



Australian Government

Department of the Environment and Heritage

Assessment of the
Western Australian Temperate Shark Fisheries

February 2006

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Disclaimer

This document is an assessment carried out by the Department of the Environment and Heritage of a commercial fishery against the Australian Government *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 Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Australian Government.

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Assessment of the ecological sustainability of management arrangements for the Western Australian Temperate Shark Fisheries

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
Background	4
Overall assessment	9
Conditions:	10
PART I - MANAGEMENT ARRANGEMENTS	12
Conclusion	14
PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES	15
STOCK STATUS AND RECOVERY	15
<i>Maintain ecologically viable stocks</i>	15
Information requirements	15
Assessment	16
Management response	17
Conclusion	18
<i>Promote recovery to ecologically viable stock levels</i>	18
Conclusion	19
ECOSYSTEM IMPACTS	20
<i>Bycatch protection</i>	20
Information requirements	20
Assessment	20
Management response	20
Conclusion	20
<i>Protected species and threatened ecological community protection</i>	21
Information requirements	21
Management response	22
Conclusion	22
<i>Minimising ecological impacts of fishing operations</i>	22
Information requirements	22
Assessment	23
Management response	23
Conclusion	23
REFERENCES	24
LIST OF ACRONYMS	25

EXECUTIVE SUMMARY

Background

The Department of Fisheries Western Australia (DFWA) has submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document *Application to the Australian Government Department of the Environment and Heritage on the Western Australian Temperate Shark Fisheries* (the submission) was received by the Department of the Environment and Heritage (DEH) in December 2005. The submission was released for a thirty-day public comment period that expired on 16 January 2006. Three public comments were received. DFWA provided a response to the issues raised. No changes were made to the submission as a result of public comment.

The submission reports on the Joint Authority Southern Demersal Gillnet and Longline Managed Fishery (JASDGLMF) and the West Coast Demersal Gillnet and Longline Interim Managed Fishery (WCDGLMF), (together known as the Western Australian Temperate Shark Fisheries (WATSF)) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries* (the Guidelines). The DEH assessment considers the submission, associated documents, public comments and DFWA's response to the comments.

Table 1: Summary of the WATSF

Area	<u>West Coast Demersal Gillnet and Longline Interim Managed Fishery</u> : 26°S and 33°S on the west coast of Western Australia. <u>Joint Authority Southern Demersal Gillnet and Longline Managed Fishery</u> : 33°S and 129°E longitude.
Fishery status	Dusky whaler and whiskery sharks overfished. Gummy sharks fully exploited. Sandbar sharks overfished. Other sharks and rays unknown. Scalefish unknown, thought to be underfished.
Target Species	Sharks and rays primarily juvenile dusky whaler sharks (<i>Carcharhinus obscurus</i>), gummy shark (<i>Mustelus antarcticus</i>), whiskery shark (<i>Furgaleus macki</i>) and sandbar shark (<i>Carcharhinus plumbeus</i>). Schools sharks are taken in the eastern area of the JASDGLMF.
Byproduct Species	“Secondary species” include smooth hammerhead (<i>Sphyrna zygaena</i>), wobbegongs (family Orectolobidae), spinner shark (<i>Carcharhinus brevipinna</i>), Rays (order Batoidea). Scalefish are also taken, dhufish, pink snapper, Samson fish and sweetlip emperor dominate the scalefish catch of the west coast fishery while queen snapper and blue groper dominate the JASDGLMF.
Gear	Majority of vessels use demersally set monofilament gillnets. The use of Demersal longlines is also permitted but not usually used. An increasing interest in moving to longlines has occurred.
Season	Year round, however a two month closure in the WCDGLMF and the JASDGLMF west of Albany will be implemented in 2006.

Commercial harvest 2002/03	<p>Shark harvest: combined take of 1244 tonnes comprised of:</p> <table border="1" data-bbox="683 188 1453 416"> <thead> <tr> <th>Species</th> <th>JASDGDLF</th> <th>WCDGDLF</th> </tr> </thead> <tbody> <tr> <td>Dusky whaler</td> <td>182 t</td> <td>95 t</td> </tr> <tr> <td>Gummy shark</td> <td>380 t</td> <td>27 t</td> </tr> <tr> <td>Whiskery shark</td> <td>133 t</td> <td>30 t</td> </tr> <tr> <td>Sandbar shark</td> <td>30 t</td> <td>134 t</td> </tr> <tr> <td>Other shark</td> <td>150 t</td> <td>83 t</td> </tr> </tbody> </table> <p>Scalefish harvest: JASDGDLF: 129 t (primarily Queen snapper, blue groper, dhufish, pink snapper and “other” scalefish) WCDGDLF: 87 t (primarily dhufish, pink snapper, Samson fish, sweetlip emperor and “other” scalefish)</p>	Species	JASDGDLF	WCDGDLF	Dusky whaler	182 t	95 t	Gummy shark	380 t	27 t	Whiskery shark	133 t	30 t	Sandbar shark	30 t	134 t	Other shark	150 t	83 t
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Value of commercial harvest 2002/03	\$5.5 million.																		
Recreational harvest	<p>Estimated take (between Augusta and Kalbarri) was 3700 sharks with a further 3500 released. Estimated weight of shark harvest in the west coast is approximately 15-20 t (likely to have increased).</p>																		
Commercial licences issued	<p>JASDGDLF: 57 licences. WCDGDLF: 26 licences.</p>																		
Management arrangements	<p><u>Management arrangements to date:</u> JASDGDLF:</p> <ul style="list-style-type: none"> • Gear limitations: gillnets must have a mesh size greater than 114 mm but not less than 162.5 mm, must be set “wholly or partly in continuous or intermittent contact with the seabed”, must have attached surface floats and, time gear units, in any one reported month, do not correspond to a total entitlement in excess of 8240 m of gillnet. • Gear limitations: longlines must be set “wholly or partly in continuous or intermittent contact with the seabed”, and time gear units must not correspond, in any one reported month, to a total entitlement in excess of 2800 hooks. <p>Additional conditions may be placed on licences in relation to the type of gear permitted, mesh size, gear unit entitlements, zone or zones in which the licence may operate. Longline and gillnets are not permitted to be used at the same time.</p> <p>WCDGDMF:</p> <ul style="list-style-type: none"> • Gear limitations: Unless otherwise specified on permit conditions, demersal gillnets with a mesh size less than 175 mm are not permitted. • Similarly, unless otherwise specified, gillnets must not have a depth exceeding 20 meshes. • Gear limitations: longlines must have attached surface floats of 200 mm. <p>Additional licence conditions may apply in relation to areas fished. Also, demersal gillnets or demersal longlines used in the Fishery must be removed from the water at least once a day.</p>																		

	<p>Management controls for both fisheries have recently undergone review (prior to review minimal controls in place). Changes scheduled for implementation in January 2006 and June 2006 and include:</p> <p>January 2006:</p> <ul style="list-style-type: none"> • Prohibition on the use of wire trace in any fishery (apart from the mackerel fishery and the tropical shark fishery) • Prohibition on the use of longline outside of shark fisheries • New longline gear restrictions: Controls on configurations of longlines and prohibition on the use of wire trace, hook size controls, materials used and branch line length controls • Implementation of a maximum size for dusky sharks • Revision of anti-filleting regulations, increased penalties for filleting and black marketing of shark product. Tightening of the anti filleting regulations to cover both sharks and rays • Prohibition on the use of hooks on Demersal gillnets or other static gear associated with Demersal gillnet fishing • Amendment to shark and sawfish definitions in regulations • Commercially protected fish status for sharks and rays (with exceptions apart from on the harvest of sawfish of the genus <i>Pristis</i>) <p>June 2006:</p> <ul style="list-style-type: none"> • Closure to targeted shark fishing between North West Cape and Broome • Closure to fishing in the west coast fishery and the western part of the JASDGLDF from 16 August to 15 October • Implementation of Vessel Monitoring System (VMS) to measure time consumption and time area closures. • Effort controls to bring the fisheries back to 2001/2002 effort levels and conversion of time unit for effort measurement from months to days • Management response for future reduction
Export	Exported after processing to Asian markets.
Bycatch	Considered low due to a large number of species considered as target or secondary species.
Interaction with Threatened Species	Medium to high levels of interactions. Possible interactions include Great white sharks, Grey nurse sharks, turtles, cetaceans, billfish (commercially protected under the Western Australian (WA) <i>Fish Resources Management Act 1994</i> (FRMA), pinnepeds and seabirds.

The JASDGLMF and the WCDGLMF abut each other at 33°S latitude on the west coast of Australia. The WCDGLMF lies between 26°S and 33°S on the west coast, while the JASDGLMF lies between 33°S and 129°E longitude. Part of the fishery area is in Commonwealth waters, however the entire fishery is managed by Western Australia under an Offshore Constitutional Settlement (OSC) between the Commonwealth Government and the Government of Western Australia.

The WATSF targets a range of shark species including whiskery, gummy, school, sandbar and juvenile dusky sharks. A range of scalefish species, including dhufish, pink snapper, queen snapper, blue groper and sweetlip emperor are also taken. Secondary species include a range of other shark and ray species including wobbegongs, smooth hammerheads, spinner sharks and rays.

Due to the large number of shark and teleost species harvested in the fishery, it is not possible to include detailed biological details on each species harvested. The submission includes a range of information on the key target species as well as reference to detailed scientific reports on shark species. A number of details however are important to note. Shark species generally are slow growing, long lived and have a low fecundity - so require strict management controls, (lacking to date in this fishery), to ensure sustainability of harvest. Additionally, gummy sharks, thought to be endemic to Australian waters, require special management. There is a lack of scientific knowledge on shark species generally and therefore any harvest should be precautionary.

Approximately 1244 tonnes of shark and over 300 tonnes of teleost scalefish were harvested in the WATSF in 2002/03. The value of the fisheries in 2004 was \$5.5 million. Commercial shark fishing began in WA in 1941 with a single operator primarily targeting gummy sharks. During the late 1940s and early 1950s the fishery expanded across Albany, Fremantle and Geraldton and effort increased steadily. The fisheries originally focussed on the local market, however an increased demand for fins led to an increase in the export of fins to Asian markets.

In response to a large increase in fishing effort and accompanying fall in catch, a management plan was introduced for the fishery in 1988. At this time the JASDGLMF was split into four zones and entry was restricted to fishers who could show a historical use of the stock. Effort was limited by the allocation of time/gear units of entitlement. Currently there is only one active licence in zones 3 and 4.

Mechanically powered hauling gear north of 33°S was prohibited in July 1989 by an amendment to the Western Australian *Fisheries Act* 1995, which limited gillnets and longline access to the west coast. An interim management plan was introduced in 1997 for the WCDGLMF resulting in similar management arrangements being put in place for both the JASDGLMF and the WCDGLMF.

In the late 1990's a series of effort reductions was put in place to assist the recovery of whiskery and gummy sharks. These measures however had limited success, as latent effort was activated in the fishery.

A major review of the management of the fisheries was instigated in 2003 in response to dramatic increases in demersal longline fishing and strong evidence of a significant decline in dusky shark stocks. A stock assessment of Sandbar sharks in 2004 revealed that this species too was in significant danger of overfishing.

The interim plan for the fishery expired in May 2006 to allow the completion of the recent review of management measures. All new management arrangements were to be put in place by June 2006.

The fishery is currently managed using effort controls in the form of time/gear units, with each unit allowing a net length of 540 metres or 180 longline hooks.

While WATSF endorsements permit the use of demersal longlines, the majority of vessels use demersally set monofilament gillnets. A small number of vessels have been using longline gear and this method has been used recently in the northern part of the WCDGLMF to effectively target larger sharks for their fins. Interest in moving to longlines has been widespread. DFWA states that measures have been put in place to reduce the effectiveness of longlining gear in targeting larger sharks.

Detailed information on gear structure is available in the submission. Table One provides a detailed description of current management as well as proposed changes to management arrangements for implementation in January and June 2006.

Direct information on bycatch in the fishery is limited, however the WA Status of the Fisheries Report 2003-2004 states that “There is some discarded bycatch of unsaleable species of sharks, rays and scalefish.” The report further states that the Ecological Risk Assessment carried out for the fishery in 2002, all impacts on bycatch species are considered to be low.

Interactions with protected species under the Commonwealth EPBC Act occur on a regular basis in these fisheries. A number of species are at risk of entanglement in nets or longline equipment including Great white sharks, grey nurse sharks, turtles, cetaceans and pinnepeds. A low risk is also present for seabirds and billfish, which are listed under the WA FRMA. These interactions are assessed in more detail under Principle Two of this report.

Significant recreational and indigenous harvest of sharks and scalefish occurs in this fishery. Limited management measures are in place to control this harvest, however there is very limited compliance and enforcement activities to enforce such measures.

The fishery is managed under the Western Australian *Fish Resources Management Regulations 1995* (FRMR) in force under the Western Australian FRMA. The WATSF are currently being managed under interim management plans while the management arrangements for each fishery is reviewed. Biomass targets and trigger points have been established in the fishery, however the *Status Report for the Southern and West Coast Demersal and Demersal Longline Fisheries and Northern Shark Fisheries* recommends that biomass targets be reviewed to more “appropriate levels”. DEH notes that previous trigger points set for the fishery have been ineffective, given that the majority of them were significantly breached – some by up to approximately 45%, without timely management response.

New management arrangements, inclusive of new effort restrictions, are due to be implemented by June 2006. Management arrangements are discussed in more detail in Part II of this report.

Overall assessment

The material submitted by DFWA demonstrates that, with the implementation of new management controls in the fishery, and DFWA agreement to the implementation of a number of stringent conditions, the management arrangements for the JASDGDLMF and the WCDGDLF adequately meet the requirements of the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*.

The management measures currently in place do not adequately mitigate identified risks including:

- Declining catch rates over the history of the fishery;
- Overfished and fully exploited status of the majority of the target shark species;
- Lack of management response to breaches of trigger limits by up to 45%;
- The absence of catch limits such as total allowable commercial catch;
- Inadequate information on critical elements of the target species biology;
- Inadequate management response to available information;
- Lack of performance measures, objectives or trigger limits (that lead to a management response); and
- Significant and ongoing interactions with protected species.

The operation of the fishery, with the implementation of DEH conditions, is consistent with Part 13A of the EPBC Act. The fishery is being managed in an ecologically sustainable manner and environmental risks have, or will be, minimised or managed in a way which would give confidence in the recovery of overfished stocks and the sustainable management of target species not already overfished.

DEH considers that the fishery is not detrimental to the survival and conservation status of the taxon to which it relates in the short term. DEH therefore recommends that this fishery be placed on a short term Wildlife Trade Operation (WTO) approval for a period of 12 months, while improved management arrangements are put into place and the conditions developed by DEH are implemented.

As the official fishery area encompasses Commonwealth as well as State waters, consideration under Part 13 of the EPBC Act is required regarding the impact of the fishery on listed threatened species, listed migratory species, cetaceans and listed marine species.

Protected species occurring in the fishery area include marine turtles, seals, seabirds, cetaceans, great white sharks and grey nurse sharks. While only a small number of interactions with turtles, seabirds, seals and cetaceans have been reported, a high level of interaction with protected sharks has occurred in the past. No adequate protection for these species is currently provided, however this will be remedied through the conditions imposed on the WATSF. There are no listed threatened ecological communities in the fishery area.

DEH considers that the management regimes for the JASDGDLMF and the WCDGDLF should be declared an accredited management plan under Sections 208A, 222A, 245 and 265 of the EPBC Act. In making this judgement, DEH considers that the fishery to which the regime relates does not adversely affect the survival in nature of listed threatened species or population of that species, or the conservation status of a listed migratory species, cetacean species or listed marine species or a population of any of those species. DEH also considers that, once conditions are implemented, the management regime will require that all reasonable steps are taken to avoid the killing or injuring of protected species. On this basis, DEH considers that an action taken by an individual fisher, acting in accordance with the management regime and associated DEH conditions will not have a

significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

The implementation of the conditions and recommendation made by DFWA in the submission will be monitored and reviewed as part of the next DEH review of the fishery in 12 months time.

Conditions:

- 1: Department of Fisheries, Western Australia, to advise DEH of any material change to the JASDGDLMF or the WCDGDLMF's legislated management plan and/or arrangements that could affect the criteria on which EPBC decisions are based, within three months of that change being made.
- 2: Within 12 months, DFWA to develop fishery specific objectives linked to performance indicators and performance measures for target species, key byproduct, discards and protected species interactions. Within 3 months of becoming aware that a performance measure has not been met, DFWA will develop appropriate management responses for timely implementation.
- 3: Within 4 months, DFWA to implement all proposed management changes, as outlined in the *Application to the Australian Government Department of the Environment and Heritage on the Western Australian Temperate Shark Fisheries*. Additionally, DFWA to review the effort caps in place for the fishery and if necessary implement reduced effort limits commensurate with the precautionary principle within 6 months.
- 4: Within 12 months, DFWA to conduct a compliance risk assessment for the WATSF paying particular attention to illegal harvest, non compliance with fin to meat ratios and non compliance with new management arrangements and any other identified risks. DFWA to also develop a compliance strategy for the fishery to address these risks.
- 5: Within 10 months, DFWA to develop and implement a strategic research plan addressing key priorities in the fisheries including (but not limited to) key target stock biology and ecology, stock assessments for key target stocks, monitoring of byproduct, bycatch and ecosystem impacts and levels of protected species interactions and measures to reduce interactions.
- 6: Within 9 months, DFWA to develop and implement ongoing monitoring of byproduct and bycatch in the fishery, sufficient to identify changes in the composition and quantity of catch. The nature of the monitoring program will be informed by the analysis around observer coverage needs.
- 7: Within 8 months DFWA to develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels.
- 8: DFWA, within 3 months, to provide a mechanism, which allows fishers to record interactions with protected and/or listed species. DFWA will implement an education program within 3 months to ensure that industry:
 - has the capacity to make these reports at an appropriate level of accuracy; and
 - is aware of the EPBC Act requirement to report any interaction with a listed and/or protected species to DEH within 7 days of the interaction occurring.

- 9: Within 6 months, DFWA to analyse existing information and observer data and develop a predictive model to identify the levels of coverage required to determine, for management purposes, the nature and level of protected species interactions within the fishery. Within 12 months, DFWA will, in consultation with DEH, implement a program consistent with the levels of coverage identified.

Recommendation

- 1: Within 8 months, DFWA to develop and implement a process to improve estimates of recreational, indigenous and illegal harvest and factor these estimates into stock assessment processes and future management arrangements.
- 2: Where interactions with protected species are identified as occurring, DFWA will initiate a management response within 3 months to mitigate the risk of further interactions.

PART I - MANAGEMENT ARRANGEMENTS

The JASDGDLMF and the WCDGDLMF is managed by DFWA.

The management regime is described in the following documents, all of which are, or will be publicly available:

- FRMA;
- FRMR;
- Western Australian *West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery Management Plan 1997*;
- Western Australian *Joint Authority Southern Demersal Gillnet and Demersal Longline Limited Entry Fishery Notice 1992*; and
- Relevant Fishery Status Reports, Gazetted notices and licence conditions.

A number of other documents, including research reports, scientific literature and discussion papers are integral to the management of the fishery.

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Because of the importance of the management plan and documents referred to above to DEH's assessment of the fishery, an amendment could change the outcomes of the assessment and decisions stemming from it. Decisions resulting from this assessment relate to the arrangements in force at the time of the decision. In order to ensure that these decisions remain valid, DEH needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision.

Condition 1: *Department of Fisheries, Western Australia, to advise DEH of any material change to the JASDGDLF or the WCDGDLF's legislated management plan and/or arrangements that could affect the criteria on which EPBC decisions are based, within three months of that change being made.*

As the submission provided to DEH is "interim" no information on consultative mechanisms was provided. DEH is aware that consultation was undertaken with a variety of stakeholders in the establishment on the management plan and in developing the suite of management changes aimed at improving the management of the fishery. DEH considers that the level of consultation in these issues have been adequate and is confident that DFWA will continue to ensure interested parties are consulted appropriately. DEH will revisit this issue in more detail when the temporary WTO decision is revisited in December 2006.

The fisheries are managed according to the policy regime described in the interim management plans in force under the FRMA. The interim plans contain very limited controls relating to the harvest of target species, however these have not been adequately enforced, particularly in the case of trigger limits which were dramatically exceeded in 2003-04 (for one species, catch levels overshoot the trigger limit by approximately 45%). DEH is concerned at the lack of a timely response to these breaches and that no fishery specific objectives or performance indicators are currently in place to ensure that the performance of the fishery can be measured and management action taken as required. DEH considers that the development of fishery specific objectives, linked to performance indicators and performance measures for target stock, key byproduct species, discards and impacts on the ecosystem is a priority for the WATSF, and should be developed as a priority. Once developed, the WATSF should be regularly monitored in relation to the objectives, indicators and performance measures. A clear process for responding to a breach in a performance

measure is also required to ensure that prompt management action is taken to address any threats to sustainability.

Condition 2: *Within 12 months, DFWA to develop fishery specific objectives linked to performance indicators and performance measures for target species, key byproduct, discards and protected species interactions. Within 3 months of becoming aware that a performance measure has not been met, DFWA will develop appropriate management responses for timely implementation.*

Current management of this fishery is based on a mixture of input controls including:

- Gear limitations (demersal gillnets or demersal longlines);
- Limitations on mesh size and depth; and
- Limitations on the number of hooks or metres of net used in any one months (not to be in excess of either 8 240 metres gillnet or 2 800 hooks).

In the review of the management arrangements of the fishery, a number of strategies were developed to improve management of the fishery. These new arrangements were outlined in Table One of this report. While the range of management arrangements proposed will improve the ecological sustainability of the WATSF, DEH is concerned about ongoing delays in their implementation. DFWA has advised DEH that the range of changes scheduled initially for implementation in January 2006 will not be in place until mid March at best, the end of June at worst. Given the importance of the new arrangements in this assessment, DEH considers that DFWA must commit to implementing all proposed management changes no later than June 2006 to ensure that the management of the fishery is improved as a priority. Further, DEH is concerned at the level of effort caps set for the WATSF. This issue is discussed in more detail in Part II of this report, however given its relevance to this condition, it is also dealt with here.

Condition 3: *Within 4 months, DFWA to implement all proposed management changes, as outlined in the Application to the Australian Government Department of the Environment and Heritage on the Western Australian Temperate Shark Fisheries. Additionally, DFWA to review the effort caps in place for the fishery and if necessary implement reduced effort limits commensurate with the precautionary principle within 6 months.*

DFWA is responsible for ensuring compliance with relevant fishery legislation in all WA fisheries. Compliance activities in the WATSF are limited due to the low comparative value of the fishery, however there are a range of compliance risks in the fishery, including but not limited to, illegal harvest, black marketing of catch, non compliance with fin-to-trunk ratios and possible non compliance with new management arrangements. While DFWA intends to implement mandatory VMS in the WATSF to ensure compliance with relevant new management arrangements, DEH is concerned that no compliance risk assessment has been carried out and that no compliance resources have been dedicated to the fishery. DEH therefore requires that a compliance risk assessment be undertaken for the WATSF, with a compliance strategy developed to address identified risks.

Condition 4: *Within 12 months, DFWA to conduct a compliance risk assessment for the WATSF paying particular attention to illegal harvest, non compliance with fin to meat ratios and non compliance with new management arrangements and any other identified risks. DFWA to also develop a compliance strategy for the fishery to address these risks.*

As stated above, the fisheries are currently undergoing review to establish new management arrangements in 2006. Stock assessments have recently been conducted on target species in the fishery and the status of the fisheries are reported on in the annual Fishery Status Report. These reviews are discussed more fully in Part II of this report.

Fishery dependent data relating to the target species is collected on a regular basis in the fishery. Some fishery independent information is also collected. Discussion of the information collection system can be found in Part II of this report.

An analysis of the fisheries capacity for assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species lives and the fishery operates is contained under Principle II of this report.

A number of the shark and finfish species harvested in the WATSF have wide distributional ranges and some stocks are shared with fisheries managed by WA and other jurisdictions. DEH therefore strongly encourages DFWA to pursue complementary management arrangements and joint research opportunities with relevant states and the Commonwealth, where appropriate.

DEH considers that the current management arrangements do not comply with all relevant threat abatement plans or recovery plans, specifically the National Plan of Action (Sharks) (NPOA). Once revised management arrangements are put into place and DEH conditions implemented, DEH considers that DFWA will more adequately comply with the NPOA and other relevant plans or policies including the National Policy on Fisheries Bycatch and bycatch action strategies developed under that policy. DEH expects that DFWA will also ensure compliance with any future plans or policies as they are developed.

The prime international regime affecting the fishery is the United Nations Convention on the Law of the Sea (UNCLOS). The management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery, for example the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate requiring that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the Submission, the fishery's compliance with their requirements can be assessed by examination of Part II of this report.

DEH considers it is incumbent on all authorities to develop a thorough understanding of the framework of national, regional and international agreements and their applicability to export-based fisheries for which they are responsible.

Conclusion

DEH considers that the WATSF management regime is documented, publicly available and transparent, and is developed through a consultative process. The management arrangements are not currently adaptable and underpinned by appropriate objectives and performance criteria by which the effectiveness of the management arrangements can be measured, enforced and reviewed. This situation will be improved with the implementation of **Condition 2**. Compliance will be improved with the implementation of **Condition 4**.

The management arrangements are capable to some extent of controlling the harvest through a combination of input and output controls. Management arrangements will be improved with the implementation of **Condition 3**. Periodic review of the fishery is provided for.

The management regime takes into account arrangements in other jurisdictions, and will adhere to arrangements established under Australian laws and international agreements.

DEH considers that there is scope to further refine the management arrangements and has provided a number of conditions for improvements in the longer term.

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

Fishery dependent data are obtained through compulsory daily logbooks. The logbooks contain information on daily and shot-by-shot target catch, hours fished and areas of operation. Fishers must record target stock and byproduct taken, however there is no requirement to record discard levels or interactions with protected species. Fishery data is provided monthly and entered in fishery databases within 7 days.

DEH believes that data reliability is reasonable for the WATSF in terms of the reporting of target species and byproduct harvest. There is some risk of underreporting however DEH believes that the compliance risk assessment required under **Condition 4** will address this issue. Discards and protected species interactions reporting are discussed in more detail below.

Information provided in the submission in relation to fishery independent data collection is limited.

DFWA collects data from a wide range of sources (logbooks, observer data, stock assessment processes) in an effort to counteract the lack of fishery independent data. DEH is concerned that the data validation mechanisms available in the fishery largely relate to landed target species and there is little validation of data relating to non target species, including discards.

DFWA has conducted extensive empirical research into the fisheries’ target and some secondary shark species and has sound data on aspects of their biology and ecology. The characteristics of other species are either known generally or can be inferred from other studies. The level of information on stock status for key target species is adequate.

DFWA has committed considerable resources to research and has also been extremely successful over the past 13 years in obtaining research funds to improve the level of understanding about key target species and byproduct and to inform management decisions. Attachment 6.3 of the submission notes that there are still a range of areas that require further research including:

- Key gaps in the understanding of key target stock biology and ecology, particularly reproductive frequency, distribution and abundance outside of the fisheries area and the timing and duration of migratory patterns;
- More recent stock assessments for key target stocks; and
- Research into secondarily targeted shark species.

DEH also considers that further research is needed in the monitoring of byproduct, bycatch and ecosystem impacts and to investigate the level of protected species interactions.

Given the limited funds and resources available for such research, DEH considers that DFWA should develop a detailed research plan to identify key research needs for future funding.

Condition 5: *Within 10 months, DFWA to develop and implement a strategic research plan addressing key priorities in the fisheries including (but not limited to) key target stock biology and ecology, stock assessments for key target stocks, monitoring of byproduct, bycatch and ecosystem impacts and levels of protected species interactions and measures to reduce interactions.*

Overall, given the range of fishery dependent data gathered by DFWA and the commitment to the development of a research plan, DEH considers that there is a reliable information collection system in place appropriate to the scale of the fishery. Continuation of existing data collections and research programs, combined with some extension and refinement of such activities will be important for the future management of the fishery.

Assessment

DFWA state that comprehensive empirical biological data on the key target species is used to conduct accurate assessments of the status of stocks. The most recent report produced in 2005 outlines current and historical levels of catch and effort, the biological status of the key target species, identifies management needs and research priorities. The Status Report noted that:

- dusky sharks are in recruitment failure and that ALL avoidable sources of older dusky shark mortality should/ must cease immediately;
- Gummy sharks have been overfished but recruitment is steady; and
- Whiskery sharks are showing some signs of recovery, however latent effort is undermining this recovery. Additional management measures are needed to rebuild the stock.

Additionally, a stock assessment was conducted specifically for sandbar sharks (assessed as currently overfished) in 2005. The report concluded that the demographic model generated indicated that: to reverse the current decline in this stock, major reductions in fishing mortality are necessary in both the WATSF and in the WA Tropical Shark Fisheries unless the fishing mortality in one or other fishery is reduced to zero.

DFWA state that the range of management changes outlined in Table One of this report will address all of these issues, however DEH is concerned that these management changes may not be sufficient to ensure the recovery of all overfished stocks. This is further discussed under Objective 2.

A range of both international and national studies provides a fairly comprehensive picture of the distribution and spatial structure of the key target species in the fishery. Both dusky and sandbar sharks are widespread, being found in most tropical and temperate oceans in the world. Gummy and whiskery sharks however are thought to be endemic to Australia. Studies undertaken in WA have also given some limited indication of stock movement and has been used to identify pupping areas for closure. Despite substantial research conducted in WA and internationally, relatively little is known about growth rates, migration, ecosystem and habitats.

Dedicated shark and finfish fisheries are also operating in other jurisdictions including the Commonwealth and Northern Territory. Ideally, management arrangements affecting single stock should be under single jurisdiction, or at least complementary across jurisdictions. DEH believes it would be beneficial for DFWA to continue to be involved in cross jurisdictional actions to address shared stock concerns. Furthermore, removals of key species in other jurisdictions should be factored into stock assessment and management controls in the WATSF.

Potential removals from the shark and finfish population include direct harvest by the WATSF, recreational and Indigenous harvest, direct harvest and discarding of the species in other fisheries.

A number of surveys have been undertaken on the extent and harvest of recreational fishing in the area of the fisheries, however they are not regularly conducted or specific to the WATSF, nor are they considered particularly robust due to the age of the data. Due to the overfished status of a number of the target stocks, it is important that robust information on the large recreational sector is obtained for the purposes of managing the overall level of take within sustainable levels.

Indigenous harvest is also unquantified at this time and should be considered in the total removals from the stock. Illegal harvest from the fishery is also a significant issue and take should be taken into account in stock assessment processes and management arrangements. Given the range of conditions in place for the fishery and lower priority of this issue in comparison to others, DEH considers that this issue should be placed as a recommendation rather than a condition.

Recommendation 1: *Within 9 months, DFWA to develop and implement a process to improve estimates of recreational, indigenous and illegal harvest and factor these estimates into stock assessment processes and future management arrangements.*

Management response

The current and proposed WATSF management regime aims to manage the fished stock in an ecologically sustainable way through a range of input and output controls outlined in Table 1 and Part I of this report. DEH considers that the combination of these controls, combined with the implementation of all conditions made in this report should ensure adequate protection of the target stock. DEH is concerned about effort caps in place for the key target species, however this is discussed in more detail under Objective 2.

No performance indicators have been put in place for the WATSF. **Condition 2** addresses this issue. Informal trigger points were put in place for the key target species in the WATSF, however it should be noted that the trigger limits have been exceeded in the past with limited and delayed management response (trigger limits have been exceeded by 45% for dusky sharks, 8% for whiskery sharks, 33% for gummy shark and 25% for whiskery sharks). DEH is extremely concerned at the lack of timely management response in regard to this issue, particularly given the overfished status of the stocks. DEH considers however that the implementation of **Condition 2**, in particular the requirement to develop responses to breaches within three months, will ensure that this does not happen again in the future.

Secondary species (byproduct) taken in the fishery include smooth hammerhead (*Sphyrna zygaena*), wobbegongs (family Orectolobidae), spinner shark (*Carcharhinus brevipinna*), and Rays (order Batoidea). Scalefish are also taken, with dhufish, pink snapper, Samson fish and sweetlip emperor dominating the scalefish catch of the west coast fishery while queen snapper and blue groper dominate the JASDGLMF.

Fishers are required to record in compulsory logbooks byproduct species taken. No management objectives, performance indicators or management measures are in place to trigger management action if take increases substantially. This issue will be dealt with through the implementation of **Condition 2**.

The take of scalefish species has increased 17% from 2002/03 to 2003/04. The submission states that the changes to longline use (due to management changes) may increase the capacity of demersal longlines to take scalefish and/or because of the reduction in the catch of large sharks, operators will seek to increase their catch of scalefish to compensate for the reduction in earnings from sharks. DFWA state that industry has been warned that this will be under close scrutiny, however no management strategies or monitoring programs have been developed to outline how this will be reviewed and no trigger limits have been set. DEH therefore requires that, within

9 months, DFWA develop and implement ongoing monitoring of bycatch and byproduct in the fishery sufficient to identify changes in the composition and quantity of catch.

Condition 6: *Within 9 months, DFWA to develop and implement ongoing monitoring of byproduct and bycatch in the fishery, sufficient to identify changes in the composition and quantity of catch. The nature of the monitoring program will be informed by the analysis around observer coverage needs.*

Conclusion

DEH considers that the management regime in the WATSF, contingent on the implementation of new management arrangements and implementation of DEH conditions, is appropriately precautionary and provides for the fishery to be conducted in a manner that does not lead to over-fishing. DEH considers that the information collection system and stock assessment and management arrangements generally are sufficient to ensure that the fishery is conducted at catch levels that maintain ecologically viable stock levels with acceptable levels of probability.

DEH considers that there is scope to further refine some of the existing information collection, assessment and management responses and has provided conditions and a recommendation for improvements in the longer term.

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’*

Recent assessments of the key shark stocks has revealed that a number of trigger limits have been breached (see above) and the stocks are considered overfished (see Table One). The management response to this has been slow, however this will improve with the introduction of new management controls within four months and the implementation of other DEH conditions.

While DFWA state that the range of management changes (particularly the effort cap and area closures) will provide for the recovery of the overfished shark stocks taken in the WATSF. DEH is concerned however that the effort caps are not scientifically based, or independently reviewed and may have been set too high to allow an effective recovery of overfished species. This is a particular concern for whiskery sharks, for whom the effort caps represent only a 6% drop in effort, while effort for sandbar sharks will actually increase by 10%. Table Two provides a detailed summary of the outcomes of the effort caps.

Table Two: Temperate Shark Fisheries – explanation of effort reductions.

Species	JASDGLDF	WCDGLDF	JASDGLDF: Effort reductions to 2001/02 levels	WCDGLDF: Effort reductions to 2001/02 levels
Dusky shark (overfished – recruitment failure)	202.2 t (↑19% between 2002/03 and 2003/04)	137 t (↑64% between 2002/03 and 2003/04)	180 t (↓ of 22 t)	54 t (↓83 t)
Gummy shark (fully fished)	455.5	9 t (total Gummy shark harvest in temperate fisheries ↑108% in Zone 1	345 t (↓110.5 t)	4 t (↓5 t)

		of JASDGDLF alone between 2002/03 and 2003/04)		
Whiskery shark (overfished)	150.2 t	34.1 t (overall ↑ of 14% between 2002/03 and 2003/04)	144 t (↓ 6.2 t)	28 t (↓ 6.1 t)
Sandbar shark (overfished)	22 t (↓ 35% between 2002/03 and 2003/04)	182.2 t (↑ 34% between 2002/03 and 2003/04)	32 t (↑ 10 t)	131 t (↓ 51.2 t)
Other shark	150 t	83 t	146 t (↓ 4 t)	107 (↑ 24 t)
Total shark catch	979.9 t	445.1 t	847 t (↓ 132.9 t)	324 (↓ 121.1 t)

DEH considers that the implementation of **Condition 2** will ensure that these effort caps are reviewed annually to ensure that they are providing a sustainable basis upon which to base the recovery of overfished species.

The submission concedes that a number of the key target shark species are overfished and that the current level of harvest of sandbar sharks is unsustainable. The current management of this situation does not adequately meet with the Guidelines, nor does it comply with the NPOA - Sharks. While the range of management changes to be in place by June 2006 will provide some protection for the species, no specific recovery strategies have been developed for overfished shark species in the fishery. DEH believes that it is crucial that prompt and effective action is taken to recover stocks to ecologically viable levels and that specific strategies should be developed for each overfished species to ensure recovery. DEH therefore requires that, within 8 months, DFWA will develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels. These strategies should be developed in consultation with scientists and conservation groups and include management measures that reduce harvest of overfished stocks to precautionary levels in the absence of robust scientific evidence to allow recovery of the stocks and will complement the implementation of other DEH conditions.

Condition 7: *Within 8 months DFWA to develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels.*

DEH is confident that, through DFWA's responsible approach to management of the fishery and the implementation of the recommendations made in this report, the key shark stocks can be recovered to ecologically viable stock levels and these levels can be maintained through precautionary management measures.

Conclusion

The recent assessment that stocks are overfished will be addressed through the development of a recovery strategy. DEH considers that there is a high probability that the stocks will recover.

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

Fishers in the WATSF are not required to report the level of discards in the WATSF. DFWA state that there are sufficient data on the spectrum of non retained species to recognise that it is a low risk area. DEH is concerned at the lack of information collected with regard to bycatch species.

Assessment

An ecological risk assessment was carried out for the WATSF in 2002, which indicated a low to negligible risk for bycatch species. This decision was based on data from 1994 to 2001 when effort was substantially higher than target effort cap levels (in place by June 2006), therefore impacts are likely to be lower.

Management response

No management measures are in place to monitor or reduce bycatch in the WATSF. DFWA state that risk are low and that, as all "fish" species are permitted to be landed by fishers, bycatch is low. DEH is concerned however that there is no measure of the actual level of bycatch in the fishery and that monitoring of this issue has not occurred. No specific group of indicator species is monitored.

DEH considers that although the ERA carried out in 2002 indicated low to negligible risks (despite a lack of data on bycatch), monitoring should be carried out to establish the level of bycatch in the WATSF. DEH considers that the implementation of **Conditions 3 and 6** will address this issue.

Conclusion

DEH considers that there is a high likelihood the fishery is conducted in a manner that does not threaten bycatch species. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that DFWA would undertake appropriate actions to ensure that bycatch species are not threatened by this fishery.

Conditions 3 and 6 have been developed to ensure that the risk of unacceptable impact on bycatch species is detected and minimised in the longer term.

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

Information on bycatch generally is collected from fisher logbooks, however the current logbooks do not contain fields for recording interactions with protected species. DFWA state that fishers are only required to report landed species, but as fishers are not permitted to land protected species, no report of interactions are made.

Other than logbooks, no information is collected on protected species interactions. The 2003-2004 State of the Fisheries Report states that the rates of capture of protected species were very low throughout the fishery (McAuley and Simpfendorfer 2003). DFWA state that just over 1 mammal, 4 seabirds and 1 turtle are caught per 100 000 km gillnet hours.

Alarmingly the report states that <20 Great white sharks (*Carcharodon carcharias*) and <80 Grey nurse sharks are caught annually. Both species are listed as vulnerable under the EPBC Act (eastern populations of Grey nurse sharks are listed as critically endangered). The Report states that this catch does not significantly impact the viability of populations of protected species, however DEH has serious doubts about this claim, particularly given the life characteristics of these shark species and the fact that larger number are likely to be taken given the lack of validated reporting and unknown post release mortality of caught specimens. DFWA further states that the data on which the report was based was collected from 1994 to 1999. Apparently after this date (and the listing of the species under the EPBC Act), interactions were no longer reported. DEH seriously doubts that interactions have ceased due to this listing and believes that the lack of reporting is likely due to DFWA reporting requirements, which only require landed catch to be recorded. As protected species are not allowed to be landed, no reports have been made, though no doubt some level of interaction has occurred.

Assessment

DEH considers it vital that logbooks are amended to allow the reporting of protected species interactions in the fishery. DFWA state that non reporting may also be occurring due to a lack of awareness of reporting requirements under the EPBC Act, or because of fears of prosecution. DEH therefore considers that in addition to logbook modifications, an education program must be implemented as a priority to ensure that industry has the capacity to make reports at an appropriate level of accuracy and that industry is aware of reporting requirements under the EPBC Act.

Condition 8: *DFWA, within 3 months, to provide a mechanism, which allows fishers to record interactions with protected and/or listed species. DFWA will implement an education program within 3 months to ensure that industry:*

- *has the capacity to make these reports at an appropriate level of accuracy; and*
- *is aware of the EPBC Act requirement to report any interaction with a listed and/or protected species to DEH within 7 days of the interaction occurring.*

In addition, as no information on protected species interactions has been obtained since 1999, DEH expects that a comprehensive, independent observer program will be developed and implemented with a high level of coverage to determine the level of protected species interactions in the fishery.

If interactions occur, DFWA will develop and implement measures within 3 months of the interaction occurring, to mitigate against further interactions.

Condition 9: *Within 6 months, DFWA to analyse existing information and observer data and develop a predictive model to identify the levels of coverage required to determine, for management purposes, the nature and level of protected species interactions within the fishery. Within 12 months, DFWA will, in consultation with DEH, implement a program consistent with the levels of coverage identified.*

Recommendation 2: *Where interactions with protected species are identified as occurring, DFWA will initiate a management response within 3 months to mitigate the risk of further interactions.*

There are no listed ecological communities in the fishery area.

Management response

Interactions with protected species are not currently well managed by DFWA. DEH considers that the implementation of **Conditions 2, 8 and 9** will improve this situation.

Conclusion

DEH notes that there is a strong potential of interactions with protected species in the WATSF but considers that, through the implementation of **Conditions 2, 8 and 9** the WATSF will be 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. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that appropriate actions will be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

Conditions have been developed to ensure that the risk of unacceptable impact on protected species is minimised in the longer term.

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

No information is currently collected regarding ecosystem impacts arising from the WATSF. DFWA advise that a research program has recently been undertaken, in collaboration with Murdoch University, to assess bioregional and trophic impacts of fishing (including shark fishing). DEH understands that this project is being undertaken at a bio regional level rather than at a species specific or fishery specific level, given minimal resources available and the need to identify ecosystem impacts across a broad area.

DEH is concerned at the lack of information collection and research covering the fisheries impact on the ecosystem and environment generally. However, DEH understands that this lack of information is the case across a range of Australian and International fisheries and until appropriate research techniques and programs are developed and implemented this will continue to be the case. DEH strongly supports research in this area and commends DFWA for pursuing this project. DEH considers that it will be instrumental in providing further information on ecosystem impacts of the WATSF and informing future management decisions.

Assessment

The Ecological Risk Assessment (ERA) carried out in 2002 determined that impacts on the ecosystem were low to negligible. This decision was based on data collected from 1994 – 1999 when fishery effort was 40% higher than what will be enforced in June 2006.

The most likely ecosystem impact arising from the WATSF would be trophic level impacts, resulting from the depletion of apex predators. DFWA state however that this risk is likely to be low as smaller sharks are targeted, which are opportunistic feeders with non specific diets (unlike other higher order predators). DFWA believe that any trophic impacts caused by the removal of sharks by the WATSF is likely to be spread across a wide variety of prey species

It is widely acknowledged that the depletion of apex predators may have wide ecological impacts, however DFWA state that this is difficult to measure and that there has been no indication of this occurring in the WATSF in the past 30 years. DEH considers that this is not necessarily a sign that this has not been occurring in the WATSF, given impacts aren't monitored.

The fishing gear generally is not regarded as posing a significant risk to the physical environment and the impact of vessel discharge on the ecosystem is considered to be low. WA legislation requires all vessels to be maintained to appropriate standards and not discharge any materials into the water. The number of vessels permitted in the fishery is regulated and no breaches have been reported.

Management response

No management measures have been implemented to specifically minimise the impact of the WATSF on the wider ecosystem and their components. The new management measures, and conditions developed by DEH have been established to protect target, byproduct, discard and protected species, however a number of these conditions are likely to have an indirect impact in improving the management of ecosystem impacts. Specifically, the development the reduction of effort in the fishery and size limits will ensure that the impacts on the trophic structure of the ecosystem is minimised by protected larger sharks and reducing the total amount of sharks harvested. The proposed research program outlined above will greatly assist in determining the level of impact that the WATSF has on the ecosystem and will provide future guidance for management action.

DEH intends to revisit this issue in the WATSF review in 12 months time.

Conclusion

DEH considers that the fishery is conducted in a sufficiently precautionary manner to minimise the impact of fishing operations on the ecosystem generally over the short term. These issues will be revisited in 12 months time.

REFERENCES

McAuley, R. and Simpfendorfer, C. 2003

Catch Composition of the Western Australia temperate demersal gillnet and demersal longline fisheries, 1994 to 1999.

Fisheries Research Report No. 146, Department of Fisheries Western Australia. 78 pp.

LIST OF ACRONYMS

DEH	Department of the Environment and Heritage
DFWA	Department of Fisheries Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1992</i>
ERA	Ecological Risk Assessment
FRMA	<i>Fish Resources Management Act 1994</i>
FRMR	<i>Fish Resources Management Regulations 1995</i>
JASDGLMF	Joint Authority Southern Demersal Gillnet and Longline Managed Fishery
NPOA	National Plan of Action
OCS	Offshore Constitutional Settlement
UNCLOS	United Nations Law of the Sea
VMS	Vessel Monitoring System
WATSF	Western Australia Temperate Shark Fisheries
WCDGLMF	West Coast Demersal Gillnet and Longline Interim Managed Fishery
WTO	Wildlife Trade Operation