

South East Fishery Industry Development Subprogram: facilitation, administration and promotion

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Fisheries Research and Development Corporation

South East Fishery Industry Development Subprogram: facilitation, administration and promotion.

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2001 / 238South East Fishery Industry Development Subprogram:
facilitation, administration and promotion.

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OBJECTIVES:

- 1. Coordinate the FRDC SEF Subprogram (applications, workshops, communication)
- 2. Conduct an annual research workshop to present research outcomes from the Subprogram and to define research objectives for subsequent years.
- 3. Facilitate travel of industry representatives and the Subprogram leader to biannual steering committee meetings.
- 4. Coordinate the preparation of a Subprogram newsletter, media releases, and workshop publications.
- 5. Integrate with other FRDC and externally funded SEF projects to ensure maximum leverage of industry funds and avoid duplication.

NON-TECHNICAL SUMMARY

OUTCOMES ACHIEVED TO DATE:

- Increased levels of communication and cooperation between industry members across the SEF whole of supply chain.
- Development of a whole of chain R&D strategy for the SEF
- Initiation of numerous projects focussing on SEF industry development
- >1:1 leverage of external funds : FRDC funds across SEF Industry development projects
- Establishment of Australian Seafood Co-products and significant progress towards the commercial utilisation of bulk seafood wastes across south eastern Australia
- Development and support of new technologies and improved utilisation to add value to the SEF seafood supply chain

Many of the economic indicators for Australia's South East Fishery (SEF) are poor. The low profitability in the fisheries is recognised by many operators in the catching sector and this has flowon effects throughout the supply chain. To achieve the complementary outcomes of sustainability and economic benefits to the stakeholders in the SEF, a whole of chain approach to R&D is required (which is in accordance with government direction on R&D planning).

Previously, most of the research carried out for the SEF has focused on the collection of biological data, assessment of the status of fish stocks and the impact of fishing on the environment. There has also been research into the economics of the fishery and how this has been affected by changing management arrangements. In recent years, the need for a broader coverage of R&D to address whole of supply chain needs of the SEF has been recognised. As a result, the SEF Industry Development Subprogram was established in 2000 to increase the value of the fishery by value-adding to fish products, adopting new technologies and improving utilisation of catches.

The main focus of the Subprogram over the last two years has been to find a solution to the large amounts of fish waste that are discarded by the seafood industry each year. To this end, the Subprogram formed Australian Seafood Co-products (ASCo) during 2002. The goal of ASCo is to add value to the seafood supply chain through the sustainable utilisation of fish and fish co-products that are not traditionally utilised or marketed. ASCo shareholders include the FRDC and numerous major Australian seafood companies from Queensland, New South Wales, Victoria, Tasmania and South Australia. Their initial shareholder contributions have been used alongside government funding to run a number of projects to help get ASCo off the ground. Some of the projects that have been completed to date include a feasibility study on installation of a fish silage plant at central fish processing sites, development of a business network plan for ASCo and development of an agreed structure for the operation of ASCo. ASCo decided that processing of the fish waste into a valuable organic fertiliser was the option that was most feasible at this point in time. As a consequence, ASCo Fertilisers was formed - a partnership between ASCo and Sieber, a New Zealand company that has the proven technology and experience to process fish wastes into organic fertilisers. Through this partnership, ASCo Fertilisers intends to utilise large quantities of fish waste from across south-eastern Australia to produce fish-based fertiliser products that have proven benefits to agricultural crops and can be certified for use in the rapidly growing organic (farming) market.

To support this goal, the FRDC and the Department of Primary Industries (Victoria) are funding scientific trials of the fish-based solid phosphate fertiliser – $BioPhos^{(0)}$ – on a variety of crops including tomatoes and dry and irrigated pasture. Preliminary results revealed that the fish-based fertilizer was just as effective as superphosphate in improving yields from tomato crops.

A suitable alliance with an Australian based fertiliser manufacturer is now the critical success factor associated with the ASCo venture. ASCoF is now in the final stages of developing a MOU with Incitec Pivot that seeks to leverage their combined intellectual property and operational capacity to create significant business opportunities through the commercialisation and marketing of fish-based fertiliser products. Another critical stage for ASCoF is the construction of fish processing plants and beginning commercial production. It is envisaged that ASCo will begin sales of commercial quantities of BioPhos during 2004, thereby bringing returns back into the Australian seafood industry through the utilisation of fish wastes.

Although the ASCo waste utilisation project was one of the main areas of work for the Subprogram over the last couple of years, the Subprogram is also concentrating on a number of other ways to increase the value of the fishery by value-adding to fish products, adopting new technologies and improving utilisation of catches.

One major project being investigated is improved returns on some of the bulk low-value species that are commonly caught in the SEF (eg redfish and spotted warehou). A preliminary grant from the National Food Industry Strategy (NFIS) was used to explore the potential for improved through-chain handling and storage of these species so they become suitable for a wider range of processing techniques and broader target markets. Work is now underway to put this into practice through a \$500,000 NFIS Food Chain Program "Flagship" project to formally link the supply chain involving lower value south east Australian fish with retail supermarket seafood categories in Australian and selected export markets. This project requires significant cultural change among members of the fish catching sector; a change which will see their roles shift from suppliers of a low value commodity to a supply chain partnership in which they adjust their product handling methods to deliver a quality product to meet customer expectations. Supermarket groups will use the chain to improve their understanding, and their ability to manage seafood products, and will transfer some of the experience gained in managing other fresh food products to seafood.

A critical part of this supply chain is the production of high quality fish from SEF vessels. Just recently, the Subprogram has been successful in obtaining a NFIS grant to introduce and trial the use

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of Flo-Ice TM plants on SEF vessels to demonstrate the increased value and potential of high-quality fish to alternative markets.

Another area that the Subprogram is working on is the need for skills development and training across the fishery's supply chain, especially in areas such as product handling, food safety and OH&S issues. Specific opportunities to fund projects to address these issues are being sought. Recently, the Subprogram has facilitated the development of a hands-on training program for the SEF industry run by the Australian Maritime College with subsidisation from FarmBi\$ Victoria.

By continuing to link groups of people in the seafood industry with expertise in the whole of supply chain, the Subprogram is continuing to deliver the successful outcomes for the SEF seafood industry. The through-chain approach being adopted by the Subprogram for industry development has attracted interest from a wide range of stakeholders and will continue to be successful in accessing considerable funds that are not usually available to the seafood industry. The benefits of establishing the SEF Industry Development Subprogram are starting to be realised in the number of projects we have initiated that are targeted specifically on the "D" of fisheries R&D. Presently, we have projects worth >\$800,000 up and running focussed on industry development with a further \$600,000 of projects either recently approved (~\$120,000) or in the process of getting funding approval. More than 60% of the funding for these projects has been accessed from sources outside FRDC. Thus, the objectives of the Subprogram are already being achieved but the real benefits from the Subprogram are expected to be realised as the outputs from these projects bring many millions of dollars of returns to the SEF seafood industry over the next few years.

KEYWORDS: South East Fishery, industry development, value-adding, training, waste utilisation.

ACKNOWLEDGEMENTS

The Subprogram acknowledges the support from each member of the Steering Committee. Their different ideas and the willingness to discuss issues and work together to find a way forward has been a great help to me. The Subprogram has sought external grants to match the funding received from FRDC for the Subprogram. This has been achieved in each year since the inception of the Subprogram. I gratefully acknowledge the people and organisations that have funded various Subprogram projects including: Ted Loveday, Jayne Gallagher and Seafood Services Australia's Seafood Industry Development Fund, Bruce Green and Victoria's Department of Innovation, Industry and Regional Development, NSW EPA's Profiting from Cleaner Production Industry Partnership Program, Dr Aravind Surapaneni and Victoria's Department of Primary Industry, and Paul Ford and David Gregory from the National Food Industry Strategy's Food Innovations Grants and Food Chains Program respectively. I appreciate the plant feasibility project by Gordon Pender. Special thanks to Wayne Street of Street Ryan and Associates for all of the great works and support he has provided for the initiation of ASCo. Thanks also to Terry Moran and Steve Buckless from SETFIA, John Roach and Michael Kitchener from Master Fish Merchants Association, Grahame Turk from the Sydney Fish Market. The project was funded by the Fisheries Research and Development Corporation with special thanks to Peter Dundas-Smith and John Wilson for their support of the Subprogram and ASCo.

BACKGROUND

The bulk of the research that has been carried out for the South East Fishery (SEF) over the last decade has focused on the collection of biological data, assessment of the status of fish stocks and the impact of fishing on the environment. There has also been research into the economics of the fishery and how this has been affected by changing management arrangements. These areas of research have been in line with AFMA's legislative requirements, and the research priorities have been guided by a five year strategic research plan developed by the SETMAC Research Sub-Committee. The South East Fishery Assessment Group (SEFAG) was developed within this system to oversee and evaluate stock assessments on the SEF quota species. A number of species-specific Assessment Groups (eg Orange Roughy Assessment Group), which require input from Industry representatives, researchers and managers, have been established to undertake these stock assessments. It is generally agreed that this process has been valuable and has improved the quality of research being undertaken in the SEF. Nevertheless, as a result of this process, most of the research has tended to have a narrow focus towards stock assessment and sustainability issues.

In recent years, the need for a broader coverage of R&D to address whole of supply chain needs of the SEF has been recognised by the seafood industry, SETMAC, and the FRDC. Following a workshop held in November 1999 (Canberra) a recommendation was made that FRDC develop a Subprogram to support the industry development component of R&D for the SEF. As a result, the SEF Industry Development Subprogram was established in 2000 to increase the value of the fishery by value-adding to fish products, adopting new technologies and improving utilisation of catches.

Although slow to gain momentum, the initial 18 month project for SEF Industry Development Subprogram project was reasonably successful. The Subprogram developed a whole of chain R&D strategy for the SEF and a number of project proposals were prepared and submitted. One of the more successful of these was the Eboat project run by the South East Trawl Fishing Industry Association. The most positive aspect of the Subprogram, however, was the increased levels of communication and cooperation between industry members across the SEF whole of supply chain. The potential for this approach to add value to the SEF and broaden the focus of R&D for the fishery was recognised by the FRDC and the current two-year project to continue the work of the SEF Industry Development Subprogram was supported.

NEED

Many of the economic indicators for the commonwealth scalefish fisheries in south eastern Australia are poor. The low profitability in the fisheries is recognised by most operators in the catching sector and this has flow-on effects throughout the supply chain. To achieve the complementary outcomes of sustainability and economic benefits to the stakeholders in the SEF, a whole of chain approach to R&D is required (which is in accordance with government direction on R&D planning). Current practice focuses on the biology and fishery management which has precluded more innovative ways of adding value and meeting sustainability performance measures.

There is a dearth of R&D projects focused on industry development for the SEF. Recognising that catch levels are unlikely to increase in the future, fishers are looking for various options to improve profitability by increasing the value of their catch. The SEF Industry Development Subprogram was established in 2000 to increase the value of the fishery by value-adding to fish products, adopting new technologies and improving utilisation of catches. Members of the Seafood Industry involved in the SEF see the need for R&D into industry development projects to continue and supported the submission of this proposal to continue the Subprogram.

OBJECTIVES

- 1. Coordinate the FRDC SEF Subprogram (applications, workshops, communication)
- 2. Conduct an annual research workshop to present research outcomes from the Subprogram and to define research objectives for subsequent years.
- 3. Facilitate travel of industry representatives and the Subprogram leader to biannual steering committee meetings.
- 4. Coordinate the preparation of a Subprogram newsletter, media releases, and workshop publications.
- 5. Integrate with other FRDC and externally funded SEF projects to ensure maximum leverage of industry funds and avoid duplication.

METHODS

The Subprogram was established to help develop a whole of supply chain R&D strategy for the SEF and initiate new R&D projects, which increase the value of SEF products through industry development. It was formed to ensure that research conducted in the SEF did not just focus on biology and stock assessment, but addressed other important areas that contribute to the SEF sustainability such as value adding, better seafood handling, new technologies and improved utilisation of catches. The Subprogram would principally report to the key stakeholders - SESSF industry, FRDC and possible other investment sources (e.g. NFIS, AFFA, FRRF, Seafood Services Australia).

Under the Subprogram Leader, an expertise-based steering committee was formed in 2001 consisting largely of industry members from throughout the SEF supply chain.

Subprogram Leader

The Subprogram Leader should be independent and have: a good understanding of scientific principles; knowledge of the industry; a track record of project management; a good understanding of corporate governance; excellent leadership and communication skills; vision; courage and the ability to act in the interests of the whole industry sector.

Tasks and responsibility

To ensure:

- Timely completion of milestone objectives;
- Efficient coordination and integration of projects to ensure national collaboration of research;
- Efficient and effective organisation of meetings and workshops;
- Establishment of effective reporting structures;
- Coordination and delivery of Subprogram reports and newsletters;
- Development of an appropriate and media policy (approved by the steering committee);
- Provision of advice to the steering committee;
- Coordination of new funding applications;
- Ensure relevance of the R&D Strategic plan to industry's current research needs;
- Promotion of Subprogram outcomes through effective and efficient extension.

Steering Committee

Tasks and Responsibility

- To review industry financial and in-kind contribution to the Subprogram.
- To review and recommend changes on existing FRDC projects' (and any associated projects not funded but within the Strategies) research directions within the guidelines of the FRDC contractual agreement.
- Develop a Strategic R&D Plan with key performance measures and timeframes. This should be regularly reviewed.
- To prioritise new research proposals and develop a priority list that can be used by other funding agencies. They should adopt a whole of chain approach to priority setting to ensure Key Result Areas are addressed within an overall strategic plan for the Subprogram.
- To provide research direction to the relevant Fisheries Research Advisory Bodies (FRABs).
- To ensure that research objectives are commercially focused and outcome driven.
- To coordinate industry and research provider involvement so as to maximise usage of available resources. Maximise leverage from other R&D investment sources by incorporating within the leadership of the Subprogram.
- To facilitate industry extension and technology transfer.
- To advise on flexible components of budget expenditure e.g. Subprogram administration. This would entail developing an overall budget for the Subprogram that had key performance indicators.
- The convening of regular meetings (minimum of one every six months).
- Develop an appropriate and approved media policy.
- Ensure efficient and effective reporting structures.
- To promote the Subprogram and its achievements so that it can become the focus for all Industry Development R&D within the SESSF.
- To develop an Annual Operating Plan (AOP) for key stakeholders including the FRDC Board.
 To be submitted by December 1 annually.

Membership

Person	Company
Tony Bewley	Ocean Fresh
Peter Dundas-Smith	FRDC
Steven Gill	Master Fish Merchants Association
Dimitrios Goulas	Conway Fish Trading Co
Ian Knuckey	Marine and Freshwater Resources Institute
Lachlan Marshall	Presmint Pty Ltd
Michael Miriklis	Jack Miriklis Pty Ltd
Terry Moran	TJ & JJ Moran
Roy Palmer	Fishy Business
Stuart Richey	Richey Fishing Co Pty Ltd
Tony Smith	CSIRO Division of Fisheries
John Susman	Greengrocer.com.au
Ian Wells	Seafood Services Australia

Original SEF Industry Development Steering Committee Members

The composition and functioning of the Steering Committee was reviewed at a meeting during 2003 with the view to developing a more appropriate mechanism for the future operation of the Subprogram. Unlike other FRDC Subprograms, the SEF Industry Development Subprogram did not have an eager group of researchers vying to obtain research funds for specific projects as a driving force. In fact, the SEF ID Subprogram began without any projects under its umbrella and had the requirement of needing to obtain matching funds from agencies other than FRDC. This has resulted in the Subprogram Leader needing to commit considerable resources to driving project submissions and leading the core projects of the Subprogram. Thus, it has become apparent over the last couple of years that the SEF ID Subprogram would probably only have one or two major projects going on at any one time. As such, there does not appear to be the need for a large Steering Committee to review and oversee project objectives, milestone reports, final reports etc. Added to this were the difficulties that many members of the catching sector were having in attending meetings.

It was decided that the Subprogram would be better serviced by a Steering Committee consisting small core of dedicated people keen to initiate and drive various industry development projects. Rather than being a part of the steering Committee, input to the Subprogram from the catching sectors would be gained from SETFIA and SENTA directly. This would be facilitated through attendance at these industry meetings by the Subprogram Leader or by having a standing agenda item by which members of the catching sector could provide input and ideas up to the Subprogram. Other people with specific expertise would be accessed through the various networks of the Steering Committee members, SETFIA and SENTA, and called upon where appropriate to provide input into Subprogram projects.

The revised Steering Committee is made up of a small group (six) of industry representatives mainly from the demand end of the SESSF supply chain, with input from the various catching sectors coming through their respective industry associations. The Committee may also invite input from experts not directly associated with any funded projects. Also, it may include a broader definition of industry and include a representative from service sectors, for example environment NGO's or gear suppliers.

Revised SEF Industry Development Steering Committee Members

Peter Dundas-Smith	FRDC
Ian Knuckey (Subprogram Leader)	Fishwell Consulting
John Roach	Master Fish Merchants Association
Roy Palmer	Fishy Business
John Susman	Greengrocer.com.au
South East Fisheries Association	SEF Non-trawl members
South East Trawl Fishing Industry Association	SEF Trawl members

The Steering Committee meets at least twice each year to review project progress and establish research priorities. All new industry development projects are assessed by the Steering Committee and are submitted to the FRDC Board via the Subprogram.

Facilitation, administration and promotion

Industry Consultation

The Subprogram Leader (Dr Ian Knuckey) has an extensive network of industry connections in the South East Trawl, Great Australian Bight Trawl, Southern Shark and Gillnet hook and trap fisheries of the SEF. Through input from these catching sector associations and established connections with other industry members of the supply chain (eg. Sydney and Melbourne Fish Markets, Master Fish Merchants Association, ASIC etc) the Subprogram Leader has maintained relevant industry contacts across the whole of supply chain. These were used to establish communication flow between seafood industry stakeholders.

Priority Setting

The Subprogram Leader, in conjunction with the Steering Committee, utilised research reports to monitor progress against objectives and to update research priorities. Formal reviews of the direction of the Subprogram were undertaken together with the development of longer-term research strategies. These will be presented to FRDC in the form of written research reports and coordinated research funding applications in subsequent years.

Meeting facilitation

The Subprogram Leader convened all Steering Committee meetings and research workshops. This included setting the agenda, inviting participants, organising venues, making travel and accommodation arrangements as required and preparing either minutes or proceedings for distribution.

Liaison with research groups

The Subprogram Leader attended meetings and workshops of relevant research projects. This ensured the Subprogram was privy to the directions and outcomes of similar research being conducted around Australia. The Subprogram Leader endeavoured to have at least one meeting per year with the Principal Investigators of the component Subprogram projects to ensure their needs were being met by the Subprogram and to identify any problems that could hinder the project outcomes.

Coordination of research proposals and reports

The Subprogram Leader has edited and adjusted all research application associated with SEF Industry Development, to ensure that they align with the Strategic R&D Plan and optimal use of resources. The Subprogram Leader coordinated the preparation of a set of research reports in the required time-frame for review by FRDC.

Promotion of the SEF Industry Development Subprogram

Promotion of all results from the Subprogram will be via the Subprogram Leader, who has developed media liaisons and strategies for high impact release of information. He also lobbied conference organisers to feature the Subprogram at relevant meetings and conferences.

Identification and collection of additional research funds

The Subprogram Leader took a lead role in the identification and successful procurement of research funds to enhance the existing research projects. Funding sources were identified, contacted and arrangements made for the preparation of research submissions.

Liaison with FRDC

The Subprogram Leader has been the conduit for all communications between the FRDC and Subprogram participants. The Subprogram Leader provided feedback in relation to concerns raised by project leaders, reported on project progress and made recommendation in relation to the future direction of the Subprogram. The Subprogram Leader also made presentations to the FRDC board as required.

Liaison with AFMA and members of the SETMAC / SEFAG process

Dr Knuckey is the Industry Liaison Officer for SETMAC, research member of GABMAC, Chair of the Shelf Assessment Group, and member of SESSFAG and SESSFEAG. Through these links with the AFMA process, Dr Knuckey will ensure that the SESSF Industry Development Subprogram maintains strong links with the MAC research priority setting process to ensure complementary consideration of research priorities and avoid duplication and conflict between the two groups responsible for setting research priorities within the SESSF.

Links with other Subprograms and Infrastructure Projects

This Subprogram has important synergies and collaborative links with other FRDC and non-FRDC related research. The most important links are with the Effects of Trawling Subprogram, Seafood

Services Australia (National Seafood Centre) and the National Food Industry Strategy. It will be important to ensure coordination across these activities to avoid duplication and maximise benefits from any investment.

RESULTS / DISCUSSION

Sector Progress

During 2001/02, a range of management issues have been (and still are) of concern to the SEF catching sector. High among these was the move towards strategic assessment of all commonwealth fisheries under the EPBC Act and the implications this may have for the South East Fishery. Also, issues relating to the TAC setting process, TAC levels and cross-sector quota transferability have led to industry concerns about potential impacts on their quota asset value. Overall, these issues caused the catching sectors to have some degree of uncertainty about the future, which probably influences their commitment to some areas of industry development. Another potential result of the uncertainty of fishing operations is the trend for larger diversified companies to buy up and control more of the quota which they may lease back out to vessels as they see appropriate.

The price of fish was generally high during 2001/02, so there was increased potential to introduce new species to the market. This resulted in larger quantities of some of the under-utilised species making it to market. Some areas of the catching sector were looking to broaden their fishing operations and catch certain species in addition to their traditional SEF catches. Lack of market recognition has caused lower prices for these species, however, so these companies may tend to fall back on the traditional species over time if this situation does not improve. One of the obvious areas for the Subprogram to continue to tackle is how to get the market to try new products. It has been suggested that there has not been enough recognition of the different prices of different fish species at the retail and restaurant outlets, which introduces a potential hurdle to introducing new lower price fish into the market. Another result of high prices is the public perception of what is good value for money in seafood. There has been increased pressure from some retail areas to move away from the accepted \$/kg labelling and replace it with serve portions. While five dollars may be an acceptable price for a crumbed or battered portion of fish, how many people would buy the same fish with a \$45/kg label? Some sectors also feel that the restrictions imposed by AQIS in applying the National Fish Naming Committee's marketing names to Australian-caught fish for export also

curtails some marketing opportunities. Despite some of the difficulties mentioned above, generally there is far more discussion and effort around industry to make more of the under-utilised species.

There are indications that the traditional seafood supply chain (catcher? wholesaler? fish trader? distributor? retailer) may be undergoing a change. With easier access to marketing and networking tools the wholesalers and distributors may take over the traditional role of the fish trader.

Good prices and the strong domestic market during 2001 and 2002 reduced the push to develop overseas markets to a certain extent. As a result, the processing for export tends to be seasonal, driven by the strength of domestic markets and the exchange rate. This reduces the continuity of supply, employment and other potential longer-term developments.

During 2003, an important issue for the Australian seafood industry (and the SEF) was the rising Australian dollar and the SARS outbreak and their negative influence on export prices and markets in Asia. Many SEF operators lost markets for export species (eg spotted warehou, whiting) resulting in a glut of these species on Australian markets or fishers simply not bothering to target these species.

The other important issue for the fishery during 2003 was the introduction of the Management Plan for the Southern and Eastern Scalefish and Shark Fishery (SESSF). This fishery now includes the South East Trawl Fishery, South East Non-trawl Fishery (now the Gillnet Hook and Trap secotr), Southern Shark Fishery and Great Australian Bight Fishery. Similar to the previous year, a range of management issues are the prime concern to the SESSF catching sector. High among these is the strategic assessment of the SESSF under the EPBC Act. This has now been completed and has a number of recommendations that have significant implications to the fishery. The main issues are:

- The establishment of harvest strategies, including decision rules and reference points, for quota species and other target and major byproduct non quota species including: monitoring of landed catch; TACs or trigger ranges/levels of acceptable catch; and development of management responses when reference points or trigger ranges/levels are reached.
- Identification and implementation of management responses to fishing impacts identified from the ecological risk assessment process, taking into account known fishing impacts on: vulnerable and/or overfished species; listed threatened species under the EPBC Act in the fishery; species with low productivity; key species in the food chain such as squid and jack mackerel; areas of localized depletion; cumulative gear impacts across the life cycles of species in the SESSF and

adjoining fisheries; species with increasing levels, or significant potential for increased levels, of catch landings.

- Implementation of management actions to limit the level of non quota species catches to ensure catches do not increase above a pre-determined range of historical catch landings.
- Development and implementation of a system of spatial and temporal management to assist the fishery to be managed in an ecologically sustainable manner. The system of strategic closures will take account of impacts of fishing on: high risk species; overfished stocks; and, important spawning / pupping / juvenile / feeding /refuge grounds;
- Development and implementation of management arrangements to significantly reduce the current total level of quota and non quota discarded species. Mandatory management requirements to use discard and other bycatch mitigation measures will be introduced.
- Assess and reduce the extent of interactions of seals, cetaceans and seabirds across all sectors of the SESSF, and interactions with syngnathids in the trawl sectors and white sharks in the gillnet and hook sector.

In addition to the above, management issues relating to the TAC setting process and addressing poor economics in the fishery, fleet overcapacity and declining catch rates in some sectors are also issues that are being addressed by the industry. Further, changes in legislation on food safety are now in place in both Victoria and NSW that will have a large impact on the seafood industry across the whole of supply chain. In Victoria, the Victorian Meat Authority now has the responsibility of licensing all seafood handling operations. In New South Wales, a similar role is being undertaken by Foodsafe. The subsequent tightening up of legislation with respect to food safety seafood handlers may lead to considerable changes in how fish is handled across the supply chain. Seafood operations, including the catching sector, will be audited against the Australian Seafood Standards, which will place increased onus on businesses to develop and follow their food safety plans.

Obviously, in a fishery for which many operators are already suffering from low financial returns, the issues highlighted above have important implications to the costs of operating in the fishery. Most notably, the requirement to reduce bycatch levels will have an immediate impact on returns through the loss of small marketable fish.

All of the above issues highlight the need for the ongoing work of the Industry Development Subprogram to assist the catching sector to maximise the value of its catch. This can not be achieved by the catching sector alone; cooperation and involvement of the whole of supply chain is required if this goal is to be achieved.

Major Research Outputs of the Subprogram

Overall, the work of the subprogram is proceeding well, and with good industry support some beneficial outputs are beginning to emerge. The progress and research outputs of the projects being undertaken by the Subprogram are outlined below.

Implementation of onboard electronic data collection and transmission for the SEF

The E-boat project was the first project carried out under the Subprogram and it has now been completed. Initiated by the South East Trawl Fishing Industry Association, the "E-boat" project examined the full industry development potential of electronic data collection and transmission on board working South East Trawl vessels. Funded by the AAA-Farm Innovation Program as well as FRDC's SEF Industry Development Subprogram, it developed an integrated network of electronic tools (software and hardware) on Australian fishing vessels aimed at providing increased potential for industry development and reducing inefficiencies in fisheries data collection. This software is now being installed on SESSF vessels involved in the South East Trawl, Southern Shark and Great Australian Bight fisheries. Negotiations are underway to begin installation on vessels from other fisheries. Through the Subprogram, software developers are working closely with the AFMA data section to overcome developmental difficulties with implementation of electronic logbooks in the fishery. The mechanisms to enable fishermen to digitally encrypt, sign and send messages with ease have now been developed and are the key to the success of this project.

Assessing the commercial viability of utilising fish processing wastes

Within the Australian Seafood industry, thousands of tonnes of fish waste are produced by processors and retailers each year. In the processing sector, it is generally only the fillets that are retained, while the bulk (~60%) of the product is discarded, often at a cost to the processor and ending up as little more than land-fill. This practice is coming under increased scrutiny due to environmental issues and is becoming an increasing cost burden for the whole industry. Across the industry in south eastern Australia alone, there is an estimate that well over 20,000t of fish product waste is produced each year. If this waste could be utilised, it would bring millions of dollars into Australia's seafood industry.

Through the efforts of the Subprogram, a group of key stakeholders in the seafood industry decided to form Australian Seafood Co-products (ASCo) to add value to the seafood supply chain through the sustainable utilisation of fish and fish co-products that are not traditionally utilised or marketed. ASCo now has 17 seafood companies as shareholders spanning the five south eastern Australian states. These include: Angelakis Brothers, Better Choice Fisheries, Capitol Seafoods, Christies Seafoods, De Costi Seafoods, Doyles Seafoods, Fisheries Research and Development Corporation, Flemington Market Seafood Stallholders, South East Trawl Fishing Industry Association, Racovolis Amalgamated Fish Merchants, McLaughlin Consolidated Fishermen, Musumeci's Seafoods, George Town Seafoods, Master Fish Merchants Association, Morgan's Seafoods, Raptis & Sons, and Sydney Fish Market. A shareholder's agreement is now in place and company directors have been elected.

ASCo has now established a formal partnership with Sieber by forming a subsidiary company -ASCo Fertilisers, of which Sieber has a 33% shareholding. Sieber is a New Zealand fertiliser company with proven fertiliser technology, technical backup, and partnerships with other established fertiliser companies and the agricultural industry. Sieber have a range of fish-based fertiliser products in New Zealand that have proven benefits to agricultural crops and have also been certified for use in the rapidly growing organic (farming) market.

Each of the ASCo shareholders put forward \$5000, raising a total of \$85K which has been used to leverage over \$800,000 from a variety of government agencies to support the projects needed to get the company off the ground. Different aspects of the project are being funded by different agencies. ASCo has received \$30K from Seafood Services Australia's Seafood Industry Development Fund and \$24K from Victoria's Department of Innovation, Industry and Regional Development to employ a business consultant to engage with seafood companies interested in ASCo, develop an agreed structure for the operation of ASCo, undertake a feasibility study and develop a business plan. In NSW, an ASCo shareholder (Master Fish Merchants Association) obtained \$23K from the EPA's "Profiting from Cleaner Production Industry Partnership Program" to investigate the feasibility of installing a fish processing plant at the Sydney Fish Market. The Fisheries Research and Development Corporation and Natural Resources and Environment (Victoria) are funding a \$755K project of scientific trials of the seafood-based fertiliser – BioPhos – on tomatoes, pasture and crops. The progress of these trials is outlined in the next section.

Much of the work ASCo has commissioned over the last year has centred on the feasibility of the project and development of a business plan. The results of this work are summarized below.

ASCo and The conclusions of a feasibility study by Gordon Pender of a proposed fish silage processing plant, to be located at Sydney Fish Market, was that the project was attractive from an environmental and financial point of view. Better solutions to the current problem of fish waste disposal were required, both to deal with the existing situation at the markets, and to address the likelihood of more stringent regulation in the future. The process selected (production of fish silage for use in BioPhos) appears likely to provide this solution.

The financial basis for the project is straightforward and positive. It depends on contracted sale of the product at prices in excess of the cost of production. Financial modelling estimates the cost of production at 11.3 cents per litre of product for the minimum volume of waste produced only from within the SFM. At the maximum volume, the cost reduces to 8.0 cents per litre. The process is financially viable if the product can be sold for 10 cents a litre or more. That assumes no payment to suppliers of fish waste. It also assumes charging clients 2 cents a kilo for transport and storage of waste generated within the SFM. The figure of 10 cents a litre does not include freight of the product from SFM. It is assumed that freight will be paid by the customer. Freight rates for bulk tanker loads of 22 tonnes within about 100 km of SFM are likely to cost about 3 cents a litre. Major risks to the viability and safety of the project appear low and manageable.

Below is an excerpt from the Executive summary of Street Ryan's Business Network Plan for ASCo.

Biological farming is a rapidly growing sector of Australian agriculture. It promotes environmental responsibility and sustainable farming practices. However, the volumes required for the BioPhos venture to be attractive suggest that it would be important to have mainstream farming markets.

The ASCo network company and the joint venture company with Sieber (ASCoF), present an excellent opportunity to convert an unused waste product into a productive and profitable seafood industry co-product which will support biological farming practices.

The BioPhos trials conducted to date in Australia have had positive results and suggest that the ASCoF fertiliser products will have commercial application in both irrigated and dryland Australian farming situations.

BioPhos has a range of competitive strengths, such as

- strong price competitiveness (including the ability to offer good margins to a national dealer/merchandiser network)
- cost-effective concentrations of phosphorous
- organic certification and environmental sustainability
- beneficial soil microbial action

The venture has taken somewhat longer to develop than anticipated, at conception, and implementation now needs to be fast tracked to capitalise on opportunities. However, there is a need for the venture to be "driven" by ASCo to a greater extent than expected.

The ASCo network development has been supported by the formation of a company together with shareholders agreements, which are nearing finalisation.

The joint venture terms with technology supplier and intellectual property owner Sieber, have been secured. A license agreement has been drafted.

Financial projections suggest that the venture is not only viable, but is an attractive investment under a range of scenarios, including

- ASCoF owning and operating the liquid BioPhos processing plants
- Individual ASCo shareholders owning and operating the liquid BioPhos processing plants
- Contracting out the liquid BioPhos processing plants function.

A supply relationship with Resource Care/IQ Ag would be sensible. However this company is unlikely to be a major manufacturer of solid fertiliser products within the next 2 – 3 years. The two improved manufacturing facilities of IQ Ag will process up to 2,500 tonnes of liquid fish nutrient at full production.

There is no merit in proceeding with the installation of a fish nutrient processing plant at the premises of one or more ASCo members until there are firm arrangements in place for the supply of liquid fish nutrient. In addition, it would be preferable to have a firm agreement with a fertiliser manufacturer to produce and market at least 20,000 tonnes of BioPhos per annum. ASCo and ASCoF could enhance the prospects of such an agreement by offering to be involved in the manufacturing venture as a joint venture partner (perhaps in cooperation with Phosphate Resources). Manufacturing venture partners could be

- Resource Care (who could only become solid fertiliser manufacturers by a joint venture arrangement)
- Incitec Pivot, pending negotiations
- Impact Fertilisers, pending negotiations.

Financial projections suggest that, in order to process 18,000 tonnes of seafood waste; there would need to be markets for 120,000 tonnes of BioPhos and 12,000 tonnes of liquid fertiliser. This would be a sizable proportion of Australia's fertiliser market.

Next Steps and Strategic Issues for Resolution

The incorporation of all entities and the enactment of agreements and memoranda of understanding need to be completed.

A suitable alliance with an Australian based fertiliser manufacturer is now the critical success factor associated with the venture. Negotiations are proceeding with the Independent Quality Resources (IQR) group, which is a consortium in the biological agribusiness sector, and some discussions have been held with other fertiliser manufacturers. Clearly, the liquid BioPhos produced by ASCoF needs to be input into a final product by a committed manufacturer, with established agricultural markets and distribution systems.

The location, staging of implementation and the ownership of liquid nutrient and BioPhos processing plants needs to be finalised and agreed by ASCoF stakeholders. Options include

- ASCoF owning and operating the plants
- Individual ASCo shareholders plants
- Contracting out the processing function
- Joint ventures.

Irrespective of the preferred strategy, from the above, the commercialisation of the chain is unlikely to proceed rapidly without strong input from ASCo. There is no doubt that the members of ASCo are the most financially sound and most significant businesses in the supply chain to date. Unless ASCo provides resources or facilitation to further develop the chain, there is a low probability that the venture will proceed to commercialisation in the short term.

A suitable alliance with an Australian based fertiliser manufacturer is now the critical success factor

associated with the venture, and serious negotiations are in progress with Australia's largest fertiliser

company Incitec Pivot. Clearly, the liquid fish nutrient to be produced by ASCoF needs to be processed into a final product by a committed manufacturer, with established agricultural markets and distribution systems. To this end ASCoF is now in the final stages of developing a MOU with Incitec Pivot. In this MOU, ASCoF and Incitec Pivot seek to leverage their combined intellectual property and operational capacity to create significant business opportunities through the commercialisation and marketing of a liquid fish associated fertiliser product (Biophos). It is intended that a joint development team consisting of technical and commercial representatives from both groups will be formed to define market opportunities and implementing actions to meet those opportunities. A summary of the main points of the MOU are provided below.

The joint development and marketing venture will be determined to be successful if:

- Biophos and derivative products can be shown to be as effective as conventional phosphatic pasture products in field trials;
- It can be determined that marketable product(s) can be economically manufactured and distributed in Australia; and
- A mutually agreed volume of Biophos and/or derivative products can be sold to the Australian market place annually, within a certain time period.

Subject to satisfaction of the success factors referred to above, the business to be conducted by ASCoF and Incitec Pivot shall consist of:

- Exclusive rights to Incitec Pivot to market the jointly developed product(s) in Australia;
- Access to the liquid fish nutrient resources of ASCoF with first right of refusal over supply.
- Access to the Incitec Pivot national distribution network.
- Establishment of mutually agreed sales targets for any products developed as part of the program.

The business shall be implemented in the following stages:

- Product field evaluation.
- Establishment of liquid fish nutrient plants by Australian Seafood Co-Products Pty Ltd on an agreed rollout schedule.
- Development of a joint venture or agreement for the manufacture and marketing of Biophos products.
- Product launch and agreed marketing program.

Establishment of fish processing plants by ASCo shareholders

For ASCoF specifically, the next critical stage is the construction of fish processing plants and beginning commercial production. Following discussion of the business plan it was agreed that ASCo shareholders will be invited to own and operate liquid fish nutrient plants, under a purchase agreement with ASCo.

It was considered that Georgetown Seafoods would be a suitable location for the pilot liquid fish nutrient plant because they already have much of the equipment required, they are in a suitable urban environment and they already produce a form of fish waste as a fertilizer and have a means of distributing this waste.

It is recognized by ASCo that under this business structure there is potential for internal conflicts between ASCo and those shareholders that intend to operate a plant. The main issue is defining the level of return that goes to the plant operator which obviously impacts on the potential returns that are available to ASCo members through their 67% shareholding in ASCoF. It was agreed that members operating a plant should achieve an appropriate commercial return from constructing and operating liquid fish nutrient plants. In line with this, ASCoF is considering offering a fixed price to ASCo plant operators of \$0.60 during the first year and \$0.40 in subsequent years. Based on the financial models, this provides plant operators with an attractive return on investment and still ensures that good profits will come into ASCoF. ASCoF will invite ASCo members to consider constructing and operating a plant on a case-by-case basis depending on product demand and the economic feasibility of plant operation. A draft ASCoF / plant operator contract is currently being drawn up.

As the potential operators of the pilot ASCo plant, Georgetown Seafoods is progressing the process of implementing a plant on their site. George and Craig Doumouras are considering the above arrangements and will be travelling to New Zealand to observe an operating plant in Auckland. If they agree to go ahead, it is expected that ASCo will have the first plant in operation by late March.

Developing an interim market for liquid fish silage

Although the potential for a joint venture with Incitec Pivot is encouraging, the final decision to produce and market BioPhos is dependent on a number of factors, not the least of which is their own trials and market testing of the product. This may take up to two years. In the meantime, ASCo members are still looking to utilize their waste fish products through production of fish silage. In this

respect, ASCo is exploring a number of options for sale of product to individual agricultural companies or co-operatives on a direct basis. There are a couple of interested parties at this stage. This is being done to maintain cash-flow and bring in some returns to ASCo to cover basic administration and running costs. We are also exploring the possibility of obtaining some government funding through the National Food Industry Strategy to assist in the network development between ASCoF and Incitec Pivot. This funding may also relate to the environmental benefits of what ASCo is trying to achieve.

Agricultural trials of a fish-based fertiliser.

This is the FRDC project 2002/205 - SEF Industry Development Subprogram: Agricultural trials of a fish-based fertiliser (BioPhos) produced from Australian seafood processing wastes. The project is jointly funded by FRDC and Department of Primary Industry Victoria. Dr Aravind Surapaneni is the Principal Investigator.

A field site, consisting of 12 raised beds (1.5m wide x 80 m long) was established in late November 2002. Preliminary soil testing revealed the site to be low in Olsen P (8 mg/kg), and thus likely to respond to the intended fertiliser treatments. The site was located on the Institute for Sustainable Irrigated Agriculture (ISIA), in an area used solely for pasture production for many years.

Fertiliser treatments were hand spread and raked into the topsoil of each plot on 02/1202. Plots were 3 beds wide and 8 metres long. There were twelve replicates of each treatment, randomised across the site. Seedlings of the standard processing tomato cultivar Heinz 9035 were raised on the institute and transplanted in single rows with 30cm between plants, on 3/12/02.

The plants established well despite some very hot weather and strong winds. Irrigation was applied (initially to fully wet the beds) through a buried drip system installed at a depth of approximately 15 cm. Some variation in wetting was observed, which is not uncommon on newly worked ground (ie cropped after a long pasture phase). Soil moisture monitoring tubes were installed at the end of 2003 January, to coincide with the period of rapid fruit growth. Tubes were monitored weekly thereafter, using a Gopher Profiler meter and probe.

Plots were weeded regularly, and several tomato plants that failed to survive transplanting were replaced in early January. Pest and disease levels in the block were generally low, but some tomato spotted wilt virus was observed. This virus is spread by thrips, and a regular spray program was

maintained based on thrips numbers, as monitored from an insect trap several hundred metres from the trial site. Few other sprays were required, but when tomato grubs (*Helicoverpa* spp.) were noted on field plots nearby, the trial site was sprayed as a precautionary measure. Similarly, plots were sprayed with Sulphur in March 2003 to protect plants from powdery mildew (Oidium sp.)

Plant harvests were taken on January 13th and February 19th to determine plant response to the treatments during crop establishment and early fruit set stages. Final harvest was completed on 4/04/03. Early results have shown the fish fertilizer to be just as effective as superphosphate in improving crop yield. Good commercial yields (>100t/ha) were achieved despite some harsh seasonal conditions. Final results have still to be statistically analysed in the context of soil nutrient levels, but initial figures suggest that the plants treated with composted fish waste yielded just as well as those given conventional fertilizer. The site has been carefully cleared so as not to disturb the plot structure, and a further trial in which treatments would be re-imposed, is planned for next season to determine whether reported long term benefits of the fish waste fertiliser on soil biology can be demonstrated.

Results from the first season's tomato experiment have been communicated informally to industry representatives, who are aware of the work through visits to the site (DPI Tatura) as reported under the previous milestone. Full data analysis had not been completed for the experiment by the time of the annual industry forum (28/05/03), so the decision was taken not to formally present results to the meeting. The profile of the work is expanding however, with presentations to scientific audiences at the DPI Horticultural Conference (26-27/08/03, Tatura) and at the 2nd International Phosphorus Symposium (21-26/09/03, Perth). More aggressive promotion of the project with industry is planned for the coming season should results continue to show promise.

Other trials of BioPhos on dryland crops and irrigated pasture are now underway. In the dryland cropping module, a crop of tritacle was successfully established at the Gippsland Water Authority's Duston Downs property. The irrigated pasture trial (Module 3) is being currently established at DPI Tatura. Pasture was first sown in April 2003. Due to heavy weed burden and poor clover germination the bays were resown on 23/09/03. Treatments were imposed during late November 2003.

Related Projects and Research Linkages

The Subprogram is continuing to establish a number of beneficial research linkages. Much of this has occurred on the back of the development of ASCo and as such, there have been many linkages outside the typical fisheries sphere of activities. The most important of these has been the links with fertiliser companies interested in the utilisation of fish wastes. Notably, ASCo has developed a formal partnership with Sieber – a New Zealand based company. This has provided us with access to technology and IP required to process fish wastes into organic fertilisers. We have also been able to access the considerable R&D work that Sieber has conducted in this area.

The other links that have been necessary in the establishment of ASCo are those with potential end users of the fertilisers. One is the Australian companies active in the field of biological farming such as the Independent Quality (IQ) Group of farmers that are interested in a product such as BioPhos. Other links are those being established with fertiliser companies such as Incitec Pivot and Impact Fertilisers. Links with these large fertiliser companies are crucial to the success of ASCo and it is likely that such companies will contribute to the field testing and commercialisation of BioPhos. A Memorandum of Understanding is currently being established between ASCo and Incitec Pivot to formalise these linkages.

Through the development of ASCo, the subprogram has also managed to realise our goal of establishing strategic links with other state and commonwealth funding agencies to improve the scope for the funding of seafood industry development projects. Some of the more relevant of these include State and Regional Development Agencies, New Industries Development Program, Science Technology and Innovation Initiative (Vic), Reframing the Future and a range of AusIndustry schemes. The smaller projects being undertaken by ASCo have obtained funding from NSW EPA's "Profiting from Cleaner Production Industry Partnership Program" and Victoria's Department of Industry, Innovation and Regional Development.

Strategic links have been established between the Subprogram and industry training bodies (State and Commonwealth). This will become more important with the increased push for improved training in seafood handling, quality assurance and occupational health and safety. A good partner in this process will be the FarmBi\$ programs in each state. Now broadened to include the fshing industry under its umbrella, FarmBi\$ has been involved in a number of the Subprogram initiatives and we are actively discussing ways to bring FarmBi\$ funding into the fishing industry. We have been

actively working with FarmBi\$ (Vic) and have now established a recognised training package tailored to the SEF through the Australian Maritime College.

Communication and Technology Transfer Activities

Media articles

The Subprogram agreed that it would not be developing its own newsletter. Rather, its communication and extension activities will centre on information sheets and publications in the variety of current fisheries publications (Professional Fisherman, FRDC/AFMA News, Seafood Australia etc). Examples of how we have achieved this can be seen in the main communication/extension work from the Subprogram on the E-boat and development of ASCo and the tomato trials. Copies of the articles are provided in Appendix 3.

Article Title	Publication
The E-boat project	SETFIA Newsletter Sept 2001
Presentation of E-boat project	Seafood Directions 2001
SETFIA Launches E-boat technology trial	AFMA News October 2001
Waste whacked in two ways	FRDC R&D News July 2002
Eco-efficiency – Industry takes steps to profit from fish waste	NSW fisheries magazine "Catch" Autumn 2002.
Subprogram Leader's Report	FRDC R&D News October 2002
Loaves and Fishes' – New Testament News	Professional Fisherman Jan 2003 – Baz column
Fish proves a good 'sauce' for tomatoes	FRDC R&D News July 2003
Fish waste: Nuisance to Nutrient	Seafood Directions 2003 – Poster Presentation
Subprogram Leader's Report	FRDC R&D News October 2003
From fishy tails on organic boost	Innovate Australia July 2003 Vol 2 – No 2.
Fish offcuts a fertile answer	The Weekly Times May 26 2004

Meetings and Workshops:

Much of the communication activities of the Subprogram are through direct meetings with fishers and other people and organisations interested in seafood industry development projects. An outline of the main meetings of the Subprogram Leader during the last year gives an indication of the purpose of the meetings and the people involved.

Date	Meeting	Attendees	Description
12- 13/12/02	George Town Seafoods	Ian Knuckey, George Domouras, Craig Doumouras and Rob McRoberts	View processing sites and discuss installation of a fish processing plant at George Town. Presentation of proposal to obtain funding from TAS industry development to install plant
24/01/03	George Town Seafoods	Ian Knuckey, Rob McRoberts	View processing site at Hobart and discuss progress with ASCo.
24/02/03	ASCo		Shareholders meeting for ASCO. Reviewed the shareholders agreement and finalised shareholders for the company.
27- 29/03/03	E-boat	Ian Knuckey, Locky Marshall, Fatima Fealaar	Worked to address E-boat software communication problems further develop the electronic logbook.
9/-4/03	ASCo	Steve Buckless, Julian Baldey, Kevin, Craig, David Doyle, Michael Kelly, Ian Knuckey, Malcolm McLaughlin, Barry McRoberts, Chris Papageorge, John Roach, Kerry Strangas, Grahame Turk, John Wilson, Wayne Street, Gordon Pender and Ron Watts	Australian Seafood Co-products Shareholders meeting
11/04/03	SEFID	Ian Knuckey, Wayne Street, David Gregory	Meeting with Project Director of Food Chains Program with the National Food Industry Strategy to discuss potential for a project improving the chain management of seafood in the SEF.
1/05/03	Street Ryan Consultants	Ian Knuckey, Wayne Street, Graham Martin	Meeting to discuss consultancy for developing Business Plan for ASCo and to progress development of a proposal for Food Chains Project.
28/05/03	Training	Ian Knuckey, Lyn Warn, Paul McShane	Meeting to develop a proposal to obtain Farmbis funding for onboard training of SEF operators.

31/05/03	E-boat	Ian Knuckey, Locky Marshall	Met to progress the development of the electronic logbook, especially transmission of data to AFMA.
12/06/03	ASCo	Ian Knuckey, Roy Palmer, John Garven, John Roach, John Susman, Crispian Ashby, David Gregory, Wayne Street, Aravind Surapaneni	Meeting of the steering committee of the SEF Industry Development Subprogram
13/06/03	ASCo / Sieber / IQR	Ian Knuckey John Roach, Grahame Turk, Clive Sinclair, Jim Mace, Steve Buckless Crispian Ashby, Wayne Street, Gordon Pender, Mike McKosker, Brett Warren, Hans- Peter Weiderman	ASCo Director's meeting to finalise agreements with Sieber and discuss potential collaboration with IQR.
7/08/03	Street Ryan	Ian Knuckey, Wayne Street, Joan Gleeson	Meeting with Street Ryan to discuss Business network plan
03/09/03	ASCo	Ian Knuckey John Roach, Grahame Turk, Malcolm McLaughlin, Clive Sinclair, Bill Sinclair, Jim Mace and Wayne Street.	ASCo Directors meeting discuss Business Plan and decide on options for progressing the business plan. Finalisation of IP agreement with Sieber and ASCo Fertilisers shareholders agreement.
03/09/03	ASCo Christmas Is phosphate	ASCo directors, Sieber, Wayne Street and Chris De Guigand	Chris DeGuigand attended the meeting to discuss possible collaboration of ASCoF and Christmas Is Phosphate Co.
03/09/03	ASCo / Incitec Pivot	Ian Knuckey, Clive Sinclair, Bill Sinclair, Jim Mace and Nigel Bodinnar	ASCo and Sieber directors met with Nigel Bodinnar, Technical Services Manager of Incitec Pivot to discuss the potential for BioPhos to be included as part of the Incitec / Pivot range of products
04/09/03	George Town Seafoods	Clive Sinclair, Bill Sinclair, George Doumouras and Craig Doumouras.	Sieber met with George Town Seafoods to discuss practicalities of installation of nutrient plant at the George Town site.
21/11/03	Incitec Pivot	Wayne Street, Charlie Walker, Product Development Manager, Incitec Pivot, Clive Sinclair, MD, Sieber Australia Pty Ltd	Discussed progress of development of BioPhos as a product to be marketed by Incitec Pivot. Developed an MOU between ASCo and Incitec Pivot.
22/11/03	Impact Fertilisers / George Town Seafoods	Wayne Street, Clive Sinclair, George Doumouras	Progressed discussion on the installation of a trial plant at George Town. Discussed potential partnership with Impact Fertilisers.

BENEFITS AND ADOPTION

The benefits of establishing the SEF Industry Development Subprogram are starting to be realised in the number of projects we have initiated that are targeted specifically on the "D" of fisheries R&D. Presently, we have projects worth >\$800,000 focussed on industry development up and running with a further \$600,000 of projects either recently approved (~\$120,000) or in the process of getting funding approval. More than 60% of the funding for these projects has been accessed from sources outside FRDC. Thus, even with the outputs from these projects yet to provide financial returns to the SEF seafood industry, many objectives of the Subprogram are being achieved. Importantly, once sales of BioPhos get underway, 2004 will be the year during which financial returns from ASCo project will start to be realised. In doing so, the present costs to the seafood industry in the disposal of fish wastes (anything up to \$150/tonne) will be replaced by returns from waste utilisation of up to \$800/tonne. This is the starting point of bringing many millions of dollars back into the seafood industry each year.

The adoption of the work being undertaken by the Subprogram is partially evident in the range of Australian seafood companies involved in ASCo. As mentioned previously, never before has such a large range of companies and associations from Australia's seafood industry come together in a company for the mutual benefit of through-chain partners in Australia's seafood industry. Other evidence of the adoption of the Subprogram's work is in the fact that Australia's largest fertiliser company – Incitec-Pivot – is willing to enter into a Memorandum of Understanding with ASCo Fertilisers on the joint intellectual property, commercialisation and marketing of the fish-based solid phosphate fertiliser BioPhos.

FURTHER DEVELOPMENT

We are endeavouring to promote and support initiatives which may progress any of the following areas of industry development.

Value-add low-price species in the SEF

Discarding of low-value species from trawlers in the SEF is a critical area that needs to be addressed by the catching sector. Projects that tackle this issue are always being considered. The Subprogram has previously discussed potential R&D projects that would help overcome such concerns whilst garnering government support and industry buy-on to address other important issues such as OH&S, training and food quality areas. It was recognised that the initiation of through-chain industry development projects that focused on improved financial returns to industry through the adoption of better workplace practices was the most likely avenue for success. We came up with a concept of using specific through-chain partnerships between the catching, transport, wholesale and retail sectors b value-add low-price species in the SEF (namely spotted warehou and redfish). By adopting better handling and food quality techniques (incorporating training, OH&S and QA), the catching sector will land better product that has improved shelf life and opportunity for value-added packaging (MAP). Using a specific marketing campaign, these products may be further value-added to meet specific niche market demands. The techniques developed in DITR's value chains management project, partnerships will be developed to return value to each member of the value chain. A project with this underlying concept was drafted following the June 2003 Subprogram meeting.

Since that meeting we have made considerable progress towards getting this project funded by the NFIS Food Chain Program. Further discussions have resulted in a preliminary grant of \$10,000 to scope the project and expand it to become one of the "Flagship" projects of the Food Chain Program. A summary of the proposed project is provided below.

The overall objective of this project is to improve the Australian, and selected export markets, retail supermarket seafood categories through a formal supply chain involving lower value south east Australian fish.

Intermediate objectives will include:

- to enable fishing businesses in the chain to optimise their catch of the targeted lower value fish species;
- to improve fish quality by enhanced handling and management throughout the chain
- to raise the market image of the target species;
- to move toward market recognition of the individual fishing business, through product traceability procedures and branding; and
- to assist major supermarket groups to expand their market share in fresh seafood.

The project aims to generate superior customer value. Retail supermarkets, both in Australia and in some export markets, have a very poor market share in fresh seafood, despite huge advances in

other fresh food categories (such as fruit, vegetables, meat and poultry). In part this is due to a lack of development of formal supply chains in the "fish catching sector" comparable with the agriculture or farming sector. We hope for this project to improve efficiency through the chain by: reduced fish wastage through less discarding of unwanted catches; greater information exchange along the chain; agreed new product handling procedures, and; elimination of the "seafood markets" from the chain.

In agribusiness it has become common for meat, fruit and vegetable producers and processors to have direct relationships with food service and retail customers. However, in seafood, the "wholesale markets" still totally dominate product sales, which add a link to the chain and reduces the ability of producers and processors to understand and meet customer needs. This project will demonstrate the benefits of a formal, efficient and quality oriented supply chain in the seafood industry, which should have major impacts on the future directions of the catching sector and on the development of seafood in Australian and selected export supermarket chains.

This project requires significant cultural change among members of the fish catching sector; a change which will see their roles shift from suppliers of a low value commodity to a supply chain partnership in which they adjust their product handling methods to deliver a quality product to meet customer expectations. Supermarket groups will use the chain to improve their understanding, and their ability to manage seafood products, and will transfer some of the experience gained in managing other fresh food products to seafood.

The demonstration benefits to the wider seafood industry will be very substantial. Success in raising the economic viability of the spotted warehou and redfish catch will be a very strong endorsement of a formal supply chain approach. It is believed that the seafood industry lags other food sectors in adopting a value-chain approach, but there may be useful generic demonstration outcomes.

Management implications of bycatch utilisation

Recommendations of the strategic assessment of the SESSF under the EPBC Act have highlighted that targets for bycatch reduction for the fishery need to be set and achieved in the next 3 years. It is likely that this will result from a combination of gear modification to reduce bycatch and improved utilisation of bycatch species. There are several issues that need to be addressed with regard to the utilisation of bycatch by the catching sector that do not apply to the utilisation of processing waste (being addressed by ASCo). It is important to establish whether the retention of all bycatch (rather than throwing it overboard) is an ecologically sustainable practice. To this end, an assessment of the

ecological impact of retaining bycatch would need to be carried out. Furthermore, conservation groups emphasised that they would only support the concept of bycatch utilisation if industry were making every attempt to minimise bycatch levels. There have been and are currently a number of FRDC projects operating in the SEF (98/204, 2001/006), Northern Prawn Fishery (1993/179, 1996/254), and various haul seine fisheries in New South Wales (1997/207) and Victoria (1997/210) designed to reduce bycatch levels through gear modification. Reduction in the amounts of bycatch resulting from Industry uptake of these modified gears needs to be evident before conservation groups will sign off on the utilisation of bycatch.

The other difficult aspect of bycatch utilisation was the likelihood that some degree of fish processing may need to be undertaken on board the vessel. As such, it would be necessary for the fish to be crudely processed in some form that would allow them to be brought back to port. AFMA highlighted a number of management issues would need to be addressed before large-scale onboard processing of fish would be allowed to occur in the fishery. The potential for quota species to be processed without being deducted from the quota was of prime concern because it would be extremely difficult to detect. This issue needs to be resolved before large-scale bycatch utilisation by the catching sector can proceed. The SESSF Ecological Assessment Group has been requested to consider this issue and it is also being incorporated in the current trophodynamics project being run by CSIRO.

Training and skills development

There is a need for skills development and training across the fishery's supply chain, especially in areas such as product handling, food safety and OH&S issues. Whilst it is recognised that this is a high priority for the fishery, it understood that implementation of this type of industry development is a medium to long-term goal for the Sub-program.

It was agreed that the priority training required throughout the industry (starting with the management level ie skippers, shop owners, processors etc) would be the units covered by the four core competency standards:

-	Food handling and safety practices	(SFICORE101A)
-	Working effectively in the Seafood Industry	(SFICORE102A)
-	Communicate in the Seafood Industry	(SFICORE103A)
-	Meeting workplace health and safety requirements	(SFICORE104A)

In addition to these core competencies, it was agreed that a combination of elective units needs to be put together to cover the ecological sustainability issues that are facing the fishery. It was considered that an appropriate range of suitable units is already available (ie none need to be developed) and just need to be packaged up into a relevant training strategy for the SEF whole of supply chain.

Although this appears to be relatively straightforward project, we have yet to get this off the ground. A project was submitted to Reframing the Future during 2003 for funding but it was not successful. Nevertheless, the Subprogram is still committed to establishing a training strategy for the SEF. Specific opportunities to fund projects to address these issues are being sought. It should be noted that most of the projects mentioned above have some level of training in seafood handling and quality assurance integrated into them.

PLANNED OUTCOMES

Outcomes

- The development of whole of chain R&D strategy for the SEF
- Establishment of new research projects targeted at SEF Industry Development
- Increase the value of SEF products through value adding and improved utilisation of catches
- Increased levels of cooperation between those in the SEF across the whole of supply chain
- Development of new technologies that will benefit all people involved in the SEF.

Beneficiaries

- The SEF catching sector
- SEF processors and wholesalers
- Those involved in marketing and retailing SEF product
- Consumers of SEF produce
- Suppliers of products and services to the industry
- Those conducting research and management relating to the SEF

CONCLUSION

Previously, most of the research that has been carried out in the SESSF has focussed on the collection of biological data and assessment of the status of fish stocks and the impact of fishing on the environment. In recent years, the need for a broader coverage of R&D to address whole of supply chain needs of the SESSF has been recognised.

Until the establishment of the SEF Industry Development Subprogram, there was a dearth of R&D projects focused on industry development for the SESSF. The Subprogram was established in 2000 and has since accessed over \$800K in funding (of which almost half has been from sources external to FRDC) to increase the value of the fishery by value-adding to fish products, adopting new technologies and improving utilisation of catches.

The role that the Subprogram is now starting to play in industry development is encouraging. First, it has brought together a range of people from across the SEF whole of supply chain to discuss areas of potential R&D. The varied skills and knowledge of these people broadens the perspective of the group and ensures that those involved think outside their own sector of the fishery and see the importance of the whole of supply chain approach. One of the most encouraging examples of this is the inclusion of many of the largest seafood companies and associations in south eastern Australia to form Australian Seafood Co-products. Never before has such a large range of companies and associations from the seafood industry come together in one company to develop through-chain outcomes that will benefit Australia's entire seafood industry. If the ASCo model of mutual cooperation across the seafood industry is successful, it could have applications well beyond waste utilisation in the future and will be a good testament to the role that the Subprogram has played in industry development.

The current projects operating under the Subprogram and those that are planned to get underway over the next year are good evidence that the Subprogram is meeting its objectives and realising its goals. The coordination and facilitation role of the subprogram is being achieved through both formal workshops and informal meetings between members of the fishing industry and others in the supply chain. Using the initial FRDC funding as a foundation, the Subprogram has been successful in maximising the leverage of industry funds by accessing a wide variety of funding sources from different state and federal government agencies. This has resulted in the optimal value per dollar invested in Subprogram projects by FRDC, other funding agencies and the seafood industry.

By continuing to link groups of people in the seafood industry with expertise in the whole of supply chain, the Subprogram will continue to deliver the successful outcomes for the seafood industry involved in the SEF. The through-chain approach being adopted by the Subprogram for industry development is continuing to attract interest from a wide range of stakeholders and will continue to be successful in accessing considerable funds that are not usually available to the seafood industry. For example, the Subprogram has recently accessed \$10,000 to develop up a \$500,000 through-chain market development and innovation project under the National Food Industry Strategy's Through Chain Program. We have also accessed \$80,000 from the National Food Industry Strategy to conduct trials of a flow-ice plant on a working SEF vessel as a critical first stage of the supply chain development of alternative markets.

APPENDIX 1 INTELLECTUAL PROPERTY

A number of Intellectual Property issues have arisen in the projects being overseen by the Subprogram.

There were initial difficulties in signing a project agreement between FRDC and NRE for the fish fertiliser trials due to IP issues but these have now been resolved.

The potential for producing a solid phosphate fertiliser from fish wastes involves IP from a New Zealand-based fertiliser company "Sieber". This company has developed the IP for a solid phosphate fertiliser "Biophos" that incorporates fish silage. Following the due diligence conducted on Sieber, a Non-disclosure Agreement has been signed by the Subprogram leader on behalf of ASCo.

ASCo intends to produce this product but the IP will remain with Sieber. An IP agreement has been established between ASCo and Sieber for ASCo Fertilisers. Subsequently, an IP agreement needs to be developed between ASCo Fertilisers and the companies chosen to manufacture BioPhos in Australia. One of the potential manufacturers in Australia is Incitec-Pivot, and a MOU has been developed between ASCo Fertilisers and this company. FRDC have become shareholders in ASCo along with 16 other seafood companies from south-eastern Australia. As a result of the transfer of IP to ASCo Fertilisers, any royalties from the production and sale of BioPhos will be distributed to the two shareholders (ASCo and Sieber Australia) in proportion to their equity in the company.

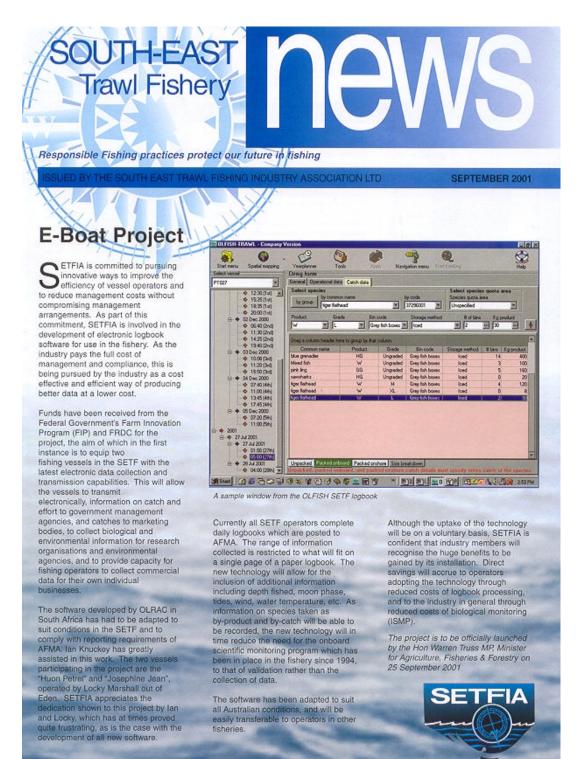
APPENDIX 2 PROJECT STAFF

The only person employed on this Subprogram is Dr Ian Knuckey.

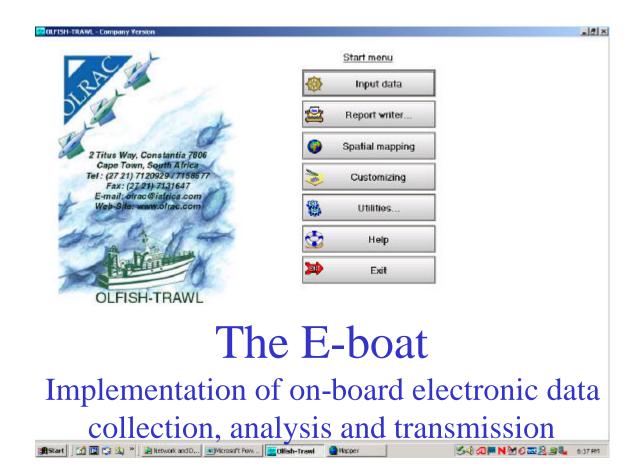
APPENDIX 3 SUBPROGRAM EXTENSION AND PROMOTION

The E-boat project featured on the front page of the inaugural SETFIA Newsletter that was

distributed at the end of September 2001.



An over-view of the software was presented at Seafood Directions 2001, the Australian Seafood Industry National Conference. WIN Regional TV filmed a segment which went to air in Queensland as part of a weekly segment devoted to scientific innovations.



Articles on the E-boat project appeared in AFMA News in October 2001

and FRDC R&D News



SETFIA LAUNCHES E-BOAT TECHNOLOGY TRIAL

Collecting and transmitting data on catches and fisheries is about to go 'high tech' following the launch of the South East Trawl Fishing Industry Association's (SETFIA's) trial of the E-boat system.

The new electronic data collection and transmission system will make recording catches far more userfriendly and efficient for the industry and the Australian Fisheries Management Authority,

Launching the trial at AFMA's Canberra offices on Tuesday 25 September, the Minister for Agriculture, Fisheries and Forestry, the Hon Warren Truss MP, said that the E-boat project demonstrated the way the fishing industry is meeting the challenges of fisheries management.

The SETFIA project received \$73,000 in matching funds through the Federal Government's Farm Innovation Program and \$20,000 from the Fisheries Research Mr Truss highlighted that, of the 265 applications forwarded for the Farm Innovation Program, 65 have been successful so far, with the SETFIA trial being the first grant of its kind for the fishing industry.

Development Corporation.

"This proposal for the trial was assessed by an independent committee which found the technology to be highly innovative and a step forward for the fishing industry," Mr Truss said.

"This is good for the environment, good for the fishing industry and good for fisheries management," he said.

SETFIA President Mr Terty Moran said that during the trial, fishers will be able to key in data about the types and quantities of fish caught, as well as environmental and biological data relevant to that particular fishery.

"This information will be transferred into on-board computers and then sent directly from the vessels at sea to AFMA. Alternatively, operators can transfer data to a floppy disk and then forward it to AFMA through their home computers. They can also forward it directly to marketers for on-line selling of the product," Mr Moran said.

"This device will allow fishers to capture 'real time' data at sea and is expected to provide a cost effective means of transmitting that data to AFMA. The adoption of the technology could see much of the current logbook paperwork replaced," he said.

The new system is currently being tested on two commercial fishing vessels operating in the South East Trawl Fishery which have been fitted with the latest electronic data collection and transmission capabilities.



AFMA NEWS



SETFIA LAUNCHES E-BOAT TECHNOLOGY TRIAL

AFMA Managing Director Mr Frank Meere congratulated the South East Trawl Fishing Industry Association (SETFIA) for developing the E-boat technology and said that AFMA was looking forward to working with the trial boats to assess the effectiveness of the new system.

"We believe this technology will provide AFMA with more accurate and more timely information about fisheries management," Mr Meere said.

"In support of the trial, AFMA has committed funds to develop the infrastructure to receive and process catch data from vessel operators," he said.

Eden commerical fisher Lachlan Marshall has provided two of his vessels, the *Huon Petrel* and the Josephine Jean, for the Eboat trial and is keen to see the results.

"This will be a huge step forward for fishers," Mr Marshall said.

"As we generate this detailed information it can only help us further with our fishing," he added. "I know of 14 operators within SETFIA who have agreed to buy this equipment when the trials have been completed.

"Therefore, potentially, we will have at least 14 vessels out there operating as research vessels as well. This is showing that we are responsible towards the fisheries because we have to manage the fisheries for our long-term future and we're doing it by example," he said.



Mr Frank Meere, AFMA, Mr Lachlan Marshall, the Hon Mr Warren Truss MP, Mrs Gail Richey, SETFIA, and Mr Terry Moran, SETFIA, at the launch. Photo courtesy of FRDC

Article on ASCo and waste utilisation printed in the NSW Seafood Industry Council Magazine

"Catch" Issue 4, Autumn

2002.

ECO-EFFICIENCY

SEAFOOD INDUSTRY TAKES STEPS TO PROFIT FROM FISH WASTE



The seafood industry has realised the opportunity to turn waste into profitable resources that generate income, as well as removing costs and environmental concerns relating to their disposal. Each year, thousands of tonnes of fish waste from the gutting and filleting process is sent to landfill, costing up to \$150/tonne for disposal and causing environmental problems. This is now set to change, Establishing a seafood

industry fish waste utilisation company

A number of key players in the seafood industry recently met

with the FRDC South East Fishery Industry Development Subprogram, and agreed to establish an 'industry-based' fish waste utilisation company. The company, Australian Seafood Co-products (ASCo), aims to add value to the seafood supply chain through the sustainable utilisation of fish and fish co-products that are not traditionally utilised or marketed. Subprogram Leader, Dr Ian Knuckey says "the increasing financial and ecological costs associated with industry having to dump fish waste will soon be a thing of the past". One of the options under serious consideration by the company is the facilitation of through-chain collection of fish waste, which would be processed into a value added organic fertiliser and marketed to the commercial horticulture and agriculture sectors

These processed fish wastes, which are typically low in the essential elements phosphorus and nitrogen, can be combined with other products using innovative technology to form a valuable fertiliser that has great potential to replace superphosphate for use in the rapidly growing organic (farming) market.

In the near future, seafood businesses that produce large quantities of fish waste will have the opportunity to gain a share in the company. Once up and running, profits from fertiliser sales will be shared amongst shareholders and businesses supplying fish waste. The concept behind the company and its exciting opportunities have already fostered wide support from industry and a variety of agencies, including Seafood Services Australia, Environment Australia and state regional development departments.

While a great deal of work remains to be done before the company can convert all of industry's fish wastes into organically-certified agricultural fertilisers and dollar returns to industry, the MFMA believe this innovative concept has great potential and is well worth supporting. We will keep you posted on future developments, however, if you would like to know more about the company in the meantime, please contact Ian Knuckey on Ph. 0408 581 599.

A burly approach to waste reduction

There are other solutions to the same problem. The approach taken by retail business East Coast Seafood in Miranda Sydney is a great example. Co-owner Dave Gillies attitude is "why pay to throw away something that can actually make you money, it just makes common sense!" The only solid waste leaving David's business is cardboard and plastics. But how does he do it? It's called burly, fishermen love it and here's how it works.

Each day staff put all fish frames and offal though a small mincing machine to produce a delicious fish burly (or so the fish think). The burly is then packed in 7 litre plastic containers with a sealable lid and sold from the bait freezer for \$5.00 a bucket. It doesn't end there however! If people purchasing the burly bring back the plastic container they get a discount on their next bucket.

So what's the pay back? The mincing machine was bought second hand for about \$800 dollars and the buckets are largely recycled with the assistance of customers. It is expected that the payback period will be as short as 6-12 months.

While the sale of burly won't buy Dave a new Ferrari (at least not in the near future) there are several advantages for his business including increased patronage, full product utilisation and elimination of potential waste disposal issues related to spills and odours. East Coast Seafood also has the opportunity to promote themselves as an environmental aware business. The Chair of the NSW Seafood Industry Council John Roach said, "this is a prime example of eco-efficiency practices at its very best".

On the horizon

Don't forget if you're a member of the MFMA, the Oyster Farmers Association (OFA), ProFish or the Co-Op's Association you'll soon be receiving an Ecoefficiency Survey in the mail. The survey information provides an opportunity to benchmark and promote where industry is at now, also to demonstrate improvements over time!

For more information please contact Michael Kitchener at the MFMA Office on (02) 9552 1611 or e-mail: michael@mfma.com.au. For all other sectors contact Fiona Curley at Ocean Watch on (02) 9660 2262 or e-mail: fiona@oceanwatch.org.au.



CATCH AUTUMN 2002

Article on ASCo in the "BAZ" column of Professional Fisherman January 2003.



A personal comment from Ulladulla's very own Barry McRoberts on Management Matters.

'Loaves and Fishes'– New testament news



You can feed a multitude with five fish sandwiches; it's in the book - or was it just sloppy reporting?

It seems news reporting hasn't changed much in the last 2000 years. Maybe Jesus really did manage to cater for the whole mob. When I tried, though, the best I could do was a dozen fish cakes and a pretty watery soup. Of course the good book doesn't say what sort of fish were dished up, but I doubt they were landing tuna or tooth-fish in the Galilean Fishing Zone.

Whatever was used, you can bet a quid nothing much was wasted; which brings me to the subject of waste minimisation. If we are looking for wider community support then second only to high profile sustainability of our fishing effort must come minimal industrial waste. To date most waste utilising efforts have been individual and suffered from being species specific or geographically difficult.

succeeded in pulling major players spectra spectra of conferences ASIC, together with FRDC, succeeded in pulling major players together and formed a company to tackle the problem. Australian Seafood Co (ASCO) will adopt technology currently used in New Zealand by Sieber to produce fertilizer. According to lan Knuckey who is working on the project, returns of approximately \$0.80c per kg to suppliers are about par for the course in NZ. Now just because things work in NZ.

Now just because timings work in N2., doesn't necessarily mean they work in OZ. Take a bit of a look at Bondi for instance. There are quite a few Kiwi exports on the beach that don't work here. (Sorry guys, I couldn't resist that).

Anyway, in this instance the project has attracted some heavy weight industry

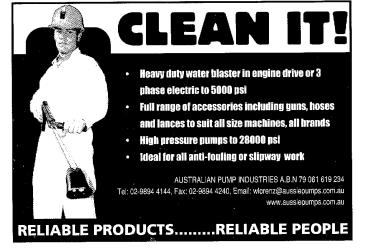
support. Major players such as the Sydney and Melbourne Fishmarkets, the Master Fish Merchants Association, SETFIA and several well known processors are keen to see the enterprise up and running. Frankly, any project that further unites all industry sectors is worth pursuing, even if it only breaks even. No doubt profit will be the motivation for most industry interest and that will most likely come from cost savings compared with present waste disposal methods.

present waste disposal methods. The way I see it the most significant benefit may be less tangible. It will come from community perceptions. The perception of a cleaner greener industry will go a long way to silencing much of the ill motivated criticism from those who would divert attention from their own pillaging, polluting, playtime practices.

An each way bet on a two horse race

Harking back to my comment about reporting at the start of the column; Sydney's Sunday Telegraph of November 10, was an interesting, if not confusing read. Pages 91 and 92 carried an article by Amanda Phelan headed "Emptying the Ocean, Plundering the Sea". It quoted the gospel according to Greenpeace and the World Wide Fund for Nature, who as we know, use some very questionable modelling when it comes to bycatch figures, etc. The article was a pretty fair reflection of

The article was a pretty fair reflection of the sensationalist attention the industry cops in today's tabloids. After all, alarm and despondency makes better copy than good news. In the absence of a story about a pack



8 January 2003 PROFESSIONAL FISHERMAN

raping school of sharks on Harley Davidsons, an alarmist-fishing story using yesterday's practice, attitudes and statistics is bound to get a run. And, as usual, it ended with an anecdote from some passing disgruntled angler claiming he fished the Botany Bay area man and boy for yonks; and now can't get a bite.

Usgrinfied angler claims in class in the obbotany Bay area man and boy for yonks; and now can't get a bite. So there it was, no good news, just pretty much a re-run of all commercial fishing stories on a quiet news day. My confusion came about from page 105 which carried a column headed 'Fishing' by Robert Swinburn. Robert obviously hadn't spoken to Amanda, because he had a totally different perspective on Botany Bay. He reported a 6.2kg dusky flathead taken in the Bay and one boat with six yellowfin taken just outside. Broken Bay anglers were hooking into schooling salmon and tailor, while youngsters casting from the banks near Wisemans Ferry were busy hauling 'em in from a plague of soapy-jewfish.

plague of soapy-jewfish. Robert was equally up beat about Sydney Harbour's upper reaches, with school jewfish, flathead and bream biting and plentiful morwong and flathead outside. An eight-kilogram snapper was weighed in at Newport. Now if 1 was confused the hundreds of keen guys and gals Robert said fished the Hawkesbury Classic and then attended the huge resulting auction, must have had real trouble understanding where the decimated areas were. Particularly seven year-old Tim Rose, whose photo appeared at the end of Robert's column holding up a nice plate size flounder he caught in the supposedly commercially ravaged Botany Bav.

Yep! No doubt about it folks, if you read it in the daily paper it must be true; the pro's have stuffed the place.

'Crop it sweet'

While the noisy self-servers are busy whipping up the anti-pro frenzy, there are people like Prof. David McConchie and young science student Estelle Weber, who quictly get on with finding a way to address the real environmental problems.

Prof. McConchie of Southern Cross University developed a product called Bauxsol. Bauxsol is used to clean up contaminated soil including acid sulphate. The Sun Herald reported student Estelle Weber of Murwillumbah receiving the Young Scientist of the Year Award, for identifying a cost effective means of using Bauxsol to prevent acid sulphate run-off from cane fields.

Congratulations to the good Prof and Estelle for making a fair dinkum effort to improve things for all of us; not only the cane farmers. BAZ

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Article on ASCo printed in FRDC R&D News July 2002

R&D News — July 2002

Waste whacked in two ways

THE financial and ecological costs of dumping fish waste will soon be a thing of the past, predicts FRDC South East Fishery Subprogram leader Ian Knuckey, outlining two recent initiatives.

The first is the establishment of a fish waste utilisation company,Australian Seafood Coproducts (ASCo).

Key SEF participants have agreed to establish ASCo to utilise the fish waste that currently goes to landfill at up to \$350 a tonne and rising. Other seafood businesses generating big quantities of fish waste are likely to be offered shares.

The initial intention is to set up processing operations near the Sydney and Melbourne fish markets and, possibly, in Tasmania; with other major ports as longer term prospects.

One of the proposed company's options is to combine the residues of filleting and gutting with other natural ingredients to produce fertiliser for the expanding organic farming sector.

Buckets of berley

Meanwhile, at the retail end of the supply chain, East Coast Seafood of Miranda, Sydney is making sure the only solid waste that leaves its premises is cardboard and plastics. Australian Seafood Co-products

Co-owner Dave Gillies' attitude is "why throw away anything that can actually make you money" and his solution is berley.

Each day the staff put all fish frames and offal though a mincer to produce the berley, which is packed in 7-litre, sealed lid plastic containers and sold out of the bait freezer for \$5 a bucket.

Berley buyers who bring back the bucket get a discount on their next one.

So how are the numbers stacking up? The mincer cost about \$800 secondhand. The buckets are largely recycled. Dave Gillies expects that the payback period will be as short as six to12 months.

Ian Knuckey says that while the initiative won't buy Dave a new Ferrari — at least not in the near future — the



Subprogram Leader, Ian Knuckey advantages for his business include

increased patronage, full product utilisation and elimination of potential waste disposal problems.

East Coast Seafood also has the opportunity to promote itself as environmentally aware for undertaking what John Roach, Chair of the NSW Seafood Industry Council, says is ecoefficiency practice at its very best. MORE information: Ian Knuckey, phone 0408 581 599.

Article in FRDC Annual Report 2002/03

Challenge 6 – Improving utilisation of processing wastes.

REPORT OF OPERATIONS R&D PROGRAM REPORTING: PROGRAM 2

The Aquaculture Nutrition Subprogram is a new FRDC subprogram that has evolved from the highly successful Aquaculture Diet Development Subprogram. One of the many aims of the new subprogram is to identify alternative sources of protein and lipids capable of sustaining aquatic animals exclusively of fresh bait, trash fish, fishmeals and fish oils. Identification of substitutes for fishmeal will allow more fish to be retained in the food chain and reduce Australia's reliance on imported feeds. To reduce reliance on fishmeal ingredients, nutrient sources that allow similar production levels and product quality will need to be identified.

Challenge 6 — Improving utilisation of processing wastes



There is a low supply of organic fertilisers in Australia, and fast-growing demand for them. Fisheries bycatch and processing wastes can meet some of this demand. Early results from tomato crops grown with fertilisers produced from these wastes are very promising. The project's Principal Investigator, Dr Ian Knuckey, is with Dr Aravind Surapaneni, of the Department of Primary Industries, Victoria.

Most Australian seafood processing is elementary: filleting, peeling, boiling and shucking; and chilling, freezing or packing such products. Waste comprises fish frames, heads and gut, and shell material. Some businesses derive returns from their waste materials by selling them as bait, but most often they use the least costly method of disposal: typically, discarding it at sea, flushing it down the drain, or paying for it to be dumped as landfill.

Some commercial incentives will come from increased costs of dumping to landfill. These increases are local government's response to community pressure to improve waste management as part of ecologically sustainable development. Continuation of such practices by members of an industry that is badly affected by urban and agricultural run-off will be increasingly counter-productive. Further, as governments move to encourage businesses to offset their pollution by contributing to environmentally beneficial projects, market forces will lead businesses to show themselves as meeting community expectations in this regard.

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FRDC ANNUAL REPORT 2002-03

Businesses that innovate in waste management as an investment will thus gain a competitive edge by being able to demonstrate tangible "good corporate citizenship" — including by eco-labelling — to an increasingly perceptive consumer market. Further incentives will flow from byproducts fetching higher prices, thereby overcoming disincentives of transport costs, unwillingness of some businesses processing high-value products to become involved in low-value wastes, and current unsuitability of processing equipment for small volumes of waste.

Responding to findings of a stakeholder workshop, the FRDC initiated the South-east Fishery Industry Development Subprogram (2001/238) to address, among other things, waste issues in that fishery — principally post-harvest waste at present. The subprogram is managing a project that is researching the use of a fish-based fertiliser, derived from processing waste, that can be used for several farming practices. The project (2002/250, "SEF Industry Development Subprogram: agricultural trials of a fish-based fertiliser (BioPhos) produced from Australian seafood processing wastes"), is trialling an organic-waste-based fertiliser against current superphosphate fertilisers.

The project has identified three major forces that are beginning to control the movement of organic wastes:

- the need for minimisation of waste,
- the opportunity to utilise the high nutrient value in fish waste materials, and
- increased barriers to disposal of waste products (especially those rich in organic content) in waterways or landfills.

Organic fertilisers can be used in both conventional and organic agriculture. Meeting the needs of the organic agriculture sector is of particular interest, however, because there is a low supply of organic fertilisers and fast-growing demand for them. Fisheries bycatch and processing wastes are principally organic in nature and can therefore be designated as "organic wastes", subject to appropriate certification.

The subprogram is also examining other alternatives for processing waste. Project 2002/405, "Assessing the commercial viability of utilising fish processing wastes", has been initiated by Australian Seafood Co-products Pty Ltd. This new company, mainly comprising entities from the catching and post-harvest sectors (the FRDC also has a small interest), is seeking to increase profits to the seafood industry by utilising the many thousands of tonnes of fish waste produced each year.

To achieve the complementary outcomes of sustainability and economic benefits to the stakeholders, a whole-of-chain approach to R&D is required — which coincidentally accords with one of the new Australian Government national research priorities.

Niche-marketing of fish wastes to the organic farming sector is an excellent opportunity that can be exploited

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Article on ASCo and the tomato trials printed in FRDC R&D News July 2003



R&D News — July 2003

Fish-fert's potential grows

GOOD commercial yields of tomatoes have been reported from a Victorian trial of fish waste fertilisers.

In this first phase of a long term project at Tatura, seedlings of a processing tomato cultivar were transplanted into raised beds fertilised with either composted fish waste or a blend of fish waste and superphosphate.

Despite a harsh growing season, yields at harvest in April approached 100t per hectare.

These results had not been statistically analysed against soil nutrient levels as this edition of *R&D News* went to press, but initial figures suggested that plants treated with composted fish waste had established more slowly than those given conventional fertiliser, but yielded as well in the end.

The project is funded by FRDC (Project 2002/250) and the Victorian Department of Primary Industries with the objectives of minimising waste, utilising the high nutrient value of fishbased materials in organically-certified fertiliser and bypassing the increasing barriers to the disposal of processing residues in waterways and landfills.



Tasty, freshly harvested tomatoes that have been grown using fish waste fertiliser at Tatura in Victoria.

For the trial, a control treatment eliminating phosphorus was included and all treatments were replicated 12 times in a random block design.

The site has been cleared and the plot structure retained, so a further trial can be staged next season to test reported long-term benefits of fishbased fertiliser on soil biology.

MORE information: Ian Knuckey, phone 03 5258 4399; email Fishwell@datafast.net.au Fishwell@datafast.net.au. lan Knuckey is handed freshly harvested tomatoes by Aravind Surapaneni from the Department of Primary Industries in Tatura.

Article on ASCo and the tomato trials printed in Innovate Australia July 2003



Article on tomato trials printed in The Weekly Times May 26 2004



Waste not; fish filleting produces large amounts of waste.

Fish offcuts a fertile answer

By KATIE FISHER

FISH offcuts have proven to be an environmentally friendly fertiliser for horticultural crops

Last year Department of Pri-mary Industries project leader Aravind Surapanent found that applying fish offcuts to tomato crops was just as productive as superphosphate fertilisers.

Mr Surapaneni said that de-tritt last season's harsh seasonal conditions, good commercial tomato yields — of more than 100 tommes a hectare — were produced after fish-offcut fertiliser was applied. The first of the tomato field trials was on a low advendment for the tomato the environment.

trials was on a low-phosphorus-site at Tatura.

"The yields were comparable to those obtained using super-phosphate, although the plants grown with fish waste tended to establish more slowly." Mr Sur-apaneni suid.



nology, the wastes can be proc-essed and incorporated with rock phosphate into mainstream agri-

The trial was repeated this senson with similar rusults. Mr Surapaneni said every year thousands of tomes of fish officuts and ager Lin Knuckey said the processing of fish fillets resulted in up to 60 per cent waste