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# ***A preferred co-management model for the Spencer Gulf prawn fishery***

Paul McShane<sup>1</sup>, Karen Hollamby<sup>2</sup>, Sean Sloan<sup>3</sup> and James Brook<sup>4</sup>

1. Global Marine Resource Management Pty Ltd
2. Spencer Gulf and West Coast Prawn Fishermen's Association Inc
3. PIRSA Fisheries, South Australia
4. On behalf of the Conservation Council of SA

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## ***Executive Summary***

This paper has been produced as a result of the FRDC project 2007/025 *Competition to Collaboration: exploring co-management models for the Spencer Gulf Prawn Fishery*. The objectives of the project were to: (i) build working relationships between stakeholders; (ii) explore and evaluate different co-management models; and (iii) develop a preferred management model for the Spencer Gulf Prawn Fishery. This paper delivers the project outcomes required under objective 3.

Three co-management models were evaluated by Spencer Gulf Prawn Fishery stakeholders: status quo, a partially delegated model, and a fully delegated model. Stakeholders were: industry (represented by the Spencer Gulf and West Coast Prawn Fisherman's Association Inc (the Association)), government (represented by the Department of Primary Industries and Resources South Australia (PIRSA)) and the conservation sector (represented by Conservation Council of SA (CCSA)).

There were a number of drivers and incentives identified by stakeholders for progressing towards greater co-management, including:

- Greater industry stewardship of the resource;
- Improved environmental performance (habitat protection and reduced impact on threatened, endangered and protected species);
- Depoliticising fisheries management;
- Reducing unnecessary administration ('red tape') and improving management flexibility;
- Sharing responsibility among stakeholders for management of the resource;
- Improved communication among stakeholders;
- Improved efficiency and reduced costs;
- Increased transparency of fishery operations and fisheries management processes.

The partially delegated model was assessed as best suiting the needs of stakeholders given the potential administrative complexities of a fully delegated model.

The status quo, which already involves a high level of collaboration (between industry and the government), was considered to be inefficient given that there was significant involvement of industry stakeholders in stock assessment surveys, and in development and application of harvest strategies. Replication of these functions by government was considered to be inefficient. It was recognised that efficiencies and cost savings could be gained by formally delegating these functions to industry under a partially delegated model.

The fully delegated model was considered to be too risky (legally and financially) for all stakeholders given that many core processes of management and administration of the fishery, particularly cost recovery, were not well suited to industry given its present capacity. Stakeholders considered that,

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pending audit performance and evaluation of the preferred model implemented over a phased period, further delegation may be undertaken.

Under the preferred co-management model, the following responsibilities would be formally delegated to industry:

- developing, implementing and managing harvest strategies;
- contracting research and stock assessment services, including stock assessment surveys, subject to audit/oversight of research performance by a research sub-committee (including stakeholders) and the government (PIRSA);
- further delegation of management/administration services may be considered based on performance audit and assessment and willingness by Government, industry and other stakeholders.

Under the preferred co-management model, the following responsibilities would be retained by PIRSA Fisheries:

- full independent audit process of all delegated functions;
- enforcement and compliance functions;
- conducting ecological risk assessment;
- leading development of the next management plan in consultation with the Fisheries Council, the Association, its research sub-committee and other stakeholders;
- establishing ecosystem benchmarks in consultation with the Association and with the conservation sector;
- collating logbook data and providing this to the research provider under confidentiality agreements;
- cost recovery of core management processes delegated to the Association.

The preferred co-management model would involve the following roles and responsibilities for the conservation sector:

- the conservation sector to be formally involved in co-management through active participation with the Association and with the government, but also more generally in the consideration of future management initiatives among stakeholders;
- active participation on any relevant Association sub-committees (involving stakeholder representatives);
- greater involvement in management planning;
- proactive input into environmental management issues including:
  - participation in the ecological risk assessment process;
  - evaluation of ecosystem benchmarks;
  - development of strategies to manage impacts on threatened, endangered, and protected species (TEPS);
  - assisting in a shared approach to habitat protection (e.g. threats to the Spencer Gulf ecosystem more generally);
- participation in conflict resolution (formally through the Fisheries Council of South Australia, and informally through improved communication among stakeholders).

Other key features of the preferred co-management model include:

- A phased approach to delivery of the preferred model is considered necessary to facilitate a smooth transition to greater co-management of the fishery, to provide additional security to all stakeholders, to ensure audit requirements are being met and to allow for industry capacity building;
- a formal conflict resolution process will involve the Fisheries Council of South Australia (empowered under the Act to advise the responsible Minister) in the event that conflict cannot be resolved through informal processes.

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## ***Introduction***

The South Australian government through the Fisheries Division of Primary Industries and Resources, South Australia (PIRSA) encourages co-management of fisheries as a policy tool to improve management outcomes, through greater stakeholder stewardship and responsibility. The *Fisheries Management Act 2007* (the Act) establishes the Fisheries Council of South Australia (FCSA) as the independent peak advisory body for the Minister on fisheries management issues. The FCSA is expertise based, incorporating expertise in fisheries management, commercial, recreational and traditional fishing, fish processing, conservation, research, business, law and economics.

PIRSA Fisheries has well established consultative co-management arrangements in place with all major fisheries, through partnership arrangements with industry associations, and has collaborative arrangements established with some fisheries, including the Spencer Gulf Prawn Fishery. Both PIRSA Fisheries and the Spencer Gulf Prawn Fishing industry have recognised the importance of broader stakeholder involvement, including the conservation sector, in future co-management arrangements. PIRSA Fisheries is developing an over-arching co-management policy to apply across all South Australian fisheries. The learning outcomes emerging from the evaluation of co-management options for the Spencer Gulf Prawn Fishery will form the basis of the broader South Australian co-management policy and more generally to evaluation of opportunities for co-management of other Australian fisheries.

In a recent Australian review, Neville (2008) defined co-management as *“an arrangement where responsibilities and obligations for sustainable fisheries management are negotiated, shared, and delegated between Government, fishers, other interest groups and stakeholders”*. He outlined some essential pre-conditions deemed necessary to progress a co-management model for a fishery. These pre-conditions are presented in the context of progressing co-management arrangements for the Spencer Gulf Prawn Fishery.

- *a willingness by governments to consider alternative management models involving greater shared responsibility*. South Australia is committed to progressing co-management opportunities in managing commercial fisheries, consistent with principles of ecologically sustainable development (ESD) as required by the Act. The Act permits the Minister to delegate functions prescribed under the Act, allowing the sharing of responsibilities among stakeholder groups. Industry already has shared responsibilities with the government for some aspects of the management of the fishery.
- *Fishers groups with a significant proportion of members wanting to move to co-management*. The body representing industry, the Spencer Gulf and West Coast Prawn Fishermen’s Association Inc (the Association) is committed to take on greater shared responsibility for management of the fishery.
- *Identified “champion/s” who can negotiate effectively with governments and build organisational ownership*. For some time the Spencer Gulf Prawn Fishery, through the Association, has had a close working relationship with the government. The Association employs a full time Executive Officer and has a governing Management Committee, which is leading the industry’s involvement in co-management. The Management Committee also has responsibility for developing harvest strategies for the fishery. The Association has contractual arrangements with the government for a Coordinator At Sea to provide a link from industry through to government and its fishery managers. Further to this, the Association’s Committee At Sea works to implement and manage harvest strategies in close consultation with the government. More recently, the Association has been working closely with Conservation Council of SA (CCSA). CCSA has a nominated representative who is working closely with the Association and with PIRSA Fisheries to evaluate co-management options for the fishery. This multi-lateral relationship has improved communication and

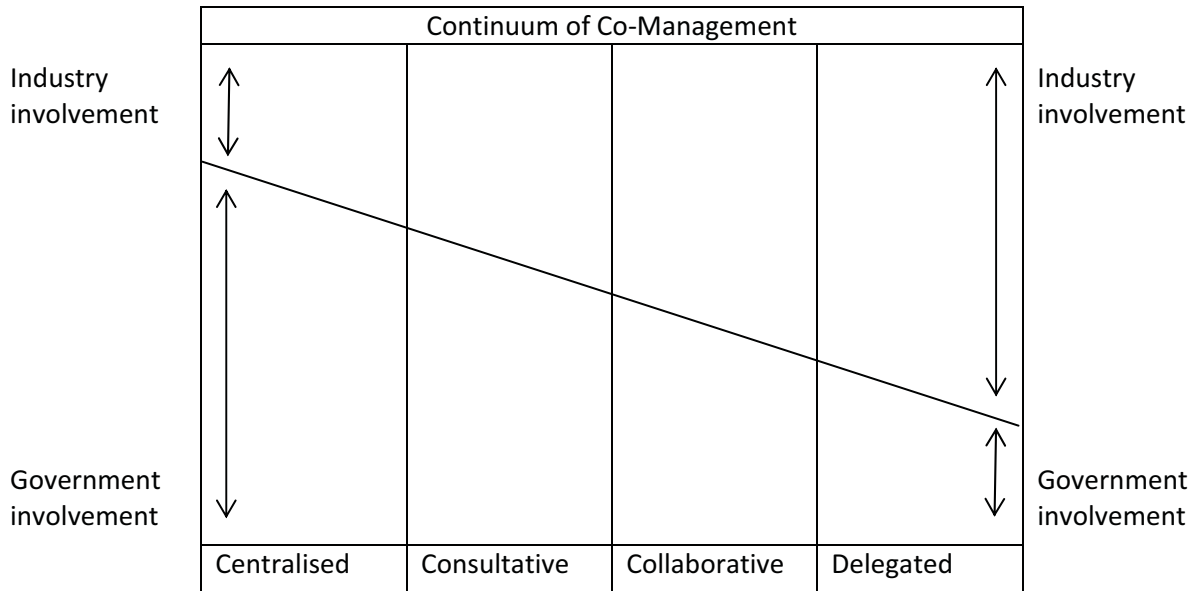
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understanding of the needs of major stakeholders in the fishery (including the conservation sector).

- *An effective fisher organisation structure with good governance and an ability to communicate with all fishers and other stakeholders.* The Association is an incorporated body with membership comprising most of the licence holders. It has a management committee with an independent chair and a number of sub-committees (including a committee at sea responsible for making daily spatial management decisions, and a research sub-committee for advising on research matters).
- *A fisher organisation with sufficient resources and skills to implement and deliver services, or an ability to negotiate and attract such resources.* The Association collects fees from its members for day to day operation on behalf of its members. Under the preferred model the Association will take a greater role in managing the fishery. This will require a capacity building strategy and additional resources including support for the Executive Officer and the Coordinator At Sea to undertake the formal liaison with government given the functions delegated. PIRSA Fisheries has confirmed that the government cost recovery process, used to set annual licence fees to fund management services, will be utilised to ensure that any 'core' management processes are securely funded before any functions being formally delegated from government to industry. Core management processes are those processes that are integral to fishery management involving all licence holders, and which would be delegated to the Association, e.g. scientific surveys, stock assessment and research, Coordinator At Sea services, harvest strategy development/application, and real time spatial management. The core management processes do not include other administration functions or other initiatives such as marketing, promotions, or provision of an Executive Officer) of the Association.
- *Existence of a legislative basis to delegate powers.* The Minister can delegate powers under the *Fisheries Management Act (SA) 2007* (the Act) to other bodies. Section 10 (1) states: *The Minister may delegate a function or power of the Minister under this Act ... to ...any other person or body.*
- *Ability to generate, and commit to, legally binding undertakings through an MOU, contract or other form of agreement between the parties.* The Act provides for such legally binding undertakings consistent with the SA government's policy of encouraging co-management of fisheries. It is envisaged that the delegation of management responsibilities under section 10 of the *Fisheries Management Act 2007* would require the development of a Memorandum of Understanding (MOU) between the Minister and the Association.
- *Ability for the fisher's organisation to legally enforce agreements through civil, contractual or company law.* The Association currently has contracts with survey vessels and operates under a constitution, management committee code of conduct and Committee at Sea charter. Further agreements and contracts could be developed as necessary.
- *Existence of conflict resolution mechanisms.* Conflict resolution is an essential pre-requisite to co-management. In the first instance, the aim is to resolve conflict through open and constructive communication among stakeholders. Participation by stakeholders on the relevant Association sub-committees will play an important role for communication and discussion of shared interests in the Spencer Gulf Prawn Fishery. In the event that conflict is unable to be resolved informally or through a process determined by stakeholders, the conflict would be escalated to a formal process. This process would include the FCSA, which has a formal channel for advising the responsible minister if the conflict cannot be resolved through other mechanisms.

Neville (2008) described co-management as an evolving process where management arrangements vary from a centralised model to a delegated model (Figure 1). A centralised model is one where Government makes the decisions with little or no consultation with other stakeholders, while a delegated model is where agreed and negotiated management decisions are made by stakeholders (including Government) within a broad framework and agreed functions are undertaken, or services delivered, by fisher groups under a formal agreement.

The Spencer Gulf Prawn Fishery has evolved from a centralised (government controlled) management regime to collaborative management (between industry and government). Other stakeholders, including the conservation sector, do not have any involvement in such collaborative management processes, due to a number of factors including the design of the co-management arrangements, funding availability, competing priorities and expertise. These issues have been recognised as shortcomings and are being addressed in the proposed co-management model and through existing management arrangements. Progress in co-management, under the current Fisheries policy, would involve further delegation of government responsibility to industry through the Association. Other stakeholder organisations, including the conservation sector, will not necessarily have any formal delegated functions within this proposed model. However, greater stakeholder input (including from the conservation sector) in fisheries management processes has been identified as being important to achieve effective delegated co-management regimes. This applies not only to involvement in some delegated industry functions but also those functions remaining with government.



**Figure 1.** The four broad fisheries management models and the level of Government involvement in decision making at each level (Neville 2008).

In considering any further delegation of responsibilities to stakeholders, PIRSA Fisheries would take the following steps, in consultation with stakeholders:

1. *Establish Pre-conditions:* A set of broad government pre-conditions will be developed, using the national co-management framework as a guide. These pre-conditions clarify the

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government's policy position and the requirements that need to be met by stakeholder groups before delegation of fisheries management functions.

2. *Establish Operational Standards*: A set of operating standards will be developed to ensure each pre-condition is met. The operating standards provide details of the 'on the ground' activities necessary to meet the pre-conditions. For example, a set of operating standards were developed for the scientific survey and stock assessment processes in the Spencer Gulf Prawn Fishery, during workshop discussions.
3. *Determine Resource Requirements*: The resource levels required by each stakeholder group to implement the operating standards will be determined. This step will be further investigated during an evaluation of changed management arrangements planned for the 2009/10 fishing period.
4. *Establish Performance Audit Process*: Auditable performance measures will be developed for each delegated function.

### ***Current Co-management of the Spencer Gulf Prawn Fishery***

The co-management framework in South Australia has evolved over time. Consultative co-management was first promoted under the *Fisheries Act 1982* through the formation of Fisheries Management Committees (FMCs) for all South Australian fisheries. The *Fisheries (Management Committees) Regulations 1995* outlined a set of co-management principles that underpinned the formation of the Prawn FMC.

The *Fisheries Management Act 2007* (the Act) facilitates co-management in a number of ways, including through the formation of the FCSA and through providing scope for fishery associations to be delegated functions under the Act. Under the Fisheries policy, formal delegations are proposed to be made to a central body such as an industry Association. This approach will provide a forum for consultation and engagement particularly between government and industry. However, successful co-management will be dependent on how well the structure of fisheries management involves all stakeholders (including government, fishers and other interest groups) in a participatory regime (Neville 2008). Section 10 of the Act sets out provisions for the delegation of functions or powers of the Minister to a person or a body to facilitate shared responsibility in fisheries management, where this is considered appropriate. The Act recognises stakeholder importance by having expertise on the FCSA in a number of stakeholder sectors and having requirements for consultation on important planning processes.

Historically, the South Australian recreational sector has been directly involved in fisheries co-management through the Fisheries Management Committee (FMC) process. Other stakeholder groups have been engaged from time to time in more of an *ad hoc* fashion through workshops, public meetings and consultative processes, run by PIRSA Fisheries or by the Association. The conservation sector, however, has had limited involvement in fisheries management. This has been due to a combination of a lack of resources and a lack of fisheries management expertise within the sector, rather than a lack of interest or commitment. CCSA's activities are dependent on project funding (ie through Commonwealth and State Government natural resource management funding programs), which has traditionally precluded fishery management projects.

The engagement of the conservation sector in this instance represents a shift towards improved stakeholder engagement in the fisheries management process. It should be noted that this has only been possible as a result of the funding through FRDC to enable effective CCSA participation. The conservation sector will require ongoing access to resources to build its capacity to effectively engage with the fishery.

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Using Figure 1 as a guide, the majority of South Australian fisheries have historically been, and currently are, managed using 'consultative' co-management arrangements, particularly between government and industry. In terms of industry involvement, the Spencer Gulf Prawn Fishery has moved further along the co-management continuum to a more collaborative and partially delegated co-management arrangement (referred to in this paper as the status quo) for the following reasons:

- High confidence in stock sustainability, demonstrated in the annual stock assessment process;
- Historically, industry has demonstrated a willingness to meaningfully engage with government;
- The industry association is representative, credible and financially secure;
- The industry association is well resourced, has an independent chairperson and an executive officer;
- The industry association has transparent reporting arrangements in place;
- There is a history of constructive working relationships and trust between government and industry;
- There is minimal stakeholder conflict associated with the fishery and the industry has a track record of working with stakeholders to address conflict issues;
- There is an effective management plan in place;
- Industry has had a clear desire and has built its capacity to take on more responsibility
- Industry is developing stronger links with other stakeholder groups such as the conservation sector;
- Government has a willingness to collaborate and share responsibility.

Responsibility for the management functions are delegated to industry under the current 'status quo' model, as follows:

- Coordinating and managing stock assessment and spot survey activities, including contracting vessels to conduct surveys, organising survey logistics and industry based observers. This activity is conducted under an exemption issued under Section 115 of the Act, which is provided to the Association annually;
- Development of harvest strategies following industry-coordinated spot surveys and stock assessment surveys. The harvest strategies developed under this arrangement require government approval and are implemented by government using Section 79 of the Act through published notices in the gazette;
- Management of harvest strategies during fishing through the Association's Committee-At-Sea, primarily by spatially managing harvests to avoid the capture of small prawns;
- Fleet management, including dissemination of fishing notices, area closures and other information.

Under the current 'status quo' model responsibility for the following management functions remain with PIRSA Fisheries:

- Government policy development;
- Legislative development and enactment;
- Licensing functions;
- Development of the management plan, including establishing sustainability benchmarks, in consultation with the Association and other stakeholders;
- Addressing fisheries access and allocation issues;
- Participating in development of harvest strategies;
- Formalising and implementing all harvest strategy decisions made by the Association's management committee;
- Conducting ecological risk assessment and establishing ecosystem benchmarks;
- The cost recovery process, including determining service levels required and licence fee setting;

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- Compliance, enforcement, monitoring and prosecution; and
  - Formal communication with licence holders.

Under the current 'status quo' model, responsibilities for the following management functions remain with government through its research body, South Australian Research and Development Institute (SARDI) Aquatic Sciences:

- Stock assessment, including analysis of survey data;
- Assistance with stock assessment surveys;
- Provision of fishery independent observers for stock assessment surveys;
- Provision of scientific advice for harvest strategy development;
- Auditing of harvest strategy development, through annual stock assessment;
- Collate and manage all commercial fishery logbook data collected by the fishery;
- Conduct most other biological research underpinning stock assessment in the fishery including non-target species research, assessment and monitoring;
- Communicating scientific information to licence holders.

In considering further delegation of responsibilities under the preferred co-management model, the following are evaluated:

1. management function (e.g. research);
2. operational details (e.g. stock assessment);
3. resources required (e.g. surveys, data analysis);
4. quality assurance and audit (e.g. peer review).

A meeting of stakeholders was held to evaluate proposed co-management arrangements under the broad headings above.

### ***Evaluation of Different Co-management Models***

McShane (2009) presented three co-management models: status quo, a partially delegated model and a fully delegated model. The status quo model (Model 1) reflects the current operation of the fishery and provides some management responsibilities for the industry. The current co-management arrangements in place for the Spencer Gulf Prawn Fishery already reflect a high degree of collaboration between PIRSA Fisheries and the Association. Shared responsibility under this model includes advice on spatial management of Spencer Gulf following industry coordinated surveys; subsequent management decisions are formalised via the government (PIRSA).

A partially delegated model (Model 2) provided greater responsibility for industry including the conduct of research necessary to evaluate the status of the fishery (stock assessment). This differs from Model 1 which engaged government, via its research agency SARDI, as the mandatory research provider. In Model 2, responsibility for stock assessment and spatial management of the fishery is formally delegated to industry by removing the requirement for PIRSA endorsement of harvest strategies and the mandatory engagement of SARDI as the research provider. Additional stakeholder input (including the conservation sector) is proposed through active participation in a sub-committee of the Association.

A fully delegated model (Model 3) transfers all major management responsibilities, except audit and compliance, to industry. It was recognised by project stakeholders that a fully delegated model would require some activities to remain with government. Under this model, responsibility for management and administration would be delegated to stakeholders with an augmented governing body (the Association's Management Committee incorporating broader stakeholder representatives).

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The attributes of the three models were evaluated and discussed at a stakeholder workshop (government, industry, and the conservation sector) in April 2009. At the workshop, a number of incentives were identified by stakeholders for considering co-management. These include:

- greater industry stewardship of the resource;
- improved environmental performance (habitat protection and reduced impact on threatened, endangered and protected species);
- depoliticising fisheries management;
- reducing unnecessary administration (“red tape”);
- improving management flexibility;
- a shared responsibility among stakeholders for management of the fishery;
- improved communication among stakeholders;
- improved efficiency and reduced costs;
- increased transparency of fishery operations and fisheries management processes.

The status quo (Model 1) was considered to be inefficient given that there was already a high degree of involvement of industry stakeholders in stock assessment surveys, and in development and application of harvest strategies. Replication of these management and stock assessment functions by government was considered to be inefficient. Efficiencies and cost savings could be gained by formally delegating these functions to industry under a partially delegated model. The partially delegated model (Model 2) was the preferred model. The fully delegated model (Model 3) was considered to be too risky (legally and financially) given that many core functions of management and administration of the fishery were not well suited to industry given its present capacity. Stakeholders considered that, pending the outcomes of performance audit and evaluation of the preferred model, further delegation may be undertaken.

### ***Stakeholder participation***

Stakeholders met again in July 2009 to evaluate the preferred model (Model 2). A synopsis of the main issues for each stakeholder group is presented below.

#### **Government**

PIRSA Fisheries is supportive of the preferred co-management model, which involves partial delegation of management functions from government to industry, based on adoption of the following broad conditions and processes:

- **Phased Approach:** Implementation of the preferred model will be through a phased approach that allows industry to build its capacity over time and allows for a government audit process to measure performance and success;
- **Audit process:** Development of full independent audit processes for all delegated functions, to be managed by PIRSA Fisheries (funded by industry);
- **Management Plan:** Refinement of the existing management plan to improve audit capacity, including establishing sustainability criteria. PIRSA Fisheries to lead this process in association with the Fisheries Council of South Australia, the Association and other stakeholders;
- **Scientific Services:** Development of criteria and process for contracting scientific services;
- **Stock Assessment:** Development of criteria for stock assessment, including surveys, data analysis and reporting;
- **Data Collection:** Maintaining a mix of fishery dependent and independent data collection, including provisions for independent scientific observers during surveys;
- **Data Storage:** Development of criteria and process for quality assurance of data verification, storage and security;

- **Scientific Observers:** A strategy developed to build capacity for industry based scientific observers, including a training program. Fishery-independent scientific observers would be used during stock assessment surveys;
- **Industry Capacity:** Development of an Association capacity building strategy;
- **Monitoring:** Prior reporting by licence holders before catch is landed;
- **Stakeholder Involvement:** Appropriate levels of stakeholder input and engagement in the co-management process.
- **Conflict Resolution:** A conflict resolution process to be facilitated by the Fisheries Council of South Australia.

A change from the status quo model to the partially delegated model would involve PIRSA Fisheries retaining the following functions:

- Full independent audit;
- Management plan development;
- enforcement and compliance functions;
- conducting ecological risk assessment;
- establishing ecosystem benchmarks in association with industry and other key stakeholder groups;
- collating logbook data and providing this to the research provider under confidentiality agreements;
- cost recovery of core management processes that are to be delegated to industry.

The conditions outlined above provide a guide to the industry for implementation of the preferred co-management model. Details on delegated tasks will be outlined as follows:

- **Management function:** A description of the management or administration function delegated;
- **Operation:** The business practices and processes that will be required to implement the delegated arrangements (i.e., what practical activities will be required to implement the proposed co-management);
- **Resources:** The resources required to implement the preferred co-management model;
- **Quality assurance and audit:** The accountability mechanisms that will be used to assess overall performance of the preferred model after each phase of implementation.

Under the requirements of the Act, there is a requirement to undertake an ecological risk assessment accompanying a management plan for the fishery. The management plan and the associated ecological risk assessment are fundamental inputs to the co-management process because they will underpin the future independent Government audit process for the fishery (under co-management). The ecological risk assessment process involves stakeholder workshops to ensure transparency and accountability in the determination of risks and risk management for each fishery.

## Conservation

The conservation sector is represented by Conservation Council of SA (CCSA), which is the peak body for non-government conservation groups in SA. With more than 50 member groups it represents over 60,000 South Australians. The conservation sector Steering Committee comprises CCSA staff and representatives from the following member groups: Wilderness Society (SA Branch); Marine Life Society of SA; Whale and Dolphin Conservation Society; and Fishers for Conservation.

Involvement of the conservation sector in fisheries management is seen as beneficial in facilitating greater communication and understanding of issues of mutual concern (e.g. habitat protection) among all sectors. Conservation sector involvement could also provide industry with additional expertise in conservation issues, including managing impacts on threatened, endangered and protected species and by-catch mitigation.

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Support from the conservation sector for moving towards the preferred co-management model is dependent upon:

- Audit, compliance and ecosystem related responsibilities remaining with PIRSA Fisheries (as per Table 1); and
- Independent observer coverage being maintained at an effective level.

It is also based on the sector having:

- Active involvement in the implementation of the model;
- Membership on relevant Association sub-committees;
- Active involvement throughout the development of management plans;
- Active input into environmental management issues including :
  - participation in the ecological risk assessment process;
  - evaluation of ecosystem benchmarks;
  - development of strategies to manage impact on threatened, endangered, and protected species (TEPS);
  - assisting in a shared approach to habitat protection (e.g. threats to the Spencer Gulf ecosystem more generally);
- Involvement in the scientific observer program, including development and delivery of the training program, as appropriate.

All of the above are in turn dependent upon the sector being adequately resourced to do so.

## **Industry**

Industry, represented by the Spencer Gulf and West Coast Prawn Fishermen's Association Inc (the Association) is reluctant to accept delegation of all functions of fisheries management currently undertaken by the government (Model 3). This reluctance reflects the diversity and complexity of current fisheries management and administration (McShane 2009).

A partially delegated model (Model 2) was seen as more consistent with industry's aspirations in the short term. Importantly, adoption of Model 2 in a phased approach provides an opportunity for evaluation of those functions which could be considered for future delegation before progressing to a fully delegated model (Model 3). Any further delegation to industry must yield improved efficiencies and reduced costs consistent with industry's desire for sustainable profitability. Thus, the active involvement of stakeholders under the preferred models must be consistent with industry's desire to improve efficiency of management, reduce costs (financial and time) and present a demonstrable improvement on the status quo. This is also important in presenting the benefits (and costs) of co-management to other participants (in other fisheries) examining the Spencer Gulf Prawn Fishery as an example.

## ***A preferred co-management model***

The Spencer Gulf Prawn Fishery has moved further along the co-management continuum to a more collaborative and partially delegated co-management arrangement (between industry and government), referred to in this paper as the status quo. The reasons for this are also recognised for the fishery to continue to move along the continuum to a more delegated co-management arrangement with government. Again, the reasons are as follows:

- High confidence in stock sustainability, demonstrated in the annual stock assessment process;
- Historically, industry has demonstrated a willingness to meaningfully engage with government;
- The industry association is representative, credible and financially secure;
- The industry association is well resourced, has an independent chairperson and an executive officer;

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- The industry association has transparent reporting arrangements in place;
  - There is a history of constructive working relationships and trust between government and industry;
  - There is minimal stakeholder conflict associated with the fishery and the industry has a track record of working with stakeholders to address conflict issues;
  - There is an effective management plan in place;
  - Industry has had a clear desire and has built capacity to take on more responsibility;
  - Industry is developing stronger links with other stakeholder groups such as the conservation sector;
  - Government has a willingness to collaborate and share responsibility.

The preferred co-management model is Model 2 (McShane 2009) represented schematically below.

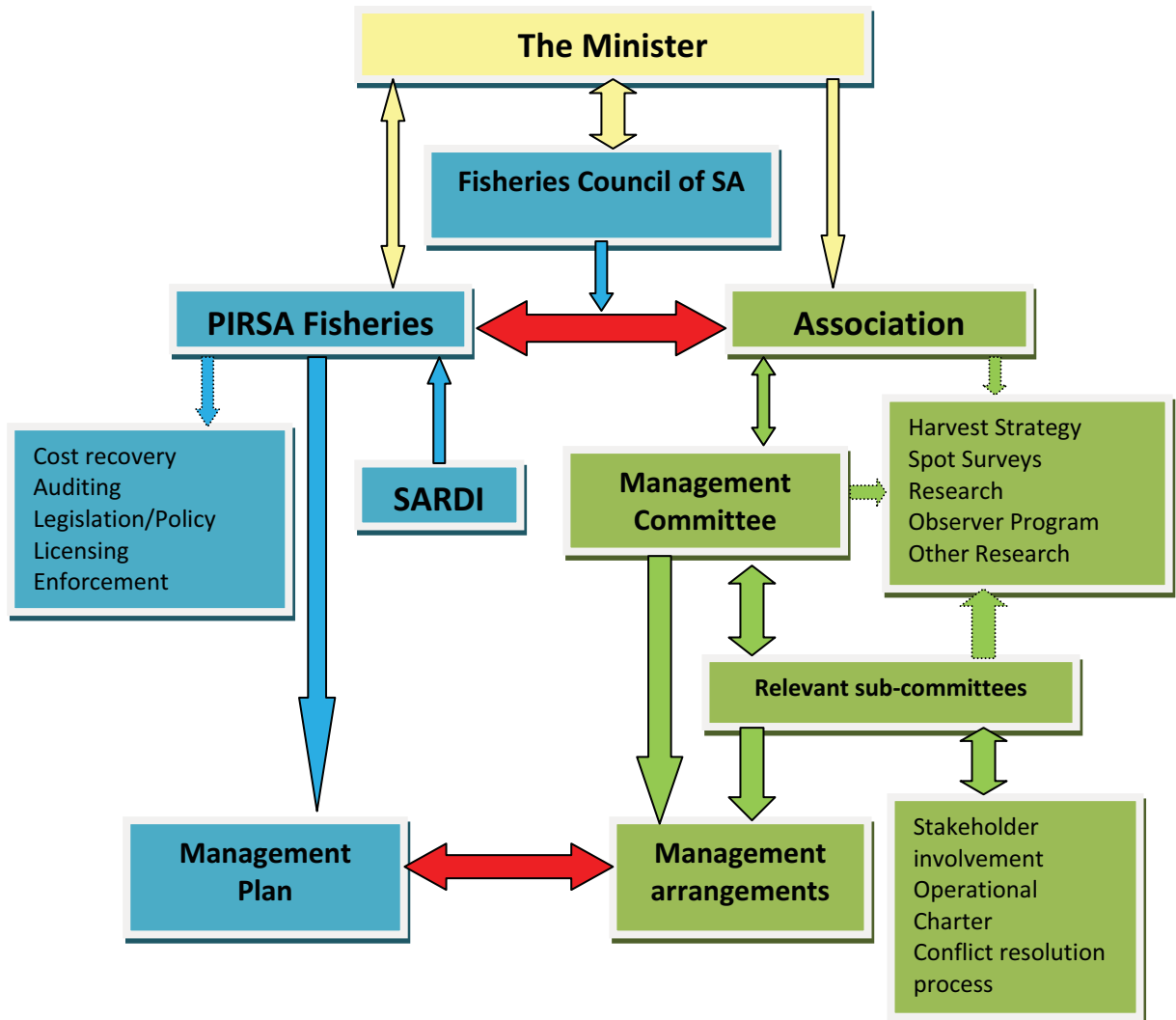
Important points to note:

- The preferred co-management model would be implemented through a phased approach, to allow for the industry to build its capacity to undertake the delegated functions effectively and to allow for performance assessment/audit;
- Government (PIRSA) retains responsibility for cost-recovery through collection of licence fees sufficient to fund annual costs of all core activities necessary for management of the Spencer Gulf Prawn Fishery through the Association;
- The conservation sector has input into the research planning processes applicable to the Spencer Gulf Prawn Fishery via participation in relevant sub-committees of the Association. The conservation sector will also have more general input into the fisheries management process through input to the development of the fishery management plan for the Spencer Gulf Prawn Fishery. Importantly, in the context of co-management, the conservation sector will also participate in the phased introduction of the preferred model and in consideration of further delegation of management/administration (Model 3);
- Importantly, industry would retain control over the daily spatial management decisions following spot surveys. This is because such decisions need to be made in real time following nightly “spot surveys”. The conservation sector (or stakeholders other than industry) would not be involved in daily spatial management decisions;
- Resources will be required for ongoing participation of the conservation sector in co-management including funding towards a sector facilitator to coordinate the sector’s involvement and to build its capacity to do so, and the reimbursement of expenses to attend and participate in the relevant sub-committees. As stated in Neville (2008) *‘Genuine interaction and partnerships are at the heart of co-management’*. The genuine involvement of the conservation sector in co-management is dependent upon the provision of such resources;
- Under the preferred model, industry is primarily responsible for undertaking research and monitoring of the fishery consistent with the performance indicators, and with the research and stock assessment processes specified in the management plan. Thus, research services are contracted by industry under guidelines established by stakeholder’s criteria (e.g. experience and qualifications of the research provider, provision for independent quality assurance audit) and who meet the requirements to be placed on the register of service providers;
- The Fisheries Council oversees the co-management process including oversight of the management planning process (under the provisions of the Act) and, where necessary, formal resolution of stakeholder conflict in co-management.

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Table 1 below compares the current management model (Model 1) with the preferred model (Model 2).

**Model 2** The preferred co-management model showing the delegation of management from government (blue) to industry/stakeholders (green).



**Table 1.** Comparison of current service delivery with a delegated co-management model. All delegated functions will be audited by government.

Process	Task / Duty	Model 1				Model 2				
		PIRSA Fisheries	SARDI	Conservation sector	Association	PIRSA Fisheries	SARDI	Conservation sector	Association	
Harvest Strategies	TEPS reporting (interactions)				M			I	M	
	TEPS impact assessment	M	I			M	I	I	I	
	Review of stock assessment survey data for harvest strategies	M	I		D				D	
	Review of spot survey data for harvest strategies	M	I		D				D	
	Determine spatial harvest strategies (areas open to fishing)	M	I		D				D	
	Catch / effort (number of nights) restrictions	M	I		D				D	
	Gazettal / implementation of fishing notices	M	I		I				D	
	Amendments to fishing notices	M			I				D	
	Coordination of Committee at Sea (to direct fishing operations)				D				D	
	Catch and prawn size data collection during fishing (logbook)				M				M	
	Closing original harvest strategy areas nightly (RTM)	M			M				M	
	Notifying the fleet of changes	M			D				D	
Fishing trip report				M				M		
Spot Surveys	Survey development and design	I	I		D	I			D	
	Survey coordination and logistics				D				D	
	Survey data collection				D				D	
	Survey data collation, verification and analysis		M		D				D	
	Survey authorisation	M							D	
	Assessment of effectiveness of Harvest Strategies	M	M			I			D	
Research <i>Stock assessment surveys, catch &amp; effort data, and by-catch / by-product research</i>	External review of stock assessment	M				M				
	Survey data collation		M						D	
	Coordinate and manage the survey	M	M		I				D	
	Survey development and design	I	M		I	M			I	
	Survey logistics	I	I		D				D	
	Survey data collection		I		D				D	
	Survey data verification and analysis		M		I		I		D	
	Manage fishing logbook program, including validating returns		M			I	M		I	
	Logbook data: collate, enter, maintain database (storage)		M				M		I	
	Assessment of fishery against Management Plan	M	I		I	I	I	I	D	
	Assessment of effectiveness of Harvest Strategies	M	D		I	I			D	
	Collection and storage of other biological data		M			I			D	
	Fishery assessment report (X1)	Data collation and analysis		M			I	I		D
		Report writing		M			I			D
		Peer review	I	M			M	I	I	I
	Stock status report (X1)	Data collation and analysis		M			I			D
		Report brief	I	M			I			D
	Survey interim reports (x3)	Data collation and analysis		M			I			D
Report writing		I	M			I			D	

\*M = Managing authority; D = Delegated authority; I = Input

Process	Task / Duty	Model 1				Model 2			
		PIRSA Fisheries	SARDI	Conservation sector	Association	PIRSA Fisheries	SARDI	Conservation sector	Association
Observer Program	Develop observer program	I	M	I	D	I	M	I	D
	Facilitate observer training	I	M		D	I	M		D
	Maintain observer database	I	M		D	I	I		D
Other Research	Research priorities	M	I		I	M	I		I
	Economic research	M			I	M			I
	Non-target species research	M	I		I	M	I		I
	Biosecurity	M	I		I	M	I		I
	Ecosystem and habitat research	M				M			
	Broader research	M	M	M	M	M	M	M	M
Legislation / Policy	Establishing ecosystem impact benchmarks	M	I	I	I	M	I	I	I
	Development of over-arching policy to guide fisheries management	M	I	I	I	M	I	I	I
	Regulations development and review	M	I	I	I	M	I	I	I
	Management Plan development and review	M	I	I	I	M	I	I	I
	Public consultation on above	M				M			
	Act development and review	M	I	I	I	M	I	I	I
Licensing	Setting conditions	M			I	M			I
	Issue (determining if the licence can be issued)	M				M			
	Demerit points	M				M			
	Transfer	M				M			
	Cost Recovery (fee setting) / Invoicing	M	I		I	M	I		I
	Boat transfers and Master registration	M				M			
	Management of the Public Register	M				M			
Communication	With commercial licence holders	M	M		M	M	M		M
	To the public	M	M			M	M		
	With other government departments	M	M	M	M	M	M	M	M
	With the media	M	M	M	M	M	M	M	M
Enforcement	Prosecutions	M				M			
	Prior reporting (notifying of departure and return, including changes)	M				M			
	Vessel and equipment inspections	M				M			
	Audit of exemptions and prior reporting to data collection	M				M			
	Audit of fishing reports	M				M			
	Development and implementation of compliance strategy	M			I	M			I
	Review of risk assessment	M	I		I	M	I		I
	Promoting compliance within the Spencer Gulf Prawn Fishery (ie code of conduct, on boat management system)	M			M				M
Industry Development	Market research	I			M	I			M
Human Capital Development	Capacity building	M			M	M			M

\*M = Managing authority; D = Delegated authority; I = Input

### Research services

Under the proposed co-management arrangements, responsibility for coordinating and undertaking research for the Spencer Gulf Prawn Fishery will be delegated to industry and audited by government. A set of operating standards for the stock assessment survey will ensure the robustness of processes and reporting of industry. Here, research functions, operational details, resources required and performance audits are presented.

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The management plan for the Spencer Gulf Prawn Fishery (Dixon and Sloan 2007) sets objectives and strategies to maintain ecologically viable stock levels in the Spencer Gulf prawn fisheries consistent with the principles of ecologically sustainable development. Accordingly, the four key management goals are:

- maintain ecologically sustainable stock levels;
- ensure optimum utilisation and equitable distribution;
- minimise impacts on the ecosystem;
- enable effective management with greater industry involvement.

There are a number of permanent controls used to manage the fishery. These include limited entry, limits on vessel size and power, limits on gear (rig, headline length and mesh size), limits on fishing areas (i.e. greater than 10m depth) and limits on fishing times (i.e. only at night). Controls on the day to day management of the fishery are primarily based on closures (spatial and temporal). Some of these closures are permanent, some are voluntary and some are seasonal. Under status-quo management arrangements, spatial and temporal closures are determined in real time on the basis of survey research conducted by industry in partnership with government research agency (SARDI).

Three fishery independent “stock assessment surveys” are conducted each year in November, February and April. Closures are also influenced by the results of “spot surveys” conducted during each fishing period that stock assessment surveys are not conducted. The surveys, coordinated by industry, are proposed to continue under co-management, with formal delegation to industry. There are performance indicators (and reference points) which are derived from data collected from the research program (Dixon et al. 2007, Dixon and Sloan 2007). The current management plan for the fishery specifies information requirements for surveys. These requirements inform the operational details of the delegated research function under the proposed co-management arrangements, although they were not developed in the context of formally delegated co-management arrangements. The survey requirements are detailed as follows:

- collect fishery-dependent information through commercial logbooks;
- maintain the fishery-independent prawn survey program;
- assess the status of the stock through quantitative stock assessment;
- collect appropriate environmental data to aid assessment;
- review and update the strategic research and monitoring plan.

In addition to these research requirements, the Act requires that an ecological risk assessment (ERA) is undertaken prior to development of a management plan, which includes stakeholder workshops. The next revision of the management plan for the fishery will include a response to the high priority risks identified during the ERA process including strategies to manage impacts on threatened, endangered and protected species. Operational details for any additional environmental research following the ERA will be formulated with stakeholder input (under the proposed co-management arrangements). For example, strategies to address interactions with threatened, endangered, and protected species (TEPs) will be developed with input from the conservation sector. Operational details, including identifying those resources necessary to monitor interactions (consistent with provisions in the management plan) will emerge from such input.

The next revision of the management plan will need to provide clearer direction to the stock assessment process, to facilitate the independent audit process (of delegated research functions). Under the proposed co-management arrangements, government will retain control of the performance audit function.

### ***Fishery dependent information***

Data for commercial fishing and spot surveys are collected in commercial fishing log books (completed by skippers in the Spencer Gulf Prawn Fishery). It is compulsory for licence holders to complete the logbook on a daily basis and submit the information monthly to SARDI Aquatic

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Sciences for fishery assessment. Data collected include catch rates (weight of prawns per minute trawled), size composition (weight of prawns in various size grades), mean size (number of prawns per 7 kg), depth, average trawl speed, and start/finish times. More recent changes include specific location data (GPS position) for at least 3 trawl shots per night fished, and retained by product information (squid and bugs). Fishery dependent data are used to assess the status of the stock against reference points (total catch, numbers per 7 kg, and weights per 20+ grade) specified in the management plan (Dixon and Sloan 2007). Under the preferred model such fishery dependent information will continue to be collected and used to assess the status of the Spencer Gulf Prawn Fishery. Commercial fishers are also required by law to complete a wildlife interaction logbook to record any wildlife interactions, particularly with threatened, endangered and protected species.

### ***Fishery independent surveys***

Three fishery independent surveys (stock assessment surveys) are currently undertaken each year with commercial vessels (i.e. fishing vessels owned and operated by Spencer Gulf prawn licence holders). Surveys are undertaken at each of about 200 fixed survey sites in Spencer Gulf by trawling for 30 mins and recording the catch including catch rates, reproductive state and size composition. Commercial vessels are used to ensure data consistency with commercial fishing information. The actual number of sites surveyed varies slightly within and among years, depending on conditions and time available.

Fishery independent surveys provide information on prawn stock abundance and recruitment. The information collected during the survey process is central to the real time management of the fishery. Under current arrangements, the Association coordinates the stock assessment survey through a formal contractual agreement with PIRSA Fisheries. The Association will use the scientific survey design identified in the management plan for the fishery. Following the survey process, the data are provided to SARDI Aquatic Sciences for analysis.

During the life of the co-management project, a number of industry based observers have been trained by SARDI scientists to collect prawn survey information. In addition to the industry based observers, SARDI scientists continue to participate in fishery independent surveys. Future surveys will also include evaluation of by-catch/by-product and environmental impact (including impacts on TEPs). Under the proposed arrangements, such surveys will be delegated to industry with a research provider commissioned to collect and analyse the survey data.

Under the preferred co-management model, some independent observers will be retained. An auditable certified training program will be established for all observers to complement the independent survey process. The Association has begun work to develop a certified observer training program. An audit program, coordinated by the government, will evaluate the results of industry coordinated surveys, including the results of the observer program.

### ***Research providers***

A significant difference between Model 1 (Status Quo) and the preferred model (Model 2) is the delegation of responsibility for undertaking stock assessment and research services to industry. Under the preferred model, industry would contract research from a register of appropriately qualified and experienced providers. Such a register could be developed by government, industry and other relevant stakeholders and maintained by PIRSA. The preferred approach is to present a minimum set of criteria (e.g. job and person specifications) to guide the process of identifying which research providers could be placed on the research provider register, for engagement of a research provider by industry. Selection would be undertaken by the research sub-committee of the Association. This would provide an opportunity for stakeholder input into the selection process and also provide for transparency in the process. Furthermore, provision for audit and independent review facilitated by PIRSA Fisheries will ensure accountability and rigour in assessing fishing impacts on the Spencer Gulf ecosystem.

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It is important to note the role of SARDI, the government research provider. Purchase of research services from organisations other than SARDI potentially diminishes capability and relevant expertise in that organisation with consequent negative impact on local research capacity. Under the preferred model, SARDI may be a contracted research provider, or it may be involved in audit of contracted research services (as proposed in the phased introduction of the preferred model).

### **Observers**

Observers will be required to undergo a certified auditable training program, provided by a Recognised Training Organisation, to ensure the effectiveness of service provided by observer coverage. Under the current co-management arrangements the Association is working, in consultation with PIRSA Fisheries, SARDI and CCSA to develop a suitable program. Observers who have successfully completed the training (and who can demonstrate at-sea training) will enter into an agreement with the Association to provide accurate and correct information. Qualified observers will be placed on a register kept by the Association. Observers can be sourced from credible observer service providers, including industry, government, independent service providers, or other stakeholders with an interest in the fishery (external to industry).

Legitimate concerns in relation to research quality, rigour, and potential conflicts of interest need to be addressed to the satisfaction of the government and other stakeholders. Thus, as stated in the section on 'fishery independent surveys', the preferred model will include provision of independent observers to evaluate the efficacy of Industry research services (including out-sourced research services). The process will allow for the ongoing maintenance of independent (of industry) observer coverage.

An incentive-based approach to utilising industry vessels to collect information addressing ecological impacts should encourage compliance to desired standards of data integrity. Thus, the frequency (and therefore cost) of independent observer coverage (in stock assessment surveys, spot surveys and in environmental impact assessment) would reflect the quality of data collected by trained industry based observers. Where there is a significant difference between data collected by industry based observers and by independent observers, the frequency of independent observer coverage would increase. Similarly, where data quality is comparable, independent participation in research services (and therefore cost) would decrease. In any case, the extent (and therefore cost) of independent observer coverage will reflect the phased approach to co-management as presented below. Government will maintain its capacity to place independent observers on fishing vessels through the powers established under the Act.

Development of a certified auditable training program for observers is considered to be a key component of the observer program and necessary for quality assurance.

### **Cost Recovery**

The Association currently provides a range of services to licence holders, through voluntary payment of membership fees. All but one of the Spencer Gulf Prawn Fishery licence holders are members of the Association. Therefore not all licence holders currently pay for Association services. However, core management processes, necessary for real time management of the fishery, that are undertaken by the Association are cost recovered from licence holders through PIRSA Fisheries licence fees. These fees are then paid to the Association under contractual agreements between PIRSA Fisheries and the Association. It is recognised that, for delegated co-management arrangements to be effective, the industry association must have a secure source of funding for core management services. It is acknowledged that costs must be recovered from all licence holders to deliver existing or new core management processes under the proposed co-management arrangements.

Under the preferred model, PIRSA Fisheries will continue to collect licence fees from all Spencer Gulf Prawn Fishery licence holders for core management processes. Funding for these activities could be provided to the Association under contracts, for core management processes. Core management

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processes currently not delegated to the Association would need to be adequately defined but would include:

- stock assessment and related research to address performance indicators as specified in the management plan;
- coordinating the observer program (including arranging training to the required standard);
- coordinating the survey program (including spot surveys);
- analysis and reporting of data (from survey and stock assessment);
- managing the relevant sub-committees where stakeholder involvement is necessary;
- developing and applying the harvest strategy (including managing the committee-at-sea process);
- liaison with government (including SARDI for access to log-book data and to respond to performance audits of delegated stock assessment, survey, and environmental research undertaken by industry);
- operational capability specific to core fishery management activities.

### ***Conflict resolution***

Conflict resolution will initially be addressed through the Association's sub-committees. If the conflict cannot be resolved through this forum, the matter will be referred to representatives of each stakeholder on the sub-committee for discussion and any resolution of these stakeholder representatives will be forwarded to the Management Committee for evaluation and determination. Should the determination not satisfy each stakeholder party and the matter remains unresolved, the matter will then be referred to the Fisheries Council of SA for determination, where one stakeholder representative from each stakeholder group will be able to lay out its argument for consideration. Stakeholders may not further influence the Fisheries Council. Any determination of the Fisheries Council will not be entered into debate. The Fisheries Council will be involved only when conflict is unable to be resolved through existing communication channels.

### ***Phased introduction***

A phased introduction is considered necessary to ensure a smooth transition to delegated functions and to allow for industry to incrementally build its capacity to undertake the delegated functions and enable stakeholders to build capacity to be effectively engaged. Three phases are suggested during which an evaluation of the performance of industry-delegated functions is undertaken. This process is also useful to assess the potential for co-management of other fisheries (consistent with the aim of the present project). At this stage, a timeframe for phasing in of the co-management model has not been determined. The trajectory of the phased introduction will be determined by evaluation of the preferred co-management model by the Association, the progress of the co-management model once implemented and the government audit process.

A suggested phased approach for the preferred co-management model is outlined below.

### ***Phase 1***

The following functions/tasks will be delegated to the Association:

- harvest strategy development, implementation and communication;
- stock assessment survey and spot survey coordination;
- data collection;
- reporting (harvest strategy and stock surveys).

Prerequisites to move through this phase include:

- appropriate stakeholder representation on the Association's sub-committees;
- defined roles and responsibilities of the Association's sub-committees;
- direct engagement of the conservation sector and other stakeholders in key aspects of management of the fishery (i.e. ERA, management planning etc);
- operating standards developed for each responsibility to be taken on by industry;

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- resource arrangements in place for adequate stakeholder representation;
  - stakeholder approved criteria developed for Association selection of suitable staff/consultant;
  - appropriate confidentiality agreement to enable survey data to be submitted to the Association.

During this phase the following quality assurance protocols will apply:

- PIRSA Fisheries audits each fishing period against a set of agreed operating standards;
- PIRSA Fisheries and SARDI will provide support to industry as necessary, to assist the transition to the delegated co-management model;
- survey data are verified by SARDI;
- the observer program is assessed by relevant stakeholders;
- at least three independent observers are provided for each stock assessment survey (independent of industry);
- the conflict resolution process is reviewed by relevant stakeholders.

Development of protocols and a training program for industry observers will proceed during this phase.

A formal assessment of delegated functions in relation to the aims of co-management will be completed during this phase. Such an assessment could be managed through the Fisheries Council (SA) consistent with its aim of encouraging co-management of South Australian fisheries.

## ***Phase 2***

The following functions/tasks will be delegated to the Association:

- analysis, verification and reporting of scientific data collected through stock assessment and spot surveys (transferred from SARDI);

Prerequisites to move through this phase include:

- development of a certified auditable observer training program;
- creation of an observer database listing all observers trained under the certified program (use of certified observers only).

During this phase the following quality assurance protocols will apply:

- logbooks submitted to SARDI after data are collected;
- PIRSA Fisheries conducts annual audit of delegated functions;
- PIRSA Fisheries and SARDI will provide support to industry, as necessary, to assist the transition to the preferred co-management model.

A formal assessment of delegated functions in relation to the aims of co-management will be completed during this phase, as conducted during phase 1.

## ***Phase 3***

During this final phase the following functions/tasks will be delegated to the Association:

- stock assessment (linking surveys, observer program, data collection/analysis and reporting);

The following quality assurance protocols will apply:

- independent review/audit of all delegated functions, including stock assessment process;
- logbook data made available by industry to independent auditor (for audit purposes);
- enforcement and prosecution activities by PIRSA.

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An evaluation of the potential to progress to a fully delegated model (Model 3) will be undertaken following the conclusion of the phased introduction of the preferred model (Model 2). The evaluation will include assessment of the effectiveness of stakeholder involvement.

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