



**Fisheries 'prospectivity' and  
implications for MPA planning**

Prepared for the South West industry stakeholders group

July 2011

**MRAG**  
asia pacific

## About MRAG Asia Pacific

MRAG Asia Pacific is an independent fisheries and aquatic resource consulting company dedicated to the sustainable use of natural resources through sound, integrated management practices and policies. We are part of the global MRAG group – an international leader in the field of fisheries and aquatic resource consulting with offices in Europe, North America and the Asia Pacific.

Established in 1986, MRAG has successfully completed over 400 projects in more than 60 countries. Our in-house experts have a wide variety of technical expertise and practical experience across all aspects of aquatic resource management, policy and planning, allowing us to take a multi-disciplinary approach to every project. Our capability to service an extensive array of resource management needs is further extended through our network of associations with internationally acclaimed experts in academic institutions and private organisations worldwide.

Level 30  
345 Queen Street  
Brisbane Qld 4000 Australia

PO Box 732  
Toowong Qld 4066  
Australia

P: +61 7 3371 1500  
F: +61 7 3100 8035  
E: [info@mragasiapacific.com.au](mailto:info@mragasiapacific.com.au)

## Summary

- Prospectivity in the fishing sector can apply in a range of circumstances including, for example, the potential to catch the same species, using the same rights in new fishing grounds; the potential to develop new species (particularly with the emergence of new market and/or higher prices) ; and the potential to catch existing species using new techniques in new areas.
- While the majority of world's major commercial fishing opportunities have been developed, new fisheries continue to emerge both in Australia and internationally. Evidence for fisheries prospectivity can come from a range of sources including previous commercial exploration, fishery-independent surveys, previous foreign fishing activity and comparisons of similar seabed features holding commercially valuable fish stocks elsewhere.
- The main implication of fisheries prospectivity in the establishment of MPAs is that it cannot automatically be assumed that areas previously unfished, or lightly fished, can be closed without cost to the fishing industry and community. The strength of arguments to retain access to prospective areas increase in line (a) the weight of evidence for prospectivity and (b) the degree to which conservation objectives have been already achieved.
- The issue of prospectivity should be included in the scope of socio-economic impact assessments undertaken in association with marine conservation planning. Where credible claims of likely foregone profit are identified, consideration should be given to providing assistance in line with the Australian Government's *Fisheries Adjustment Policy*.

## Prospectivity – what is it?

Prospectivity as a concept is not well-defined outside of the mining sector, but can generally be taken to mean the potential to realise a return from an as yet unused, or underutilised, resource. In the mining sector, areas that have high resource potential are said to have “high prospectivity”; areas that are resource-poor are said to have “low prospectivity”. In the commercial fishing sector, the principle of prospectivity can apply in a number of circumstances, for example:

- The potential to catch the same species, under the same rights (e.g. fishing licences, ITQs, etc) but in different areas;
- The potential to establish fisheries and markets for new species (for example, the availability of a particular stock and techniques to catch it may be well-known, but current market circumstances do not make it viable. However, with changing community tastes and the continuing emergence of new markets globally, the stock may support a valuable commercial fishery. A good example is Moreton Bay and Balmain bugs which were discarded in the early stages of Australia's tropical prawn fisheries, yet are now a premium product);
- The potential to catch the same species using new techniques in different areas, either under the same or new rights;
- The potential to reactivate rights that have lain dormant for many years.

Fisheries agencies around Australia and internationally have recognised potential prospectivity in the commercial fishing sector through the adoption of exploratory and developmental fishing frameworks to guide the development of new opportunities (e.g. <sup>1, 2, 3</sup>).

## Prospectivity in commercial fisheries – have all fisheries been developed?

While it is probably true that most of the world’s major commercial fishing opportunities have been developed, it is not the case that all new opportunities have been exhausted.<sup>4</sup> New, mostly ‘boutique’, fisheries continue to be developed both globally and in Australia, driven by a growing need for fish-based protein, changing community tastes, increasing use of ‘bycatch’ and changing market circumstances, amongst other reasons (e.g. <sup>5,6,7</sup>). In more recent times, new management frameworks have also been established to manage new fisheries made available through climate change.<sup>8</sup> Table 1 provides some non-exhaustive examples of new fisheries developed, or currently under development, in developed world jurisdictions in recent years.

**Table 1: Non-exhaustive list of new fisheries developed, or under development, in developed world jurisdictions in recent years.**

Jurisdiction	Species	References
New Zealand	surf clams, deepwater crabs, geoduc	9,10
Western Australia	blue swimmer crabs, octopus	11
South Australia	Central zone abalone - Cowell area	12
Canada – Pacific Coast	Pacific sardine ( <i>Sardinops sagax</i> ) surfperch (Embiotocidae), surf smelt ( <i>Hypomesus pretiosus</i> ), northern anchovy ( <i>Engraulis mordax</i> ), Pacific octopus ( <i>Enteroctopus dofleini</i> and <i>Octopus rubescens</i> ), opal squid ( <i>Loligo opalescens</i> ), goose-neck barnacles ( <i>Pellicipes polymerus</i> ), and sea cucumber ( <i>Parastichopus californicus</i> )	13
Oregon	Pacific sardines, bay clams	14
Falkland Islands	Patagonian toothfish, grenadier	15

<sup>1</sup> AFMA (2005). *Fisheries Management Policy Series, FMP No. 5 – Exploration of Fisheries Resources*.

<sup>2</sup> Halmarick (1999). *Developing New Fisheries in Western Australia: A guide to applicants for developing fisheries*. 40pp. (Accessed at: <http://www.fisheries.wa.gov.au/docs/mp/mp130/fmp130.pdf>)

<sup>3</sup> Canadian Department of Fisheries and Oceans (2001, revised 2008). *New Emerging Fisheries Policy*. Accessed at: <http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm>

<sup>4</sup> MRAG (2010). *Starting from Scratch: Best Practice Application of New Zealand’s Fisheries Management Framework to Developing Fisheries*. Report prepared for the New Zealand Ministry of Fisheries (accessed at: <http://www.m2cms.com.au/uploaded/5/MRAG%20AP%20Developing%20Fisheries%20-%20Final%20Report.pdf>)

<sup>5</sup> Soboil, M and A. Craig, (2008). Self governance in New Zealand’s developmental fisheries: deep sea crabs. In Townsend, R.; Shotton, R.; Uchida, H. (eds). *Case studies in fisheries self-governance. FAO Fisheries Technical Paper*. No. 504. Rome, FAO. 451p

<sup>6</sup> Miller, R.J. (1999). Courage and the management of developing fisheries. *Can. J. Fish. Aquat. Sci.* **56**: 897–905

<sup>7</sup> Perry, R.I., Purdon, R, Gillespie, G. & Blewett, E. (2005) *Canada’s staged approach to new and developing fisheries: concept and practice. Fisheries assessment and management in data limited situations*. Alaska Sea Grant College Program.

<sup>8</sup> NMFS (2009). *Fishery Management Plan for Fish Resources of the Arctic Management Area*. 146pp. Accessed at: <http://www.fakr.noaa.gov/npfmc/fmp/arctic/ArcticFMP.pdf>

<sup>9</sup> Ibid, Soboil and Craig (2008)

<sup>10</sup> Ibid, MRAG (2010)

<sup>11</sup> Ibid, MRAG (2010)

<sup>12</sup> Mayfield, S., McGarvey, R., Carlson, I. And Dixon, C. (2008) Integrating commercial and research surveys to estimate the harvestable biomass, and establish a quota, for an “unexploited” abalone population. *ICES Journal of Marine Science*, **65**:1122-1130.

<sup>13</sup> Ibid, Perry et al (2005)

<sup>14</sup> Harte, M., Endreny, P., Sylvia, G. & Munro Mann, H. (2008). Developing underutilized fisheries: Oregon’s developmental fisheries program. *Marine Policy*. **32**: 643–652

<sup>15</sup> Ibid, MRAG (2010)

In the south west region, some degree of prospectivity appears to exist in a number of potentially affected fisheries. For example, in the Western Australian-managed South West Inshore Trawl Fishery dormant licences have recently been reactivated around the Rottneet area which has seen the re-establishment of a profitable saucer scallop and king prawn fishery. In the Commonwealth-managed Western Deepwater Trawl fishery, operators have explored new markets for deepwater bugs (*Ibacus* spp.) and boarfish. In the Western Tuna and Billfish Fishery, effort is currently limited by unfavourable exchange rates, but previous Japanese catch history shows considerable catches of tuna in the south west region. Changing market conditions (e.g. rising prices for finfish witnessed in recent years; changes in exchange rates; establishment of new markets in Asia), availability of more cost effective processing (e.g. offshore processing) and the existence of better infrastructure may make many of these species commercially viable in the future.

Interestingly, the Western Australian Government's developmental fisheries process was suspended in 2001 following an 'overwhelming' response to a call for expressions of interest in new fisheries.<sup>16</sup>

### Evidence for prospectivity

Generating evidence for prospectivity in the mining sector is comparatively straightforward, albeit highly sophisticated. Remote "prospectivity mapping" can be undertaken based on the geological and geophysical attributes of an area (e.g. <sup>17,18</sup>) and, if likely areas are identified, more detailed observations can be made in the field based on essentially static resources. By contrast, the situation in the fishing industry is more complicated. Commercially fished stocks are subject to significant spatial and temporal variation and collecting objective evidence for prospectivity can be more 'hit and miss'. This is demonstrated by the many fisheries that have been 'discovered' by fishers after several years fishing in essentially the same location using essentially the same gear (a good example is the ETBF albacore fishery off the east coast of Queensland that was 'discovered' in 2006, simply by fishing longlines at 300m deep rather than 100m deep<sup>19</sup>). As a result, much of the evidence for prospectivity in commercial fisheries is likely to be inferred. Evidence for prospectivity might come from:

- Previous exploratory catch history;
- Previous fishery-independent surveys (e.g. trawl surveys, aerial surveys);
- Previous catches by foreign fleets;
- Comparisons of seabed formations against like areas which hold commercially-valuable stocks elsewhere; and so on.

Evidence for the existence of a fishable stock can be further supported by information other factors which influence the viability of a fishery (e.g. establishment of new markets, higher prices, new fishing techniques, new processing methods, etc).

Additional evidence for prospectivity can also be drawn from operators' continued payment of levies in fisheries that have yet to see significant commercial activity or generate significant return.

---

<sup>16</sup> Department of Fisheries, Western Australia - Media Release, 27 September 2001, (<http://www.fish.wa.gov.au/docs/media/index.php?0000&mr=41>).

<sup>17</sup> <http://www.prospectivitymapping.com/>

<sup>18</sup> <http://www.prospectivity.com.au/>

<sup>19</sup> G. Heilmann, pers. comm.

Examples in the South West region include the Commonwealth Western Deepwater Trawl Fishery and Western Tuna and Billfish Fishery, amongst others. The initial purchase of rights in these fisheries is often done on the basis of one or more forms of evidence listed above, and the continued payment of access fees (often many thousands of dollars annually) represents an ongoing commercial judgement that a viable commercial opportunity exists (even where current fishing effort is low). Put simply, the continued payment of significant management levies could not be justified if there wasn't a reasonable chance of a commercial return.

### Implications for MPA planning

The main implication of prospectivity is that it can't be automatically assumed that areas previously unfished, or lightly fished, can be closed at no cost to the fishing industry or the community.

Given the political nature of marine park zoning considerations, there can be a temptation to close all unfished, or lightly fished, areas to improve the 'optics' of the outcome (i.e. to increase the overall percentage of 'no-take' area within a planning region). This is particularly the case where lesser degrees of protection are able to be achieved in more politically and/or socio-economically 'difficult' bioregions. However this approach may result in the closure of areas far in excess of that required to achieve representative protection from a conservation perspective and may be inconsistent with the principle of 'least cost' (particularly if the area shows some degree of fisheries prospectivity). In addition, it can be counter to achievement of 'real' long term outcomes by creating a misleading impression in the community of environmental progress.

The argument to maintain access to areas on the basis of future prospectivity strengthens as (i) the evidence for prospectivity increases and (ii) conservation objectives have been achieved by closures to other areas. That is, if the evidence for prospectivity is weak and conservation objectives have not been achieved through closures elsewhere, the area might be a logical candidate to include in an MPA (assuming a conservation benefit). However, if evidence for fisheries prospectivity exists and conservation objectives have already been achieved through closures elsewhere, the argument for retaining access to the area is strong (i.e. additional closures would be inconsistent with the principle of 'least cost').

### Implications for Adjustment Assistance

Just as a mining company might seek compensation for foregone profits where a likely mineral deposit over which they held an access right is closed for conservation purposes, access right holders in the fishing sector may seek similar consideration where known areas of fisheries prospectivity are included in MPAs.

The strength of the claim to consideration for foregone profits would largely depend on the evidence for prospectivity and the nature and strength of the access right. That is, where evidence for prospectivity is weak and access rights are weak or absent, claims for consideration of foregone profits are weak. On the other hand, if evidence for prospectivity is strong and access rights are clear and well-defined, claims for consideration of foregone profits are stronger.

Valuing foregone profits for an unused, or under-utilised, resource is likely to be a challenging exercise given the absence of established markets or commercial history upon which traditional valuation models are based. Further complicating assessments for fisheries is that assessing the strength of an access right is a complex task depending on the statutory regime and history of the fishery. Nevertheless the difficulty of the task is not a good reason for a failure to fairly assess impacts and consideration should be given to including the impacts of lost prospectivity within the scope of the socio-economic assessment to be undertaken to determine the impacts of MPAs on fishers and communities. This process should provide an objective avenue through which claims of impact due to lost prospectivity can be assessed. Ideally, where credible claims of likely foregone profit are identified, an agreed method of offsetting impacts could be agreed between Government and fishers consistent with the Australian Government's *Fisheries Adjustment Policy*.