



Assessment of the
Exmouth Gulf Prawn Fishery

**Marine and Water Division
Environment Australia**

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This document is an assessment carried out by Environment Australia of a commercial fishery against the Commonwealth's Guidelines for the Ecologically Sustainable Management of Fisheries. It forms part of the advice provided to the Minister for the Environment and Heritage on the fishery in relation to decisions under Part 13A of the EPBC. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Commonwealth Government.

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**Assessment of the ecological sustainability of management arrangements for the Exmouth
Gulf Prawn Fishery**

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EXECUTIVE SUMMARY

Background

The Department of Fisheries Western Australia (DFWA) has submitted a document addressing the *Guidelines for the ecologically sustainable management of fisheries* for assessment under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The draft *Application to Environment Australia for the Exmouth Gulf Prawn Fishery* (the submission) was released for public comment on 7 May 2002. The public comment period ended on 7 June 2002 with six submissions received. DFWA responded to the comments in a letter to Environment Australia (EA) dated 5 August 2002. No changes were made to the submission as a result of public comment.

This document reports on the assessment of the Exmouth Gulf Prawn Fishery against the Commonwealth *Guidelines for the ecologically sustainable management of fisheries*.

Table 1: Summary of Exmouth Gulf Prawn Fishery

Area	Exmouth Gulf in Western Australia
Fishery status	The two target species are fully exploited
Target Species	Western king prawns (<i>Penaeus latisulcatus</i>) Brown tiger prawns (<i>Penaeus esculentus</i>)
Byproduct Species	Not limited. Predominantly endeavour prawns, banana prawns and coral prawns. Other species retained include bugs, cobia, cod, crabs, mackerel, NW snapper and shark. Small amounts of squid, cuttlefish, tuna and some species of finfish also retained.
Gear	Otter trawl gear: regulations allow twin gear, although all vessels currently trialing 4.5 fathom quad gear, ground chain limited to 10mm.
Season	200 nights fished each year Fishery generally open April to November
Commercial harvest 2001	670 tonnes (comprising four primary prawn species)
Value of 2001 commercial harvest (including byproducts):	\$10 million
Indigenous harvest	No significant indigenous take.
Recreational harvest	No significant recreational take
Commercial licences issued	13 boats licensed to operate in the fishery since 2000 season
Management arrangements Commercial	Mainly input controlled through: limited entry, boat and gear restrictions, and spatial and temporal closures. No quota.
Export	Major markets for Australian tiger prawns are Japan and Taiwan. Australia, Europe, United States of America and Taiwan are the major markets for western king prawns. Endeavour prawns are mainly sold in Australia and New Zealand.
Bycatch	Various, predominantly small finfish, sponges and some invertebrates.
Interaction with Threatened Species	Seasnakes – occasionally caught and generally returned alive Syngnathids – approx 1 per night caught across entire fleet Turtles – very few reported captures, returned alive

The Exmouth Gulf Prawn (EGP) Fishery operates in waters in and to the north of Exmouth Gulf, located on the west coast of Western Australia (WA). The principle fishing area does not extend to Commonwealth waters.

The fishery targets both western king prawns (*Penaeus latisulcatus*) and brown tiger prawns (*Penaeus esculentus*). There is no limit to the quantity or species that may be taken as byproduct by the fishery. The fishery currently retains a catch of endeavour prawns (*Metapenaeus endeavouri*) and banana prawns (*Penaeus merguensis*), as well as a number of other byproduct species including coral prawns, blue swimmer crabs, squid, cuttlefish, sharks, bugs, cobia, cods, mackerel, nor-west snapper and a small amount of shells and small fish. The Specimen Shell and Marine Aquarium Fish Managed Fisheries and the WA Shark Fishery Management Plan also cover the Exmouth Gulf area. These fisheries will be considered in separate assessments.

Harvested in several trawl fisheries throughout their range, the two target *Penaeus* species are widely distributed in Australian waters. The brown tiger prawn is found in significant numbers along the northern coast of Australia, from WA to southern Queensland. Western king prawns have been found from waters off South Australia around the coast to WA, Northern Territory, Queensland and as far south as northern New South Wales¹. The DFWA submission states that genetic differences have been identified between western king prawn populations and although no genetic differences were detected between brown tiger prawn populations it is thought they operate as functionally independent stocks. Both of these species are relatively short-lived with current harvesting operations rarely catching individuals over two years of age.

Tiger and king prawns are typically associated with hard sand or sandy mud substrate in their adult phase. Prawn species are highly fecund and these two species release between 50,000 and 700,000 eggs per spawning. They are prey to a variety of species, especially during their larval stages but do not constitute the sole food source for any one predator species¹.

Endeavour prawns are distributed from Shark Bay in WA, across northern Australia to New South Wales, with a high degree of genetic isolation between populations. Adult endeavour prawns live primarily over sandy or muddy substrates and are generally found inshore of the main fishing grounds in the EGP fishery.

Banana prawns are more wide spread with a distribution throughout the Indo-West Pacific region and South China Sea to northern Australia, where they are found from Shark Bay WA, across northern Australia to Tweed River in northern New South Wales. The banana prawn generally inhabits low energy coastlines as an adult and is known to aggregate in high numbers forming a "boil" on the surface. Predation by sharks and finfish on the banana prawn is high¹.

Rainfall in the area is extremely low, which has provided a stable hydrological environment, altered occasionally by cyclones. The south-eastern and eastern regions of the Gulf are hypersaline nursery areas for the resident tiger prawn stock.

The EGP is the second largest prawn fishery in WA. Initially targeting banana prawns the fishery began in 1963 with a catch of 68 tonnes. The expansion of the fishery over the next decade led to a shift in target species to the western king prawn and brown tiger prawn. The 2001 season comprised a catch of 670t valued at \$10 million.

There are currently 13 boats licensed to operate within the fishery, 12 of which are owned by one operator. The vessels primarily tow two standard otter trawl nets, although over the past three seasons the operators in the fishery have been permitted to trial the use of quad gear. There are restrictions on the length of the trawl net headrope, mesh size, and the size of the trawl otter boards and ground chains. The fleet is currently trialing bycatch reduction devices (BRDs) and the use of BRDs in the form of large object excluder and finfish excluders will be introduced in 2003/04.

¹ Kailola et al. 1993

Approximately five vessels in the fishery have a ‘well’ sorting system on board allowing the catch to remain in the water for an extended period, thus maximising the survival of discarded species.

As in most trawl fisheries, bycatch to target ratios are high, with a large variety of species caught. An ESD workshop, involving Government agencies, industry and a broad range of stakeholders, completed a risk analysis for bycatch and byproduct species. Protected species interactions include the capture of syngnathids, seasnakes, flatback turtles, loggerhead turtles and green turtles. An assessment of these interactions is discussed under Principle Two of this report.

The EGP fishery is primarily an input controlled fishery that utilises management tools including limited entry, boat size and gear controls and seasonal and spatial closures. The fishery is generally closed between November and April to allow rejuvenation of the stock. Temporal closures include full moon closures and the variable opening and closing of zones within the fishery. A large nursery area permanently closed to fishing that extends up the eastern side of the Gulf, combined with limited permitted areas and untrawlable areas, leaves only 35% of Exmouth Gulf available to trawling. The submission states that the fishery is managed under a “constant escapement policy”, designed to leave a minimum level of prawn spawning stock during their breeding season to maximise recruitment levels the following year.

The fishery is currently managed under the *Exmouth Gulf Prawn Management Plan 1989*, a formal statutory document that dictates the management measures for the fishery. The Exmouth Gulf Prawn Management Advisory Committee (EGPMAC) also provides advice on management of the fishery. Legislative framework is provided by the *Fish Resources Management Act, 1994* (FRMA). In addition, an Ecologically Sustainable Development (ESD) workshop was held to conduct a risk assessment of the fishery. The outcomes of this workshop are presented in a report submitted with the application. Indicators, performance measures, actions and monitoring requirements contained in the report have been fundamental considerations during the EA assessment.

Overall assessment

The material submitted by DFWA indicates that the fishery operates in accordance with the Commonwealth *Guidelines for the ecologically sustainable management of fisheries*. EA concurs that the EGP Fishery is a well managed fishery that is unlikely to have an unacceptable or unsustainable impact on the environment in the short to mid term. Recommendations have been developed to ensure that the risk of impact is minimised in the longer term. Overall, the sophisticated management regime of real time monitoring, spatial and temporal closures based on spawning stock, data collection systems and defined acceptable catch ranges suggests that the fishery is being managed in an ecologically sustainable way.

In making this assessment, EA is satisfied that the information collection system, risk assessments, management arrangements and objectives are sufficient to ensure the fishery is conducted in a manner that does not lead to overfishing and that stocks are not currently overfished. Considering the research programs and management arrangements in place, EA is satisfied that fishing operations are managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem. Management of this fishery has a history of reacting appropriately to threats to sustainability and EA is confident that DFWA will continue to provide this high quality management.

The assessment concludes that the fishery is managed in an ecologically sustainable way. EA recommends that the export of species taken in the fishery should be exempt from export permit requirements of Part 13A of the EPBC Act, with that exemption to be reviewed in five years.

To further strengthen the effectiveness of the management arrangements for the EGP Fishery, and to contain the environmental risks in the medium to long term, a series of recommendations have been developed. The implementation of these recommendations and other commitments made by DFWA in the submission, will be monitored and reviewed as part of the next Commonwealth review of the fishery in five years time.

Recommendations

1. The ESD report, including all performance measures, responses and information requirements, should be formally incorporated into the management regime and decision making process within one year, with a clear timeframe for implementation.
2. The ESD report should be amended to incorporate time frames for all management responses to breaches of performance measures.
3. A mechanism should be developed to enable the amendment of management arrangements to respond to new information, or future Government plans and policies.
4. EA should be informed of any changes to the management plan or managerial commitments in the ESD report.
5. Opportunity should be provided to conservation, community and recreational fishing interests to participate in the processes of the main advisory body to the WA Fisheries Minister for this fishery. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.
6. Permitted byproduct should be limited to species currently harvested with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.
7. DFWA should participate in any cross-jurisdictional activities regarding relevant target and byproduct species, including squid.
8. Ongoing monitoring should be implemented sufficient to identify long-term trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.
9. The importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle should be considered when applying the results of the biodiversity research to management arrangements.
10. All protected species interactions by commercial operations should be reported and coupled with an education program to ensure industry has the capacity to make accurate reports.

PART I - MANAGEMENT ARRANGEMENTS

The Exmouth Gulf Prawn Fishery (EGP) is managed by the Department of Fisheries Western Australia (DFWA). Management of the fishery is governed by the following publicly available documents:

- The *Exmouth Gulf Prawn Management Plan 1989*;
- The *WA Fisheries Resources Management Act 1994*;
- The *WA Fisheries Resources Management Regulations 1995*; and
- Relevant Gazetted notices and licence conditions.

There are a number of other documents, including the Ecologically Sustainable Development (ESD) report for the EGP Fishery, research reports, scientific literature and discussion papers, which are relevant to the management of the fishery.

Further information on the fishery and its performance can be found in the following reports:

- The State of the Fisheries Report (annual);
- The Annual report to the Auditor General; and
- Other irregular reports - including the application to Environment Australia (EA).

A stakeholder risk assessment workshop, involving industry, government, recreational/regional group, non-government environmental groups and invited specialists, developed the Ecologically Sustainable Development (ESD) report for the fishery. The report is to be reviewed every 5 years and specifies performance indicators, measures and management responses to address issues when required.

The ESD report is yet to be finalised and is not currently a formal component of the legislative arrangement for the fishery. Nevertheless, the submission indicated that these rules and requirements will be implemented in the fishery to ensure the fishery management regime remains strategic and capable of detecting and addressing unacceptable impacts of the fishing activity. The report contains some triggers for action should performance measures not be met, however, timeframes for the implementation of these actions are not incorporated. To ensure that required action is taken in a timely manner EA recommends that these timeframes be clarified in the ESD report. EA further recommends that the contents of this report be formally linked to legislative arrangements for the fishery.

The Exmouth Gulf Prawn Management Advisory Committee (EGPMAC), designed to provide information on matters related to the protection and management of the fishery, comprises of an independent Chairperson, two Departmental representatives and commercial prawn fishers. The ESD report, which will be reviewed every five years, was developed with participation from industry, government, recreational/regional groups, non-governmental environmental groups and invited specialists. DFWA have indicated to EA that this workshop will be repeated at the five year review of the ESD report. A fishery management regime should be developed through a consultative process providing opportunity for all interested and affected parties to participate. If the stakeholder workshop is not repeated at the five year review, then DFWA will need to ensure that this consultation occurs through other fora. This is also a requirement of the State fisheries legislation and EA is confident that DFWA will continue to ensure interested parties are consulted with appropriately.

Management of the fishery is through the combination of a number of input controls including:

- A small number of vessels (13) and a limited entry fishery;
- Fixed seasonal closures (November to April);
- Real time monitoring of fleet dynamics and operations by departmental staff;

- Variable temporal spatial closures (areas closed or open depending upon catch rates and sizes of prawns);
- Permanent prawn nursery area closure;
- Time closures (including full moon closures and limits on day trawling); and
- Input controls on gear and vessel equipment (eg. a 375 boat unit rule).

The introduction of Vessel Monitoring System (VMS) to the fishery in 2002 will increase the compliance capacity of the fishery, which currently involves a mix of sea and land patrols, radar watches and aerial surveillance. VMS will enable the Department to monitor a vessel's location, speed and direction, which will allow for particular attention to be paid to the surveillance of nursery areas. The submission states that due to the commercial success of the fishery and the existence of only two licence holders, operators are somewhat risk averse and inclined to a very conservative approach of managing the fishery. In the 2000 fishing season, the EGP fleet did not receive any offence or infringement notices.

There is an annual review of the performance of the major aspects of the EGP fishery through the completion of the "State of the Fisheries" report published by DFWA. Future management will involve the review of some input controls including the 375 boat hull unit rule, which specifies that vessels do not exceed 375 boat units, a combination of hull dimensions and engine power. DFWA are developing facilities so they can also use VMS data in the calculation of the spatial extent of the trawling and the area swept and for the validation of spatial catch data.

The management regime allows for a substantial level of information collection within the fishery. Data is collected through a combination of fishery dependent and fishery independent systems, some of which have been in place since the commencement of the fishery. A long series of catch and effort information has been provided both through Catch and Effort Statistics System (CAESS) and voluntary daily logbooks submitted on a monthly basis, with a 100% participation rate by fishers. The value of accurate information is reinforced through regular feedback and consultation with industry, and estimates are validated using processor unload records. Information collection in the fishery is discussed further in Part 2 of this report.

Fishery independent spawning and recruitment surveys are each conducted by DFWA three times a year to determine the spawning abundance and recruitment of tiger prawns. An observer program is being conducted in the fishery as part of the program of implementation of BRDs. The program commenced in 2000 and records the quantity of various types of catch taken including commercial catch, byproduct and bycatch. EA looks forward to the results of this study and its application in the fishery.

An analysis of the fishery's ability to assess, monitor and avoid, remedy or mitigate any adverse impacts on the wider ecosystem in which the target species lives and the fishery operates is covered under Principle Two of this report.

The current management arrangements require compliance with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. However, there is no provision in the management plan or ESD report that requires amendment of management practices to comply with future plans. Although DFWA has demonstrated in the past their capacity and willingness to modify arrangements when required, EA recommends that a mechanism be developed to enable the amendment of management arrangements in response to new information or Government plans and policies.

Conclusion

Management arrangements in the WA EGP fishery are reasonably precautionary. DFWA has demonstrated its commitment to the ecologically sustainable management of the fishery by conducting a stakeholder risk assessment workshop and developing the ESD report. The fishery has a history of adaptive management arrangements where required to address impacts of the fishery, an example of which is the subsequent recovery of stock due to managements response to the severe decline in tiger prawn stock in the early 1980's. EA is confident that, using the ESD report as a guide, DFWA will continue to manage the fishery to reasonable levels of precaution in the next five years.

The detailed and explicit management triggers, decision rules and performance measures included in the ESD report are recognised as important to the ecological management of this fishery. Many of the triggers contained in the ESD report require specified actions to address the breach of a performance measure. No time-frames are included for the implementation of these actions. EA recommends that the ESD report should be amended to incorporate time frames for all management responses to breaches of performance measures.

Currently the ESD report is simply a guiding document that has no legislative basis. While EA is satisfied that this will not cause issues in the fishery in the short term, it is recommended the performance measures, management responses and actions contained in the ESD report be formally incorporated into the management regime and decision making process.

The EGPMAC is the body responsible for providing information and advice to the WA Minister for Fisheries on matters related to the protection and management of the fishery. This body currently consists of an independent chair, industry and DFWA officers. EA considers that other interests and stakeholders should also participate in the processes of the main advisory committee for a fishery. This issue was also raised in public comment submissions. DFWA responded to these comments stating that one new trawl MAC to represent the Shark Bay Scallop, Shark Bay Prawn and Exmouth Gulf Prawn fisheries will be established and will include a member with community sector experience and a member with conservation sector expertise. No timeframe was provided for the establishment of a joint Trawl MAC.

EA considers that in addition to representation from the interest groups proposed, participation should also be sought from recreational fishers. EA therefore recommends that DFWA ensure that the processes of the main advisory body to the WA Fisheries Minister for this fishery include participation from conservation, community and recreational fishing interests. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.

The submission is silent on specific actions and requirements in the fishery related to the prevention of marine pollution from vessels, however DFWA has informed EA that they undertake annual inspections of all vessels for seaworthiness. The ESD workshop concluded that air and water quality issues are of insignificant risk to require a managerial response or a justification within the report. EA recognises that the low number of operators could be expected to contribute minimal pollution to air and water in the region, however, DFWA should be prepared to demonstrate how the fishery actively minimises air and water pollution.

While EA considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions, the ESD report and Management Plan have been important consideration in EA's assessment of the fishery. Amendment of either of these could change the outcome of our assessment. Therefore, EA recommends that DFWA inform EA of any changes to the management plan or managerial commitments in the ESD report.

The current management arrangements for the EGP fishery do not require the amendment of management practices to comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies in the future. EA recommends that a mechanism be developed to enable the amendment of management arrangements to respond to new information, or future Government plans and policies.

Recommendations

- The ESD report, including all performance measures, responses and information requirements, should be formally incorporated into the management regime and decision making process within one year, with a clear timeframe for implementation.
- The ESD report should be amended to incorporate time frames for all management responses to breaches of performance measures.
- A mechanism should be developed to enable the amendment of management arrangements to respond to new information, or future Government plans and policies.
- EA should be informed of any changes to the management plan or managerial commitments in the ESD report.
- Opportunity should be provided to conservation, community and recreational fishing interests to participate in the processes of the main advisory body to the WA Fisheries Minister for this fishery. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

Principle 1: *“A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover”*

Maintain ecologically viable stocks

Objective 1: *“The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability”*

Information requirements

There is a significant amount of both fishery dependent and fishery independent information being collected in the EGP fishery. Fishery dependent data is collected through voluntary daily log sheets, completed by 100% of fishers, reporting hours fished, areas of operation and estimated catch per trawl. Data from the logbooks is verified using processor unload records. There is also a statutory license requirement to submit monthly returns indicating level of catch and effort.

Two commercial boats are used to collect fishery-independent data to gauge the level of tiger prawn recruitment during March and April each year, and to determine the level of tiger prawn spawning stock during August, September and October each year. EA considers the current level of information and data collection occurring in Exmouth Gulf demonstrates the fishery’s commitment to the maintenance of acceptable target stock levels. In EA’s opinion the dependent and independent surveys provide an adequate amount of data to give a reasonable estimate of the stock levels and short term viability.

The CAESS (Catch and Effort Statistics System) and limited field observations have provided some information on the level and nature of bycatch in the fishery. Two Fisheries Research and Development Corporation (FRDC) funded programs currently taking place in the region will provide additional information on bycatch and byproduct species in the fishery. These programs are discussed under Principle Two of this report.

Assessment

The catch of target species is monitored throughout the fishing season through both fishery dependent and independent data collection, while the spawning stock levels and recruitment are closely monitored in the fishery independent surveys. This information is publicly available in the annual State of the Fisheries report.

There is a long time series of catch and effort information for the fishery. This history has enabled a reliable estimate of sustainable yield to be calculated for the fishery. EA is satisfied that DFWA is capable of ensuring assessments of the dynamics and status of the fishery are robust and capable of identifying any reduction in biological diversity and reproductive capacity.

The distribution and spatial structure of both target species is well understood. The prawn stocks in the EGP are considered to be functionally separate to other regions where fishing for these species occurs.

The combination of fisher’s monthly returns, processor unload records, voluntary daily logbooks and onboard observer data is thought to provide reliable estimates of all removals. As there is no significant recreational or indigenous take in the fishery, and minimal likelihood of a significant level of illegal capture, only commercial data is required to estimate total removals. The assessment

of spawning biomass is supported by indices of recruitment and spawning stock with respect to the accepted stock-recruitment relationship.

In the early 1980s the tiger prawn stock in Exmouth Gulf suffered a severe decline in recruitment and subsequently catch as a result of overfishing. Since the introduction of a suite of management measures to combat the decline, tiger prawn stocks have continued to show improvements. Tiger prawn catch is now achieving levels caught in the 1970s.

The spawning area has been closed to fishing, both before and during the critical spawning period, since 1982. Fishery independent surveys of the breeding grounds have been conducted since this time. The survey catch rate of tiger prawn spawning stock should be above 8-10 kg/standardised hr (equates to 16 kg/hr by current twin gear rigs and 19 kg/hr for quad rigs). Once the threshold catch rate is reached tiger prawn spawning areas are closed for the remainder of the season to ensure protection of adequate remaining stock, or temporary closures of certain fishery zones may be triggered. If the results of the spawning stock survey are below an average of 19 kg/hr (quad gear equivalent) then the catch rate that closes the fishery may be increased in the following season.

The major constraints on the fishery are designed to protect the tiger prawn stocks. The constant escapement policy for tiger prawns in place in the fishery ensures that the spawning biomass does not fall below the minimum level and provides a robust way of determining annual yield. EA considers the use of this constant escapement policy to be a highly reliable method of ensuring fishing does not exceed the potential productivity of the stock. The acceptable annual catch range of tiger prawns has been determined to be 205-682 tonnes.

King prawn catch has been closely related to effort levels and has stayed within the acceptable range for the fishery over the last 10 years. Current stock recruitment studies indicate that the king prawn stock remains at a point where recruitment is not affected by the residual stock biomass. As the king prawns are a more robust species in this environment, no stock recruitment relationship has been identified for the king prawn stock. An acceptable annual catch range has been generated from historical catches as 350-500 tonnes annually.

Acceptable annual catch ranges have also been set for primary byproduct species including endeavour prawns (120-300 tonnes), banana prawns (only targeted in years of significant rainfall when acceptable range is 10-60 tonnes) and coral prawns (20-100 tonnes). The DFWA State of the Fisheries Report 2000/2001 states that banana prawn catch in 2000 was 62 tonnes. DFWA have clarified that as a result of this breach a review was conducted which concluded the high catch was a result of environmental influences and the impacts of fishing were not significant.

Deviation outside an acceptable catch range triggers a review of the fishery. If the review concludes the fishery is impacting unacceptably on the stock, the ESD report specifies several actions that must be taken to address the impact. As discussed in Part One of this report, there are no timeframes specified in the report in which the action must be implemented. EA recognises that DFWA has a history of implementing action in this fishery when required, however we recommend that the appropriate timeframes be clarified in the ESD report.

Management response

This fishery is multi-species, where primary and secondary target species have overlapping habitats but different capture rates and spawning strategies. The submission states that management must ensure that fishing for one species does not jeopardise the sustainability of the other. In doing this, the fishery has established a catch rate trigger for the most susceptible species, the tiger prawn, and acceptable ranges for the five types of prawns taken.

The submission states that management arrangements try to optimise not maximise catch. The ESD report specifies review and response requirements should the acceptable catch ranges be breached, with possible responses including further spatial and/or temporal responses.

In addition to the acceptable catch ranges, closures in separate zones or the whole fishery are triggered when monitoring detects tiger prawn catch rates of less than 19 kg/hr (quad gear equivalent). The submission states that tiger prawns are far more susceptible to overfishing than the other prawn species of this fishery. Therefore, by implementing a reference point for tiger prawns, the other species will be protected at levels higher than their own biological bottom line. EA is confident that these reference points and consequent management actions are appropriate to ensure viable stock levels in the short to mid term.

The EGP fishery is managed through a combination of input controls as detailed in Part 1 of this report. Real time monitoring in the fishery is achieved through the use of voluntary daily logbooks and compulsory monthly returns. These measures assist the fishery to implement temporal and spatial closures when catch ranges or rates are breached. The real time monitoring was demonstrated to be effective in the 2000 season where a series of spatial closures and openings were employed during the season to optimise the long-term yield of the fishery and the catch of larger prawns, while protecting breeding stocks.

In addition to the spatial closures throughout the season, full moon closures are also implemented in the fishery. Since the 1999 season, moon closures have been changed from the standard three-day period to between three and five days over the full moon. A nursery area in the shallow eastern and southern sectors, accounting for 28% of the licensed area, is permanently closed to trawling. These closures ensure that only 35% of the licensed fishery area is trawled, which equates to 30% of the target species habitat.

EA is satisfied that the combination of the above input controls and the application of acceptable ranges will ensure adequate protection of the target stocks. As there is no significant recreational or indigenous take of the target species, EA is satisfied that these management strategies are capable of controlling the total level of take of primary species stocks in Exmouth Gulf.

Over the past three seasons operators in the fishery have been granted permission to trial the use of quad gear. The submission states that while there may be a small increase in fleet efficiency with quad gear, the impact of this will be offset by the reduction in vessels actually fishing. The introduction of quad gear resulted in the removal of two boats from the fishery for the 2000 season. In addition the fleet headrope length was adjusted to ensure previous effort levels were not exceeded. It is intended, depending on the results of the trial, that the Plan will be formally amended to allow for the use of quad gear within the EGP fishery on a permanent basis. In establishing actions to take when performance limits are exceeded, the submission has considered the possible future increase in efficiency of the fleet and has incorporated appropriate strategies to cope with this.

The submission states that management strategies are constantly being reviewed to ensure adequate spawning stock levels remain. DFWA recognises that changes in the efficiency of the fishing fleet and effort must be monitored carefully, to ensure that spawning stocks are not over-exploited. EA is confident that any increase in fishing power will be managed effectively to ensure that it will not impact the fishery resources to unacceptable levels in the short to mid term.

The ESD workshop assessed the risk to byproduct species and concluded the risk to banana, endeavour and coral prawns was sufficient to require ongoing monitoring. An acceptable catch

range has been identified for these species and catches are monitored through logbooks and processor unload records. Other species currently taken as byproduct include:

- Blue swimmer crab (av. catch 17t);
- Squid (average catch 13t);
- Cuttlefish (average catch 1t);
- Sharks (average catch 5t);
- Bugs (2000 catch 642kg);
- Cobia;
- Cods;
- Mackerel;
- Nor-west snapper; and
- Small amounts of shells and small fish

The management of shark and shell and marine aquarium fish will be covered in separate fishery assessments.

EA notes this fishery does not have a list of permitted byproduct, therefore any species may be retained if the operators are able to find a market. Although DFWA has a demonstrated history of adaptive management and reviews the risk assessment every five years, EA believes that unacceptable levels of damage could be caused during that period if markets were to shift. EA believes it is important that management has the ability to monitor and manage shifts in the catch of a fishery. EA recommends that permitted byproduct be limited to species currently harvested with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.

Ideally management arrangements affecting a single stock should be under a single jurisdiction or at least complementary across jurisdictions. EA is satisfied that the majority of species retained in this fishery are fundamentally independent within WA waters. However, concerns were raised in the Northern Fisheries Managers meeting in Darwin in September 2002 that increasing fishing pressure and opportunistic targeting of squid in fisheries around the coast could significantly affect the status of this shared stock. Squid are taken at an average of 13 tonnes per year in this fishery. The submission claims this level of take is negligible due to the small and isolated catch in comparison with the extensive population size and distribution of squid along the WA coastline. EA recognises that this fishery currently harvests comparably small amounts of squid. However, due to the potential for this take to increase and the cumulative impact of squid harvesting in the numerous fisheries along the coast, EA believes it would be beneficial, for both the squid stocks and WA governance, for DFWA to participate in any cross-jurisdictional actions to address shared stock issues. EA therefore recommends that DFWA commit to participate in any cross-jurisdictional activities regarding squid. This is a concern applicable to all target and byproduct species that may be affected by cross-jurisdictional issues.

Conclusion

EA is satisfied that the information collection system and stock management arrangements are sufficient to maintain ecologically viable stock levels in the short to mid term, and believe the regime is capable of controlling the level of take from the fishery.

The use of real-time monitoring and a series of temporary and permanent spatial closures gives EA confidence that viable stock levels will be maintained in the fishery. EA considers these closures an effective way of ensuring stock escapement and protection of juveniles from the fishery.

As mentioned above, there are currently a number of studies on biodiversity and habitat structure in the fishery, as well as distribution of the species concerned. EA would like to highlight the importance of the completion of these programs and the incorporation of their results in to the current management measures. These studies played a fundamental part in the assessment of this fishery and it is crucial for the sustainable management of a fishery that bycatch and byproduct species populations are maintained, and that the fishery does not threaten their viability.

The potential to threaten stocks of byproduct species should be managed by limiting the species that can be taken. This will prevent changes in fishing practices due to operators targeting species currently not considered as target species when market shifts encourage them to do so. A robust system to manage the addition and removal of species from this list should also be developed and implemented to ensure that sustainable harvest of these species is still able to occur. As discussed above, this should be coupled with the implementation of suitable catch triggers, management responses and timeframes for required action.

Concerns regarding cross-jurisdictional management of squid species may not currently be a priority for this fishery. However, EA considers that as squid are taken in several fisheries it would be beneficial to governance and environmental concerns if DFWA were to be involved in any action to address these cross-jurisdictional concerns. The benefits of participating in such discussions and responses would also benefit all other target and byproduct species whose stock may be shared with other jurisdictions.

Recommendations

- Permitted byproduct should be limited to species currently harvested with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.
- DFWA should participate in any cross-jurisdictional activities regarding relevant target and byproduct species, including squid.

Promote recovery to ecologically viable stock levels

Objective 2: *“Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes”*

This objective is not applicable to the fishery at present. Trigger points and management responses are in place to ensure that the risk of overfishing any of the target stocks remains negligible. In the early 1980s the tiger prawn stock in Exmouth Gulf suffered a severe decline in recruitment and subsequently catch. With the introduction of tight management restrictions at the time the stock has recovered and catch has been within the acceptable range since the late 1980s, excluding the 2000 season.

In 1999 cyclone Vance crossed the Exmouth Gulf resulting in dramatic variations in the prawn catches. The low seagrass and tiger prawn survival in the fishery coupled with management controls designed to ensure sufficient tiger prawns spawning stock remain and the early closure of tiger prawn grounds resulted in significantly reduced catches in the 2000 season. This example demonstrates the ability of EGP management to effectively monitor and manage stock levels in the

fishery. EA recognises this and considers the current management arrangements adequate for promoting the recovery of stock levels in the event that significant declines in stock are detected.

Ecosystem impacts

Principle 2: *“Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem”*

Bycatch protection

Objective 1: *“The fishery is conducted in a manner that does not threaten bycatch species”*

Information requirements

There is no generic bycatch reporting and as a result limited information exists on the level and nature of bycatch in the EGP fishery, both currently and historically. The current information is contained in the very limited logbook data on declared non-target catch in the fishery, and from limited independent field observations, usually of large individuals such as turtles or sharks. The submission indicates that the voluntary daily logbooks record hours fished, areas of operation and estimated catch per trawl.

An observer program, comparing the quantity of various types of catch taken by the control net, to that taken by the net fitted with a Bycatch Reduction Device (BRD), commenced in the EGP fishery as part of the implementation of BRDs in the fishery. The FRDC funded program commenced in 2000 and is due to be completed in 2002. It is anticipated that the program will assist the fishery in collecting additional information on bycatch and byproduct species.

In addition to observers collecting data on commercial vessels during normal fishing operations, experimental trials have also been conducted on various excluder grid types in the fishery. Both large object excluders and finfish excluders are being trialed in the fishery. Large object excluders will be mandatory in all nets by 2003, and finfish excluders will be in all nets by 2004.

DFWA has also begun preliminary work on a biodiversity survey explicitly examining the impact that the fishery may be having on bycatch species. This study will analyse the distribution of fish and invertebrates caught by trawl gear both within and outside the trawled areas to determine if these species do occur across substantial areas closed to commercial trawling. This study will also examine the relevance of having reference sites.

An additional FRDC funded program looking at the inshore fish assemblages of the Pilbara and Kimberley coasts, will assist the fishery managers in further understanding the bycatch and byproduct species in the area.

While DFWA has demonstrated a commitment to increasing the current knowledge on bycatch in the EGP fishery, the current proposals are finite projects conducted over a relatively short time. These projects will provide valuable information, however the ongoing monitoring of bycatch levels and species composition is necessary to identify long term trends in the fishery. EA recommends that DFWA develop methods of ongoing monitoring, sufficient to identify long-term comparative trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.

Assessment

The submission states that in the EGP fishery the ratio of discards to retained species is about 2-5:1 (weight in terms of small fish, invertebrates and sponges), approximately 70-80% of which is small finfish.

A formal risk assessment of bycatch species was conducted at the stakeholder ESD workshop. The assessment concluded that the fishery poses a negligible risk to discarded fish and invertebrates. An analysis of the risk to individual discarded fish species, using the same criteria developed and applied by Stobutzki et al. (2000) in the Northern Prawn Fishery, was undertaken in Shark Bay Prawn Fishery where the species composition is thought to be similar to that of the EGP. The analysis found that the risk associated with fish bycatch was minor. The submission states that a relatively low amount of discards are generated from this fishery and the introduction of BRDs, such as square mesh panels in the net, will further reduce the amount of small fish caught.

EA regards the ESD process as a robust approach to risk assessment. The completion and implementation of the previously mentioned studies and the introduction of ongoing monitoring will be important for validating the ESD assessment and assist its performance as a management tool. EA advises DFWA to review the performance limits and suitability of current management arrangements as the monitoring data becomes available.

Management response

The submission states that the impact on all species in Exmouth Gulf is reduced as a result of the small proportion of the Exmouth Gulf in which the fishery operates and the limited closure of the fishery between November and April. It is unknown whether bycatch species also inhabit the untrawled areas of Exmouth Gulf although, as stated previously, programs are underway to further knowledge of bycatch species, composition and distribution. A performance measure of the ESD report is that the major species of bycatch are found in significant numbers outside of the trawled areas. Should the studies discussed above indicate that this measure is not met, strategies such as expanding area closures or further modifications to trawl gear will be implemented.

In completing these studies EA would like to advise DFWA to reassess current management plans in light of the new information. Bycatch species are of particular importance to the ecosystem in any marine environment and their population status should be carefully monitored. In ensuring that bycatch species maintain viable populations within Exmouth Gulf, EA recommends that DFWA take into consideration habitats and specific areas important to all lifecycle stages of bycatch species when incorporating biodiversity results in management arrangements.

By 2003 all nets will have a BRD and by 2004 FEDs will be required in the nets. The survival of bycatch species that escape through BRDs is still largely uncertain in most, if not all, trawl fisheries in Australia. Reducing the catch landed on the vessel of some species does not necessarily equate to an equivalent reduction in fishing mortality of that species. Current technology and competing priorities limits the extent to which researchers can assess these reductions in a single fishery. This is a significant issue in a number of fisheries and EA considers it should be a priority for large scale research in the future.

Approximately five vessels in the fishery are using a 'well' sorting system often called a 'hopper'. Due to the expense of these tools it is not expected that the entire fleet will be refitted in the near future. While it is recognised that the implementation of this system across the fleet is not probable due to economic limits, EA encourages the use of the system as evidence suggests it increases the survivability of bycatch species.

Although the fishery started out day-trawling for banana prawns, the fishery is now a night-only fishery, with a minor exception. In times of significant rain, night trawls can be traded for day trawls to specifically target the banana prawn stocks. Banning daylight trawling can reduce the catch of many bycatch species that are far less active at night and also maximises the yield of target

species that are more active at night, such as tiger prawns. The fishery also has several closures during full moon periods.

A draft bycatch action plan, outlining the proposals to deal with these issues, was due to be released for comment in 2002. EA looks forward to viewing this document on completion.

Conclusion

EA is satisfied that DFWA are implementing programs to increase the information on bycatch in the fishery, and that the risks of the fishery's impact on bycatch species has been assessed. Management measures are in place to avoid the capture and mortality of bycatch species and progressive steps are being taken to further reduce the impact.

There is limited existing information on the level and composition of bycatch in the EGP fishery. While the previously mentioned programs will greatly improve the knowledge of bycatch in the fishery, it is important that the results be incorporated in the management arrangements.

The ongoing program of data collection on bycatch species and composition will better inform future management and validate the results of the ESD assessment. EA therefore recommends that DFWA implement a method of ongoing monitoring sufficient to identify comparative long-term trends in bycatch between fished and unfished areas.

The studies outlined in the submission are an important step in obtaining ecologically sustainable management practices in the fishery and were thus fundamental in the assessment of the fishery. EA therefore highlights the importance of completing these projects and implementing these results in the management measures of the EGP fishery. The submission states that the risks associated with bycatch will be reassessed at the next major review of the fishery, which will occur within five years. Having stated in the submission that the proposed data gathering projects will be completed in the next five years, EA expects that the results of these studies will be considered during this review. To further minimise the threat to bycatch species, EA recommends that DFWA should consider the importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle when applying the results of the biodiversity research to management arrangements.

As the ESD report does not include timetables to implement management responses to performance measure breaches, there is less confidence that the overall fishery is conducted in a manner that does not threaten bycatch species. This is a generic concern that EA has with all management responses in the ESD report and it has been addressed as a recommendation earlier in this report.

Recommendation

- Ongoing monitoring should be implemented sufficient to identify long-term trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.
- The importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle should be considered when applying the results of the biodiversity research to management arrangements.

Protected species and threatened ecological community protection

Objective 2: *“The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities”*

Information requirements

The information on interaction with protected species in the fishery is currently limited to a small amount of data contained in the logbook comments section and from fishery-independent field observations during research surveys. The submission asserts that the logbook recording mechanism is a robust fishery dependent method of gathering information. EA recommends that all protected species interactions by commercial operations should be reported and be coupled with an education program to ensure industry has the capacity to make accurate reports. This data should be validated against observer records to ensure that accurate information is used when monitoring levels of interaction and assessing the impact of the fishery on those species.

One of the biggest barriers to successful commercial reporting of protected species interactions is the capacity of the fishers to identify the species involved. In addition, many operators may not be aware of the importance of reporting for the species involved. Both of these barriers can be reduced through education programs and opportunistic advice from observers and researchers. EA suggests that an education program on the importance of protected species reporting and identification be run in conjunction with the introduction of logbook reporting to increase the value of this approach.

The fishery is currently collecting information to further the knowledge on protected species interaction through the FRDC funded program on the implementation of BRDs. This program will collect additional information on bycatch and byproduct species, and will greatly improve the information levels for the fishery.

Assessment

The risks the fishery poses to protected species were assessed during the ESD workshop and have been discussed in the ESD report. In the ‘capture’ category the analysis concluded that there was a negligible risk to seasnakes, leatherback turtles, green turtles, flatback turtles and hawksbill turtles, with syngnathids and loggerhead turtles getting a low risk rating. In terms of ‘interaction but no capture’ leatherback, green, flatback and hawksbill turtles rated a negligible risk, while loggerhead turtles, dugongs and cetaceans rated as low.

The negligible risk rating given to syngnathids is a result of the low numbers caught in Exmouth Gulf and trawling occurring only in areas that are unfavourable to syngnathids. Seasnakes are only occasionally caught in Exmouth Gulf trawlers, are thought to have a high survival rate and are not known to be vulnerable in the area. Low and negligible risk ratings for turtle species were given as a result of a number of factors including the very low numbers of reported catches and interactions in the area.

The impact of the addition of discarded fish to the waters of Exmouth Gulf was rated as low in the ESD report. The submission accepts that discarded fish has the potential to affect the feeding behaviour of some species through the water column and the surface, with some seabird populations thought to have been affected as a result of the discards from the fishery.

EA believes the results of current projects and the introduction of ongoing monitoring will assist with the confirmation of these findings. EA advises DFWA to review the performance limits and suitability of current management arrangements as more data becomes available.

Management response

All nets will be fitted with BRD grids by the beginning of the 2003 season, and by 2004 FEDs will be required in all nets. As a result of this introduction DFWA expects that the quantity and likelihood of protected species captures will be minimised. Although the exact details of the devices to be implemented have yet to be developed, EA is confident that the period of gear trials and observer surveys will identify the most appropriate devices for this fishery.

The grids used to minimise turtle catch in this fishery currently consist of bars with spacing of 200mm. DFWA advises EA that during observer surveys since 1998 in the Shark Bay Prawn fishery, no turtles were caught in any of the nets which had BRD grids fitted. The use of these grids is also believed to reduce discarded fish and therefore the provisioning of dolphins, sharks and seabirds. The use of 200mm bar spacing differs from grid devices used in other trawl fisheries in Australia. As a result EA supports rigorous testing and ongoing trials and research to improve the effectiveness of such devices to ensure they are appropriate to meet the objective.

As previously mentioned, DFWA intend to conduct research surveys to identify the composition and distribution of species within and outside trawled grounds. This survey is expected to assist in identifying whether the current management responses addressing protected species are sufficient and appropriate.

The actual trawled area is approximately 35% of the licensed area. The submission states that combined with the use of BRDs, these measures allow sufficient refuge for protected species that are at risk from the fishery. As previously discussed, EA agrees with the theory that representative closures implemented throughout a fishery increase the fishery's ability to retain viable stock levels and populations of protected species.

Conclusion

There are no threatened ecological communities associated with the EGP fishery and therefore these provisions in the Guidelines are not applicable.

The risks to protected species have been assessed through the ESD risk rating process and are monitored through fishery independent surveys and potentially through the voluntary logbooks. EA would like to emphasize the importance of monitoring and managing the impact of fishing on protected species and strongly encourages the reporting of species interactions in the fishery. EA therefore recommends that commercial reporting to the relevant State Department of all protected species interactions should occur and be coupled with an education program to ensure industry have the capacity to make accurate reports. While improving the reliability of data, the introduction of logbook reporting of protected species will also validate results of the risk assessment and strengthen the outcomes of fishery independent data.

Although minimal information on protected species information in the EGP is available, EA believes that the current initiatives of DFWA will significantly add to the current knowledge. EA is satisfied that the fishery is generally conducted in a manner that attempts to minimise and avoid death or injuries to protected species, however this system could be strengthened to minimise the risk of unacceptable impact even further through the implementation of the previously mentioned recommendation regarding ongoing monitoring of bycatch and the following recommendation.

Recommendation

- All protected species interactions by commercial operations should be reported and coupled with an education program to ensure industry has the capacity to make accurate reports.

Minimising ecological impacts of fishing operations

Objective 3: *“The fishery is conducted in a manner that minimises the impact of fishing operations on the ecosystem generally”*

Information requirements

A range of data has been collected in the EGP Fishery through both fishery dependent and fishery independent surveys, many of which have been in place for decades. These data include catch and effort, environmental flows, climatic variations, and sediment and habitat classification. The submission states that in cases where the level of information is insufficient, projects being conducted and the use of GIS should provide additional information and enable a more informed decision to be made. The FRDC funded programs will provide information on species distribution throughout Exmouth Gulf.

Assessment

The ESD workshop analysed the risks to general ecosystem components. This assessment will be reviewed every five years. The assessment identified negligible risk to coral/sponge and macro-algal habitat due to them being largely separated from the trawled area on a geographical and depth basis. The impact to mud/shell habitat was identified as a low risk, as <40% of the mud/shell habitat in Exmouth Gulf is trawled. Benthic habitats are thought to be at low risk due to the small percentage being trawled and the area of equivalent, trawlable habitat in the bioregion that is thought to be much larger than the Exmouth Gulf area and is void of trawling activity.

The ESD workshop found the impact of taking byproduct species on trophic interactions to be negligible, while the impact of taking prawns and all retained and non-retained species are established as low. The ESD report also stated that negligible risk is posed to the ecosystem by translocation and turbidity, while discarding fish rated a low risk.

As the risk to the environment from marine and air pollution from fishing operations was considered negligible, the submission is silent on current monitoring, assessment and management arrangements of such impacts. EA is satisfied that the risk assessment workshop was robust enough to ensure short to mid-term risks were identified and addressed. We are confident the DFWA will continue to consider such impacts in their management of the fishery and its impacts.

Concerns were raised during the public comment period that the information used to assess these risks at the workshop was sparse and largely uncertain and that therefore the conclusions were inaccurate. The DFWA response outlined the precaution that was used when utilising the available data. EA concurs with DFWA that in cases where it is impossible to obtain comprehensive information on which to base a decision, that a risk assessment implemented in a precautionary way can provide a suitable decision making system and guide. EA has made several recommendations in this report aiming to improve the information system used when conducting risk assessments.

Management response

The management methods used to maintain significant levels of prawns and byproduct species, assist with minimising the impact of the fishery on the broader ecosystem. The fishery currently trawls only 35% of the licensed habitat in Exmouth Gulf. The trawl grounds have been contracting over the past decade due to direct management and reduction in overall effort levels. The ESD report contains a performance measure that no more than 40% of the mud/shell habitat of Exmouth Gulf will be available for trawling.

With the proposal of future studies, for which funding has been secured, to be conducted on the different habitats within Exmouth Gulf and the introduction of the VMS in 2002, further information will be generated allowing a more accurate assessment of these issues. The submission

states that there is scope to redraw some of the boundaries where trawling will not be allowed to ensure the continuation of habitats, such as the sponge gardens, in Exmouth Gulf. Bottom-opening varieties of BRDs are being trialed given the occurrence of heavy rocks and sponges on the trawl grounds.

As discussed previously in this report, the use of BRDs, spatial closures and restrictions on fishing gear aim to reduce the impact of fishing operations on the benthic environment and on the ecosystem generally. Using a ground chain no larger than 10mm helps to minimise these impacts.

A tiger prawn stock enhancement project is currently being undertaken in Exmouth Gulf by FRDC, CSIRO and DFWA. The project aims to both increase and stabilise catches, ensuring continuous market supply from the fishery². Initial stages are complete, with the next step, experimental release, predicted to take place in mid 2004. EA believe that stock enhancement should not be used as a surrogate for fisheries management. While this is not necessarily the case in this fishery and a detailed project plan has been demonstrated, EA advises extreme caution be taken in the introduction of stock enhancement to any fishery.

Stock enhancement projects raise a number of concerns in relation to the ecological impact on the area. These issues include impacts on the genetic diversity of stocks, habitat disturbance and possible disease or pest introduction. A full risk assessment looking at these and other issues should be an integral part of the project implementation. It should be noted that the release of species into the wild that cannot be contained within State waters may constitute an action under s.23(2) of the EPBC Act. This report is not assessing the stock enhancement project and EA advises DFWA to ensure that the implications of the project have been fully explored and dealt with in a comprehensive manner.

EA strongly encourages a precautionary approach be taken to the introduction of stock enhancement in the fishery and asks that DFWA advises EA of progress with the project.

Conclusion

The potential to impact unacceptably and unsustainably on the environment is generally quite high in trawl fisheries. DFWA has conducted a risk assessment of these issues in this fishery and has implemented actions to address areas of significant concern.

EA is satisfied that the fishery is conducted in a manner that minimises the impact of fishing on the ecosystem generally in the short to mid-term. EA is satisfied that actions are in place to ensure that mid to long-term risks will be identified in the next five years and all significant issues will be addressed at the next review of the ESD report.

Further actions to strengthen current management of this fishery have been recommended previously in this report. EA is confident that these new actions will contribute to ensuring this objective is met.

² R&D news, April 2002

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Acronym List

BRD	Bycatch Reduction Device
CSIRO	Commonwealth Scientific & Industrial Research Organisation
DFWA	Department of Fisheries, Western Australia
EA	Environment Australia
EGP	Exmouth Gulf Prawn
EGPMAC	Exmouth Gulf Prawn Management Advisory Committee
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESD	ecologically sustainable development
FED	Finfish Excluder Device
FRDC	Fisheries Research and Development Corporation
TED	Turtle Exclusion Device
VMS	Vessel Monitoring System
WA	Western Australia