

CHAPTER G. ECONOMIC ISSUES

This is the first formal incorporation of an economic assessment of a management plan in the fisheries of NSW. It has been compiled from a limited amount of existing information, augmented by the results of economic and social surveys initiated by NSWF and undertaken by Roy Morgan Research (Roy Morgan, 2001a&b).

The following summary is based on the detailed Consultants report prepared by Dominion Consulting Pty Ltd and presented in Appendix CG1. The Consultants report on economic issues is in two sections; a review of existing information and then an assessment of the impacts and issues in the Estuary General draft FMS, examined against the DUAP guidelines.

1. Existing Information

Existing information is available from NSW Fisheries records and provides information on licensing, effort and catches at the primary level. Price, at first sale in Sydney, is also available and this enables an imputed Sydney fish price to be generated. This Sydney price probably underestimates landed value by between 12% and 21% in the Estuary General Fishery, as estimated by the recent economic survey (Roy Morgan, 2001a). Data on the fish processing industry is limited, being collected only from registered fish receiver annual registration forms. The seafood processing, wholesale and retail industry in NSW requires further study.

An economic survey was undertaken by mail to enable a profile of the commercial fishers to be developed (Roy Morgan, 2001a). The statewide economic survey has a response rate of 16%, 259 fishers from 1,640 completing the questionnaire of which 147 were active Estuary General fishers. The social survey sample size was greater than the economic survey by approximately 100 people due to businesses owned by companies or partnerships where more than one person is involved. The survey enabled the economic performance of businesses in the estuary general catching sector to be appraised. It also gave an indication as to the position of industry to pay additional charges and purchase shares under the proposed draft FMS.

A rapid social appraisal telephone survey was undertaken by Roy Morgan Research (Roy Morgan, 2001b) and had a response rate of 50%, with 870 fishers completing the questionnaire of which 502 estuary general fishers (58%) completed surveys. This social survey included some economic questions and enabled the assessment process to have up to date information on industry, its social profile and an indication of the potential social impacts of changes under the draft FMS which are examined in Chapter H.

The review of existing catch, effort and endorsement information, indicated the Estuary General Fishery is based predominantly north of Sydney (80% of estuary general endorsements) and there are a diverse range of businesses with endorsements in several managed fisheries. The Estuary General Fishery is seasonal with a low period in June to August and is predominantly one person businesses, with partnerships between fishers and a limited amount of corporate involvement. The social survey enabled the relationships between the estuary general fishers and their non-fisheries work to be examined.

Endorsement holdings in the estuary general indicated that in 1999-2000 only 623 of 1,003 fishers (as opposed to 944 businesses) entitled to fish were active, with 380 fishers as latent effort - not

having submitted a catch return in any fishery during 1999-2000. Of the 623 active fishers, 533 had fished in estuary general and 90 had chosen to fish solely in other fisheries in NSW. Of those 533 who fished in the estuary general, 360 were estuary general only fishers and 173 were in estuary general and other fisheries.

The employment associated with estuary general endorsed fishing businesses was examined in the social survey and estimated as 566 employees. Given there are 632 active fishers, and 1,003 endorsed fisher, the total employment estimate is between 1,198 to 1,569 persons including full time and part time fishers. This also includes processing staff and needs further research as a statewide profiling exercise in order to avoid double counting and accurate assessment in the fishing and processing sectors.

The economic survey obtained data on industry operating costs, revenues and capital for one financial year only. The fishery is highly variable in activity and capital investment levels, some fishers having low capital investment. Survey returns were analysed to measure economic profit and to estimate a net economic contribution to the economy.

Estimates of operating profit were made, as many operators did not include owner's payment from fishing. An economic approach was used to review long term viability. The economic test of long term viability subtracts economic costs from revenues and tests for evidence of a surplus. The economic costs have operating costs, fixed costs, including opportunity costs of capital, labour and economic depreciation. Having imputed a 7% risk adjusted opportunity cost of capital and imputed labour costs for all days worked from survey information, an estimate of economic depreciation was applied to test for long run viability, evidence of capacity to replace capital in the long term. Given the variation in the scale and scope of fishing operations, results were divided into estuary general fishers only, estuary general plus other fisheries over \$60,000 p.a. revenue, and estuary general plus other fisheries under \$60,000 p.a. revenue.

Economic surplus exists for 20% of all estuary general fishing businesses examined, and was greatest in the higher grossing multi-fishing businesses which returned an economic rate of return to capital of 11%. The average economic rate of return to capital across all the businesses was negative (-17%), the median being (-30%). The results are consistent with previous studies (IPART, 1998), but are for one financial year 1999-2000, and further economic annual surveying is required to monitor economic performance in the longer term.

The businesses currently operating below the long term viability criteria, are effectively subsidised by forgoing returns on capital and particularly on labour. This may be to accommodate lifestyle, or indicate barriers to fishers exiting the industry, such as lack of alternative employment in rural areas.

For these less viable operators, increased charges and requirements to purchase shares, will significantly reduce operational viability. There is a large range of operator performance given numerous part time fishers, multiple fishing interests, and fishers with involvement in industries outside fishing, including subsidies from welfare. This is common in other rural industries, such as the NSW dairy industry, and requires on-going research on social structure of the industry and the economics of fishers households and communities.

Trends in licence values show no significant rise in estuary general endorsement values in the last eight years, but this is a limited measure of economic performance due to the restriction on transfers of endorsements and poor perceptions of management among fishers.

Limited information is available on non-Sydney market fish prices. Exporting of seafood out of Australia was estimated as between 2% and 13% of gross sales, for estuary general only and estuary general plus other fishers respectively (Roy Morgan, 2001a).

Regional economic information on the fishing industry is limited to several studies in northern and southern NSW in the late 1980s. Economic multipliers in the fishing industry are low and total effects are generally between 1.5 and 2.0 times the direct effect (Tamblyn and Powell, 1988; Powell *et al.*, 1989). Existing information from expenditures outside local towns infers that approximately 70% of expenditure stays in the local communities generating local multiplier effects (McVerry, 1996). This is an area for future research work. The social survey examined the regional purchase behaviour for major purchases made by estuary general fishers, showing the importance of business links between estuary general fishers and Sydney, Newcastle and Brisbane.

2. Assessment

The assessment of the draft FMS draws on this background information and the responses under the draft FMS are ranked on their potential for larger scale economic impacts. There is insufficient cost and benefit information for a definitive ranking. The following issues are assessed.

Zoning policies mean that operators will be constrained to one zone for operation, in order to regionalise fishers in management regions. Under stage one of this process, the impact will be differing degrees of economic and operational dislocation, significantly impacting 17-41 fishers in a range of regions. Mitigation through stage two is recommended in order to enable fishers to adjust to new arrangements.

The change from 1,000 m and 725 m haul nets to operation of a maximum length of 500 m in estuaries with further restrictions to one shot per crew per day, will impact 20-30 fishers with large hauling nets, but may benefit the fish stock and improve the public perception of fishing. The cost impact on fishers is significant and immediate. Fishers query the perceived benefits of the policy. This policy may be mitigated by implementing a change to 725 m nets and then appraising the distributional impacts on fishers.

The intention under the draft FMS is to continue the annual 3% per annum reduction in the number of fishing businesses seen under the Recognised Fishing Operation policy, to control effort in industry through the category 2 share management regime and give the remaining fishers improved fishing rights. For assessment purposes a 15% reduction in business numbers under the first five years of the FMS is envisaged, reducing 944 fishing businesses in 2001, to 802 in 2006, 141 choosing to exit. The basis of share allocation has yet to be decided. It is envisaged that minimum share holdings may translate into businesses having to pay between \$500-\$1,000 per year to remain in the fishery, in addition to new management charges. Some businesses will exit, the most likely being latent effort holders and those businesses grossing below \$10,000 per year. Shares will be more readily purchased by those 20% of businesses in economic surplus. To the majority of fishers without an economic surplus, there is an incentive to increase effort to cover the new payments. It is essential to monitor latent effort and contain active effort levels within historical guidelines, as stated in the strategy. Given the low output associated with exiting fishers, the economic flow-ons from exiting businesses will be low. Social costs may be significant as reported in Chapter H, social issues.

A similar shareholding provision at the endorsement level will be implemented within estuary general regions and minimum share holdings set by endorsement type. A 15% reduction has been envisaged for assessment purposes equating to a payment of \$150-\$240 per year to retain a crab endorsement, or \$450-\$720 p.a. for three endorsements. For a fisher with several method endorsements, this minimum shareholding may reduce the endorsements they wish to hold. Again, it is likely that latent effort holders, and those businesses grossing less than \$10,000 per year, may sell. With 15% of endorsements exiting in five years, this may represent approximately 150 small businesses. However, the effect of business and endorsement level adjustment is cumulative. A 15% adjustment in both business shareholdings and endorsement share holdings is predicted to equate to approximately 20% of businesses exiting the industry. This would equate to 188 businesses exiting through business and endorsement shareholding arrangements. Active effort levels would be monitored in regions. The economic impacts of the move to manage fishing capacity by minimum shareholding can be mitigated in the setting of rates of minimum shareholding. High rates of change in minimum shareholding levels would risk effort levels increasing to pay for adjustment and

stagnation in the share market if sellers outnumber buyers. Mitigation of this may involve financial assistance from government.

Less impacting elements of the draft FMS are assessed, such as net and gear changes, alterations to fish size regulations, changes in crab management arrangements and changes in icing and food safety practices. These have minor impacts in comparison to reallocative consequences of share management arrangements.

The costs and benefits of the major elements of the draft FMS are appraised through an environmental account of the management of the fishery. To the estimate of economic surplus from fishing operations, the subsidised costs of management, research and compliance are added. Any change in the level of stocks is also counted to give a statement of current fishery status under environmental accounting principles. New costs to industry from the FMS and share trading, are estimated and incorporated in the cost benefit analysis.

The fishery has a significant economic deficit at the commencement of the FMS and seeks to move towards economic viability by 2006. Costs to fishers from new management charges and share purchase are substantial as the fishery moves towards full cost recovery in the years 2005 to 2008.

The economic achievement of the objectives of the draft FMS depends on the category 2 shareholding proposal being as effective as envisaged in the plan. This is new territory in fisheries management and fuller economic investigation of share allocation and subsequent monitoring of restructuring is warranted. Mitigation may involve shares being related to an amount of total effort, as opposed to a share of access.

By 2006, changes arising from the FMS will alter industry operations and cost recovery policy will address subsidies, moving towards full cost recovery by 2008. The draft FMS enables this process to occur and monitors the health of stocks underpinning industry and fishery viability. The FMS is a first step towards a more economically sustainable fishery in accordance with ESD principles.

3. Conclusions

This is one of the first economic analyses of a FMS in Australia and is done against a background of little available economic information. The major thrust of the draft FMS is to assist industry to adjust to more economically viable and sustainable harvesting. The analysis of the core costs and benefits of the management plan, indicate that the fishery will be more profitable by 2006-07. However, the level of achievement of the desired draft FMS objectives through the new category 2 share management need to be monitored, as this is a new untested allocation regime. There are significant economic costs and social impacts for industry under the plan, as 150 to 188, of 944 businesses exit the Estuary General Fishery in the 2002-2007 period. Many of these will be small businesses and lessen the regional impact of adjustment due to their low output. The draft FMS should be seen as a significant first step in a longer path towards achieving ESD objectives.

4. Data Requirements in Relation to the Assessment of the Impacts on the Economic Issues

a) Reference to technical data and other information relied upon to assess impacts

The data used in the assessment is from several sources. The catch and effort data is from NSW Fisheries and is logbook data joined with NSW Fisheries licensing data for tables which contain endorsements. Both districts and zones are used for spatial analysis and as districts are less aggregated there may be occasions that fishery activity in an estuary traverses two zones. Effort data at the days fished level is complicated by the logbook system where fishing three methods in one day ends up being records as one day of effort against each of three methods. This limits the potential for accurate production modelling or bio-economic analysis.

A significant issue for fishers is the use of the Sydney price index for price imputation on declared catches. The monthly average price for a species from Sydney Fish Market is multiplied by the declared catch for a species. This enables both fishery wide and individual fisher revenue estimation. There are several cautionary notes in doing this.

Some species such as squid may not have a representative monthly average price. The imputed price will likely be a minimum estimate of the price of species which are in demand. For example seafood such as larger prawns, are unlikely to be sent to Sydney market as local demand is strong at higher prices without commission and freight. In some cases fishers in areas outside Sydney may on occasions receive prices closer to Sydney retail levels for valuable species. Similarly fish with added value capacity, through sashimi grade handling etc, may better the Sydney index and prices for say female mullet in roe in the north of the state may on occasions be several times the Sydney price.

In contrast the estimate of price at first sale does not deduct between 11% and 23% of gross revenue for market and handling expenses. Therefore to a fisher adjacent to Sydney landing to the fish market, the imputation is potentially too high to the extent of marketing fees.

The economic survey asked fishers to declare gross revenue from catch in 1999-00 and this was compared with the predicted Sydney index for each fisher to see the inter-relationship. Preliminary examination suggests the Sydney index may under estimate actual prices in estuary general businesses by between 12% and 21% (preliminary results requiring further validation).

There are also uncertainties in the value of estuary general businesses and endorsement values. Diversity among business packages mean the true value of access is difficult to determine. The move to share management will require examination of the structure of business and endorsement values.

b) Important knowledge gaps

Several gaps are apparent. The major one is the lack of an industry wide profile of the seafood industry in NSW, including processing, wholesaling and the movements and values of seafood in the marketing chain. This would enable an evaluation of the secondary stages of the fish catch including processors, exports, imports and employment derived from the NSW fish resource. It could also extend to retailing.

Multipliers could be estimated and contribute to future assessments. The regional importance of the seafood industry in each region could be evaluated. Part of this could use the Registered Fish Receiver annual renewal forms to include more information on processing activity in relation to the fisheries under management.

Several of the assessment issues involving fishing gear selection require fish length and price relationships for micro evaluation of gear changes - costs and benefits. This requires investigation of the finer scale data potentially available.

Price information outside Sydney needs to be collected on a regional and fishery basis. This is required as several of the future assessment issues such as the optimal harvesting time of prawns will require bio-value models using biological and size and price information for different prawn species during their estuary to sea migrations.

Business values, endorsement values and shares valuation is an area requiring more research. Similarly longer term planning needs to be able to monitor the cost of operations and this could use existing survey information to establish a representative "fishing cost index". This would monitor cost changes for producers and could parallel the Sydney price index for fish revenues.

Economic inter-relationships between fishing communities and within the fishing industry has been briefly addressed in the current social survey and could be augmented through time.

c) Timetable for developing the data sets

Data needs can be addressed in the next five year period through development of a strategy for improving the following data:

- investigation of available price data in respect of fishery valuations and for modelling resource management scenarios such as maximising prawn bio-value through harvesting
- examination of the viability of businesses, business values, endorsement and share values and the basis of share allocation prior to trading. Subsequently, monitoring of share values to ensure industry viability and the achievement of the FMS
- surveying of the economic performance of businesses after the implementation of the plan (year 2-3)
- consider developing a statewide fishing industry economic restructuring model for predicting and appraising fishing business adjustments across fishery administrative divides
- revising the collection of effort data to enable more sensible modelling of catch per unit effort and productivity data. This would involve changing the fishery data logbook system and needs to happen within five years in preparation for long term sustainability issues, including economic modelling and monitoring
- developing an economic profile of the regional fishing and seafood processing industry in NSW. This could include marketing, economic infrastructure and regional benefits. This needs to be progressed by area and in conjunction with social community profiling as a basis for longer term planning.

CHAPTER H. SOCIAL ISSUES

This is the first formal incorporation of a social assessment of a management strategy in the fisheries of NSW. It has been compiled from a limited amount of existing information, augmented by several NSW Fisheries initiatives, including a social survey (Roy Morgan, 2001b).

The following summary is based on the detailed Consultants report prepared by Dominion Consulting Pty Ltd and Umwelt (Australia) Pty Ltd and presented in Appendix CH1 and CH2. The report on social issues is in multiple sections; a review of existing information, an assessment of the draft FMS against the DUAP guidelines, health issues, heritage issues, Indigenous issues and data issues.

1. Existing Information

Existing social data on fishers and their communities is limited to licence data records and was supplemented by obtaining access to ABS data⁷ and through implementing a telephone questionnaire (Roy Morgan, 2001b).

The regional and community location of fishers was identified from licensing data and compared with the ABS data for a range of social indices, at the postcode level. This included local population, unemployment and fisher employment data from the 1996 National census and the SEIFA⁸ index of disadvantage for rural communities (ABS, 1996). The fishing communities tend to focus around key estuaries and towns, though a significant number of fishers reside in smaller communities. More in depth studies of fishing communities is an area for future work. A rapid social assessment telephone survey contacted 502 estuary general fishers with a range of questions relevant to the draft FMS.

Total employment in businesses with an estuary general endorsement, is estimated as between 1,198 and 1,569 persons (full time and part time), though those directly associated with the Estuary General Fishery would be less. Some of the employees are probably in processing and there is no measure of the extent of part time involvement. This requires further studies as recommended.

A demographic profile of fishers was generated describing, age, education levels, marital status and dependent children and relatives. The way of life of estuary general fishers was investigated through questions on working hours in the normal, high and low seasons, and details of industrial injury through fishing. The estuary general fishers were found to be an aged, highly resident population, with substantial fishing experience and strong family involvement with fishing, 53% of fishers having had more than two generations of family in the fishing industry. However, 47% are first generation fishers. Fishers in excess of 60 years of age comprise 20% of all estuary general fishers and a wide range of fishers of all ages are evident in the fishery.

The skill sets of fishers were examined through the social survey and only 100 from 502 (20%) worked outside fishing, 34% of the 100 being capable of working in another occupation full time. Further investigation suggests that up to 25% of the estuary general fisher population could consider working in other industries full time or part time. However, approximately 70% were insistent about

⁷ Thanks to staff of the Social Science Unit, Bureau of Rural Science, Canberra.

⁸ (Social and economic index for areas)

their identity as fishers and were unable, or unwilling, to consider re training. This “physic income” from fishing and problems in mobility of fishers is similar to NSW dairy farmers and a range of issues are discussed. These require future research. Regional unemployment in NSW is higher on the north coast of NSW (14%) and areas outside Sydney, and is a significant issue for older fishers considering alternative employment to fishing.

There is little independent opinion on community perceptions of fishing activities. In a community telephone survey in 1999, there was general concern among a random selection of the population for the well being of the fishery environment and for the need to manage and conserve fish stocks (Roy Morgan, 1999). Other community opinion about fishers, is less formal and is an area requiring development. Much commercial fishing activity is not seen by the public. The community may take the provision of fish by commercial fishers for granted and may not relate environmental management issues to seafood supply.

Recreational fishers are becoming more aware of the commercial fishery and conflict over commercial fishing methods, such as hauling, is common. The draft FMS seeks to reduce the conflict among commercial fishers and between commercial and recreational fishers. The recreational fishing area program is addressing these issues outside the FMS process with unknown impact on the draft FMS.

2. Assessment

The social assessment followed the DUAP guidelines, but as there is no established social impact assessment framework for fishery management plans, an approach was developed from guidelines and available literature. The draft FMS management responses were ranked into high and low impacts: firstly, those socio-economic issues arising from policy changes that could have broad impacts; secondly, issues of social process, where policy changes require these processes to function properly for management to be most effective.

The most highly impacting issues include the changes to zoning, hauling net lengths and to minimum shareholdings, as discussed in the economic assessment. Each of these changes has the capacity to impact many families, local communities and regions, the assessment being able to examine regional and predicted family impacts from available data. Each of the impacts are assessed and mitigation is suggested where applicable.

The major social changes in the plan involve the displacement of between 150-200 fishers, through management cost increases and the implementation of minimum shareholdings. These will probably impact part time and older fishers, as 20% of fishers are over 60 years old. A diverse range of people who are either latent endorsement holders or fishing businesses owners grossing less than \$10,000 per year may also be impacted.

The predicted social impacts assume a 20% displacement of business/fisher numbers over the first five years of the FMS. The numbers of dependants associated with 150-200 typical EG fishers is between 220 and 294. This is an upper estimate, as if older fishers exit the fishery, then the number of dependent children below 16 reduce substantially. Exiting fishers are likely to be low catchers, or have other income sources, if they are currently latent effort. This reduces the proportion of social impact attributable to the exiting of fishers under the draft FMS.

The draft FMS will have different regional community impacts as indicated by the SEIFA index of disadvantage for fishing communities. On implementation of the draft FMS, the most vulnerable estuary general districts are Clarence, Wallis Lake and Far South Coast. Other communities outside Sydney and the Hawkesbury are also potentially disadvantaged to a lesser but significant extent. Social impacts on communities will also depend on the economic responses of fishers to category 2 share management, which will not be uniform. The social impacts of the draft FMS may be mitigated by the rate at which adjustment of minimum shareholdings occurs. The funds from the recreational fishing area process may impact the adjustment process indirectly and to an unknown extent.

Other measures in the draft FMS will require functioning social processes to ensure effective management. Responses involving communication, compliance, codes of conduct and new gear regulation require cooperation between management and industry and a reduction in conflict to make the FMS successful. The draft FMS seeks to reduce conflict among estuary general commercial fishers and between commercial and recreational fishers. This needs to be monitored to ensure the effective implementation of the plan.

3. Conclusions

This is the first social assessment of a FMS in NSW and little previous information. Available data and specially commissioned survey results, are used to describe the fishers and communities in the Estuary General Fishery. It is notable that several rural areas away from Sydney on the north and south coast, are socio-economically disadvantaged and will be less resilient to impacts under the draft FMS.

Most of the social issues arise from reallocation under category 2 share management and will impact fishers, employees, families and communities associated with the existing 188 estuary general businesses. It is predicted that older fishers, businesses earning less than \$10,000 per year and latent effort holders, will be likely to exit, with low levels of regional economic impact, due to the small loss of output associated with these fishers. An estimated 150-200 fishers, with up to 220-294 dependants, will be impacted to differing extents in proportion to their age and income dependence on the Estuary General Fishery.

The social impact will be significant, given the place of fishing among fishers and estuary general fishing communities, and the lack of alternative employment for many fishers. Other social aspects of NSW fishing communities require further research in the next five years. A priority should be to understand fishing communities, as a basis to appraise the impacts of successive fishery plans on a community. This would give greater clarity and reduce the risk of cumulative impacts on communities through a series of different fishery management strategies. The current draft FMS is a first step in moving towards ESD objectives in the management of the Estuary General Fishery.

4. Health Issues

a) Health risks related to the environment

The seafood safety scheme is based on the premise that some species and/or activities represent a potentially higher food safety risk than others. The highest food safety risk is associated with bivalve molluscan shellfish because they can readily accumulate harmful contaminants (bacteria, viruses, algal toxins and heavy metals) from their environment and transmit these to the consumer.

Within the context of the Estuary General Fishery only those engaged in the harvesting of bivalve molluscs need special arrangements. Because of past problems arising from the accumulation of algal biotoxins those engaged in the pipi fishery are already required under NSW Fisheries legislation to have in place biotoxin management plans. Pipi harvesters have grouped themselves (usually geographically) into small collectives each of which has a plan endorsed by NSW Fisheries and audited by an external provider. These plans have, and continue to be, effective in their operation. With the introduction of the seafood safety scheme Regulation responsibility for this sector in terms of food safety will pass to SafeFood. It is anticipated that the food safety programs/plans of pipi harvesters will include similar provisions for biotoxin management.

b) Handling and processing health risks

The activities conducted and species targeted in the Estuary General Fishery pose little in the way of food safety risks, with the few possible exceptions discussed above.

As food producers, the provisions of current NSW food legislation, namely the *Food Act 1989* and the *Food Regulations 2001*, bind participants in the fishery. Vessels are included in the definition of “vehicles” in the *Food Act 1989*. There are no specific provisions relating to seafood specifically in the context of this fishery but general requirements about hygiene and cleanliness, keeping good records and keeping products cool apply to the handling of all foods including fish.

The *Food Production (Seafood Safety Scheme) Regulation 2001* due to be introduced by December 2001 will require all seafood businesses including those in the catching/harvest sector to be licensed with SafeFood Production NSW and prepare a Food Safety Program in respect of their activities.

With respect to the Estuary General Fishery this will apply from the point at which the catch is brought on board the vessel, or in the case of pipis at the point of harvest. Where the same business or individual further processes or handles products on shore (after landing) the Food Safety Program will have to encompass each and all of those other activities.

For most participants who simply catch fish and transport them to land, the basic requirements would already be understood and met since they involve good handling and hygienic practices. However, given the range of scale and sophistication of vessels and businesses engaged in the fishery it is likely that some improvements will need to be made, primarily of a minor nature.

Participants who currently collect from wild sources, other bivalve molluscs such as mussels and cockles, will also be covered by the *Food Production (Seafood Safety Scheme) Regulation* provisions and will be integrated into the shellfish food safety program which is already established for cultured bivalves (i.e. aquaculture permit holders under fisheries legislation).

Essentially the major food safety requirements on all participants in the Estuary General Fishery are keep the catch clean, keep it cold and keep good records. The current level of compliance is largely unknown but with the introduction of the Seafood Safety Scheme all participants will be licensed and subject to audit and inspection.

c) Health risks to fishers

There are a variety of occupational health and safety risks associated with the activity of fishing in the Estuary General Fishery. These are related to the use of machinery, boats, powered winches, etc. Workcover administers the legislation, which controls these activities and protects the workers health. The fishing businesses in the Estuary General Fishery are required by law to operate in a manner consistent with the occupational health and safety (OH&S) legislation. The draft FMS is not required to provide additional specific management responses to OH&S issues.

5. Heritage Issues

The following summary is based on the detailed Consultants report prepared by Umwelt (Australia) Pty Ltd and presented in Appendix CH2.

a) European heritage

European heritage sites reflecting the importance of maritime activities in the past development of NSW are located in many estuaries. The assessment considers potential impacts of estuary general fishing activities on those European heritage sites that are listed in inventories maintained by the NSW Heritage Commission, the National Estate and the Australian Shipwreck register.

Historic heritage has been differentiated between the transport and structural contexts and this differentiation is essentially dictated by the base source(s) or recording database(s) from which data has been derived. The transport context is specifically represented in the record of shipwrecks. The structural environment includes such resources as boatsheds, landing ramps, seawalls, breakwaters, wharves and boat harbours but also includes such developments as structures for oyster culture, groynes and piles, which may have no physical connection to the shoreline.

i) The interaction of commercial fishing with historic heritage resources

The activities associated with the Estuary General Fishery are limited to the use of a variety of netting styles, traps and static and mobile handlines, as well as the manual recovery of some species. The physical and spatial presence of heritage resources within estuaries is likely to have only a marginal interaction with commercial fishing operations. With regard to shipwrecks, it appears likely that commercial fishing will have no impact on residual material evidence, having regard to the likely nature, bulk and mass of any residual material and the potential for sub-surface material to be covered by silt/sand.

It is considered that there is a low risk that estuary general fishing activities will impact on heritage sites although some shipwreck sites may present safety risks to estuary fishers.

b) Aboriginal heritage

There is abundant ethnographic and archaeological evidence for past use of estuaries and beaches by Aboriginal people, and of the importance of resources from these environments to Aboriginal economies and lifestyles.

Known Aboriginal sites are recorded in the NPWS Aboriginal Sites Register, and there are thousands of known sites located on the banks of estuaries or along beaches. Sites are known from the banks of virtually every estuary in NSW, and middens are reported from many beaches (although the distribution of midden sites is heavily influenced by the nature of the beach and dune system). Very few (if any) known Aboriginal sites are located within the channel of estuaries that are used for commercial fishing activity.

i) Interactions between Estuary General Fishery and Aboriginal heritage sites

The draft FMS provides a framework for commercial use of estuarine fish species, and also for commercial harvesting of beach pipis and worms.

Estuary general fishing activities are most unlikely to impact on the stability of estuary banks or beds. The nature of estuary fishing means that although the banks of estuaries are lined with known Aboriginal sites, there is a low risk that sites will be impacted by estuary fishing activity.

There is potential for fishery related activities to impact on Aboriginal sites at restricted locations along estuarine waterways, for instance at boat ramps, and localities that are used for storage and maintenance of equipment. The extent of the risk associated with these activities will vary from one estuary to another, and definition of the risk for an individual estuary will depend heavily on the availability of local knowledge (e.g. provided by discussions with local Aboriginal people and local NPWS officers).

Where potential impacts on Aboriginal sites are known to exist, it is important that they are addressed by liaison and management actions at the local level. This will ensure compliance with the requirements of the NPW Act, and will also enhance co-operation and understanding of cultural concerns.

In general, the physical evidence of past Aboriginal occupation of estuary banks is most severely threatened by land uses other than estuary general fishing. Large midden sites in the Hunter estuary and north coast estuaries were exploited for lime in the nineteenth century, and sometimes also for road base. Many sites have also been destroyed by agricultural land uses, urban and tourist development and some have been destroyed by bank erosion (that may have natural or anthropogenic causes).

In the cases of both Aboriginal sites along the banks of estuaries, and Aboriginal sites along the dunes of ocean beaches, the overall risk that activities authorised by the draft FMS will detrimentally impact on cultural heritage evidence is considered to be low.

ii) Protocols to reduce the risk of harm to sites

Notwithstanding the low risk of impact on Aboriginal cultural heritage, several management actions are proposed to ensure that risks to archaeologically sensitive areas are minimised. These include:

- consultation with local Aboriginal community representatives in relation to any proposed commercial fishery facility that would be located on the bank. This would include maintenance of existing ramps, new launching ramps, wharves and regional boat storage or maintenance sites
- preparation of cultural awareness information for holders of beach pipi and worm authorisations. In particular, these operators should be aware of the nature of pipi and other midden sites along ocean beaches, and that such sites are protected by the NPW Act
- ongoing consultation with local Aboriginal communities about developments in the commercial sector. This will occur, for instance, through Aboriginal representation on regional management advisory committees (MAC).

The following proposals were also included in the draft FMS following stakeholder comment but subsequent to the consultants report:

- an explicit objective within the draft FMS is to minimise any impacts of the fishery on Aboriginal cultural heritage (see objective 4.4)
- consultation with Local Aboriginal Land Councils and review of the Aboriginal Sites Register administered by the NPWS when identifying designated landing sites for hauling nets, to avoid wherever possible hauling onto areas that are known Aboriginal sites.

6. Indigenous Issues

The following summary is based on the detailed Consultants report prepared by Umwelt (Australia) Pty Ltd and presented in Appendix CH2.

It is important to note that there are several other concurrent policy development initiatives by NSW Fisheries that will affect the interaction of Aboriginal fishers with the Estuary General Fishery. In particular, NSW Fisheries is currently working with the Aboriginal community to develop an Indigenous Fisheries Strategy, that will provide a new framework for the management of Indigenous fishing. The information presented in this assessment draws on the work in progress towards the Indigenous Fisheries Strategy, and outlines a process for ongoing review of regulatory relationships, but in no way pre-empts the outcomes of that strategy.

a) Current access of Aboriginal communities to estuary fishery resources

Commercial fishing has existed in NSW estuaries since the mid nineteenth century. Commercial fishing operations commences around Sydney then moved to more remote estuaries early in the twentieth century. Thus, the interaction of traditional Aboriginal fishing activity in estuaries (and shell fishing on beaches) with the commercial estuary sector spans approximately 150 years in the Sydney area, and 100 years elsewhere on the NSW coast. In many Aboriginal communities, at least some members held general commercial fishing licences, and participated in the commercial sector, as well as fishing to support family and friends.

From the late nineteenth century, a number of estuaries (or parts of estuaries) were closed to commercial fishing, generally to conserve or to allow the regeneration of fish stocks. Traditional Aboriginal fishers would have continued to have access to the aquatic resources of these waterways during periods of commercial closure.

Since the mid 1980s, a number of new regulations have been introduced by NSW Fisheries. The broad objective of these regulations was to enhance the efficiency of the commercial fishery, and introduce greater control over fishing effort and impact. The number of Aboriginal people who are licensed as commercial fishers in the Estuary General Fishery and the relative scale of their fishing effort, is not known.

The introduction of greater regulation in the Estuary General Fishery from the mid 1980s had several unintended consequences in relation to the access of Aboriginal communities to the estuary fishery. The impacts of the regulations continue to be of concern to Aboriginal fishers.

b) Management of Indigenous fishing and Estuary General Fishery interactions

Outstanding issues of concern to coastal Aboriginal communities

The level of Aboriginal participation in the commercial fishery sector (based on interview data) appears to have declined substantially over the last twenty years. There are now perhaps less than fifteen active fishing licences (estuary general and beach haul) held by Aboriginal families along the coast. However, the lack of commercial participation is not an indication of declining Indigenous participation in fishing generally. There are four main categories of outstanding issues of concern to

the Aboriginal community in relation to their participation in the management of fisheries in NSW (NSW Fisheries, 2000) and each of these is also relevant to the impact of the draft FMS on Aboriginal communities:

- lack of recognition and accommodation of traditional Indigenous fishing practices
- declining participation of Aboriginal people in commercial, recreational and aquaculture fisheries
- insufficient meaningful presence and participation of Aboriginal people in the process for managing and conserving fisheries resources
- need for better communication and consultation with Aboriginal people.

Actions to address Aboriginal concerns in the draft FMS

The draft FMS identifies Indigenous people as stakeholders in the Estuary General Fishery, noting that these interests arise from:

- direct participation in the fishery as commercial fishers
- traditional fishing practices, whereby people catch fish on behalf of themselves and their community
- lodging native title claims over estuarine areas that are used for commercial fishing.

Existing legislation does not currently recognise Indigenous fishers as a separate sector of the fishing population, and this is a large part of the reason, that none of the legislative reviews to date have given extensive consideration to Aboriginal community concerns.

The draft FMS does not specifically address the Aboriginal community's view that the evolution of the fisheries legislation in NSW has gradually but consistently undervalued the interests of Aboriginal people in the estuary fishery. The draft strategy does, however, foreshadow future amendments to the strategy to better accommodate Aboriginal community interests. For instance, objective 4.1 aims to monitor and provide an appropriate allocation of the fisheries resource between fishing sector groups.

In the draft FMS the performance indicator listed for appropriate sharing of the Estuary General Fishery resource is the catch level (including estimates) of the commercial, recreational and Indigenous fishing sectors. A trigger point for review is noted as a shift of relative catch levels of 25% between sectors over the term of the strategy.

It is important to note that such a shift in relative catch is unlikely to occur without significant changes to policies affecting access to the resource.

Towards a NSW Indigenous Fisheries Strategy

NSW Fisheries has recognised that coastal Aboriginal communities have long standing and legitimate interests in the fishery resources of estuaries, as well as pipis and beach worms. The NSW Government now also acknowledges that Indigenous community interests in the estuary fishery are contemporary and do not relate only to past history. The traditional access of Aboriginal communities to natural resources has been restricted by existing fisheries management policies and legislation.

A recent working paper prepared by NSW Fisheries (2000) indicates that consultation is progressing about how best to recognise and accommodate the rights and interests of Aboriginal

people in the estuary fishery and other commercial fisheries. The working paper is part of the process for the development of an Indigenous Fisheries Strategy for NSW.

Interaction of the draft FMS and the Indigenous Fisheries Strategy

The time frame for the finalisation of the Indigenous Fisheries Strategy is not clear, and there are many complex issues to be resolved before a sustainable strategy is agreed by the stakeholders. It is most probable that the draft FMS will be assessed and will commence before negotiations about the Indigenous Fisheries Strategy are complete.

The preliminary indications are that the Indigenous Fisheries Strategy will address many of the issues that remain as outstanding concerns to the Aboriginal community in relation to the Estuary General Fishery. It is also possible that the strategy will include a staged series of actions to gradually improve Indigenous access to the natural resources of estuaries and other fisheries, so that any necessary changes to the draft FMS will also be gradual.

Ongoing review of the FMS will be essential to ensure that changes in the policy approach to Indigenous fisheries are adopted within the FMS. It is proposed that the FMS should be reviewed in two years, with particular attention to ensuring consistency between any Indigenous Fisheries Strategy that exists at that time, and the management protocols contained in the FMS.

c) Summary

As noted above, the risk of impacts on Aboriginal sites from Estuary General Fishery activities is considered to be low at the whole of industry level, although specific local issues will need careful management.

Many of the concerns of Aboriginal communities about the impact of current commercial fishery regulations on their livelihoods and lifestyles are being addressed through the partnership with NSW Fisheries to develop an Indigenous Fisheries Strategy. However, this process may take some time, both to finalise to the satisfaction of all stakeholders, and to implement through changes to other strategies and legislation.

7. Data Requirements in Relation to the Assessment of the Impacts on the Social Issues

a) Reference to technical data and other information

Prior to this study there was little social information on commercial fishers in NSW. The survey data comes from a rapid social appraisal questionnaire executed by a telephone survey, which is a first step towards the incorporation of social information in the management of fishers in NSW. The survey is not a definitive social profiling exercise. Given the complexity of the fisheries production inter relationships, multiple communities and political climate among industry members facing significant allocation issues, the survey sought to gain a rapid over view of social issues raised under the draft FMS.

The survey revealed some inconsistencies in answers involving fisher income and these have been investigated by matching with the available Sydney price index information and preliminary results from the economic survey. There are some occasions in which the absence of a fisher submitting a catch return in the required time period will give inconsistent results.

b) Important knowledge gaps

The social profile of estuary general fishers can be augmented through time by further studies. Regional analysis of fisher communities is a priority integrating with economic information on the importance of the fishing activity to the community infrastructure of towns in NSW. Other approaches examine expenditures by businesses, employees, and examines employee residential locations and social infrastructure services and existing social networks (Fenton and Marshall, 2001). Future social survey work should address community structure and inter-relationships at a regional level and articulate with regional economic studies previously recommended in Chapter G. This could be developed to monitor community impacts through all the fishery management strategies being developed in the next few years.

c) Timetable for developing the data sets

More comprehensive social profiles and regional analysis should be undertaken in the next five years to assist in monitoring the impacts of adjustment and in preparation for appraisal of future management strategies. The survey information recently obtained can have existing NSW Fisheries data added to it for analysis, but has a limited shelf life.

More complete regional industry and fishing community studies need to be undertaken recognising that communities can be impacted through the implementation of multiple fisheries management strategies. In time it is desirable for the fishing community profile and characteristics to be more clearly identified. This would enable impacts from different FMSs to be monitored. In the longer term repeating social impact assessments for each fishery FMS risks ending up as a piecemeal and duplicative process if progress is not made in more fundamental fishery community profiling and monitoring in the next five years.