thus increased costs or reduced quality of research. The strategy says: "agencies .... will collaborate more effectively with others to improve the capability of the national system in priority areas". Instead, we have noted that many state agencies, if not identified as the major centre for research in the area, are shedding expertise and distancing themselves from supporting research and training, while the major centres do not appear to have increased collaboration with researchers elsewhere. While researchers are generally very open to collaboration, there is an economic incentive for administrators of research organisations to avoid distributing research funds outside their organization. We note that this is a general 'incentive problem' that applies to other centres or facilities charged with distributing funds for research in related areas.

   While our examples are specific to Victoria, we believe they are indicative of a wider trend of disinvestment by state based agencies in areas of fisheries and aquaculture research that require local knowledge and local research to address the problems that affect these industries. Further, many university researchers have built up

collaborations with these state government researchers and research organisations. These academics now have reduced research opportunities. Students have in the past gained valuable expertise working on industry related problems with state researchers, but now have less training options and consequently fewer employment opportunities. This will lead to a reduction in the quality and quantity of new researchers in many fisheries and aquaculture fields.

The state fisheries research agency in Victoria, for example, has divested itself of research on shark fisheries by an acknowledged world expert in this field, and numerous other research staff, while there has been little to no 'extension' work from other states to replace this expertise, and the work of the staff.

3. The strategy argues that further change is needed to address identified gaps in research capability. Two of these are aquatic animal health veterinarians and well trained fisheries modelers (to do strategic research as well as tactical research at both the stock and ecosystem levels). The concentration of funding to particular institutions as a result of the strategy has diminished the opportunities for new students from institutions in other states to enter these fields. Students with an aptitude are very unlikely to move states to discover whether they might possibly develop an interest in a particular research area. There need to be opportunities for students all over Australia – wherever they are discovered – to gain experience in such fields, choose areas that excite them, and become experts.

   For example, students who have interests in both mathematics and biology are rare, yet undergraduate training in both fields is essential for fisheries modeling. Opportunities for such students to engage with fisheries research problems at any University where such students are found, in order to attract sufficient talent into this field. The narrowly specified partnership of CSIRO and the University of Tasmania has not provided what is required, because the pool of student talent is far too small.

4. Finally, almost all of the funding for fisheries and Aquaculture research is focused on Tactical research for management, and Strategic research with obvious direct benefit for the industries. Strategic research supporting marine environment and ecosystem management is a longer-term investment towards sustaining fishing and aquaculture industries, but it should also be sustained and nurtured. Ecosystem based management needs more funding, commensurate with the lip-service it gets. We need alternative funding processes that are charged with ensuring these longer term conservation and management objectives are supported by good research.

   Resourcing long term objectives as opposed to short term ones is a problem in many fields other than fisheries and aquaculture. In economic management research, the drivers of good long term management are considered to be secure ownership or control of assets, and an incentive towards building a reputation or legacy in the future. We need the funding of fisheries and aquaculture research (and other research) to be controlled by bodies with secure control and an incentive to produce such a legacy.