



Summary of Myfish Task 1.2

Report on the Fisheries Governance System for the Australian Northern Prawn Fishery under the Australian Fisheries Management Authority: Objective Setting and Implementation



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Project name:

'Maximising yield of fisheries while balancing ecosystem, economic and social concerns'

Project acronym: **Myfish**

www.myfishproject.eu



1. Introduction

This report is part of a European Union (EU) FP7 project 'Maximizing yield of fisheries while balancing ecosystem, economic and social concerns' (Acronym: Myfish). It is one case study of Myfish Task 1.2, which aimed to review existing and proposed Maximum Sustainable Yield (MSY) variants, constraints and management measures. Accordingly, we have looked outwards from the EU to selected fisheries in other parts of the world (Australia, Alaska and the Faroe Islands) to investigate as case studies which illustrate various aspects of sound governance from which the EU can potentially learn.

The overall aim of Task 1.2 is to discover best practices and lessons learned with respect to MSY variants, objective (i.e. aim or goal) setting and implementation processes (i.e. means to achieve objectives), including the strengths and weaknesses, constraints and trade-offs, concerning the overall governance system for the particular fishery. We consider these practices with regard to the three "pillars" of sustainable development (c.f. Brundtland, 1987): a) Bio-ecological; b) Economic; and c) Social. We also consider Governance as forming an integrative horizontal "beam" interlinking the three sustainability "pillars".

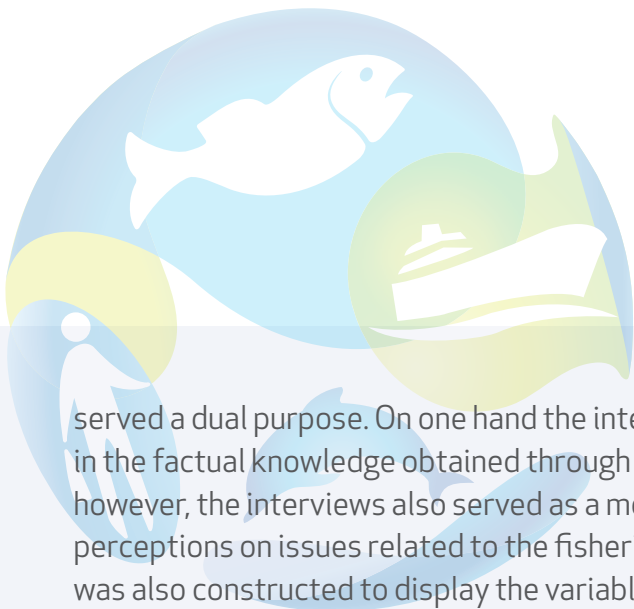
The term "governance" is defined in various ways in dictionaries. *For the sake of the current study, we consider fishery governance as the sum of the legal, social, economic and political arrangements used to manage the fishery. We view fishery-related stakeholders as persons and/or groups which believe they have a legitimate interest in the fishery.*

This specific report concerns the Australian Northern Prawn Fishery (NPF), conducted under the auspices of the Australian Fisheries Management Authority (AFMA).

2. Methodology

The report involved a) the production of a literature review of the fishery management system resulting from a comprehensive and systematic desk study of the literature and web-pages, followed by b) interviews with key stakeholders using a standard set of questions which are used for all of the case studies.

A total of 10 interviews took place, mainly via Skype, telephone calls or video conference where possible, from January to March 2013. Interviews were conducted with managers and administrators in AFMA and representatives of key AFMA entities and the scientific community, as well as the fishing industry and environmental NGOs. The interviews were conducted using the standard open-ended questions, and were recorded and subsequently transcribed and organized by means of textual analysis software (QSR Nvivo 9) and



served a dual purpose. On one hand the interviews served as a source for filling in gaps in the factual knowledge obtained through the literature review. Equally important, however, the interviews also served as a means to uncover controversies and different perceptions on issues related to the fisheries management system. A 'Fishbone' diagram was also constructed to display the variables (components/factors) that we identified, at various levels, as having an effect on a response that is to be optimized, namely the overall governance of the analyzed fishery system. As a result of the Fishbone diagram, we have then considered these main causes (factors) in the context of how they contribute to the three 'pillars of sustainability', namely Bio-Ecological, Economic, and Social but also the role of Governance as a horizontal integrator acting across the three pillars.

3. Outcomes and conclusions

3.1 Main outcomes

The governance system for the NPF under the AFMA can be the source of substantial wisdom and best practices for the EU in terms of potentially progressing the way its fisheries are managed. At the same time there are also lessons to be learned, and some caveats to keep in mind, which relate to how one prioritizes the three "pillars of sustainability" (Bio-Ecological, Economic and Social) and the potential limitations that may arise from that. Here we bring together not only the main components of best practices, but also lessons learned, from the NPF governance system in the context of implementation of new legislation/policy within the EU's Common Fisheries Policy (CFP). In addition to the three sustainability pillars, we also emphasize the importance of Governance (*c.f.* definition in the 'Introduction'), which acts as an essential cross-cutting and integrative "beam" in this sustainability "house". We would like to emphasize that our comments apply specifically to the NPF, and therefore these should mainly be considered as best practices/lessons learned in that context, i.e. a trawl-based fishery with a multispecies target of prawns.

3.1.1 The NPF: combating overcapacity, from MSY to Maximum Economic Yield (MEY), and input controls

The Australian NPF is one of the most valuable Commonwealth fisheries, and is one of Australia's few fisheries which earn a profit. It is a mixed trawl fishery targeting six species of prawns in various sub-fisheries of which those for tiger prawns and banana prawns are the most valuable. Some important 'byproduct' is also caught. The NPF started in about 1966 and the fleet expanded 10-fold to 200 operating vessels in 1970. From the late 1970s the fleet continued to expand until peaking at 302 vessels by the mid-1980s, resulting



in overcapacity/overcapitalization and declining prawn stocks. The first individual transferable fishing rights (boat units) were allocated in 1985. Various buy-back schemes and compulsory acquisition of licences reduced the number of licences from 302 to 130 between 1986 and 1993. This was followed by further industry-funded capacity reduction between 2000 and 2006 which removed 39 fishing vessels from the fishery and the 2006 government Commonwealth Structural Adjustment Programme (SAP) removed by buy-out in 2006/2007 43 Class B (licence to fish) Statutory Fishing Rights (SFRs, recognized as property rights), resulting in 52 vessels remaining in the fishery. A condition of participation in the fishery was that the fishery would move to the default output control (i.e. Total Allowable Catch/Individual Transferable Quota [TAC/ITQ]) promoted by the 2005 Ministerial Direction to the AFMA.

Since 1995, the fishery has been managed according to the 1995 NPF Management Plan, with periodic amendments. In 2001, the Northern Prawn Management Advisory Committee (NORMAC) of AFMA set a target of reaching S_{MSY} (spawner biomass that produces MSY), with 70% certainty, by 2006. In 2004, NORMAC established Maximum Economic Yield (MEY) — with industry support — as the overall management objective of the fishery, and S_{MSY} was redefined as a limit reference point. In 2007, the Northern Prawn Fishery Harvest Strategy (NPFHS) under Input Controls was introduced. The NPFHS aims to pursue MEY and maximize profit, by varying effort levels, using bioeconomic assessment of the important tiger prawn fishery. The NPFHS includes catch triggers and decision rules for banana prawn and tiger prawn fisheries.

The approach in the mixed NPF is to manage the fishery using a “basket approach” (i.e. a suite of prawn species) where it is acknowledged that not all the target species will be able to achieve the MEY target at the same point in time (we note here that species such as banana prawns are not managed according to MEY or MSY targets or limits, but use simple “triggered” control rules to ensure that they are not overfished). However, one aims at maintaining the various prawn species in the “basket” in a band that oscillates as close as possible to the MEY target (we note here that this target is only operative for tiger and endeavour prawns) with respect to fishing effort/mortality (E_{MEY} , F_{MEY}) exerted and the level of stock biomass (S_{MEY}), while aiming to ensure that the status of particular prawn species does not transgress appropriate limit reference points (which for example, is $0.5S_{MSY}$ for tiger and endeavour prawns).

Currently, the NPF continues to be input-controlled in the form of total allowable effort (TAE) for the fleet, split into individual tradable effort (ITE) quotas (Q). Additionally, there are seasonal as well as time-of-day and areal closures, plus gear restrictions. Entry into the fishery is limited by Class B SFRs governing the number of operational fishing vessels,



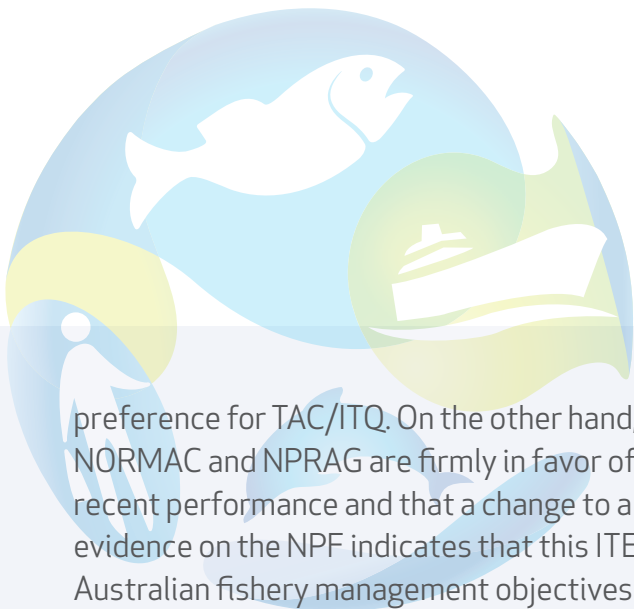
while the number of gear SFRs (adopted in 2001) regulate the amount of headrope (which affects swept fishing area) for the fishery allocated across the fleet. Fishing effort reductions resulted in effort from 2006 to the present being approximately 20% of the level in 1980.

It is notable, in the context of removals of overcapacity such as the government's 2006 SAP that: a) the leniency of the authorities in earlier decades in granting unduly large numbers of fishing licences had been a major contributor to the overcapacity, and b) the industry itself had contributed substantially to self-decided and financed vessel reductions.

Having adopted MSY management in the late 1990s and early 2000s, the move to a MEY-target after 2004 resulted in the effort applied to the tiger prawn fishery targeting the level of effort (E_{MEY}) that produces MEY. Building on the 2006 SAP effort reduction, the regulation of fishing effort resulted in recent effort, for tiger prawns, being below that necessary for MSY (i.e. $< E_{MSY}$) and close to the required E_{MEY} level. In the case of the brown tiger prawn, effort is apparently below E_{MSY} , so that effort would require to be increased to reach E_{MEY} . Noting that the fishing effort at E_{MEY} is less than at E_{MSY} , the fishing effort for the tiger prawn fishery can be considered as conservatively low. Fishing effort is now sufficiently low to ensure that, for all species/stocks targeted in the tiger prawn fishery, there is no species/stock subject to overfishing and no species/stock is overfished.

The NPF is managed by TAE via ITE(Q): the tradable gear-SFR unit is the amount of headrope a vessel can use, and therefore the effort that can be expended per boat, i.e. the effort quota. The status and trends of the NPF fleet's effort are closely monitored and the length of a unit of headrope is adjusted by NORMAC, based on scientific advice, to reflect needs to either decrease or increase the fishing effort. If effort is less than that required to achieve MEY, more headrope may be required, while trends for effort 'creep' and effort 'adjustment' (which may lead to excessive fishing effort again in the fishery) need to be compensated for by reducing the amount of headrope.

Since 2008, the AFMA Commission has agreed to several increases in the value of gear SFRs in response to recommendations from Northern Prawn Resource Assessment Group (NPRAG) and NORMAC. These recommendations have been based on the outputs of the MEY-related bioeconomic model for the NPF which indicate that, to achieve MEY for the tiger prawn fishery, effort should be increased. This has resulted in increases both in the value of gear SFRs and increases in the length of the tiger prawn fishing season. Given a properly functioning autonomous system for regulating effort, upwards or downwards as necessary, our study concludes that there is no reason why an effort (i.e. input) control system, such as the NPF's TAE/ITE(Q) system, cannot deliver a sustainable fishery in the form of a MEY target. AFMA has pressured the NPF to provide proof that the TAE/ITE(Q) system, either in its *status quo* situation or in modified/optimized form can function as well if not better than the 'default'



preference for TAC/ITQ. On the other hand, the Northern Prawn Fishery Industry Pty Ltd (NPF), NORMAC and NPRAG are firmly in favor of the TAE/ITE(Q) system on the basis of the NPF's recent performance and that a change to a TAC/ITQ represents a high-risk option. Comprehensive evidence on the NPF indicates that this ITE-based fishery is performing well with regard to Australian fishery management objectives in terms of economic efficiency and bio-ecological criteria. NORMAC believes that the likely application of a rules-based ITE(Q) system, probably hard-wired to the NPFHS and NPFMP, should provide the surety that the AFMA Commission requires that fishing capacity may not again become problematic to manage effectively.

Being a prawn trawl-fishery, the main environmental concern of the NPF is its non-selective nature resulting in a high percentage of bycatch and associated discards. The NPF as a whole, and specifically via CSIRO, has developed an innovative system of Ecological Risk Assessment (ERA) and Ecological Risk Management (ERM) primarily for addressing threatened, endangered and protected (TEP) species. AFMA and the industry are working closely to further develop the ERA/ERM system with regard to bycatch/discard issues, as well as enhancing the scientific observer programme.



*TSG - Technical Support Group - currently provided by CSIRO

AFMA's Ecological Risk Management framework (AFMA, 2012).



3.1.2 Judicious fishery policy and legislation linked to ecologically sustainable development

The 1991 Fisheries Management Act (FMA), and to a lesser extent the 1991 Fisheries Administration Act (FAA)— and their subsequent amendments — provide the overarching Australian Commonwealth fishery legislation. A major focus was emphasised by the 2005 Ministerial Direction to the Australian Fisheries Management Authority (AFMA) and by the 2007 Commonwealth Harvest Strategy Policy (CHSP). Besides the FMA and the CHSP, Commonwealth fisheries management must be consistent with the requirements of other conservation regulations including the 1992 National Strategy on Ecologically Sustainable Development (NSED), 1999 Environmental Protection and Biodiversity Conservation (EPBC) Act, and 2000 Commonwealth Policy on Fisheries Bycatch (CPFB).

The 1992 NSED pursues Ecologically Sustainable Development (ESD) as a policy and legislative object, including in marine fisheries and environmental matters. The 1999 EPBC Act focuses on protection of biodiversity and the environment and includes the promotion of ESD. The EPBC Act requires the Australian government, via the Minister of the Environment, to assess the environmental performance of fisheries and promote ecologically sustainable fisheries management. The assessment includes: a) The strategic assessment of fisheries; b) Assessments relating to impacts on protected marine species; and c) Assessments for the purpose of export approval of fishery products. Overfished species and/or stocks may be listed as threatened under the Act, potentially requiring formal recovery plans and categorization as conservation dependent species if removal of the recovery plan would adversely affect the stock. The 1999 CPFB aims to ensure that direct and indirect impacts on marine systems are taken into account and managed. It covers Commonwealth fisheries managed by AFMA. It outlines mitigation mechanisms to avoid, minimize and manage bycatch, improve the protection for TEP species and minimize the adverse impacts of fishing on the marine environment.

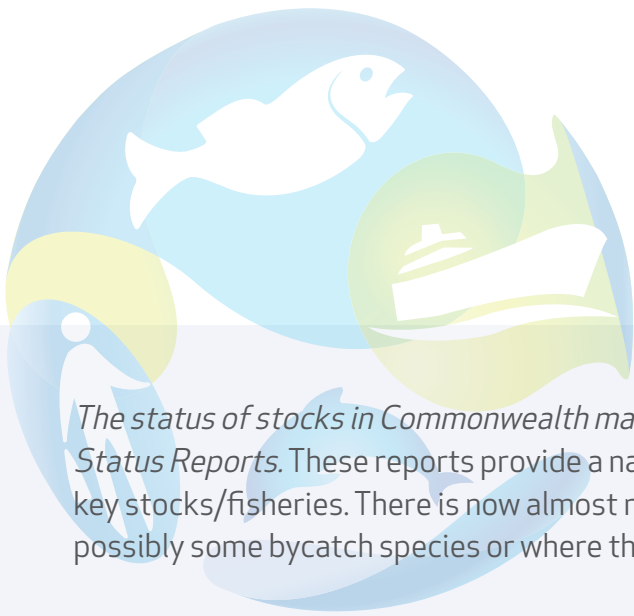
Under the fisheries legislation/policy, the Minister of Fisheries and AFMA must pursue objectives *inter alia* concerning: a) Ecological sustainability of target and non-target species; b) Maximizing net economic returns (NER); c) Ensuring that living resources of the Australian Fisheries Zone (AFZ) are not endangered by overfishing and that conditions are created that will give overfished stocks a chance to recover; d) Achieving optimum utilization of the living resources of the AFZ; e) Minimize the incentives for discarding by ensuring it is factored into the setting of catch levels; f) Manage the broader environmental/ecosystem impacts of fishing especially regarding bycatch of TEP species; and g) Complying with the obligations of international agreements to which Australia is a party.



In December 2005, a Ministerial Direction (legal instrument) was issued to AFMA under the FAA. *The 2005 Ministerial Direction ordered AFMA to “**cease overfishing and recover overfished stocks**”; develop a world’s best harvest strategy policy for its fisheries/stocks, and investigate the use of individual transferable quotas (ITQs) for all stocks, as part of total allowable catch (TAC) management. The Direction formed part of the 2005 *Securing our Fishing Future* package which included a one-off SAP (i.e. major buyback of fishing concessions). The SAP was designed to remove excess capitalization (overcapacity) where stocks were considered as overfished or at risk of being overfished— subject to the targeted fisheries, including the NPF, agreeing to TAC/ITQ management. The Ministerial Direction required AFMA to also: a) Manage the broader environmental impacts of fishing, including on protected species; b) Minimize the incentives for discarding by ensuring it is factored into the setting of TAC levels; and c) Enhance the monitoring of fishing activity, through increased use of vessel monitoring systems (VMS) with daily reporting, on-board cameras and improved observer coverage.*

In 2007, the government released the *Commonwealth Fisheries Harvest Strategy Policy and Guidelines* (CHSP) for implementation in 2008. *Core elements of the legal framework include: a) Maintaining target and non-target species at ecologically sustainable levels; b) Within that setting, maximize economic returns to the Australian community, and having MEY or a relevant proxy as the target reference point; and c) Adopt formal harvest strategies for key commercial species.* Harvest strategies encompass: 1) A biomass target – MEY (B_{MEY}); 2) A biomass limit B_{LIM} – equal to or greater than $0.5B_{MSY}$; and 3) A risk condition – $<10\%$ chance of the stock falling below the biomass limit under application of the harvest strategy. There are also *default proxies* for the *above-mentioned*: B_{MSY} proxy at 40% of unfished level; B_{LIM} at 20% of unfished level; and B_{MEY} at $1.2 B_{MSY} = 48\%$ of unfished level. *The CHSP rules, including the reference points, are very precautionary.* For example, in a data-poor fishery where the MSY is difficult to calculate, the default position is the general MEY reference point of 48% of unfished SSB rather than the normal 40% MSY point. There is no targeted fishing below B_{LIM} to protect against irreversible or slowly irreversible events, such as recruitment overfishing. Also, for $B < 15\%$ unfished biomass, conservation dependent status is assigned and a formal recovery plan is initiated.

The Harvest Strategy consists of three major aspects: a) monitoring; b) assessment; and c) a Harvest Control Rule (HCR). There is a formal requirement to test harvest strategies using *Management Strategy Evaluation* (MSE). In accordance with the 1991 FAA, each Commonwealth fishery should have a dedicated Harvest Strategy and be managed holistically through a specific *Fishery Management Plan* (FMP). The FMP should cover all the target and ecosystem requirements in a single integrated plan, and set out objectives, measures to attain such objectives, and performance criteria against which the measures taken may be assessed.



The status of stocks in Commonwealth managed fisheries is reported on annually in Fisheries Status Reports. These reports provide a national benchmarking of the status and trends of the key stocks/fisheries. There is now almost no overfishing in any Commonwealth fishery, except possibly some bycatch species or where the stock is managed internationally.

3.1.3 Bio-Ecological, Economic and Social Considerations

The Bio-Ecological pillar is sovereign over both the Economic and Social pillars of sustainability in Australian fisheries. This is due to the overarching role of the 1992 NSESD in defining the vital importance of Ecologically Sustainable Development (ESD) whereby conservation of ecological goods and services should not be subservient to economic and social considerations. Furthermore, the EPBC Act is assertive over the fishery legislation and the Minister of the Environment can demand remedial action in the case of fisheries which are found wanting with regard to environmental protection and biodiversity conservation issues. Such issues include requiring implementation of target stock recovery plans to biomass levels consistent with MSY (i.e. B_{MSY}) for stocks which are overfished, and there is the potential for appropriate stocks to be listed as “threatened” or “conservation dependent” under the EPBC Act. Other aspects of certification concern conformity in fisheries interactions with regulations on TEP species.

The 1991 FMA is closely linked to the NSESD, as it is highlighted that bio-ecological conservation and protection issues are to be viewed at very least as “first among equals” relative to economic and social considerations. Particularly, Section 3A “Principles of ecologically sustainable development” inter alia states that decision-making should: integrate, both in the long-term and short-term: economic, environmental and social and equitable considerations; apply the precautionary approach under situations of environmental risk and uncertainty, etc., and the principle of inter-generational equity; and the “the conservation of biological diversity and ecological integrity should be fundamental for decision-making” is emphasized.

The release of the CHSP in 2007, with the Guidelines providing clear interpretation of the policy, following up the Ministerial Directive, provided several core elements of a legal framework, supplementing the FMA, including: a) maintaining target and non-target species at ecologically sustainable levels; b) within that setting, maximize economic returns to the Australian community, and having MEY or a relevant proxy as the target reference point; and c) adopt formal harvest strategies for key commercial species. The latter aspect of implanting formal harvest strategies (with explicit HCRs) connected with existent FMPs at the individual stock(s)/fishery level, together with the overall requirements of the overarching CHSP, has resulted — within about six years of implementation — in few, if any, targeted Commonwealth stocks, being classified as overfished/subject to overfishing. Within harvest strategies, ERA/

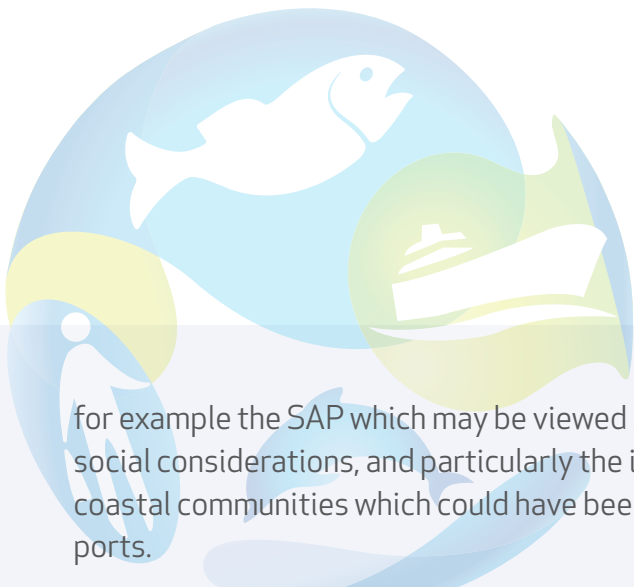


ERM has been developed as a key feature in addressing the level of risk that the specific fishery exerts on bycatch species and other ecosystem components, and in developing appropriate abatement actions/measures. Ceasing overfishing and recovering target stocks, in which removing overcapacity/overcapitalization was imperative (c.f. SAP), paved the way for addressing the economic aspirations (NER, via MEY). As pointed out below, MEY has not only a positive economic element but also a beneficial eco-biological element.

In 2005 AFMA's economic objective was changed from *"maximizing the economic efficiency of Australian fisheries"* to *"maximizing the net economic returns [NER] to the Australian community from the management of Australian fisheries"*. The 2007 CHSP states that the target reference point for a resource should be MEY or a relevant proxy. Today the NPF is at the global forefront of developing and applying an MEY approach to fishery management, not only with respect to a multispecies prawn fishery. The benefit of MEY, compared with MSY if both are considered as targets, is that MEY (besides maximizing NER) potentially provides biomass yields and fishing efforts that are less than those at MSY and in stock biomass levels greater than those at MSY. So, MEY may be viewed as favouring stock conservation and potentially causing less ecosystem impacts than MSY due to exerting lower effort levels. Thus, MEY can be viewed as providing a "win-win" situation for both the Bio-Ecological and Economic pillars, unlike having an MSY-related target which does not ensure profit for the fleet.

However, achieving MEY is challenging. It requires: a) advanced and credible bioeconomic models for tracking a dynamic path to MEY; and b) accurate and dependable economic data on revenue and expenditure (costs, prices, etc.), several of which are variable and extraneously driven, and some need to be accurately forecast. Importantly, maximization of discounted profits is difficult to achieve without changes in governance such as, for example, removing overcapacity, perverse subsidies, and providing property rights. Furthermore, the concept of economic efficiency, and thereby MEY, is poorly understood by most policy makers and by many fisheries economists in theory and practice. There are few truly operative MEY managed fisheries in the world today, which limits exchanges of best practices. However, MEY has the ability to indicate what the fleet/industry should address in order to optimize its profitability in terms of NER. Moving along an MEY dynamic pathway benefits from having used an MSY approach as the first step. To seriously tackle MEY, one needs to have first removed overcapitalization (i.e. excessive fishing capacity), as one would ideally attempt to do in a MSY approach. Furthermore, finding effective, autonomous ways to counteract "effort creep", etc., is essential in a TAE/ITE fishery such as the NPF.

Regarding social considerations, there was the unanimous conviction among our respondents that in the NPF these were the last ones to be prioritized after the bio-ecological and economic ones. Even during previous buy-outs which removed extensive fleet overcapacity,



for example the SAP which may be viewed as a socio-economic instrument, ignored distinct social considerations, and particularly the impact on smaller operators and their crews but also coastal communities which could have been affected during the shift of the industry's landing ports.

It became apparent during our contacts with a wide range of fishery-related stakeholders that this isolation of distinct social objectives was done consciously. There was awareness that removing manifestly social objectives from the equation would better ensure that the set higher level objectives (economic and bio-ecological) would be implementable and undesirable conflicts of social origin would be avoided. Social objectives are not encapsulated within the stated objectives, and accordingly are not implemented in the NPF's management system. Nevertheless, substantial weight is given to the declaration that the resources are managed on behalf of the Australian community which increases accountability of the management of the resources being related to the ownership by the Australian public. The operating framework of the 2007 CHSP for stock sustainability and maximization of the net economic return of the fishery using the MEY target and the 2005 government funded re-structuring of the industry had a positive socio-economic impact to those staying in the fishery (increase profitability), but also on those leaving the industry as it allowed them to do so with dignity.

Other socio-economic aspects which are particularly important for the fishing industry include the SFRs, which are recognized by the authorities as a property right providing durable entitlements to a share of the fishing. The SFRs form the tradable basis for the NPF's ITE(Q) system. Additionally, membership of NPF by the vast majority of the fleet/operators also has socio-economic advantages for the industry as it means that NPF functions, at least in part, as a cooperative. This has several dimensions including the ability to "speak with one voice" with the authorities and other parties, and motivating strong interests in stewardship and co-management of the resource. The case was similar for the mandatory reductions in headrope (gear SFRs) which was the same for both small and large operators despite the fact that financially, the impacts would be different at the levels of these operators.

3.1.4 AFMA –Politically neutral, stakeholder consultation model

The AFMA governance model has been good in bringing together diverse aspects of fisheries and environmental policy/legislation and focusing these in the operation of the NPF. In 1991, AFMA was established to manage Commonwealth fisheries, and the Fishing Industry Policy Council was established to provide the fishing industry with a means of input into the process of formulating government policy in relation to the management of fisheries. In the case of the NPF, NORMAC provides management-related advice and NPRAG provides science-related advice to the AFMA Commission. Close collaboration occurs between NORMAC and NPRAG. Through AFMA, the CHSP has been implemented since 2007. The CHSP *inter alia* articulates what are the acceptable

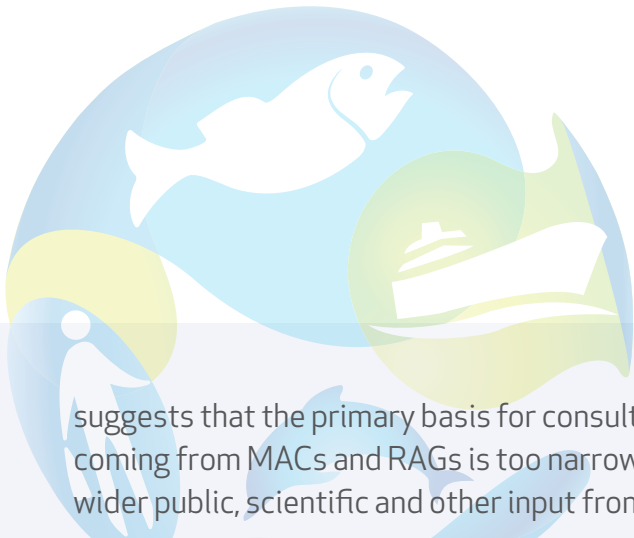


levels of risk to the Australian government in AFMA's management of the Commonwealth fisheries by providing interpretational guidelines, in trying to ensure ecological sustainability of target and non-target species and prevention of overfishing.

Wide and constructive stakeholder inclusion occurs in the work of both NORMAC and NPRAG, and in the interactions between these bodies. Partly because Australia is a large continent and the related logistics, individual Commonwealth fisheries tend to conduct their affairs in relative isolation from each other. However, with the passage of time there are likely benefits to be gained from greater contacts and exchanges of best practices, lessons learned and associated synergies between the various AFMA-managed fisheries in a wider context. The policy arm of domestic and international fisheries-related policy lies with the Department of Agriculture, Fisheries and Forestry (DAFF) which is responsible for the development of fisheries policy, and promoting the biological, economic and social sustainability of Australian fisheries. In so doing, DAFF must collaborate with the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) for effectively developing and implementing policies that protect and conserve the marine ecosystems and biodiversity.

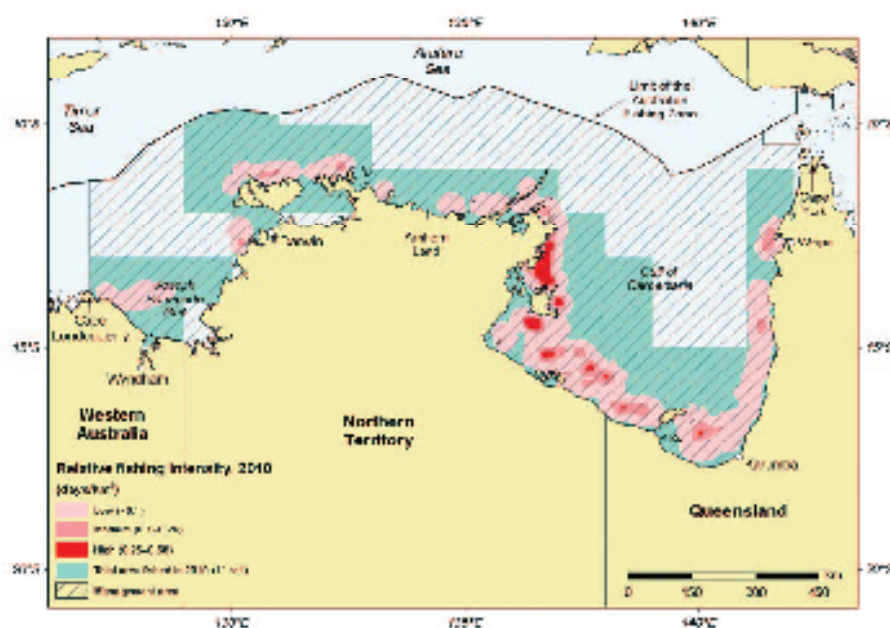
The 1999 EPBC Act allows the Australian government to assess the environmental performance of fisheries and promote ecologically sustainable management. This gives a mandate to the Environment Minister to oversee fisheries management and step in when issues of marine environmental protection and biodiversity conservation arise. AFMA was created to manage Commonwealth fisheries to ensure separation of politics from the everyday micromanagement of fisheries and in this it has been successful. It became apparent from our discussions with various stakeholders that the knowledge that the Environment Minister has the ability to act at any time to ensure ecological objectives are met keeps both the industry and AFMA on their toes in terms of ensuring that these objectives are met.

The balance of various industry sectors as well as other stakeholders, including government, research and environmental/conservation NGOs, has resulted in NORMAC and NPRAG functioning as effective and representative groups. In 2008, an incorporated company, NPFI, was formed to represent the NPF fishing industry, with voting rights being based on the unit holdings (SFRs) in the industry. Almost all of the fleet is represented in NPFI. Day-to-day management of the fishery has devolved to the company, with the main role of AFMA being to audit the company's decisions. Advice on strategic directions and the development, for example, of harvest strategies are produced by NORMAC with final approval by the AFMA Commission. The duties of NORMAC are evolving, especially as the co-management programme, which started as a trial in May 2008, evolves. The co-management programme is exploring more productive working relationships and engagement of AFMA with stakeholders. There are some issues regarding AFMA that require attention and are getting in the way of a more optimum AFMA model, particularly in terms of deficiencies in its consultation process. The 2012 Borthwick review



suggests that the primary basis for consultation and advice on fisheries management coming from MACs and RAGs is too narrow, and thus AFMA should ensure that it seeks wider public, scientific and other input from other sources.

The selection of some AFMA Commissioners who do not have a fisheries or a wider environmental background can also be problematic as it can sometimes get in the way of decision-making that is knowledgeable, flexible and adaptable to the specificities of each fishery. Additionally, there have been several complaints by different stakeholders regarding the apparent remoteness of Commissioners in their deficient attendance/presence and engagement regarding NORMAC and NPRAG meetings and outcomes. These grievances are not only related to the ongoing 'stand-off' regarding the input (TAE/ITE) versus output (TAC/ITQ) management issue in the NPF, but also to the wider delay in management decision-making.



Distribution and relative fishing intensity of the Northern Prawn Fishery in 2010. From Woodhams et al. (2011).

3.1.5 Fishbone analysis of key components and measures optimizing the fishery's performance

Our 'Fishbone' analysis identified seven primary components, plus a substantial number of associated subsidiary measures, which act together in optimizing the governance performance of the NPF. These seven components are: 1) Fishery legislation and policy; 2) Fishery and environmental integration; 3) Conservative catch targets and limit reference



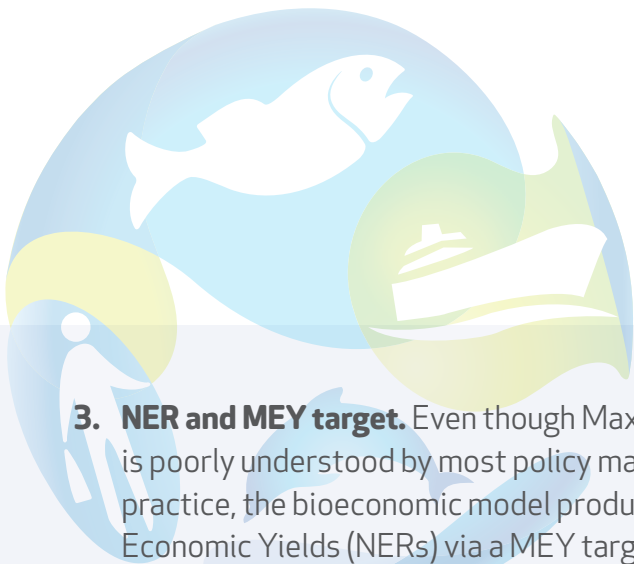
points; 4) Ecosystem impact mitigation; 5) Rationalization; 6) Compliance; and 7) AFMA – Politically neutral, stakeholder consultation model.

3.2 Conclusions on best practices for EU fisheries

The governance system for the NPF under AFMA can be the source of substantial wisdom and best practices for the EU in terms of potentially progressing the way its fisheries are managed. At the same time there are also lessons to be learned, and some caveats to keep in mind, which relate to how one prioritizes the three “pillars of sustainability” (Bio-Ecological, Economic and Social) and the potential limitations that may arise from that. This section brings together not only the main components of best practices, but also lessons learned, from the NPF governance system in the context of implementation of new legislation/policy within the EU’s CFP. In addition to the three sustainability “pillars”, we also emphasize the importance of Governance (*c.f.* definition in ‘Introduction’) which acts as an essential cross-cutting and integrative “beam” in this sustainability “house”.

The NPF exhibits many good practices. On the basis of our study of the governance of the NPF, we provide the following “take home message” to the EU concerning a few key best practices which we believe merit particular consideration by the Myfish project and fishery-related stakeholders:

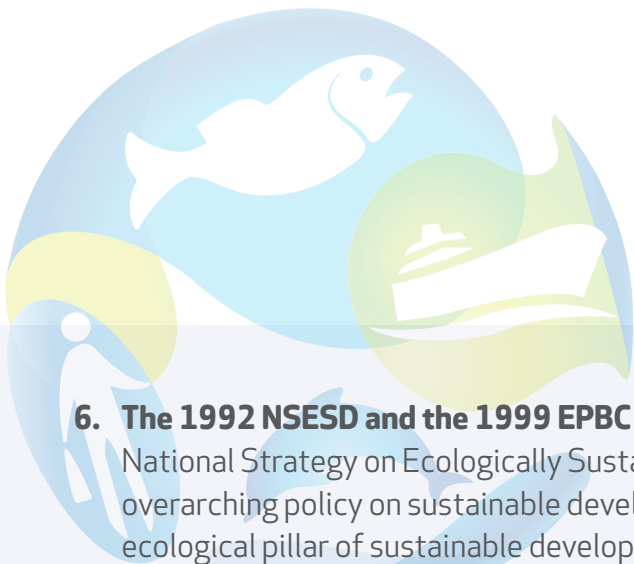
- 1. Clear and comprehensible policies.** In the EU, we lack the equivalent of the Commonwealth Harvest Strategy Policy (CHSP) between our key legislation (Common Fisheries Policy (CFP)) and our developing suite of dedicated fishery management plans (FMPs). We believe that currently the EU’s FMPs are basically comparable to the Commonwealth FMPs in being deficiently ‘content free’ (*c.f.* 2012 Borthwick review on Commonwealth Fisheries Management). Although we do not recommend a “one size fits all” application of MSY in the EU, we do contend that the EU would benefit from having the equivalent of the CHSP laying out its current approach to fisheries management as an umbrella to the FMPs. The massive, largely disjointed, and partly unintelligible text of the CFP cannot serve this purpose.
- 2. Fishery specific harvest control system.** Given that it is challenging to carry out good stock assessments and management for prawns/shrimps, the approach of the NPF — regarding the tiger prawn (with good population dynamics knowledge) sub-fishery and banana prawn (with poor population dynamics knowledge) sub-fishery — is well worth learning from with respect to applying harvest control rules for shrimp/prawn fisheries in parts of the EU. Although AFMA has a default preference for output controls in the form of TAC/ITQs, the NPF has demonstrated that input controls (TAE/ITE(Qs)) are an effective and viable option for this fishery.



3. NER and MEY target. Even though Maximum Economic Yield (MEY) is a concept which is poorly understood by most policy makers and also by many fisheries economists in practice, the bioeconomic model produced specifically for the NPF, which maximizes Net Economic Yields (NERs) via a MEY target, has led to a “win-win” situation for both the industry (added probability for sustainable economic efficiency) and the environment (larger stocks and lower impacts on the rest of the ecosystem). An MEY target may form an appropriate aspirational model for some of the EU fisheries given that appropriate data are available. Buying into an MEY target, fishers can also be motivated to provide improved fleet-related economic data in accord with the aims of the CFP’s Data Collection Framework Directive. It is emphasized that the MEY target is recommended as the second stage in optimizing sustainable fisheries, following a first stage which has adopted MSY and progressed to it. The Australian lesson has underlined that removal of fishing overcapacity is an essential precursor for facilitating the move to successful MSY and MEY management.

4. The AFMA governance model. This model is good in bringing together diverse aspects of fisheries and environmental policy/legislation and focusing these in the operation of the NPF. What is important in the EU context is that the AFMA model, and more specifically AFMA itself, allows for the separation of politics from the everyday management of the fishery. Including wide and constructive stakeholder participation through both Management Advisory Committees (MACs, such as the NPF’s NORMAC) and Resource Assessment Groups (RAGs, such as the NPF’s NPRAG) is also imperative. However, it is vital to allow for even wider stakeholder consultation than currently occurs in AFMA concerning opinions and/or being part of the debate (c.f. 2012 Borthwick review recommendations). The model potentially can provide, with appropriate adaptation, a good outline for the EU’s Regional Advisory Councils (RACs), especially when and if it is decided that the role of RACs should be strengthened.

5. ERA/ERM framework. The Australian-developed Ecological Risk Assessment (ERA) process framework uses a hierarchy of risk assessment methodologies which analyze the impact, both direct and indirect, that a fishery’s or sub-fishery’s activities have on five ecological components of the marine ecosystem. These components are: target species; byproduct and bycatch species; threatened, endangered and protected (TEP) species; habitats; and ecological communities. The Ecological Risk Management (ERM) process then promotes the application of appropriate mitigatory actions/measures for components at significant risk from the fishery. Uptake of the NPF’s ERA/ERM system would be a very important step towards improved assessment and management of bycatch issues and thereby in advancing an ecosystem-based approach in EU fisheries.



6. The 1992 NSESD and the 1999 EPBC Act as overarching policy. The Australian 1992 National Strategy on Ecologically Sustainable Development (NSESD) acts as the nation's overarching policy on sustainable development. The NSESD aims to ensure that the bio-ecological pillar of sustainable development is not subservient to the economic and social pillars of sustainable development. The 1999 Environmental Protection and Biodiversity Conservation (EPBC) Act allows the Australian government to assess the environmental performance of fisheries and promote ecologically sustainable management. This provides the Environment Minister with a mandate to oversee fisheries management and step in when important issues of marine environmental protection and biodiversity conservation arise. This third party intervention is indispensable not only for the conservation of the resource and other ecosystem components, but also for allowing the public to feel assured that the necessary "checks and balances" are being applied with respect to agreed legislation and policy standards. An understanding of the implementation of the EPBC Act concerning Australian fisheries is likely to help the EU consider how its new Marine Strategy Framework Directive (MSFD) (Environmental Pillar) may operationally interact with the CFP.

7. Co-management with cost-recovery system. There has been an increasing movement towards co-management in the Australian NFP which has allowed the day-to-day management of the fishery, subject to AFMA audit, to rest in the company that was formed as a cooperative by the owners of Statutory Fishing Rights (SFRs, which function as durable entitlements). Under co-management the industry, for example, has the ability to contribute actively to the formulation of harvest strategies, FMPs, and compliance measures, which are eventually approved by the AFMA Commission. The delegation of more power to the industry in the management of the fishery has a cost recovery function where the NPF industry pays 100% of recoverable management costs. Therefore, those who have been given the right to fish through SFRs, have the opportunity to co-manage the fishery, i.e. with rights come stewardship responsibilities. Given that the fishing industry has the right to benefit from the extraction of a public resource, there is a levy imposed for the government services provided in management of that resource (research/administrative component of the levy). The 2012 Borthwick report recommended that this levy should be extended to include an access to the resource component.