

**APPLICATION TO THE AUSTRALIAN GOVERNMENT
DEPARTMENT OF THE ENVIRONMENT, WATER,
HERITAGE AND THE ARTS ON THE
WESTERN AUSTRALIAN TEMPERATE SHARK
FISHERIES**

(Covering the West Coast Demersal Gillnet and Demersal Longline [Interim] Managed Fishery and the Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery)

Against the Guidelines for the Ecologically Sustainable Management of Fisheries
For Consideration Under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*

December 2008



Department of Fisheries
Government of Western Australia



**DEPARTMENT OF FISHERIES,
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1. BACKGROUND

The purpose of this submission is to report to the Department of Environment, Heritage, Water and the Arts (DEWHA) on the current status and management changes in the West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WCDGDLF) and the Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (JASDGDLF); collectively known as the “Temperate Shark Fisheries”, for the purposes of maintaining Wildlife Trade Operation (WTO) approval for the Temperate Shark Fisheries.

In November 2005 the Department of Fisheries, Western Australia (DFWA) submitted an application to DEWHA (then the Department of Environment and Heritage) for assessment of the fisheries against the *Guidelines for Ecologically Sustainable Management of Fisheries*. The submission was used to assess the operation of the fisheries for the purposes of Parts 13 and 13A of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 24 February 2006, Mr Andrew McNee, Delegate of the Minister for the Environment and Heritage declared each fishery to be an approved short term WTO for a period of 12 months, subject to a number of conditions and recommendations to address risks and uncertainties within the fisheries. In December 2006, DFWA provided an update on the progress against those conditions and subsequently, on 22 February 2007, Mr McNee advised that each Fishery was approved for a further 24 months (to 26 February 2009) as a WTO with associated conditions and recommendations. The conditions of that WTO approval were amended July 2007.

A copy of the initial DFWA application and the DEWHA assessment report and related documents are available on the DEWHA website:

<http://www.environment.gov.au/coasts/fisheries/wa/temperate-shark/index.html>.

The developments in the Fisheries since the last assessment and the DFWA’s progress against the WTO conditions (as amended July 2007) are outlined below. As the conditions and recommendations are the same for both fisheries, they have been reported on concurrently in this document.

Further information on both the Fisheries can be obtained from the annual State of the Fisheries report, of which the two most recent are attached to this submission or available online at <http://www.fish.wa.gov.au/docs/sof/>.

2. CONDITIONS ON THE WILDLIFE TRADE OPERATION DECLARATION FOR THE JOINT AUTHORITY SOUTHERN DEMERSAL GILLNET AND DEMERSAL LONGLINE MANAGED FISHERY (JASDGDLF) AND THE WEST COAST DEMERSAL GILLNET AND DEMERSAL LONGLINE (INTERIM) MANAGED FISHERY (WCDGDLF)

2.1 Condition One

Operation of the Fishery will be carried out in accordance with the JASDGDLF and WCDGDLF's management regime in force under the Fish Resources Management Act 1994.

DFWA has continued to manage the JASDGDLF and the WCDGDLF in accordance with their respective management plans, the Western Australian *Fish Resources Management Act 1994* (the FRMA) and its subsidiary legislation. In addition to this, DFWA has informally introduced interim arrangements that require the JASDGDLF participants to operate under a more prescriptive “days fished” management regime (as approved by the Western Australian Fisheries Joint Authority), ahead of the formal introduction of that regime on 1 June 2009. While the current regime is delivering benefits in the form of effort reductions for the Fishery, its legislated introduction next year will formally complete the suite of changes that was developed to reduce recent effort in the Fishery by 40% (and return to 2001/02 levels).

2.2 Condition Two

DFWA to advise the DEWHA of any material change to the JASDGDLF and the WCDGDLF's legislated management plans and/or arrangements that could affect the criteria on which EPBC decisions are based, within three months of that change being made.

In 2005/2006 the then WA Minister for Fisheries approved a suite of changes to the management of the temperate shark fisheries, with the main objectives of:

- a) ensuring the conservation and recovery of at-risk whickery, dusky and sandbar shark stocks;
- b) returning and maintaining fishing effort to 2001/2002 levels; and
- c) removing the capacity of fishers to overcome effort reductions by activating latent effort (buying up unfished or less fished units to maintain or increase the existing level of fishing).

In the case of the JASDGDLF, both members of the Western Australian Fisheries Joint Authority (WAFJA), i.e. the WA Minister in his capacity as a member of the WAFJA, and his Commonwealth counterpart, endorsed the suite of changes suggested and recorded the agreed policies in a Record of Decision as required under the FRMA.

In the 2007 report to DEWHA, DFWA reported that the majority of the approved management plan amendments had then been implemented, including:

- a seasonal closure of the Fisheries between 26° 30' S latitude and 118° E longitude on the south coast to protect pupping female whickery sharks;
- a reduction of the permissible maximum size for dusky sharks; and
- longline gear restrictions to both prevent the use of longlines to target large sharks and reduce the mortality of any incidental catch of large sharks.

At that time, there were two items remaining to be legislated, namely:

1. a change to the schemes of entitlement from “monthly” effort controls (where the value of a unit of entitlement is a set length of demersal gillnet or number of hooks on a demersal longline, fished during a calendar month) to “days fished” arrangements (where a unit of entitlement permits a set amount of gear to be used for a maximum number of days per season); and
2. the Vessel Monitoring System (VMS) requirements for both fisheries.

The current status of the above-described items and other related arrangements is as follows.

2.2.1 The “Days Fished” Scheme of Entitlement

The WCDGDLF management plan was amended 1 June 2008 to introduce the “days fished” arrangement. This was reported to DEWHA in June 2008 as part of the six monthly progress report submitted by DFWA as required by Condition 3 (below).

In the case of the JASDGDLF, the management plan amendments to introduce the “days fished” scheme agreed upon in the previous Record of Decision are currently being drafted with the intention of commencing 1 June 2009 (i.e. coinciding with the start of the 2009/2010 season). In the meantime, this Fishery continues to operate under (and derive the associated benefits from) the “days fished” scheme on an informal basis (as it has done by industry agreement since 2006).

In the WCDGDLF, pending the introduction of VMS to the management plan (see below), a new statutory return was legislated at the same time as the “days fished” arrangement to capture the details required to monitor effort and acquit entitlement under the new scheme. DFWA has been using the new statutory returns to monitor fishers’ consumption of entitlement since 1 June 2008. This return will be phased out once the VMS has been legislated in the management plan and DFWA is certain that the fishing effort information provided via that system is sufficiently robust.

2.2.2 Implementation of VMS requirements for both Fisheries

The formal introduction of VMS into the WCDGDLF and the JASDGDLF allows the DFWA to accurately monitor fishery compliance with spatial and temporal closures and provides a robust and efficient tool for monitoring the consumption of entitlement under the “days fished” scheme (in hours/minutes).

The past six months

DFWA intended to introduce the VMS requirements to the WCDGDLF and the JASDGDLF concurrently with the “days fished” arrangements on 1 June 2008. However, on reviewing the VMS arrangements that were first drafted in 2006, DFWA identified some aspects that required further consideration prior to being legislated. As a result, the introduction of the “days fished” scheme for the WCDGDLF on 1 June 2008 occurred separate to and ahead of the VMS arrangements.

The VMS review undertaken involved lengthy stakeholder consultation during mid-2008. The DFWA (VMS, Management and Research Divisions) worked with authorisation holders, the Western Australian Fishing Industry Council (WAFIC), the WA Net and Hook Professional Fishermen Association and the South Coast Professional Fishermen’s Association during a series of meetings to examine a range of VMS options for the Fisheries. Each option was considered in terms of its ability to deliver the required management outcomes, suitability to the operational specifics of the temperate shark fisheries and compatibility with the VMS arrangements operating in (or planned for introduction to) other State managed fisheries.

Following the review, with the intent of amending the WCDGDLF management plan to introduce the new VMS arrangements 15 October (to coincide with the end of the Whiskery Shark Popping Closure), a set of Approved Directions for Use were approved by the Chief Executive Officer (CEO) 19 September 2008 and published in the *Western Australian Government Gazette* 30 September 2008 (in accordance with the *Fish Resources Management Regulations 1995* [FRMR]).

The commencement of Caretaker Provisions in August (following the announcement of the State Government election to be held 6 September) delayed the above-mentioned plan to introduce the VMS plan amendments to the WCDGDLF on 15 October. Furthermore, as result of the election outcome, DFWA has been required to obtain “fresh” approvals from the new WA Minister for Fisheries before continuing the drafting of that (or any other) legislation. Re-approval is currently being sought and (subject to approval) the VMS amendments for the WCDGDLF will commence as a requirement of the management plan 1 June 2009 (i.e. coinciding with the start of the 2009/2010 season).

In terms of the JASDGDLF, the Record of Decision (that sets out the decisions/approvals of the WAFJA) currently only provides for VMS requirements to be applied to vessels exceeding 6.9 metres in length. However, as result of the VMS review, the DFWA formed the

view that the VMS arrangements should apply to all vessels, regardless of length and consulted with stakeholders on this proposal during mid-2008.

Current status

While DFWA will proceed to introduce the VMS arrangements via amendment of the WCDGDLF management plan from 1 June 2009, another method has been utilised in the interim to formally introduce VMS for that Fishery from 15 November 2008. This involved the use of statutory powers provided to the CEO under the FRMR.

DFWA is currently seeking the approval of the WAFJA for the extension of the VMS arrangements to all vessels (regardless of length) within the 1 June 2009 JASDGDLF management plan amendments. Drafting is currently underway in anticipation of that approval.

The WA Minister (and in the case of the JASDGDLF, the WAFJA) approved a seasonal closure of the area of the Fisheries lying between 26° 30' S latitude and 118° E longitude on the south coast to reduce catches of whiskery sharks and provide protection for near-term pregnant females from 15 August – 15 October during the years 2006, 2007 and 2008 (the “Whiskery Shark Pupping Closure”). Following the end of that arrangement this year, the DFWA’s Research Division is completing a formal assessment of the effectiveness of the closure in assisting the recovery of whiskery shark stocks. Although the assessment is still underway, results of the 2007 whiskery stock assessment showed whiskery shark biomass was increasing (at 3.4% yr⁻¹) and feedback from fishermen has indicated that the closure has been extremely successful in assisting the recovery of whiskery stocks. Industry has therefore expressed strong support for the arrangement to continue next year.

The need for, and extent of, future closure arrangements will be determined following the assessment of its effectiveness and after further consultation with stakeholders; however, it is anticipated at this stage that the closure will be legislated to continue next season (subject to the necessary approvals).

2.2.4. Progress of Other Legislation Impacting on the Temperate Shark Fisheries

In addition to the amendments made to the temperate shark management plans, a suite of amendments to other State legislation (applicable to all fisheries and elasmobranch stocks) have been made since the last assessment, including:

- the commercial protection of sharks and rays (except in the demersal gillnet and demersal longline fisheries and a few other excepted fisheries which have been assessed as posing negligible risks to stock sustainability), with the exception of sawfish of the genus *Pristis*, which are totally protected;
- significant increases in the penalty provisions for;
 - taking commercially protected sharks and rays; or
 - contravention of the anti-finning and anti-filleting regulations;
- introduction of a maximum size limit for dusky sharks; and
- tightening of the regulations to prohibit the filleting of sharks..

Additionally, two other items of previously approved legislation have made significant progress since the last assessment, namely the:

- 1) *Prohibition on Line Fishing (Metal in Lines and Traces) Order 2008*; and the
- 2) Recreational protection of whaler sharks in the West Coast and South Coast bioregions.

Prohibition on Line Fishing (Metal in Lines and Traces) Order 2008

On 24 November 2008 the State Minister for Fisheries signed Order No. 14 of 2008 *Prohibition on Line Fishing (Metal in Lines and Traces) Order 2008*. This Order will come into effect on the date of its publication in the *State Government Gazette* (this month), at which time the commercial use of any metal or wire in traces or lines will be prohibited, except under authorisation of the Mackerel (Interim) Managed Fishery and the tropical shark fisheries.

In combination with the commercial protection of sharks and rays, the Order will prevent the commercial targeting of several high-risk shark stocks (in particular dusky, sandbar, tiger and hammerhead sharks). It will also reduce the incidental take and mortality of large (breeding) sharks by commercial fishermen targeting other species, by allowing sharks to either bite through or break the snood after their initial capture.

Recreational protection of whaler sharks in the West Coast and South Coast bioregions

The take of large dusky whalers (which demographic analyses have repeatedly demonstrated are critical to the sustainability of the demersal gillnet fisheries' catches of young juveniles) is already prohibited under the WCDGDLF and JASDGDLF management plans. In support of that legislation, the drafting of amendments to the FRMR to totally protect all whaler sharks (Family Carcharhinidae) with an interdorsal fin length greater than 70cm, when taken within the West Coast and South Coast bioregions, has been finalised and is currently with the Minister awaiting his approval. Within the totally protected status, exceptions will be provided to:

1. commercial fishers, within:
 - the temperate shark fisheries,
 - Marine Aquarium Fish Managed Fishery,
 - Kimberley Gillnet and Barramundi Managed Fishery; and
 - any other managed fishery, for which a management plan specifically allows for the taking of sharks or rays;
2. recreational fishers, within the West Coast and South Coast regions, to take whaler sharks with an interdorsal fin length less than 70cm; and
3. recreational fishers, outside the West Coast and South Coast bioregions, to take whaler sharks.

The decision to totally protect all whaler sharks, rather than only dusky whalers, was made on the basis that the shark species identification skills of recreational fishers are more limited than those within the commercial sector.

Most recently, the WA Minister has also approved that the DFWA initiate a consultative process to extend the recreational protection of large whaler sharks beyond the temperate shark fisheries and into the Northern Bioregion.

West Coast Demersal Scalefish Fishery – Metropolitan Closure and the Voluntary Fisheries Reduction Scheme

Recent research by DFWA into the state of demersal scalefish stocks on the West Coast has shown that the stocks are under significant pressure from overfishing and, in the absence of mitigation measures, are likely to be depleted to levels below those required to ensure their long-term sustainability. It was therefore determined that the total fishing mortality (across all sectors) must be reduced to sustainable levels, via a reduction in total catch of at least 50%. As part of the package devised to achieve this outcome, the West Coast Demersal Scalefish

(Interim) Managed Fishery was created. This Fishery consists of five management areas, including the “Metropolitan Area.” The Metropolitan Area runs north/south for 120 nautical miles (nm) between the latitudes 31° South and 33° South and extends seaward from the coast out to the 250 metre depth contour (that encompasses the distribution of at-risk demersal scalefish species). The Area varies in width, from 25nm wide at its northern boundary (around Lancelin), to 52.5nm wide at its southern boundary at 33° South (near Tim’s Thicket). Given that the majority of recreational fishing in Western Australia occurs in this zone, the then State Minister announced in September 2007 that this Area would be closed to commercial fishing by the WCDGDLF and the newly formed West Coast Demersal Scalefish (Interim) Managed Fishery from 15 November 2007. Of the commercial fisheries operating in the Metropolitan Area, these two have the greatest impact on demersal scalefish stocks, although the WCDGDLF accounted for less than 18% of those two Fisheries’ total demersal scalefish catch in 2005/06.

The combined effect of the commencement of the West Coast Demersal Scalefish (Interim) Managed Fishery and the Metropolitan Area closure on the WCDGDLF has been that:

- As of 1 January 2008, the number of licensed fishing boats that are permitted to use (or even carry) lines with hooks on the West Coast has reduced from approximately 1250 to 61. The 61 vessels permitted to fish are also restricted to specific Areas of the Fishery (based on an assessment of their fishing history) and are subject to limits on the number of lines and hooks per line that may be used. In practical terms this means there are now far less lines in the water catching sharks on the West Coast.
- On 1 January 2009, the management plan for the West Coast Demersal Scalefish (Interim) Managed Fishery will be amended to introduce a “days fished” framework with effort restricted to explicit settings for each of the five areas of the fishery. The capacities to be introduced will deliver a 50% reduction in catch on 2005/06 levels.
- In addition to the effort reduction resulting from the implementation of the “days fished” schemes now in place for both the WCDGDLF and the West Coast Demersal Scalefish Managed Fishery, the fishing area of the WCDGDLF has been reduced by an amount that traditionally equates to approximately 33% of the total catch from that Fishery.

To offset any undesirable consequences from displacement of shark-fishing effort and to compensate fishers for the loss of fishing ground resulting from the Metropolitan Area closure, the *West Coast Demersal Gillnet and Demersal Longline Fishery Fisheries Voluntary Fisheries Adjustment Scheme 2008* was gazetted on 6 May 2008. This “buy-back” scheme operates through the voluntary sale of WCDGDLF units of entitlement to the WA Government, with the aim of reducing the amount of entitlement in the Fishery by 33% (equating to the amount of catch historically taken from the waters of the Metropolitan area as a proportion of the total catch from the Fishery). The *West Coast Demersal Gillnet and Demersal Longline Fishery Fisheries Voluntary Fisheries Adjustment Scheme 2008* will run until 16 October 2009 (until which time the effects of the closure on stocks and the Fishery will be monitored). If the 33% reduction in total WCDGDLF is not achieved, the WA Minister will either amend the duration of the Scheme, or revoke it and consider alternative means for the reduction (which may include reducing the entitlement value by the amount across the Fishery by the amount necessary to reach the 33% reduction).

2.2.5 Summary of Management Changes since the last WTO approval

| DATE | ACTION |
|-------------------|--|
| 15 November 2007 | Metropolitan Closure commenced |
| 1 January 2008 | West Coast Demersal Scalefish (Interim) Managed Fishery commenced |
| 6 May 2008 | <i>West Coast Demersal Gillnet and Demersal Longline Fishery Fisheries Voluntary Fisheries Adjustment Scheme 2008</i> gazetted |
| 1 June 2008 | “Days Fished” scheme legislated into WCDGDLF plan |
| 1 June 2008 | New statutory return legislated to monitor acquittal of entitlement under the “days fished” scheme in the WCDGDLF |
| July/August 2008 | Consultation with WCDGDLF and JASDGDLF authorisation holders re: management proposals. |
| 19 September 2008 | “Automatic Location Communicator - Approved Directions” for the temperate shark fisheries approved and gazetted |
| 15 November 2008 | VMS requirements legislated by CEO notice for authorised vessels operational in the WCDGDLF |
| November 2008 | Approval of State Minister sought to amend WCDGDLF plan to include VMS requirements |
| November 2008 | Approval of the WAFJA sought to extend VMS requirements in the JASDGDLF to all vessels |
| 24 November 2008 | s43 Order prohibiting the use of wire traces signed by Minister |
| November 2008 | Total protection of large whaler sharks (with exceptions) in West/South bioregions finalised and with Minister for sign-off. |
| 1 January 2009 | Introduce amendments to the West Coast Demersal Scalefish Managed Fishery to restrict effort to explicit capacity settings. |

2.3 Condition Three

DFWA to provide DEWHA with six monthly reporting on progress with implementing the management arrangements and DEWHA's conditions and recommendations.

The DFWA have produced and presented these reports to DEWHA as requested, with the most recent submitted to Mr Ian Creswell 18 June 2008.

3. RECOMMENDATIONS ON THE WILDLIFE TRADE OPERATION DECLARATION FOR THE JOINT AUTHORITY SOUTHERN DEMERSAL GILLNET AND DEMERSAL LONGLINE MANAGED FISHERY (JASDGDLF) AND THE WEST COAST DEMERSAL GILLNET AND DEMERSAL LONGLINE [INTERIM] MANAGED FISHERY (WCDGDLF)

3.1 Recommendation One

DFWA to monitor compliance with objectives, performance indicators and measures. DFWA to review and if necessary amend fishery specific objectives linked to performance indicators and performance measures for target species, 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.

To support the new fishery management arrangements outlined above and to improve assessments of key target stocks and achieve the more detailed data requirements of the temperate demersal gillnet and demersal longline fisheries' WTO accreditation, a new statutory return based on "Daily/Trip" catch and effort reporting was introduced in June 2006. Unfortunately, the transition to the new reporting regime has proven highly problematic for some fishers. Consequently, an apparently large amount of misreported data has been identified in the submitted returns. Since becoming aware of these issues, DFWA has been reprioritising staff resources to:

- (i) rectify (or at least quantify) levels of uncertainty in the reported data;
- (ii) develop 'real-time' data validation procedures; and
- (iii) re-implement the returns program with an appropriate level of ongoing training and data validation to ensure the integrity of reported data into the future.

However, until these processes are completed, catch and effort statistics (and hence compliance with the fisheries' objectives, performance indicators and measures) cannot be quantitatively reported with sufficient confidence. Nevertheless, the following qualitative assessments of these fisheries' compliance with their stated management objectives have been made.

3.1.1 Fishing Effort

Objective: return and maintain fishing effort within each management zone/fishery to 2001/02 levels.

Justification: these levels of effort were identified through ongoing stock assessments of the Fisheries' key target species as providing a high probability of achieving target biomass levels (see 3.1.2 below).

Assessment: Based on preliminary analyses of logbook and VMS data, together with discussions with industry groups, DFWA is confident that these fisheries have been operating within the intended effort levels of the objective. DFWA does not suspect that fishing effort in either fishery has exceeded the objective levels during the last two years. In addition, the Metropolitan Area closure (see 2.2.4 above) is likely to have caused an unanticipated reduction in WCDGDLF effort. This is largely due to the logistical and financial constraints the closure has imposed on the Metropolitan Area -based demersal gillnet and demersal longline vessels (eg. excessive travel distances, increased fuel costs and loss of skippers and crew who were unwilling to relocate, etc.).

3.1.2 Biomass Levels

Objective: to maintain the biomass of the fisheries' three traditional target stocks' at or above 40% of their virgin levels (B_0) by 2010 for gummy and whiskery sharks and by 2040 for dusky shark.

Justification: these biomass targets were set in 1995 by the Western Australian Demersal Net and Hook Fisheries Management Advisory Committee (formerly the WA Demersal Gillnet and Demersal Longline MAC), which considered them appropriate for long-lived shark species such as these. It should be noted, however, that these targets were set before formal stock assessments were completed and therefore without reference to actual biomass levels at the time.

Gummy shark assessment: the last implementation of an age-structured stock assessment model indicated that the Western Australian gummy shark stock was 42.7% of its virgin biomass in 1997/98. Although a new model that incorporates recent catch and effort data needs to be developed before this stock can be formally reassessed, a steadily increasing trend in Catch Per Unit Effort figures (CPUE) across its primary range (in Zone 2 of the JASDGDLF) and a dramatic increase in catch rates in Zone 1 of the JASDGDLF, strongly suggest that breeding biomass has been increasing over the last decade.

Dusky shark assessment: due to the longevity of dusky sharks and the highly age-specific nature of demersal gillnet catches it is impossible to estimate absolute biomass levels from the current 30 year time series of fishery data. Instead, DFWA has used a technique known as demographic analysis to provide a snapshot of this stock's population growth rate to determine whether fishing mortality (estimated from tagging experiments) is sustainable (McAuley et al., 2007). The most recent assessment, using CPUE data up to 2005/06, confirmed that rates of demersal gillnet and demersal longline fishing mortality experienced by sharks born in 1994 and 1995, when catches were approximately 58% higher than in 2005/06, were most likely to have been sustainable. However, the revised model also suggested that the stock is less productive than previously believed and predicted that an additional fishing mortality of as low as 1–2% per year applied to sharks older than 10 years of age, resulted in negative rates of population growth. Low levels of unreported external mortality (i.e. from other fishing activities) are believed to have caused an unknown level of depletion of the breeding stock, which explains the declining trend observed in demersal gillnet CPUE since 1994/95.

Whiskery shark assessment: the most recent implementation of the age-structured model for the Western Australian whiskery shark stock included CPUE data up to and including 2005/06. This assessment indicated that the whiskery shark stock had begun to recover after its significant depletion during the 1980s and slowly declining trend prior to the previous (2004) assessment. Median estimates of total biomass were calculated to have increased by 3.4% per year in 2004/05 and 2005/06. The best estimate of total biomass in 2005/06 was 38.3% of B_0 , with 95% confidence that the stock was between 35.9% and 40.4% of virgin biomass.

3.1.3 Catches

Objective: to maintain annual catches of key target species at between: 350 and 450 t for gummy shark; 200 and 300 t for dusky shark; 175 and 225 t for whiskery shark and below 120 t for sandbar shark.

Justification: these acceptable catch levels were identified through ongoing stock assessments as providing a high probability of achieving the target biomass levels referred to above and ensuring sustainable population growth rates in the Western Australian sandbar shark stock. However, these stated target catch ranges require ongoing revision in response to assessments of stock status, i.e. downward revision in response to stock depletion AND upward revision in response to stock recovery.

Assessment: given that the Fisheries are most likely to be operating within their prescribed effort levels and that fishing effort is demonstrably highly correlated with shark catches, it is reasonable to assume that catches in the last two years have been within the stated acceptable limits. However, as gummy shark abundance appears to have increased steadily over the last decade, the given range of 350 to 450 t probably underestimates the true sustainable catch range. The same may also be partly true for whiskery shark, as total biomass was increasing steadily prior to the last assessment. However, the first objective of the annual two-month Whiskery Shark Pupping Closure was to reduce whiskery shark catches. Therefore, until logbook data from the last two years can be quantified to see how effective the closure has been in achieving this objective, it is impossible to ascertain an acceptable catch range for this species. Furthermore, if the seasonal closure achieves its second objective of increasing stock recruitment by protecting near-term pregnant females, the sustainable catch range is likely to increase in 3-4 years time as those recruits reach a size at which they are selected for by the permitted gillnet mesh sizes in the WCDGLF. At that point, the acceptable catch range is likely to require further revision.

3.2 Recommendation Two

DFWA to conduct compliance risk assessment for the JASDGLF and WCDGLF, and DFWA to develop compliance strategies for the Fisheries to address these risks.

While the DFWA has not undertaken a formal quantitative compliance risk assessment on these Fisheries it has held a number of compliance workshops over the past 5 years. The workshops have identified and assessed the compliance risks associated with these Fisheries to allow the development of action plans to address high-risk compliance gaps. Although DFWA has limited compliance resources available to develop and implement a compliance program specifically developed for these Fisheries, DFWA has, and always will, conduct opportunistic inspections of catch and fishing operations and undertake intelligence driven investigations into alleged offences in the shark fisheries.

3.3 Recommendation Three

DFWA to ensure that adequate validation of logbook data is undertaken.

As evidenced by the above-reported Daily/Trip return data issues (refer Recommendation One), adequate data validation has patently not occurred over the last 2 years. However, since becoming aware of the invalid data reported since 2006, DFWA has been reprioritising staff resources to rectify the issue. To this end DFWA is currently working to quantify the misreported data and to re-implement and manage the logbook program with an appropriate level of ongoing training and data validation to ensure the integrity of reported data into the future. It is currently anticipated that a dedicated full-time demersal gillnet and longline

fishery logbook data validation officer will be in place prior to the expiry of the Fisheries' current WTOs. Rectification of the daily-trip returns data reported during the last two and a half years should take approximately 12 months, depending on the full extent of the misreporting problems.

3.4 Recommendation Four

DFWA to implement, review and if necessary further develop recovery strategies for all overfished target stocks to actively promote their recovery.

Recovery of target shark stocks that have historically suffered from varying degrees of over-exploitation is reviewed annually and no further recovery actions are currently deemed necessary. Stock assessments indicate that gummy and whiskery sharks were recovering adequately up to and including 2005/06. Additionally, the annual two-month Whiskery Shark Pupping Closure is designed to ensure and accelerate recovery of the whiskery shark stock through reduced catches and improved stock recruitment. However, the full benefits of this measure will not be evident for another 3-4 years when anticipated increases in neonate survival will be reflected in catch data from >5 year-old sharks. Apart from a total prohibition on targeted shark fishing in the Western Australian northern shark fisheries, every conceivable practical measure for mitigating external sources of dusky and sandbar shark mortality has been introduced across all WA-managed commercial fisheries. As detailed in section 2.2, these include:

- commercial protection of all sharks and rays;
- introduction of Bycatch Reduction Devices (BRDs) in most WA-managed trawl fisheries;
- significant increases in penalties for taking commercially protected sharks and rays or contravention of existing anti-finning and anti-filleting regulations;
- a maximum size limit for dusky sharks in the Temperate Shark Fisheries to reduce incidental capture mortality of older sharks (which demographic analysis indicates are critical for stock sustainability);
- maximum size limit (70 cm inter-dorsal fin length) for all whaler sharks for recreational fishers in the West Coast and South Coast bioregions; and
- a prohibition on the use of metal snood material and large hooks for all commercial fisheries (excepting the northern shark fisheries).

3.5 Recommendation Five

Where a statistically significant increase in the rate of protected species interactions is identified, DFWA will initiate a management response within 3 months to mitigate the risk of further interactions.

The reduction in effort capacity and actual fishing effort associated with the new input control regime is expected to have already reduced the rate of protected species interactions below their previously assessed low levels. Nevertheless DFWA will continue to monitor TEP species interaction rates reported in "Daily/Trip" logbooks. However, as there are no readily-comparable historical data, it is likely to take a number of years to develop an informative time-series of such low frequency events.

3.6 Recommendation Six

DFWA to ensure that recreational, indigenous and illegal harvest are factored into the stock assessment.

As dusky and sandbar shark stock assessments are based on fishing mortality rates estimated from tagging (rather than commercial CPUE data), recreational and illegal harvests have already been included to the extent of the available data. Indigenous harvests of these species are believed to be negligible, however, there are no data to support this assumption. Although gummy and whiskery shark assessments are solely based on commercial fishery data, creel survey data indicate that recreational fishing mortality is likely to be insignificant for these species relative to the level of commercial exploitation. However, if and when new data become available from non-commercial and illegal sources, it will be appropriately assessed.