INTEGRATED FISHERIES MANAGEMENT

Draft Allocation Report – West Coast Demersal Scalefish

Prepared by the
Integrated Fisheries Allocation Advisory Committee

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Government of **Western Australia**
Department of **Fisheries**

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MAKING A SUBMISSION

Members of the public are invited to make written submissions on this draft allocation report.

Those making submissions are encouraged to make reference to the particular proposal or section of the report they wish to comment on. If you disagree with a particular proposal or section, try to suggest alternative ways to address or resolve the issues identified in the report. Clear reasons should be included in your response, so that your views can be properly considered.

The Integrated Fisheries Allocation Advisory Committee (IFAAC) will consider the content of all submissions during the preparation of its final report to the Minister for Fisheries and may make changes to its initial position as and if required. A summary of all the submissions will be provided to the Minister at the time the IFAAC submits its final report to him.

After the submission period has closed, the IFAAC may write to individuals and groups who have lodged a written submission, inviting them to speak to the committee in support of their submission.

The IFAAC encourages stakeholders and other interested individuals and parties to communicate among themselves in the preparation of their submissions and would appreciate the lodgement of joint submissions on particular issues, such as percentage shares.

Submissions should be made prior to **31 August 2010** and sent to:

IFAAC

Locked Bag 39
Cloisters Square Post Office
PERTH WA 6850

Fax: (08) 9482 7224

The IFAAC would appreciate the lodgement of submissions electronically using the following email address ifaac@fish.wa.gov.au.

1.0 COMMITTEE'S DRAFT RECOMMENDATIONS

Recommendation 1

Allocations for the west coast demersal scalefish resource should be made for the area covered by the West Coast Demersal Scalefish (Interim) Managed Fishery, 26°30' South to 115°30' East (north of Kalbarri to east of Black Point).

Recommendation 2

Allocations for the west coast demersal scalefish resource should be made for the whole fishery, 26°30' South to 115°30' East, rather than for separate areas of the fishery.

Recommendation 3

The species used for the recreational fishing closure, as shown in Table 3(b), should be the suite of species used for allocation purposes of the west coast demersal scalefish resource.

Recommendation 4

Monitoring of boat fishing for silver trevally, King George whiting and other nearshore fish stocks should take place to ensure transfer of effort does not result in overfishing nearshore species.

Recommendation 5

Monitoring of the key species, dhufish, pink snapper and baldchin groper catches should be undertaken to keep catches of this species at an acceptable proportion within recommended allocations as well as within sustainable levels.

Recommendation 6

The formal allocations in the fishery should be made to the recreational and commercial sectors.

Recommendation 7

The Commonwealth's co-operation should be sought to ensure the catches of west coast demersal scalefish taken in the Western Deepwater Trawl Fishery are monitored to ensure that catches of vulnerable species do not increase.

Recommendation 8

The relative allocation proportions should be based on the total catches in 2005/06 of the recreational fishing closure list caught, less the commercial catch in the Metropolitan Area in determining the sectoral allocations for the west coast demersal scalefish resource.

Recommendation 9

That for allocation purposes the recreational catch be considered to be 25 percent greater than the catches reported in Fisheries Research Report No. 177 and the recreational fishing catches reported in Fisheries Research Report No. 175.

Recommendation 10

That the allocation of shares in the West Coast Demersal Scalefish Fishery should be 66 per cent (two thirds) to the commercial sector and 34 per cent (one third) to the recreational sector.

Recommendation 11

That the allocation to the customary sector not be quantified.

Recommendation 12

A reallocation mechanism should be implemented for the west coast demersal scalefish resource, as soon as practicable.

Recommendation 13

A system of monitoring the sectoral catches, based on the principles set out in the document "Considerations for the Implementation of Western Rock Lobster Sectoral Allocations" should be established to monitor allocations in the West Coast Demersal Scalefish Fishery.

1.1 Items to Note

Note 1

The Minister is not seeking advice from IFAAC regarding an allocation for non-extractive users of the resource as this is taken into account in the setting of the allowable harvest level provided to the IFAAC.

Note 2

The West Coast Demersal Scalefish (Interim) Managed Fishery Plan describes the zones of the fishery as "areas". To avoid confusion, IFAAC have adopted this terminology in the document. Therefore when the word area is used to describe a section of water in the West Coast Demersal Scalefish (Interim) Managed fishery, it means a zone.

Note 3

There has not been sufficient data to track relative trends in catches between the commercial and recreational sectors in the west coast demersal scalefish fishery. The IFAAC considers that because there is insufficient information, there is strong justification for using the 2005/06 data as a reference point, this being the most recent set of data.

Note 4

The 1996/97 creel survey did not take into account of catches from the charter sector of the recreational fishery. In addition, its findings were based on the number of fish caught. The weight in kilograms of certain key species, such as Western Australian dhufish, pink snapper and baldchin groper were estimated, but these estimated weights were not carried out over the broad suite of species. Therefore, research scientists have sounded a note of caution in utilising these figures and IFAAC has only been able to make limited use of the 1996/97 creel survey data.

Note 5

IFAAC concluded that the most appropriate weight to apply to the recreational fish caught that did not have a length/weight conversion ratio was 600 grams per fish.

Note 6

The top 15 species, as shown in Table 3 (a), account for 94.3 per cent of the commercial sector's catch and 93.2 per cent of the recreational sector's catch of west coast demersal scalefish (see Appendix 7 for the full list of these species). The recreational closure list of species, as shown in Table 3(b), accounts for 99.3 per cent of the commercial sector's catch and 93.1 per cent of the recreational sector's catch of west coast demersal scalefish (as listed in Appendix 7). As management arrangements are already in place around the recreational fishing closure list, IFAAC decided that it would allocate on the recreational fishing closure list species.

Note 7

The Department of Fisheries phone diary surveys indicated a catch of key indicator species in the West Coast Demersal Scalefish Fishery of around 20 percent greater than that reported in Fisheries Research Report No. 177. Dr Aldo Steffe, in his review of Fisheries Research Report No. 177, also concluded that levels of total catch (recreational catch) were under-estimated, and the uncertainty levels associated with the estimates have been greatly under-estimated.

2.0 INTRODUCTION

Integrated Fisheries Management (IFM) is an initiative aimed at addressing the issue of how fish resources in Western Australia can be best shared between competing users within the broad context of 'Ecologically Sustainable Development' (ESD) so that they can be managed on a sustainable basis.

The Minister for Fisheries established the Integrated Fisheries Management Allocation Advisory Committee (IFAAC), under Section 42 of the *Fish Resources Management Act 1994* (FRMA), in 2004 to investigate IFM resource allocation issues and make recommendations to him on optimal resource use.

The IFAAC has prepared this report, which documents the committee's initial position on allocations for the west coast demersal scalefish resource, along with the reasons for its conclusions as a basis for widespread community consultation. This report follows the IFAAC's preliminary investigation of the west coast demersal scalefish resource sharing issues and consultation with stakeholders.

The report is being released for a public comment period to the end of August 2010 to facilitate discussion and encourage comment on how the west coast demersal scalefish resource should be shared between competing users. At the conclusion of the comment period, the IFAAC will consider all submissions and finalise its advice to the Minister for Fisheries on allocations for the west coast demersal scalefish resource.

The IFAAC expects to provide this advice in 2010.

Following the receipt of the IFAAC's advice, the Minister for Fisheries, consistent with the Government's policy, will determine the allocations to sectors.

3.0 BACKGROUND

The IFM policy was adopted in 2004. In summary, IFM involves:

- setting the total sustainable harvest level of each resource that allows for an ecologically sustainable level of fishing;
- allocation of explicit catch shares for use by commercial, recreational and customary fisheries;
- continual monitoring of each sector's catch;
- managing each sector within its allocated catch share; and
- developing mechanisms to enable the reallocation of catch shares between sectors.

3.1 The IFAAC

The members of the IFAAC who prepared this report are Mr Jim McKiernan (past chairman), Mr Norman Halse, Ms Elizabeth Woods and Mr Steve Lodge. In addition, the Deputy Director, Integrated Fisheries Management, is a non-voting member of the Committee. This position is currently occupied by Dr Lindsay Joll.

Mr McKiernan represented Western Australia in the Australian Parliament for nearly 18 years. During this time he served upon and was chairman of a number of senate and other parliamentary committees. He is a Sessional Member of the State Administrative Tribunal, a Justice of the Peace and is Deputy Chairman of the Board of the Disability Services Commission. Mr McKiernan replaced Mr Murray Jorgensen as the Chairman of the IFAAC on 1 March 2006 and retired as Chairman on 1 September 2009.

Mr Norman Halse is a keen recreational fisher, conservationist and researcher. Mr Halse worked for WA's Department of Agriculture for 40 years, his career culminating as that department's Director General. His conservation interests included serving as past President of the Conservation Council of WA, as Chairman of the National Parks and Conservation Authority and as a member of the Environmental Protection Authority. Mr Halse has a strong interest in recreational fishing, which is demonstrated by his service as a past chairman, and current board member of peak body Recfishwest.

Ms Elizabeth (Libby) Woods is Deputy Chief Magistrate. Ms Woods chaired the Wetline Review Commercial Access Panel, which recommended the commercial access arrangements for the West Coast Demersal Scalefish Fishery (WCDSF), and was chairman of IFAAC following the retirement of Mr McKiernan until the appointment of a new chairman.

Mr Steve Lodge owns the Geraldton Fish Markets and the Shark Bay Fish Factory. He also has interests in the rock lobster fishery, and other processing establishments and owns Goldenwest Ice. Mr Lodge was a member of the West Coast and Gascoyne Management Planning Panel that recommended management arrangements for the WCDSF and was a member of the Purse Seine Management Advisory Committee.

Mr Ian Longson was appointed Chair of IFAAC on 1 December 2009. Mr Longson has had a distinguished career in both the private and public sector. He is currently a business development consultant. Prior to June 2009 he was the Director General of the Western Australian Department of Agriculture and Food for five years. Prior to that he was on the executive team and held the position of Deputy Director General at the Department of Agriculture since 1998. He has previously worked as a senior consultant and manager of the Perth Office of ACIL Consulting

(now ACIL Tasman), the Dairy Industry Authority of Western Australia, the Asian Development Bank and, early in his career, as an extension adviser with the Western Australian Department of Agriculture in the South-West.

3.1.1 Disclosure of interest

If a member had an interest in any matter to be considered by the IFAAC, the member disclosed the interest, the disclosure was recorded in the minutes of the committee and the member did not vote on the matter. Mr Lodge has an interest in the processing sector of this fishery.

3.1.2 Guiding principles

Following a review of the 2004 Integrated Fisheries Management Policy during 2009, the Minister for Fisheries, the Hon. Norman Moore, MLC, provided the IFAAC with the following Guiding Principles and Terms of Reference.

Government has adopted the principles, outlined below, as the basis for IFM (Appendix 1). The IFAAC should ensure that any advice to the Minister for Fisheries is consistent with these principles:

i. Fish resources are a common property resource managed by the Government for the benefit of present and future generations.

ii. Sustainability is paramount and ecological requirements must be considered in the determination of appropriate harvest levels.

iii. Decisions must be made on best available information and where this information is uncertain, unreliable, inadequate or not available, a precautionary approach adopted to manage risk to fish stocks, marine communities and the environment. The absence of, or any uncertainty in, information should not be used as a reason for delaying or failing to make a decision.

iv. A harvest level, that as far as possible includes the total mortality consequent upon the fishing activity of each sector, should be set for each fishery[1] and the allocation designated for use by the commercial sector, the recreational sector, the customary sector, and the aquaculture sector should be made explicit.

v. The total harvest across all user groups should not exceed the allowable harvest level. If this occurs, steps consistent with the impacts of each sector should be taken to reduce the take to a level that does not compromise future sustainability.

vi. Appropriate management structures and processes should be introduced to manage each sector within their prescribed allocation. These should incorporate pre-determined actions that are invoked if that group's catch increases above its allocation.

vii. Allocation decisions should aim to achieve the optimal benefit to the Western Australian community from the use of fish stocks and take account of economic, social, cultural and environmental factors. Realistically, this will take time to achieve and the implementation of these objectives is likely to be incremental over time.

viii. It should remain open to government policy to determine the priority use of fish resources where there is a clear case to do so.

[1] Fishery is defined under the FRMA as one or more stocks or parts of stocks of fish that can be treated as a unit for the purposes of conservation or management; and a class of fishing activities in respect of those stocks or parts of stocks of fish.

ix. Management arrangements must provide sectors with the opportunity to access their allocation. There should be a limited capacity for transferring allocations unused by a sector for that sector's use in future years, provided the outcome does not affect resource sustainability.

More specific principles to provide further guidance around allocation decisions may also be established for individual fisheries.

3.1.3 The IFAAC's terms of reference

Taking into account the principles detailed above, the IFAAC is to investigate fisheries resource allocations issues and make recommendations to the Minister on matters related to optimal resource use, and in particular provide advice on:

- allocations between sectors, now and into the future;
- strategies to overcome allocation and access issues arising from temporal and spatial competition for fish at a local /regional level;
- allocation issues within a sector as referred by the Minister for Fisheries;
- more specific principles to provide further guidance around allocation and reallocation decisions for individual fisheries; and
- other matters concerning the integrated management of fisheries as referred by the Minister for Fisheries.

In the first instance, a former Minister for Fisheries, the Hon. Kim Chance, MLC, requested that the IFAAC provide advice and recommendations on allocations for west coast rock lobster, abalone (with emphasis on the Perth metropolitan region), and west coast demersal scalefish (with emphasis on Western Australian dhufish, baldchin groper and pink snapper).

The IFM Government Policy released in October 2004 and amended in December 2009 (Appendix 1) is the principal source of guidance for the IFAAC in developing its recommendations on sectoral allocations. The Minister for Fisheries has also provided the IFAAC with additional advice on various IFM issues, which it has taken into account in its deliberations. These issues are discussed in section 3.2.

Under the IFM Government Policy (Paragraph 11, Appendix 1), the Minister determines the process and timeframes for resolving allocation issues in each fishery based on the advice of the Chief Executive Officer of the Department of Fisheries and the IFAAC. The Minister has approved a four-stage IFM allocation process developed by the IFAAC (Appendix 2). The four stages involve:

- determining the need for a formal allocation process in a fishery;
- development of an Integrated Fisheries Management Resource Report by the Department of Fisheries;
- the integrated fisheries allocation process, which includes;
  - Step 1. Investigation of the allocation issue;
  - Step 2. IFAAC settling a draft allocation report and releasing it for public comment;
  - Step 3. IFAAC recommending allocations to the Minister for Fisheries;
  - Step 4. The Minister determining allocations; and
- determining mechanisms for future allocations between sectors.

In the case of the west coast demersal scalefish resource, the first stage (the first point above) of the process was unnecessary, as the former Minister for Fisheries, the Hon. Jon Ford, MLC, had already requested that the IFAAC provide advice and recommendations on allocations.

The second stage of the process for west coast demersal scalefish resource was completed in December 2009, when the Department of Fisheries provided the IFM Resource Report to IFAAC. This report has been the principal source of information used by the IFAAC in its consideration of the allocations for the west coast demersal scalefish resource.

3.2 Ministerial Advice

3.2.1 Allocation to the non-fishing sector

The Minister for Fisheries, the Hon. Norman Moore, MLC, has advised the IFAAC of the continuation of the policy which states the IFM initiative was designed to determine allocation between commercial, recreational (including charter) and customary fishing sectors that are extractive users. The Minister also advised he was not seeking a recommendation from IFAAC on allocations to non-extractive users of the resource (Appendix 3).

Note 1 : The Minister is not seeking advice from IFAAC regarding an allocation for non-extractive users of the resource as this is taken into account in the setting of the allowable harvest level provided to the IFAAC.

3.3 Additional Guiding Principles Adopted by the IFAAC

The IFAAC will, in accordance with its terms of reference, be making recommendations on initial allocations for west coast demersal scalefish to each of the sectors. Other allocation principles that the IFAAC has considered or that have been brought to the IFAAC's attention, in addition to those referred to previously (sections 3.1 and 3.2) that have a bearing on its deliberations, are discussed below.

The IFAAC was guided by the following principles in relation to considering allocation options. These principles may evolve over time into more generally accepted principles in relation to the IFAAC's tasks. The principles are as follows:

- The approach should be pragmatic and incremental.
- There was a need to make explicit allocations (as distinct from making a general statement of principle about how allocations should be made).
- Allocations should not have the effect of merely deferring a decision indefinitely.
- That until there are re-allocation mechanisms, the IFAAC should be cautious in making recommendations that would have the effect of immediately and significantly impacting on a sector.
- Re-allocation mechanisms should be developed within a specified timeframe, which should be set at not more than five years for west coast demersal scalefish.

3.3.1 Optimising benefit to the community

Guiding policy vii (see section 3.1.2) of the IFM Government Policy states:

> *Allocation decisions should aim to achieve the optimal benefit to the Western Australian community for the use of fish stocks and take account of economic, social, cultural and environmental factors. Realistically, this will take time to achieve and the implementation of these objectives is likely to be incremental over time.*

The West Coast Demersal Scalefish Fishery was one of three fisheries used as case studies in a research project entitled: "*A Socio-economic Valuation of Resource Allocation Options between Commercial and Recreational Use*" (McLeod and Nicholls, 2004).

The results of the study pointed to a small reallocation of catch from the recreational sector in order to maximise the net economic benefits from the use the resource. However, the authors cautioned against using the results at the present time, because some of the underlying assumptions that were present at the time of writing their report are not currently being met.

3.3.2 Ministerial action

In November 2007, the then Minister for Fisheries, the Hon. Jon Ford, MLC, announced a ban on the commercial catch of scalefish and sharks in the Metropolitan (fishing) Area (between Lancelin and south of Mandurah). This decision had the effect of reducing the overall catches of scalefish in the area.

Commercial fishers were provided with an 'Act of Grace' payment for their loss of access to the metropolitan zone of the fishery.

3.4 Description of the Fishery

The fishery is a multi-species fishery targeting a range of demersal scalefish species. It is located along the southern part of the west coast of Western Australia from 26°30' south (north of Kalbarri) to 115°30' east (east of Augusta). The inshore part of the fishery stretches from the shore out to the 250-metre depth line.

The families and species, which characterise the fishery, set out in Table 1, are the species to which the recreational fishing closure from 15 October to 15 December applies. However, this broad suite characterises more the recreational fishery, than the commercial fishery, which is a method-based fishery, and is focussed on the more valuable commercial species in the suite. The legal definition of the commercial fishery, however, is very broad and includes ALL scalefish species taken by line or gillnet. A broad definition was used for the commercial fishery to avoid leaving 'cracks' in the definitions which would allow other commercial fishers to continue to fish for species not included in a list such as Table 1.

The fishery is a multi-user fishery, comprising commercial and recreational sectors. As is explained in Section 4.2 below, it is unlikely that there is any meaningful customary take of demersal scalefish.

Until January 2008, the west coast demersal scalefish fishery was an open access or 'wetline' fishery for the commercial sector. Access to the fishery was limited in January 2008 and the West Coast Demersal Scalefish Interim Managed Fishery (WCDSFIMF), came into effect in January 2009. All the commercial sector fisheries have undergone substantial effort and catch reductions to meet sustainability objectives of reducing demersal scalefish catches by at least 50 per cent of the sector's 2005/06 catches. These fisheries are described in more detail in section 3.4.2 below.

3.4.1 Recreational

Recreational fishing and boating has always been a popular Western Australian past-time. Recreational fishing for demersal scalefish is mainly from boats. Anglers typically use rods and reels or handlines, although a small proportion is taken by spear-fishers. Charter fishing using these same methods is also popular.

In July 2009, the Minister announced significant new rules including new licences and further restrictions in order to move towards the sustainability objective of reducing West Coast demersal scalefish catches by at least 50 per cent of their 2005/06 catches.

In September 2009, the Minister, Hon Norman Moore MLC, announced modified management arrangements for recreational fishing in the recreational WCDSF fishery, still with the objective of reducing the recreational catch by 50 per cent. These were:

- a daily mixed bag limit in the West Coast Bioregion of two "high risk" demersal scalefish species per (licensed) person, of which only one (1) may be a Western Australian dhufish;
- a boat limit of two Western Australian dhufish (six for charter boats); and
- a two-month seasonal closure on the take of "high risk" demersal scalefish (see Table 1 below) by recreational fishers in the West Coast Bioregion (between Kalbarri and Augusta) from 15 October to 15 December inclusive (boat and shore fishing).

Table 1. The take of these high-risk species by recreational fishers is prohibited during the recreational demersal scalefish closure on the West Coast (15 October to 15 December, inclusive).

SPECIES	SCIENTIFIC NAME
Coral trout and coronation trout	*Plectropomus* spp. and *Variola louti*
Cods	Family Serranidae
Western Australian dhufish	*Glaucosoma hebraicum*
Emperors ("nor' west snapper")	Family Lethrinidae
Baldchin groper and tuskfish	*Choerodon* spp.
Western blue groper	*Achoerodus gouldii*
Hapuku/bass groper/trevella and grey banded rock cod	*Polyprion* spp., Family Centrolophidae and *Ephinephelus octofasciatus*
Parrot fish	Family Scaridae
Pink snapper	*Pagrus auratus*
Queen snapper (blue morwong)	*Nemadactylus valenciennesi*
Red emperor	*Lutjanus sebae*
Red snapper – bight redfish, nannygai and swallowtail	*Centroberyx* spp.
Tropical snappers and sea perch (mangrove jack, fingermark, job fish, stripey sea perch etc.)	Family Lutjanidae
Foxfish and pigfish	*Bodianus* spp

- Fish in the current "High Risk" group ("Category 1") will be divided into two new categories – demersal scalefish and pelagic species.
- Combined bag limit changes[2] to "Lower Risk" (30) and "Medium Risk Species" (12) in the West Coast Bioregion.

[2] See Department of Fisheries website www.fish.wa.gov.au for the lists of "Lower Risk", "Medium Risk" and "High Risk" species.

- A requirement to carry a release weight for assisting in the return of unwanted demersal scalefish to the seabed.
- Introduction of a State-wide Recreational Fishing From Boat Licence ($30).
- Limiting the Recreational Fishing From Boat Licence to fishing conducted from a "powered" boat only (not kayaks or other not powered boats [e.g. dinghy with no motor]).
- Allowing any fisher not holding a Recreational Fishing From a Boat Licence to fish from a boat in the company of a licensed boat fisher within the licensed fisher's bag limit.
- Charter boat passengers not already holding a Recreational Boat Fishing Licence pay a small fee ($15) per trip.
- Removal of the recreational 'umbrella' licence with a 10 per cent discount when more than one licence is purchased at the same time; together with a 50 per cent discount for seniors, pensioners and children under 16 years of age (except for Charter Fishing Licences).
- All money raised by licensing is held in a special trust fund to be used only for recreational fishing.
- An additional $2 million annually from the Consolidated Account for 13 Fisheries and Marine Officers for recreational compliance and education.
- A voluntary logbook program for High Risk fish to provide additional catch and effort information will be introduced.

Additionally, the following elements of the recreational fishing arrangements announced in late 2008 remain in place:

- The baldchin groper spawning closure within the Abrolhos Islands Fish Habitat Protection Area that occurs over the period 1 November to 31 January (this closure also applies to the commercial sector). The finfish possession limit within the Abrolhos Islands Fish and Fish Habitat Protection Area is 10 kilograms of fillets or one day's bag limit of whole fish per person – this possession limit can be transported back to the mainland. This possession limit is to remain in place for at least two years while a review to assess the option of managing the Abrolhos Islands as a wilderness 'no take away' fishing area is undertaken.
- The minimum legal size for pink snapper south of Lancelin was increased from 450 millimetres to 500 millimetres in December 2009[3].
- Fishing competitions will be discouraged from targeting High Risk fish.
- The Recreational Fishing Fund will be reviewed with a view of providing recreational fishing stakeholders more meaningful input into the development of recreational fishing spending priorities.

Limited entry was introduced for licensed fishing tour (charter) operators in 2001 and the West Coast region has the highest number of charter operators in the State. Logbooks became compulsory in 2002/03 and recent analysis of logbook data show that there has been an overall contraction in total charter effort and operational area of charter activity in the west coast since then. However, charter effort has been consistently high off Perth, Kalbarri and around the Abrolhos Islands. In 2005/06 the charter sector took about 10 per cent of the total recorded recreational catch of dhufish and about 30 per cent of the pink snapper catch.

[3] Note: this also applies to commercial fishers and as such will impact on both the WCDSFIMF, the Cockburn Sound Line & Pot Fishery, WCDGDLF and the JASDGDLF.

3.4.2 Commercial

The major commercial demersal scalefish fishery on the west coast is the West Coast Demersal Scalefish (Interim) Managed Fishery (WCDSFIMF). The WCDSFIMF extends from north of Kalbarri (26° 30' south latitude – around Steep Point) to Black Point (115° 30' east longitude), east of Augusta (Figure 1) and seawards from the coastline to the 200 nautical mile boundary of the Australian Fishing Zone. It incorporates the habitats of the major demersal species targeted in the fishery.

The fishery comprises five management areas, four "inshore" areas (out to 250 metres) and an Offshore Area (250 metres depth to 200 nautical miles offshore), with the Abrolhos Islands as a sub-area of the Mid-West Inshore Area. Each area has a suite of demersal fish that are typically caught within its waters. These are:

Area[4]	**Typical catch**
• Kalbarri Inshore Area	Dhufish, pink snapper, sweetlip emperor
• Mid-West Inshore Area	Dhufish, pink snapper, sweetlip emperor
• Abrolhos (sub-Area)	Baldchin groper, pink snapper
• Metropolitan Inshore Area	Dhufish, pink snapper
• South-west Inshore Area	Dhufish, pink snapper, bight redfish
• Offshore Area	Hapuku, ruby snapper, blue eye trevalla and grey banded cod.

It should be noted that the catches in the Offshore Area are poorly known (less reliable) with little data available.

There are four other commercial fisheries also landing these species in the West Coast Bioregion. These are, the West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WCDGDLF), the Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (JASDGDLF), the South-West Trawl Managed Fishery (which usually takes less than five tonnes of scalefish, mostly whiting) and the Commonwealth- managed Western Deepwater Trawl Fishery. In addition, the Western Rock Lobster Fishery takes a small catch of these fish as a bycatch in their rock lobster pots.

Note 2 : The West Coast Demersal Scalefish (Interim) Managed Fishery Plan describes the zones of the fishery as "areas". To avoid confusion, IFAAC have adopted this terminology in the document. Therefore when the word area is used to describe a section of water in the West Coast Demersal Scalefish (Interim) Managed fishery, it means a zone.

[4] Kalbarri area (26°30'South to 28°South), Mid-West Area (28°South to 31°South), Metropolitan Area (31°South to 33°South), South-West Area (33°South to 115°30' East). All inshore areas extend between the coastline and the 250-metre depth contour.

The Offshore Area extends south from 26°30' South to 115°30' East between the 250-metre depth contour and the 200 nautical mile boundary of the Australian Fishing Zone.

4.0 CATCH INFORMATION

Catch information on the west coast demersal scalefish resource comes from a number of the sources. These include:

- Fisheries Research Report No.163 – provides extensive information on catch and effort statistics for the recreational and commercial sectors of this fishery;
- with the increasing concerns regarding the status of Western Australian dhufish, or simply 'dhufish' as it is commonly referred, stocks in the late 1990s and the early 2000s, a number of Fisheries Research and Development Corporation (FRDC) and other funded projects were undertaken to gather more data on this and other west coast demersal species;
- a survey of boat-based recreational fishing in the West Coast Bioregion was undertaken in 1996/97[5], another, more extensive survey that incorporated the catches of the charter sector was undertaken during 2005-06[6], and an assessment of the finfish catch by fishers in the Abrolhos Islands was made in 2006[7];
- recreational phone diary surveys; and
- more detailed commercial catch information is available from a study into wetline fishing[8] undertaken in the late 1990s and through annual departmental *State of the Fisheries* Reports.

4.1 Catch Data Uncertainty

Fisheries Research Report No. 163[9], provides extensive information on catch and effort data provided by the various commercial fishing operations that caught these species.

The data were comprehensively analysed by the authors of Fisheries Research Report No. 163 for changes in fishing efficiency and fleet dynamics, but a reliable index of abundance could not be generated. This data included a survey of boat-based recreational fishing in the West Coast Bioregion was undertaken in 1996/97, but until recently very little biological research work had been undertaken in this region on the key indicator species.

Because of the increasing concerns regarding the status of dhufish stocks in the late 1990s and the early 2000s, a number of FRDC and other funded projects were undertaken to gather more data on this and other west coast demersal species. In addition, surveys of recreational fishing on these stocks were repeated using Department of Fisheries funds (see publications listed in the References).

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[5] Sumner, N R, and Williamson P.C, *"A 12-month survey of coastal recreational boat fishing between Augusta and Kalbarri on the west coast of Western Australia during 1996-97",* Fisheries Research Report No. 117, 1999

[6] Sumner, N R, Williamson, P C, Blight, S J & Gaughan, D J, "*"A 12-month survey of coastal recreational boat fishing between Augusta and Kalbarri on the west coast of Western Australia during2005-06",* Fisheries Research Report No. 177, 2008

[7] Sumner, N R, "*An assessment of the finfish catch by recreational fishers, tour operators, commercial lobster fishers and commercial wetline fishers from the Houtman Abrolhos Islands during 2006"*, Risheries Researach Paper No. 175, 2008

[8] Crowe, F, Lehre, W & Lenanton, R, *"A study into Western Australia's open access and wetline fisheries",* Fisheries Research Report No. 118, 1999

[9] Wise, B, St John, J, Lenanton, R, (2007) *"Spatial scales of exploitation among populations of demersal scalefish: implications for management",* Fisheries Research Report No. 163

Despite the substantial increase in information generated over the last five years, the limited availability of useful historical data meant it was not possible to develop stock assessment models that could reliably estimate biomass. With the limited availability of useful historical data, where it was not possible to develop stock assessment models that reliably estimate biomass, the current assessment for the West Coast Demersal Scalefish Fishery has been based on a 'weight-of-evidence' approach.

This approach was endorsed by Malcolm Haddon and by Michael O'Neill, in their scientific reviews of Fisheries Research Report No. 163.

Dr Aldo Steffe, in his review of Fisheries Research Report No. 177[10], indicated that levels of total catch (recreational catch) were under-estimated, and the measures of precision associated with the estimates have been greatly under-estimated.

4.2 Customary

The National Native Title Tribunal's Research Report of April 2005[11] indicated that there was shore-based fishing for "schnapper" (sic) in the Swan River, whereby schools of schnapper were driven into the mouth of the Swan River and speared. Shore fishing for west coast demersal scalefish takes such a small proportion of the total catch that it is within the errors of measurement, and is ignored. Based on this, customary fishing for west coast demersal scalefish should also be considered very small, and within the errors of measurement, and could also be similarly ignored. Both customary and recreational shore fishing will continue to be allowed but a specific allocation has not been attempted by IFAAC.

4.3 Recreational

Recreational boat-based line fishing effort has increased from 269,600 days in 1996/97 to 311,400 days in 2005/06[12].

Boat registration information from the Department for Planning and Infrastructure shows a steady increase in the number of new boats registered. In 2002, 69,166 boats were registered in WA. By 2006 this number had grown to 81,417 with over 50 per cent of these based in the metropolitan area. This represents an average growth in new boat registrations of approximately 2,450 per year, although it is recognised that not all boats are used for recreational fishing. As a result of this growth, additional boat launching facilities are being considered[13]. Both the growth in boat numbers and the additional launching facilities are likely to place further pressure on fish stocks.

The metropolitan area has the greatest number of registered boats. This indicates a higher level of fishing pressure is being exerted on stocks within this area.

The first 12-month survey of recreational boat fishing in the West Coast Bioregion, including the metropolitan area, was conducted during 1996/97. This survey provided the initial data

[10] Steffe, A (2009) *"Revew of Fisheries Research Report (177)"* Fisheries Occasional Publication No. 67,

[11] Wright, G, (2005) *"An overview of the evidence for Indigenous fisheries on the west and south coasts of Western Australia",* Research Report, National Native Title Tribunal

[12] Department of Fisheries (2007), *"Managing the Recreational Catch of Demersal Scalefishoin the West Coast, Future Management Scenarios for Community Consideration",* Fisheries Management Paper No. 225

[13] Department for Planning and Inrastructure (2007), *Perth Regional Boating Facilities Study",* Technical Report No. 444

on the recreational boat-based catch for the West Coast Bioregion. A further creel survey was undertaken in 2005/06, and more creel surveys were undertaken in 2007/08 (for the Metropolitan Area) and 2008/09. However, the recent survey information is not available at the time of print of this draft allocation report.

The 1996/97 creel survey did not include the charter or diving catches whereas the 2005/06 recreational catches provided by the Department show the catches from the boat ramp creel survey of line-fishers and charter sector catches, taken from charter logbooks, but does not include the west coast demersal scalefish catches taken by divers.

An independent review of the 2005/06 creel survey undertaken by Dr Aldo Steffe indicated that, for a variety of reasons, the levels of total recreational catch were under-estimated in the creel survey results.

Recreational phone diary surveys undertaken in 2005/06 tend to support Dr Steffe's findings, as the reported catch from this survey is generally higher than the creel survey, although the reported catch difference is not statistically significant. The phone diary survey for key indicator species suggested a catch that was around 30 – 45 per cent greater than that reported in Fisheries Research Report No. 177.

Appendix 4 shows the boat based recreational catches of the predominant 15 species and the species that are subject to the recreational fishing closure for 2005/06, by area, from the creel survey that was conducted that year. It also shows the catches from the charter fishing industry, which services the recreational fishing sector. During 2005/06, 61% per cent of the 161 licensed charter fishing operators able to work in the West Coast Bioregion operated in the area. Charter operators have a compulsory logbook program.

Appendix 5 shows a similar, more detailed, breakdown of these boat-based catches into species by area, sector, and managed fishery of the species that are subject to the recreational fishing closure.

Although, for a variety of reasons, the weights of catches in 1996/97 creel survey are not as accurate as those of the 2005/06 survey, the catches of the key indicator species from this survey are shown in Appendix 6**.** These are used because they are the only other indicative data source available.

Sufficient data has not been available to track relative trends in catches between the commercial and recreational sectors. The IFAAC believes that because there is insufficient information, including the increase in recreational boat-use, there is strong justification for using the 2005/06 data as a reference point, this being the most recent set of data before management changes were undertaken in both sectors.

The current assessment for the West Coast Demersal Scalefish Fishery, where it was possible to develop stock assessment models that reliably estimate biomass, has been based on a 'weight of evidence' approach including fishing mortality derived from length/age relationships.

Note 3 : There has not been sufficient data to track relative trends in catches between the commercial and recreational sectors in the West Coast Demersal Scalefish Fishery. The IFAAC considers that because there is insufficient information, there is strong justification for using the 2005/06 data as a reference point, this being the most recent set of data.

4.4 Commercial

Appendices 4 and 5 also show the commercial sector's catches in 2005/06. These tables show the open access catches prior to the introduction of limited access, which became the interim managed fishery for the WCDSF, as well as the demersal scalefish catches of the two demersal gillnet and longline fisheries. There is also a small take of demersal scalefish in rock lobster pots.

As the management goal for the fishery is to reduce the total catch of demersal scalefish across all sectors by at least 50 per cent, the catches shown in Appendices 4, 5 and 6 are currently 50 per cent or more lower than those shown. In 2007, the former Minister, the Hon. Jon Ford, MLC, announced that, for sustainability reasons, the Metropolitan Area of the fishery would be closed to commercial fishing. 'Act of Grace' payments were made to affected commercial fishers.

Appendix 6 looks at the 1996/97 catches for the key indicator species for both sectors. Although these are out of date, IFAAC has examined them because they are the only other indicative data source and provide useful trend information.

4.5 Recreational and Commercial Catch Shares

The catch proportions for 2005/06 are shown in Tables 2(a) and 2(b)**.** They have been estimated using the commercial and recreational data from Appendices 4 and 5.

Table 2 (a). The predominant 15 species taken by the sectors in 2005/06 as a percentage of the total west coast demersal scalefish catch, not including the commercial catch in the Metropolitan Area, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey.

Area	Total commercial catch (tonnes)	Total estimated recreational catch (tonnes)	Total Catch	% Commercial catch of WC demersal scalefish to total WC demersal scalefish catch	% Recreational catch of WC demersal scalefish to total WC demersal scalefish catch
All areas	986	369	1355	72.8%	27.2%
Total commercial catch excluding Metropolitan Area	871	369	1240	70.2%	29.8%

Table 2 (b). The species subject to the recreational fishing closure by the sectors in 2005/06, as a percentage of the total west coast demersal scalefish catch, not including the commercial catch in the Metropolitan Area, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey.

Area	Total commercial catch (tonnes)	Total estimated recreational catch (tonnes)	Total Catch	% Commercial catch of WC demersal scalefish to total WC demersal scalefish catch	% recreational catch of WC demersal scalefish to total WC demersal scalefish catch
All areas	1038	366	1404	73.5%	26.5%
Total commercial catch excluding Metropolitan Area	918	366	1284	71.0%	29.0%

* Commercial sector: WCDSFIMF, JASDGDLF, WCDGDLF, Cockburn Sound Line & Pot Fishery

* Recreational sector: recreational creel survey and charter sector

5.0 ALLOCATION ISSUES

As a precursor to providing its advice on actual allocations, the IFAAC considered that it needed to discuss the following issues:

- appropriate comparative data sources;
- the suite of species;
- the multi-user nature of the fishery; and
- the multi-zonal aspects of the fishery.

5.1 Comparative Data Sources

The 1996/97 Creel Survey[14] was based on numbers of fish caught. This data was converted into tonnes for Fisheries Research Report No. 118[15] and it is the only source of weight data for this set of data. The IFAAC did not consider it appropriate to allocate the resource in terms of number of fishes caught. As mentioned above, the 1996/97 creel survey did not include the charter or diving sector catches, whereas the 2005/06 recreational catches provided by the Department show the catches from the boat ramp creel survey of line-fishers and charter sector catches, which were extracted from charter logbooks. It was decided to use the 2005/06 data as the most recent information available for both sectors prior to recent management changes.

Note 4 : The 1996/97 creel survey did not take into account of catches from the charter sector of the recreational fishery. In addition, its findings were based on the number of fish caught. The weight in kilograms of certain key species, such as Western Australian dhufish, pink snapper and baldchin groper were estimated, but these estimated weights were not carried out over the broad suite of species. Therefore, research scientists have sounded a note of caution in using these figures and IFAAC has only been able to make limited use of the 1996/97 creel survey data.

5.2 The Multi-Zonal Aspects of the Fishery

The commercial fisheries within the West Coast Demersal Scalefish Fishery include two State-managed fisheries, one joint authority fishery and one Commonwealth-managed fishery. The West Coast Demersal Scalefish (Interim) Managed Fishery (WCDSFIMF) and the two demersal gillnet and demersal longline fisheries are all multi-zoned fisheries (see Figure 1). As explained earlier, no commercial fishing is permitted in the Metropolitan Area of the fishery.

As the majority of the commercial take of demersal scalefish is caught in theWCDSFIMF, and the boundaries of that fishery align with what is considered to be the west coast, IFAAC have taken the view that the area of the West Coast Demersal Scalefish Fishery to be included in the resource allocation should be the area covered by the WCDSFIMF. However, Zone 1 of the Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (JASDGDLF) also covers this area and fishers in that fishery also take demersal scalefish. IFAAC considers that this zone should also be included in the allocations.

[14] Sumner, NR and Williamson, PC (1999) "*A 12-month survey of coastal recreational boat fishing between Augusta and Kalbarri on the West Coast of WA during 1996-97",* Fisheries Research Report No. 117, Fisheries WA

[15] Crowe, F, Lehre, W and Lenanton, R (1999) *"A study into Western Australia's open access and wetline fisheries",* Fisheries Research Report No. 118, Fisheries WA

Recommendation 1: Allocations for the west coast demersal scalefish resource should be made for the area covered by the West Coast Demersal Scalefish (Interim) Managed Fishery, 26°30' South to 115°30' East (north of Kalbarri to east of Black Point).

The WCDSIMF has only slightly different boundaries from the current west coast recreational fishing boundary of 27° South to 115° 30' East. Both the West Coast Demersal Gillnet and Demersal Longline Managed Fishery (WCDGNLF) and the JASDGDLF have different boundaries from the WCDSIMF and it was agreed to adopt the WCDSIMF boundaries for the WCDSF.

IFAAC, in discussion with the Department of Fisheries and key stakeholder groups, considered whether any of the area subdivisions applying to the commercial fisheries should also apply to the recreational fishery so that there would be different allocations for different areas. Management of the recreational fishery is difficult because where there are limited numbers of recreational fishers and no way of knowing who they are, catch information for any particular area is, therefore unavoidably imprecise. The IFAAC decided for practical reasons and ease of management, the allocations to sectors should apply across the whole fishery.

Recommendation 2: Allocations for the west coast demersal scalefish resource should be made for the whole fishery, 26°30' South to 115°30' East, rather than for separate areas of the fishery.

In making Recommendation 2, IFAAC notes that the Department of Fisheries collects data by areas in the WCDSFIMF and that if big shifts occur in the use of the resource, then IFAAC may need to examine the issue of zonal or area allocations sometime in the future.

IFAAC noted that there were three areas within the WCDSFIMF where one or the other sector had either no or virtually no catches. These were the Metropolitan Area (no commercial fishing is permitted), the Offshore Area (in waters deeper than 250 metres), where there is very little recreational catch, and the Kalbarri Area, where most of the catch is taken by the commercial sector.

The catch of the offshore species has been incorporated into the catch reports, and so it is possible to allocate the suite of species that were caught in these areas.

5.3 An Appropriate Suite of Species

IFAAC noted that were several different "lists" for demersal scalefish. These were:

- The whole suite of west coast demersal scalefish, as show in Appendix 7;
- the suite of west coast demersal scalefish species to which the recreational fishing closure is applied (Table 1);
- the predominant 15 species, which comprises the predominant 10 demersal species taken by each sector (for which length-weight relationships are available) (Tables 2[a] and 3[a]); and
- the list of key indicator species of west coast demersal scalefish, namely Western Australian dhufish, pink snapper and baldchin groper, which are closely monitored.

A possible fifth list, is one that includes the entire suite of species taken by the commercial fisheries, which includes non-demersal scalefish, such as silver trevally and herring.

Table 3 (a) which is shown below, indicates the catches for the whole suite of west coast demersal scalefish species by breaking them down into the top 15 species caught across both sectors, and the "others" (see Appendix 7 for these). The difficulties that are involved in ascertaining the recreational catch can be seen from Table 3(b), where the numbers, but not the weight of fish caught are evident from the recreational catch where no length/weight ratio was available and the weight is listed as N/A (not applicable).

Table 3 (a). Commercial and recreational catch of the predominant 15 West Coast Demersal Scalefish species in 2005/06, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey.

Common name	Commercial sector (tonnes)	Recreational sector (tonnes)	Recreational sector (number of fish kept)	Total each sector (tonnes)
Baldchin Groper	38.5	36.9	12870	75
Bass Groper	8.9	0.0	0	8.9
Blue Morwong	26.6	15.8	6395	42.4
Blue-Eye Trevalla	11.3	0.0	0	11.3
Breaksea Cod	7.8	20.2	21131	28
Eightbar Grouper (Grey Banded Cod)	13.0	0.0	0	13
Emperors	232.4	13.1	13518	245.5
Foxfish	0.0	2.4	2859	2.4
Hapuku	18.5	0.1	11	18.6
Pink Snapper	322.5	57.5	27658	380.0
Bight redfish	86.5	7.5	5708	94
Ruby Snapper	12.1	0.0	0	12.1
Sergeant Baker	0.0	3.4	4331	3.4
Sweep, Sea	0.6	5.5	4229	6.1
Western Australian Dhufish	207.2	206.5	38387	413.7
Total	**985.9**	**368.9**	**137097**	**1354.4**
Percentage of total west coast demersal scalefish*	94.3%		93.2%	
Other West Coast demersal species	59.4		10015	
	5.7%		6.8%	

Commercial sector : WCDSFIMF, JASDGDLF, WCDGDLF, Cockburn Sound Line & Pot Fishery

Recreational sector: recreational creel survey and charter sector

*See Appendix 7 for total species list

The species for the recreational fishing closure were listed in Table 1. The catches for these species are shown in **Table 3 (b)** below:

Table 3 (b). Catch of west coast demersal scalefish in the recreational fishing closure list within sectors 2005/06, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey

Species	Commercial sector (tonnes)*	Recreational sector (tonnes)	Recreational sector (number of fish kept)
Baldchin Groper	38.5	36.9	12870
Barcheek Coral Trout	5.1	3.3	1293
Bass Groper	8.9	0.0	0
Blackspotted Rockcod	0.1	0.0	0
Blue Morwong	26.6	15.8	6395
Blue-Eye Trevalla	11.3	0.0	0
Breaksea Cod	7.8	20.2	21131
Chinaman Rockcod	1.6	NA	282
Cod, General	4.0	NA	174
Cod, Spotted	0.3	0.0	0
Convict Grouper	0.0	NA	33
Coral Rockcod	0.0	NA	1
Crimson Snapper	0.0	0.0	0
Eightbar Grouper (Grey Banded Cod)	13.0	0.0	0
Emperors	232.4	13.1	13518
Flagfish / Spanish Flag	0.1	0.0	0
Foxfish	0.0	2.4	2859
Fusiliers, Jobfishes	0.0	NA	6
Goldband Snapper	4.8	0.0	0
Goldspotted Rockcod	0.2	NA	245
Hapuku	18.5	0.1	11
Harlequin Fish	0.0	NA	2105
Jobfish	0.1	0.0	0
Leopard Wirrah	0.0	NA	2
Parrotfish	5.0	NA	1
Pigfishes, General	0.1	NA	205
Potato Rockcod	0.0	NA	1
Radiant Rockcod/Comet Grouper	0.4	0.0	0
Rankin Cod	1.3	NA	90
Red Emperor	5.4	NA	27
Bight Redfish	86.5	7.5	5708
Rosy Snapper	0.7	NA	2
Ruby Snapper	12.1	0.0	0
Saddleback Pigfish	0.0	NA	13
Saddletail Snapper	0.0	0.0	0
Snapper, Pink	322.5	57.5	27658
Snappers, Other	0.0	0.0	0
Swallowtail	0.0	2.3	2773
Tang's Snapper	0.1	0.0	0

Species	Commercial sector (tonnes)*	Recreational sector (tonnes)	Recreational sector (number of fish kept)
Tomato Rockcod	0.1	NA	9
Tuskfish	0.0	NA	2
Western Australian Dhufish	207.2	206.5	38387
Western Blue Groper	23.1	0.1	8
Western Pigfish	0.0	NA	62
Western Wirrah	0.0	NA	50
Wirrahs, General	0.0	NA	2
Yellowedge Coronation Trout	0.0	NA	21
Yelloweye Redfish	0.6	0.7	1045
Total	1038.4	366.5	136990
Percentage of total west coast demersal scalefish^	99.3%		93.1%
Non-closure west coast demersal scalefish species	6.8		10122
	0.7%		6.9%

* weight less than 50 kg is presented as 0.0 in the above table.

NA - means Not Available. When a length/weight ratio of 0.6kgs is applied to all species listed as N/A (3,333 fish) the total is 2.0 tonnes

^ See Appendix 7

Dhufish have become a highly sought after fish for recreational anglers as well as for commercial fishers and IFAAC believes that the Department of Fisheries should monitor dhufish catches as a precaution and use management tools as appropriate to keep catches of this species at an acceptable proportion within recommended allocations as well as within sustainable levels. The same principle applies to baldchin groper, another highly valued fish.

Table 4. Percentage of catch of key species 2005/06 against recreational fishing closure list, using the 2005/06 recreational creel survey, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey

Species	Commercial catch excluding Metropolitan Area	Recreational catch, 2005/06 creel survey	*Total catches of all WC demersal scalefish subject to recreational fishing closure	% of total WC demersal scalefish commercial catches (1038 tonnes)	% of total WC demersal scalefish recreational catches (approx 482* tonnes)
Dhufish	163.9	206.5	1401.2	15.7%	42.8%
Pink snapper	280.9	57.5	1401.2	27%	11.9%
Baldchin groper	34.5	36.9	1401.2	3.3%	7.6%
Total	479.3	300.9	1401.2	46.1%	62.4%

* See Table 6

The top 15 species account for 94.3 per cent of the commercial catch and 93.2 per cent of the recreational sector, as shown in Tables 3(a). The recreational closure list of species as shown in Table 3(b), accounts for 99.3 per cent by weight, of the commercial catch and 93.1 per cent

by number, of the recreational catch. The catch figures by weight of the balance of the suite of species are not available for the recreational sector's catches.

IFAAC asked the Director of Research for direction as to the most appropriate weight that could be attached to recreational fish caught that did not have a length/weight conversion ratio. The advice of the Director is at Appendix 8. Option 1 is the average of demersal scalefish (around 1.4 kilograms); another option provided (522 grams) is the average of scalefish. IFAAC considered that demersal scalefish without a length/weight relationship are likely to be smaller demersal fish (these are usually larger than nearshore species, such as herring), so 600 grams would be a better 'average' demersal scalefish size (Option 2), so it chose this option.

Note 5 : IFAAC concluded that the most appropriate weight to apply to recreational fish caught that did not have a length/weight conversion ratio was 600 grams per fish.

Once the length/weight conversion ratio is applied, there is only about 0.4 tonnes difference between the predominant 15 species list and the recreational catch in the recreational fishing closure list. IFAAC did not consider this to be a significant difference, and was within errors of measurement.

IFAAC considered that the most appropriate list on which to allocate the west coast demersal scalefish resource was the recreational fishing closure list, because this was consistent with management arrangements already in place for the fishery and was easily understood.

Note 6: The top 15 species, as shown in Table 3 (a), account for 94.3 per cent of the commercial sector's catch and 93.2 per cent of the recreational sector's catch of west coast demersal scalefish (see Appendix 7 for the full list of these species). The recreational closure list of species, as shown in Table 3(b), accounts for 99.3 per cent of the commercial sector's catch and 93.1 per centof the recreational sector's catch of west coast demersal scalefish (as listed in Appendix 7). As management arrangements are already in place around the recreational fishing closure list, IFAAC decided that it would allocate on the recreational fishing closure list species.

IFAAC notes that skipjack/silver trevally, or "skippy" as it is commonly known, and King George whiting are not included in the suite of species to which the recreational fishing closure is applied, or the full list of demersal scalefish species. It is IFAAC's view that skippy would be best allocated in a near-shore suite of species, as they are popular fish for shore-based anglers, while King George whiting, although generally fished in deeper waters, can be fished in a targeted manner.

Recommendation 3: The species used for the recreational fishing closure, as shown Table 3(b), should be the suite of species used for allocation purposes of the west coast demersal scalefish resource.

Recommendation 4: Monitoring of boat fishing for silver trevally, King George whiting and other nearshore fish stocks should take place to ensure transfer of effort does not result in overfishing nearshore species.

Recommendation 5: Monitoring of the key species, dhufish, pink snapper and baldchin groper catches should be undertaken to keep catches of this species at an acceptable proportion within recommended allocations as well as within sustainable levels.

5.4 The Multi-User Nature of the Fishery

This fishery is a multi-user fishery with inter and intra-sectoral users, as indicated in Table 5. For instance there are two elements of the recreational sector that target the resource, the recreational boating fishers and the charter sector. IFAAC considered whether to allocate the resource not just to sectors, but also within sectors, which would lead to a multi-layered allocation process, reflecting the multi-user nature of the fishery. However, the level of the reliability of the data is reduced the more it is sub-divided. Therefore the IFAAC did not want to make a formal allocation within sectors.

Table 5. Catch of west coast demersal scalefish in the recreational fishing closure list within sectors 2005/06, based on the commercial and charter sectors' fishing returns and the 2005/06 recreational fishing creel survey.

Recreational Sector^				Commercial Sector+			
Zone	**Charter**	**Creel survey**	**'Wetline'**	**JASDGNDL***	**WCDGNDL****	**Cockburn Sound Line & Pot**	**Commonwealth Trawl Fishery**
Kalbarri	4.6	7.2	211.5		8.1		
Abrolhos	18.5		289.4		9.1		
Mid-West	3.1	109.3	151.6		20.8		
Metro	28.5	98.1	100.7		18.8	0.7	
South	4.4	82.4	176.3	51.3			
No zone***	10.4						5
Total	69.5	297.0	929.5	51.3	56.8	0.7	5

* Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery

** West Coast Demersal Gillnet and Demersal Longline Fishery

*** Data within the sub-bioregions does not include the entire catch for the west coast bioregion, because of incomplete returns provided by operators i.e. failing to provide a block locations, so these catches cannot be included in the sub-bioregions, however these catches are placed under "No zone".

\+ Data does not include South-West Trawl Fishery because no catches of west coast demersal scalefish are reported for 2005/06

^ Recreational catch only includes the catches recorded in the 2005/06 creel survey, and the charter sector. Fisheries Research Report No. 175 records a recreational catch at the Abrolhos Islands of 17.3 tonnes

Recreational fishing at the Abrolhos Islands area was not fully covered by Fisheries Research Report No. 177, as the larger boats fishing at these offshore islands are often not encountered at boat ramps. However, such vessels were included in the phone diary survey shown in Appendix 9 and a separate recreational fishing survey was conducted in the Abrolhos Islands for the 2006 calendar year, which was reported in Fisheries Research Report No. 175. The results for the main species from this 2006 survey were similar to those in the phone diary survey. This survey estimated the recreational catch of west coast demersal scalefish at the Abrolhos Islands to be 17.3 tonnes.

IFAAC has decided to make formal allocations to the recreational and commercial sectors only, and recommends that the Department of Fisheries should ensure that the intra-sectoral catch

shares remain at their 2005/06 levels within reasonable limits. To provide the baseline for intra-sectoral catch shares Table 5 lists the catches of west coast demersal scalefish by charter boats and private boats within the recreational sector and by the 'wetline' fishery (now the West Coast Demersal Scalefish Interim Managed Fishery), the two demersal gillnet and demersal longline fisheries within the commercial fishery and the Commonwealth trawl fishery. It noted that the charter industry is currently being reviewed and considers that this review should not alter the 2005/06 shares for the recreational catch.

IFAAC noted that the catches for the Commonwealth-managed Western Deepwater Trawl Fishery were inconsistent, but generally of a low level. IFAAC is of the view that as a commercial fishery, the Commonwealth-managed Deepwater Trawl Fishery is part of this allocation process, and the offshore species that they target should be included in the allocations.

As discussed in Section 4.2, IFAAC does not believe it is appropriate to allocate a customary share of the resource, as there is no evidence of customary fishing for demersal scalefish on the west coast.

Recommendation 6: The formal allocations in the fishery should be made to the recreational and commercial sectors.

Recommendation 7: The Commonwealth's co-operation should be sought to ensure the catches of west coast demersal scalefish taken in the Western Deepwater Trawl Fishery are monitored to ensure that catches of vulnerable species do not increase.

5.5 Relative Proportions of Sectors

In 2007, the former Minister for Fisheries, the Hon. Jon Ford, MLC, declared an area between Lancelin to south of Mandurah (31° South to 33° South) a recreational fishing only area with respect to the West Coast Demersal Scalefish Fishery.

IFAAC determined that the commercial catches of this area (the Metropolitan Area of the WCDSFIMF), should not be taken into account when determining allocations of the resource.

Recommendation 8: The relative allocation proportions should be based on the total catches in 2005/06 of the recreational fishing closure list caught, less the commercial catch in the Metropolitan Area in determining the sectoral allocations for the west coast demersal scalefish resource.

6.0 SECTOR ALLOCATIONS UNDER AN ALLOWABLE CATCH

Having decided what it considered the most appropriate mechanism for IFAAC to determine the allocations, the IFAAC then used the formula outlined in Recommendation 8 to determine how the west coast demersal scalefish resource should be allocated.

6.1 Proportional Allocations for the Recreational and Commercial Sectors

6.1.1 Under-estimation of the recreational catch in the 2005/06 creel survey

IFAAC considered the findings in Dr Steffe's review that the catches reported in the 2005/06 recreational creel survey have been under-estimated. There were a number of reasons for his conclusion, these include:

- the creel survey was carried out on week-days from 9.00 am to 5.00 pm;
- only boat-ramps, (not marinas or other launching sites) were used; and

the methods of estimations used.

The Director of Research, Department of Fisheries has advised IFAAC (Appendix 10) that the phone diary survey for the same period estimated the catches of key demersal species to be around 20 per cent higher than that reported in the creel survey. However, given the small sample sizes, this number is not considered to be statistically significant. Some recreational dive data were collected during the phone diary survey, but the survey was designed to focus on the line-fishing, so the phone diary report (unpublished) has likewise focussed on this.

Note 7 : The Department of Fisheries phone diary surveys indicated a catch of key indicator species in the West Coast Demersal Scalefish Fishery of around 20 per cent greater than that reported in Fisheries Research Report No. 177. Dr Aldo Steffe, in his review of Fisheries Research Report No. 177, also concluded that levels of total catch (recreational catch) were under-estimated, and the uncertainty levels associated with the estimates have been greatly under-estimated.

IFAAC concluded that an adjustment to the recreational catch should be made on the following basis:

- information contained in Dr Aldo Steffe's report about the underestimation of catches;
- that the creel survey catches did not include the catches taken by divers; and
- the different (higher) catches shown in the phone diary survey.

Accordingly, IFAAC deemed it appropriate to allocate a further 20 per cent greater than that reported in Fisheries Research Report No. 177 in order to take account of the under-estimate referred to in Dr Steffe's report, (but for which he did not give a figure), and a further five per cent to account for the lack of diving catch data. This is shown in Tables 6.

In addition, IFAAC deemed it appropriate to use the estimate of 17.3 tonnes for recreational fishing catches taken from the Abrolhos Islands as reported in Fisheries Report No. 175. Because this report noted that there were also other recreational catches taken by visitors staying at camps, the further 20 per cent to account for the under-estimate and five per cent to account for lack of diving data were also utilised in this instance.

6.1.2 List of adjustments to the catch levels in tables

a) 25 per cent was added as discussed in 6.1.1;

b) Two tonnes is added to recreational catch to allow for fish only recorded by numbers (see Table 3[b]);

c) 17.3 tonnes is added to recreational catch to allow for 'private' recreational boat catches from the waters of the Abrolhos Islands; and

d) 119.5 tonnes was subtracted from the commercial total to allow for the ministerial decision on commercial fishing in the metropolitan area.

Table 6. Adjusted catches of the recreational catch closure list of west coast demersal scalefish, based on 2005/06 creel survey as set out in table 3(b).

Length/Weight ratio adjustment – 2 tonnes

Recreational catch

297 tonnes, recreational creel survey

297 tonnes plus 17.3 tonnes for Abrolhos = 314.3 tonnes

314.3 tonnes plus 78.6 tonnes (25% of recreational creel plus Abrolhos) = 392.9 tonnes

392.9 tonnes plus 69.5 tonnes charter catches = 462.4 tonnes

462.4 tonnes plus 2 tonnes length/weight adjustment = 464.4 tonnes

Commercial catch

1038.4 tonnes minus 119.5 tonnes Metropolitan Area = 918.9 tonnes

	Commercial catches 2005/06 of WC demersal scalefish (tonnes)	Recreational catches 2005/06 of WC demersal scalefish (tonnes)	Total catch of WC demersal scalefish 2006/06 (both sectors) (tonnes)
Totals from Table 3(b)	1,038.4		
Recreational Creel Survey		297	
Charter		69.5	
Add estimated private recreational Abrolhos catches**		17.3**	
Add 25% under-estimate in creel survey, Abrolhos and diving catches		78.6	
Add Recreational catch length/ weight ratio adjustment		2.0*	
Less Commercial Metropolitan Area catch	119.5		
Total	**918.9**	**464.4**	**1,383.3**
Share of the catch	**66.4%**	**33.6%**	

* See Table 3(b), 3,333 fish x 600 grms = 2 tonnes

** From Fisheries Research Report No. 175

As an example, if the allowable catch in a year was 700 tonnes, this would mean that the allocation for the commercial sector would be 460 tonnes and the allocation for the recreational sector would be 240 tonnes.

Recommendation 9: That for allocation purposes the recreational catch be considered to be 25 per cent greater than the catches reported in Fisheries Research Report No. 177 and the recreational fishing catches reported in Fisheries Research Report No. 175.

Based on:

- the recreational fishing closure species catches for the 2005/06 creel survey;
- the provision of 25 per cent for the under-estimation of the recreational sector catches; and
- taking into account the exclusion of the commercial sector from the metropolitan area;

the allocation of shares in the WCDSF should be 66 per cent[16] to the commercial sector and 34 per cent to the recreational sector.

Recommendation 10: That the allocation of shares in the West Coast Demersal Scalefish Fishery should be 66 per cent (two thirds) to the commercial sector and 34 per cent (one third) to the recreational sector.

6.1.3 Customary fishing

As discussed in Section 4.2, IFAAC considered that customary fishing for WCDSF should be considered very small, and within the errors of measurement, and should not be taken into account for allocation purposes.

Recommendation 11: That the allocation to the customary sector not be quantified.

[16] The actual percentages for each sector were 66.4 per cent to the commercial sector and 33.6 per cent to the recreational sector, but IFAAC chose to round these figures to the nearest practical percentage point.

7.0 OTHER ISSUES

7.1 Reallocation Mechanisms

The implementation of a reallocation mechanism is integral to the IFM process. In particular, the reallocation mechanism will be essential for meeting the objective of optimal use over time.

The proposed recommended arrangements are contingent on the implementation of an appropriate mechanism as soon as possible. IFAAC is aware that a FRDC Report into reallocation mechanisms for the rock lobster fishery is currently being completed, and believes that the reallocation principles identified in this report should be used to ascertain the best way of reallocating the west coast demersal scalefish resource. It should be noted that should such a mechanism not be adopted, then each sector would be expected to be managed within its share from the time forward in accordance with Guiding Principle vii (see section 3.1.2).

The IFM Government Policy (Appendix 1) states that:

> *Priority will be given to investigating the potential development of market-based systems to achieve reallocations, along with due consideration of social equity considerations, as soon as practical…*

The use of market systems could have application in more than one of the possible allocation approaches discussed above. Market-based mechanisms could have immediate application in the west coast demersal scalefish fishery because there is already an established market for the sale or leasing of catching rights in the commercial fishery.

For example, the way such a system could work is that if the recreational sector has exceeded its IFM allocation, the Government on behalf of the recreational sector could go into the market and trade commercial unit entitlements equivalent to what was required to allow for additional recreational catch share. The process would work in reverse if the commercial sector exceeded its allocation of the catch share.

Recommendation 12: A reallocation mechanism should be implemented for the west coast demersal scalefish resource, as soon as practicable.

7.2 Monitoring Allocations

IFAAC recognises that there has been some controversy regarding the size and impact of the recreational sector's catch. This has led to Ministerial scientific and managerial reviews of the data and methodology of analysing the data.

The challenge will be to find a set of principles/performance indicators that account for year-to-year variation in catches so as to attempt to set longer term adjustment business rules for each sector.

IFAAC has prepared a document *"Considerations for the Implementation of Western Rock Lobster Sectoral Allocations"* and believes that the principles set out in that document can be applied to a set of business rules for the West Coast Demersal Scalefish Fishery.

Recommendation 13: A system of monitoring the sectoral catches, based on the principles set out in the document *"Considerations for the Implementation of Western Rock Lobster Sectoral Allocations"* should be established to monitor allocations in the West Coast Demersal Scalefish Fishery.

7.3 Management of Allocations

The two relevant policies regarding management of allocations are:

Guiding Principle vi (see section 3.1.2) states that:

> *Appropriate management structures should be introduced to manage each sector within their prescribed allocation. These should incorporate predetermined actions that are invoked if that group's catch increases above its allocation.*

Catch allocations establish a set share of access to a fish resource, giving all concerned a clear understanding of how much each sector may fish at an allowable level.

Guiding Principle ix (see section 3.1.2) states that:

> *Management arrangements must provide sectors with the opportunity to access their allocation…*

The Integrated Fisheries Management policy identifies who has a stake in the fishery and makes that share explicit, through an exhaustive and transparent process where one sector is not favoured over another. Under IFM all sectors should be managed within their allocation and within the overall allowable harvest level.

The IFAAC realises that management is the role of the Minister and the Department of Fisheries. However, there is a need to have appropriate management and monitoring structures in place to take advantage of the opportunities that IFM will provide to sectors.

7.4 Consultation Mechanisms

IFAAC supports the (at time of print) review of management structures and institutions to determine whether there is a need for change to enable the sectors to have more involvement in the development of future management arrangements under IFM.

7.5 Legislative Arrangements

The initial IFM policy stated that:

> *Allocation processes will be developed in the context of policy guidelines set by the Minister. In the longer term, it may be desirable to amend the FRMA to incorporate allocation processes.*

The implementation of allocation decisions in legislation will provide added security and confidence to sectors about their access to their share of the resource and supports the current plans to incorporate the IFM process into the *Fish Resources Management Act, 1994*.

8.0 GLOSSARY OF TERMS

AFMA	Australian Fisheries Management Authority
Barotrauma	Injuries resulting from the expansion of gases in the swim bladder and other organs when fish do not have time to adjust to rapid changes in water pressure as they are pulled to the surface.
Bioregion	A geographic area characterised by a combination of physical and biological characteristics, for example, terrain, climate and ecological communities.
CPUE	Catch per unit of effort
CSLP	Cockburn Sound Line & Pot Managed Fishery
Demersal	Found on or near the bottom of the sea.
DEWHA	Department of Environment, Water, Heritage and the Arts
EBFM	Ecosystem Based Fisheries Management
EPBC Act	Commonwealth Environment and Biodiversity Conservation Act, 1999
Endemic	Confined in occurrence to a local region
ESD	Ecologically sustainable development
Gyre	A large body of water, moving in a circle.
JASDGDLF	Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery
IMCRA	Interim Marine and Coastal Regionalisation for Australia
Mortality	The rate of deaths (usually in terms of proportion of the stock dying annually) from various causes
MBP	Marine Bioregional Planning
NRSMPA	National Representative System of Marine Protected Areas
PAG	Planning Advisory Group
Pelagic	Associated with surface or middle depths of a body of water, rather than the sea floor. This term is usually applied to free-swimming species, such as mackerels.
PWG	Planning Working Group
Recruitment	A fish that has just become susceptible to a fishery; e.g. a recruit to the dhufish fishery is six to seven-years-old, whereas a recruit to the pink snapper fishery is four years old.
RMP	Regional Marine Planning
SCRMSP	South Coast Regional Marine Strategic Plan
SMPSG	State Marine Policy Stakeholder Group
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TCC	Total Commercial Catch
Trophic	Predator-prey relationships. Connected with nutrition and feeding.
Unitised	A description of how a fishery is managed. A unit of measurement in a fishery is, for example, a number of gear hours per unit in a time/gear fishery, or kilograms per unit in a quota managed fishery.
WCDGDLF	West Coast Demersal Gillnet and Demersal Longline Managed Fishery
WCDSF	West Coast Demersal Scalefish Fishery (all sectors)
WCDSFIMF	West Coast Demersal Scalefish Interim Managed Fishery

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10.0 APPENDICES

Appendix 1 Integrated Fisheries Management Government Policy December 2009

General

1. The Government is committed to the implementation of an integrated management system for the sustainable management of Western Australia's fisheries.
2. The integrated management system will be open and transparent, accessible, inclusive and flexible.

Information requirements

3. The development and funding of an appropriate research and monitoring program encompassing all sectors is essential to provide the necessary information for sustainability and allocation issues to be addressed under an integrated policy. This policy will continue to be progressively developed and phased-in over a number of years.
4. The Department of Fisheries will, in consultation with sectors, investigate options for standardising catch information between sectors, noting that the scale for data collection and reporting must be appropriate for each particular fishery.

Guiding principles for management

5. The following principles will be adopted (by incorporating them into either legislation, Ministerial Policy Guidelines or Government policy as appropriate) as the basis for integrated fisheries management policy.
   i) Fish resources are a common property resource managed by the Government for the benefit of present and future generations.
   ii) Sustainability is paramount and ecological impacts must be considered in the determination of appropriate harvest levels.
   iii) Decisions must be made on best available information and where this information is uncertain, unreliable, inadequate or not available, a precautionary approach adopted to manage risk to fish stocks, marine communities and the environment. The absence of, or any uncertainty in, information should not be used as a reason for delaying or failing to make a decision.
   iv) A harvest level, that as far as possible includes the total mortality consequent upon the fishing activity of each sector, should be set for each fishery[17] and the allocation designated for use by the commercial sector, the recreational sector, the customary sector, and the aquaculture sector, should be made explicit.
   v) The total harvest across all sectors should not exceed the allowable harvest level. If this occurs, steps consistent with the impacts of each sector should be taken to reduce the take to a level that does not compromise future sustainability.

[17] The term "fishery" is defined under the *Fish Resources Management Act, 1994* (the Act) as one or more stocks or parts of stocks of fish that can be treated as a unit for the purposes of conservation or management; and a class of fishing activities in respect of those stocks or parts of stocks of fish.

vi) Appropriate management structures and processes should be introduced to manage each sector within their prescribed allocation. These should incorporate pre-determined actions that are invoked if that group's catch increases above its allocation.

vii) Allocation decisions should aim to achieve the optimal benefit to the Western Australian community from the use of fish stocks and take account of economic, social, cultural and environmental factors. Realistically, this will take time to achieve and the implementation of these objectives is likely to be incremental over time.

viii) It should remain open to Government policy to determine the priority use of fish resources where there is a clear case to do so.

ix) Management arrangements must provide sectors with the opportunity to access their allocation. There should be a limited capacity for transferring allocations unutilised by a sector for that sector's use in future years, provided the outcome does not affect resource sustainability.

More specific principles to provide further guidance around allocation decisions may also be established for individual fisheries.

Harvest levels

6. A sustainability report will be prepared for each fishery to be considered under the IFM Policy in accordance with the 'Policy for the implementation of ecologically sustainable development for fisheries and aquaculture in Western Australia'.

7. The Chief Executive Officer, Department of Fisheries, will approve a sustainability report for each fishery, which provides advice on appropriate harvest level(s), taking into account sustainability and other objectives, such as stock rebuilding, maximising economic yields and amenity values.

Effective management of each sector

8. The Government is committed to introducing more effective management across all fisheries. The implementation of more effective sectoral management in which the catch of a sector can be contained is an essential first step in the introduction of a new integrated management system within which allocation issues may be addressed. In the interim, each sector will continue to be managed responsibly within current catch ranges and should the catch of a sector alter disproportionately to that of other sectors, the Minister will take appropriate management action to address this.

9. It is important to formalise existing shares not only as a basis for future allocation discussions, but as a basis for insuring the safe harvest level. These will be formalised on the basis of proportional catch shares using the best information available at the time the Integrated Fisheries Allocation Advisory Committee starts its process (see below).

Allocation processes

10. An Integrated Fisheries Allocation Advisory Committee has been established under s42 of the *Fish Resources Management Act 1994* (the Act) to investigate resource allocation issues and make recommendations on optimal resource use to the Minister for Fisheries including:
    i) allocations between sectors, now and into the future;
    ii) strategies to overcome allocation and access issues arising from temporal and spatial competition at a local/regional level;
    iii) allocation issues within a sector as referred by the Minister for Fisheries;
    iv) more specific principles to provide further guidance around allocation and reallocation decisions for individual fisheries; and
    v) other matters concerning the integrated management of fisheries as referred by the Minister for Fisheries.
11. The Minister will be responsible for determining the process and timeframes for resolving allocation issues in each fishery based on advice from the CEO of the Department of Fisheries and the Integrated Fisheries Allocation Advisory Committee.
12. The Minister will provide a statement of decision on announcement of his determination in an allocation matter.

    The Minister may make public the Committee's report at the same time his statement of decision is released.

Compensation

13. Where a reallocation of resources from one sector to another results in demonstrable financial loss to a licensed commercial fisherman or licensed aquaculture operator, in principle there should be consideration of compensation.
14. Cases for compensation should be assessed on their merits.
15. Priority will be given to investigating the potential development of market-based systems to achieve reallocations, along with due consideration of social equity considerations, as soon as practical. Clearly, consideration of any market-based system will be based on its merit.
16. No compensation should be payable where adjustments are made for sustainability reasons.

Funding

17. The Government will consider seeking contributions from all sectors over time corresponding to the cost of managing the resource and providing access for each sector.

Appendix 2 Integrated Fisheries Allocation Advisory Committee

Integrated Fisheries Management Allocation Process

Introduction

Government Policy 2009 on Integrated Fisheries Management (IFM) states that the Minister will determine the process and timeframes for resolving allocation in each fishery based on the advice from the Chief Executive Officer of the Department of Fisheries and the Integrated Fisheries Allocation Advisory Committee (IFAAC).

(A) Determining the Need for a Formal Allocation Process in a Fishery

The Minister for Fisheries requested that IFAAC begin with the Western Rock Lobster Fishery, Abalone Fishery, the West Coast Demersal Scalefish Fishery and the Gascoyne Demersal Scalefish Fishery.

In the future the IFAAC will consult broadly as to fisheries that should be included in the IFM process and advise the Minister for Fisheries accordingly.

(B) Development of an Integrated Fishery Management Fishery Report – Department of Fisheries

The setting of sustainable harvest levels is fundamental to ensure sustainable management. An IFM Report will be prepared by the Department of Fisheries for each fish resource that is to be subject to the IFM process.

The reports will contain details such as:

- the current management practices for each sector;
- historical or estimated catch levels by each sector;
- the biology of the fish species involved;
- the harvest level that can be taken sustainably from the fish resource; and
- other relevant data such as regional employment, economic and social/ lifestyle issues.

In short, the report will be a robust summary of what is estimated or known about the fish resource and those who use it.

The Department, in finalising these reports, will consult with the key stakeholder groups. The IFM report will be approved by the Chief Executive Officer, Department of Fisheries and will include a clear statement of the sustainable harvest level.

(C) The Integrated Fisheries Allocation Process

Step 1 - Investigation of the allocation issue.

IFAAC will receive the IFM Report and then conduct preliminary investigations into the allocation issue by:

- seeking submissions and consulting with the peak stakeholder groups such as the Western Australian Fishing Industry Council, Recfishwest, the Conservation Council of WA and bodies representing indigenous interests;

- drawing on the knowledge, data, technical material and experience available with regard to the particular fishery from the Department of Fisheries and as appropriate from other sources; and
- identifying areas of agreement/disagreement between the two parties.

As part of its considerations, IFAAC may request the Department of Fisheries to further advise on the ecological, economic and social impacts of any proposed change in resource allocation. Following these actions, IFAAC will formalise its initial position.

Step 2 - IFAAC settles draft allocation report and releases for public comment.

Once IFAAC has come to an initial position with regard to allocation, this will be documented, along with the reasons for its conclusions, and IFAAC will recommend to the Minister that it be released as a 'draft allocation paper' for public comment, inviting submissions.

This stage in the process will allow those involved in fishing, managing and researching the fish resource, as well as those in the wider community who may have a specific interest in this fishery, to provide additional input. Depending on the circumstances of the particular fishery, IFAAC may hold or ask departmental officers to undertake meetings in relevant metropolitan and regional locations to enable industry, recreational fishers and community members to contribute their views into the IFAAC process.

The comment period will normally be for a duration of three months.

Step 3 - IFAAC recommends an allocation to the Minister for Fisheries.

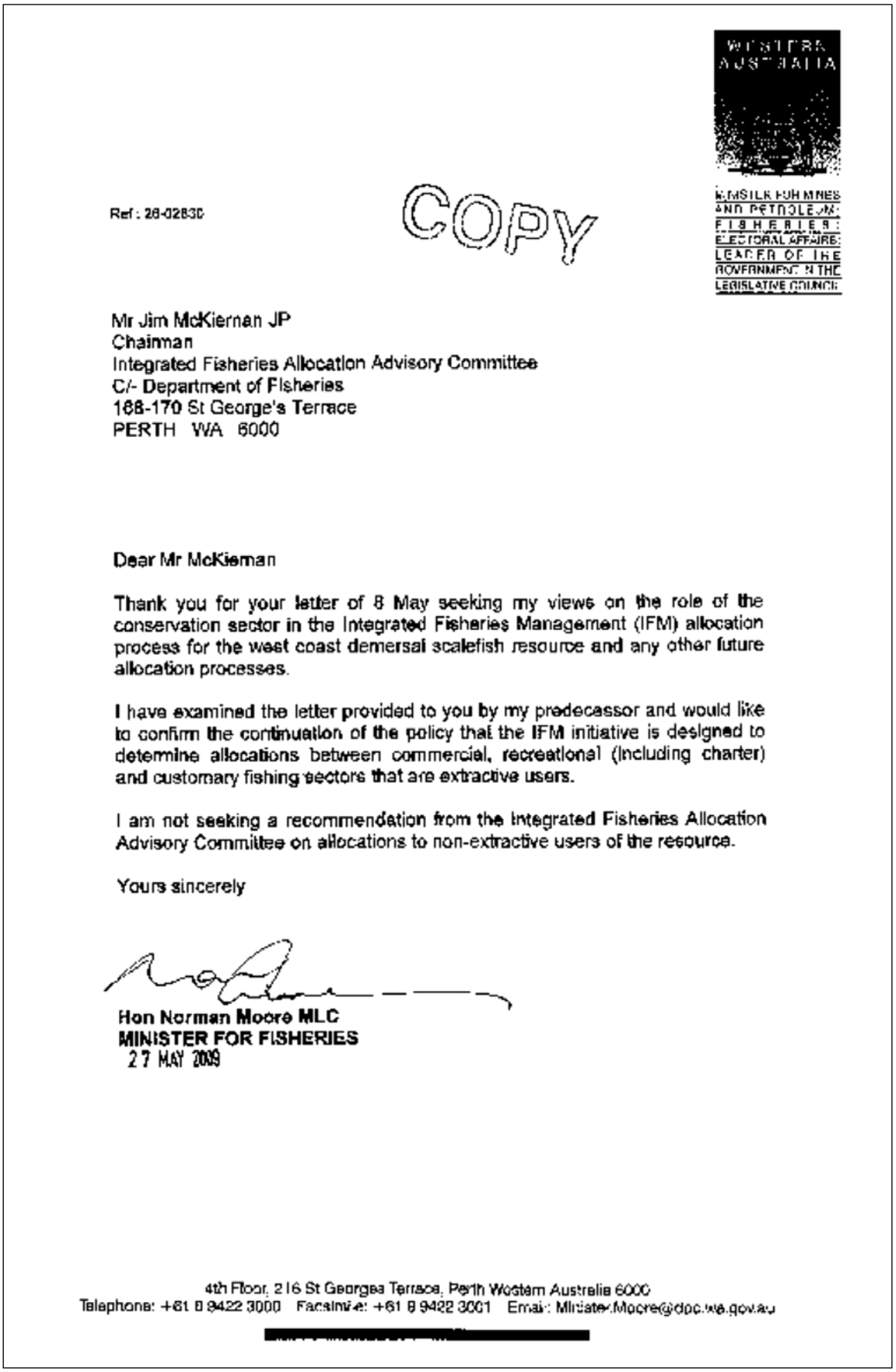
Once the comment period has closed, and IFAAC has considered the submissions received, IFAAC will finalise its position and submit a final allocation report to the Minister.

Step 4 - Determination by the Minister.

The Minister for Fisheries will then consider the recommendations of IFAAC and determine the allocations. The allocations are likely to be fixed for a period of about five years.

The Minister has agreed to provide a statement outlining his decision on announcement of his determination in an allocation matter. The Minister may make IFAAC's report public at the same time as his statement of decision is released.

Appendix 3 Minister's letter to IFAAC



WESTERN AUSTRALIA

MINISTER FOR MINES AND PETROLEUM; FISHERIES; ELECTORAL AFFAIRS; LEADER OF THE GOVERNMENT IN THE LEGISLATIVE COUNCIL

Ref : 26-02830

COPY

Mr Jim McKiernan JP
Chairman
Integrated Fisheries Allocation Advisory Committee
C/- Department of Fisheries
168-170 St George's Terrace
PERTH WA 6000

Dear Mr McKiernan

Thank you for your letter of 8 May seeking my views on the role of the conservation sector in the Integrated Fisheries Management (IFM) allocation process for the west coast demersal scalefish resource and any other future allocation processes.

I have examined the letter provided to you by my predecessor and would like to confirm the continuation of the policy that the IFM initiative is designed to determine allocations between commercial, recreational (including charter) and customary fishing sectors that are extractive users.

I am not seeking a recommendation from the Integrated Fisheries Allocation Advisory Committee on allocations to non-extractive users of the resource.

Yours sincerely

Hon Norman Moore MLC
MINISTER FOR FISHERIES
27 MAY 2009

4th Floor, 216 St Georges Terrace, Perth Western Australia 6000
Telephone: +61 8 9422 3000 Facsimile: +61 8 9422 3001 Email: Minister.Moore@dpc.wa.gov.au

Appendix 4 Boat-based Recreational and Commercial Catches 2005/06

Table 7(a). Recreational catch of the predominant 15 species by Area in 2005/06.

Zone	Estimated recreational creel survey catch (tonnes)	Estimated charter catch (tonnes)	Total (tonnes)
Kalbarri	7.2	4.5	11.7
Abrolhos		17.9	17.9
Mid-west	107.5	2.8	110.3
Metro	114.0	28.3	142.3
South	88.9	4.5	93.4
No zone *		10.1	10.1
Total	317.7	68.1	385.8

Table 7(b). Recreational catch of the recreational closure species by Area in 2005/06.

Zone	Estimated recreational creel survey catch (tonnes)	Estimated charter catch (tonnes)	Total (tonnes)
Kalbarri	7.2	4.6	11.8
Abrolhos	0	18.5	18.5
Mid-west	109.3	3.1	112.4
Metro	98.1	28.5	126.6
South	82.4	4.4	86.6
No zone *	0	10.4	10.4
Total	297	60.5	366.5

*Please note data within the sub-bioregions does not include the entire catch for the West Coast Bioregion, because of incomplete returns provided by operators i.e. failing to provide block locations, so these catches cannot be included in the sub-bioregions, however these catches are put under "No zone".

Table 8(a). Commercial catch of the predominant 15 species by zone in 2005/06.

Zone	WCDSFIMF (tonnes)	JASDGDLF (tonnes)	WCDGDLF (tonnes)	CSLP (tonnes)	Total commercial catch (tonnes)
Kalbarri	198.7		5.9		204.5
Abrolhos	281.6		8.0		289.6
Mid-west	147.9		18.8		166.7
Metro	99.2		15.9	0.7	115.8
South	175.0	34.5			209.6
Total	902.3	34.5	48.6	0.7	986.2

Commercial sector: WCDSFIMF, JASDGDLF, WCDGDLF, Cockburn Sound Line & Pot Fishery

Table 8(b). Commercial catch of the recreational closure species by Area in 2005/06.

Zone	WCDSFIMF (tonnes)	JASDGDLF (tonnes)	WCDGDLF (tonnes)	CSLP (tonnes)	Total commercial catch (tonnes)
Kalbarri	211.5		8.1		219.6
Abrolhos	289.4		9.1		298.5
Mid-west	151.6		20.8		172.4
Metro	100.7		18.8	0.7	120.2
South	176.3	51.3			227.6
Total	929.5	51.3	56.8	0.7	1038.3

Commercial sector : WCDSFIMF, JASDGDLF, WCDGDLF, Cockburn Sound Line & Pot Fishery

Appendix 5 Zonal Catches of Species Subject to Recreational Fishing Closure

Table 9. Weight and/or number kept of demersal species in the closure list by Area 2005/06.

	Live Weight (tonnes)						Number Kept	
Species	**Charter**	**Recreational Creel**	**CSLP**	**JASDGDLF**	**WCDGDLF**	**Wetline**	**Charter**	**Rec**
ABROLHOS								
Baldchin Groper	4.2				0.4	18.2	1315	
Barcheek Coral Trout	0.4					3.3	168	
Bass Groper						0.4		
Blackspotted Rockcod						0.1		
Blue Morwong					0.2	0.1		
Blue-Eye Trevalla						1.9		
Breaksea Cod	0.1					0.6	64	
Chinaman Rockcod	0.1					1.2	205	
Cod, General	NA				0.0	1.5	6	
Cod, Spotted						0.1		
Eightbar Grouper (Grey Banded Cod)						1.1		
Emperors	3.8				2.8	130.2	3351	
Flagfish / Spanish Flag						0.1		
Foxfish	0.0						4	
Fusiliers, Jobfishes	NA						1	
Goldband Snapper						0.0		
Goldspotted Rockcod						0.0		
Hapuku						0.6		
Jobfish						0.0		
Parrotfish					1.0	0.0		
Pigfishes, General						0.0		
Potato Rockcod	NA						1	
Radiant Rockcod/ Comet Grouper						0.2		
Rankin Cod	NA					0.3	2	
Red Emperor	NA				0.0	0.6	21	
Rosy Snapper	NA					0.0	2	
Ruby Snapper						2.8		
Saddletail Snapper						0.0		
Snapper, Pink	5.1				2.7	86.5	2754	
Tang's Snapper						0.1		
Tomato Rockcod	NA					0.1	7	
Western Australian Dhufish	4.8				2.0	39.1	897	
Western Blue Groper	0.0				0.0	0.1	6	
Yellowedge Coronation Trout	NA						21	

	Live Weight (tonnes)						Number Kept	
Species	**Charter**	**Recreational Creel**	**CSLP**	**JASDGDLF**	**WCDGDLF**	**Wetline**	**Charter**	**Rec**
Yelloweye Redfish						0.1		
Total	**18.5**				**9.1**	**289.4**	**8825**	
COCKBURN								
Snapper, Pink			0.7					
Western Australian Dhufish			0.0					
Total			**0.7**					
KALBARRI								
Baldchin Groper	1.0	1.4			0.8	2.9	214	500
Barcheek Coral Trout	0.1	0.0				0.6	28	6
Blue Morwong		0.1						25
Breaksea Cod	0.1	0.2				0.2	57	209
Chinaman Rockcod						0.0		
Cod, General	NA					0.8	4	
Cod, Spotted						0.1		
Eightbar Grouper (Grey Banded Cod)						0.6		
Emperors	1.2	1.6			1.3	70.2	1208	1750
Goldband Snapper						4.7		
Jobfish						0.1		
Parrotfish	NA				2.2		1	
Pigfishes, General						0.0		
Radiant Rockcod/ Comet Grouper						0.1		
Rankin Cod	NA	NA				1.0	23	62
Red Emperor	NA				0.1	4.4	18	
Bight Redfish					0.0	0.1		
Rosy Snapper						0.7		
Ruby Snapper						7.6		
Saddletail Snapper						0.0		
Snapper, Pink	1.4	2.4			2.6	109.3	1085	1183
Snappers, Other						0.0		
Tang's Snapper						0.1		
Tomato Rockcod						0.0		
Western Australian Dhufish	0.9	1.6			1.1	7.8	162	303
Yelloweye Redfish						0.2		
Total	**4.6**	**7.2**			**8.1**	**211.5**	**2800**	**4039**
METRO								
Baldchin Groper	1.3	7.5			1.2	2.8	449	2624
Barcheek Coral Trout					0.0			
Bass Groper						2.9		
Blue Morwong	5.3	5.4			3.2	3.2	1899	2290
Blue-Eye Trevalla						1.5		

	Live Weight (tonnes)						Number Kept	
Species	**Charter**	**Recreational Creel**	**CSLP**	**JASDGDLF**	**WCDGDLF**	**Wetline**	**Charter**	**Rec**
Breaksea Cod	3.1	9.7			0.1	2.4	2407	10905
Chinaman Rockcod	NA						1	
Cod, General	NA				0.1	0.1	163	
Convict Grouper	NA						27	
Eightbar Grouper (Grey Banded Cod)						3.0		
Emperors	0.0	0.0			1.5	0.5	13	9
Foxfish	0.4	1.3					372	1596
Fusiliers, Jobfishes	NA						3	
Goldspotted Rockcod	NA						1	
Hapuku						1.6		
Harlequin Fish	NA	NA					67	1139
Leopard Wirrah	NA						2	
Parrotfish					0.7	0.0		
Pigfishes, General	NA					0.0	192	
Rankin Cod	NA						2	
Red Emperor					0.0			
Bight Redfish	2.1	2.6			0.1	6.8	1498	2000
Ruby Snapper						0.0		
Saddleback Pigfish	NA						11	
Snapper, Pink	7.5	13.0			3.7	37.3	4327	6393
Swallowtail	1.2	0.4					1870	301
Tuskfish	NA						2	
Western Australian Dhufish	7.0	58.2			6.1	37.0	1132	12127
Western Blue Groper					2.0	1.5		
Western Pigfish	NA						38	
Western Wirrah	NA						48	
Yelloweye Redfish	0.7					0.2	1008	
Total	**28.5**	**98.1**			**18.8**	**100.7**	**15532**	**39382**
MIDWEST								
Baldchin Groper	0.6	18.7			1.4	10.7	195	6773
Barcheek Coral Trout	0.4	2.0			0.1	1.1	140	798
Bass Groper						3.0		
Blackspotted Rockcod						0.1		
Blue Morwong	0.0	0.4			0.8	1.0	5	181
Blue-Eye Trevalla						1.6		
Breaksea Cod	0.1	2.0				2.1	66	2248
Chinaman Rockcod	NA					0.4	11	
Cod, General					0.1	1.1		
Cod, Spotted					0.0	0.0		
Crimson Snapper						0.0		

	Live Weight (tonnes)						Number Kept	
Species	**Charter**	**Recreational Creel**	**CSLP**	**JASDGDLF**	**WCDGDLF**	**Wetline**	**Charter**	**Rec**
Eightbar Grouper (Grey Banded Cod)						2.4		
Emperors	0.4	5.5			7.0	18.8	396	6401
Foxfish	0.0	0.0					1	24
Goldband Snapper						0.0		
Goldspotted Rockcod		NA				0.2		244
Hapuku						0.2		
Harlequin Fish	NA						3	
Jobfish						0.0		
Parrotfish					1.0	0.0		
Pigfishes, General						0.0		
Radiant Rockcod/ Comet Grouper						0.1		
Rankin Cod						0.0		
Red Emperor	NA				0.1	0.1	24	
Bight Redfish					0.0	0.3		
Ruby Snapper						1.6		
Snapper, Pink	0.5	9.6			3.7	45.4	268	4822
Swallowtail						0.0		
Western Australian Dhufish	1.2	71.0			5.9	60.5	243	13398
Western Blue Groper					0.7	0.7		
Yelloweye Redfish						0.1		
Total	**3.1**	**109.3**			**20.8**	**151.6**	**1352**	**34889**
SOUTH								
Baldchin Groper	0.0	0.1		0.1		0.0	8	36
Barcheek Coral Trout						0.0		
Bass Groper						2.5		
Blue Morwong	0.2	4.1		14.9		3.4	86	1757
Blue-Eye Trevalla						6.4		
Breaksea Cod	0.5	4.1		0.0		2.4	281	4646
Chinaman Rockcod	NA						1	
Cod, General						0.4		
Eightbar Grouper (Grey Banded Cod)						5.9		
Emperors	0.0						4	
Foxfish	0.0	0.7					25	814
Hapuku	0.1					16.1	11	
Harlequin Fish	NA	NA					19	848
Pigfishes, General						0.0		
Bight Redfish	0.1	2.4		3.4		75.8	88	1874
Ruby Snapper						0.0		
Snapper, Pink	0.5	15.3		6.0		24.5	201	5410
Swallowtail	0.1	0.5					109	409

	Live Weight (tonnes)						Number Kept	
Species	**Charter**	**Recreational Creel**	**CSLP**	**JASDGDLF**	**WCDGDLF**	**Wetline**	**Charter**	**Rec**
Western Australian Dhufish	2.8	55.2		10.0		37.7	333	9395
Western Blue Groper	0.0			17.0		1.1	1	
Western Wirrah	NA						1	
Wirrahs, General	NA						2	
Yelloweye Redfish	0.0					0.0	7	
Total	**4.4**	**82.4**		**51.3**		**176.3**	**1177**	**25189**
NOZONE								
Baldchin Groper	2.2						756	
Barcheek Coral Trout	0.4						153	
Blue Morwong	0.4						153	
Breaksea Cod	0.3						248	
Chinaman Rockcod	0.1						64	
Cod, General	NA						1	
Convict Grouper	NA						6	
Coral Rockcod	NA						1	
Emperors	0.6						386	
Foxfish	0.0						23	
Fusiliers, Jobfishes	NA						2	
Harlequin Fish	NA						30	
Pigfishes, General	NA						13	
Rankin Cod	NA						1	
Bight Redfish	0.3						247	
Saddleback Pigfish	NA						2	
Snapper, Pink	2.2						1215	
Swallowtail	0.1						84	
Tomato Rockcod	NA						2	
Western Australian Dhufish	3.8						398	
Western Blue Groper	0.0						1	
Western Pigfish	NA						24	
Western Wirrah	NA						1	
Yelloweye Redfish	0.0						30	
Total	**10.4**						**3805**	
Grand Total	**69.5**	**297.0**	**0.7**	**51.3**	**56.8**	**929.5**	**33491**	**103499**

* weight less than 50 kg is presented as 0.0 in the above table.

NA - means Not Available

Appendix 6 Key Indicator West Coast Demersal Scalefish Species Taken by Sectors 1996/97 and 2005/06

Table 10. Key indicator west coast demersal scalefish species taken by the sectors in 1996/97 and 2005/06.

Year & Species	*Commercial catch (tonnes)	*Estimated Recreational Catch (tonnes)	Total Catch (tonnes)	% Commercial catch to total catch	% Recreational catch to total catch
1996/97					
Western Australian Dhufish	191	125	316	60.4%	39.6%
2005/06					
Western Australian Dhufish	207	206	413	50.1%	49.9%
1996/97					
Pink Snapper	286	25	311	92.0%	8.0%
2005/06					
Pink Snapper	323	57	380	85.0%	15.0%
1996/97					
Baldchin Groper	37	19	56	66.1%	33.9%
2005/06					
Baldchin Groper	38	37	75	51.1%	48.9%

*Commercial sector: WCDSFIMF, JASDGDLF, WCDGDLF, and Cockburn Sound Line & Pot Fishery

Recreational sector: recreational creel survey and charter sector

Appendix 7 Whole Suite of West Coast Demersal Scalefish

Species code	Family name	Common Name	Scientific Name	Category one demersal group
437026	Acanthuridae	Spotted unicornfish	*Naso brevirostris*	
290000	Apolactinidae	Thin velvetfish	*Coccotropus sp.*	
117001	Aulopidae	Sergeant Baker	*Aulopus purpurissatus*	
465014	Balistidae	Bridled triggerfish	*Sufflamen fraenatum*	
465011	Balistidae	Starry triggerfish	*Abalistes stellatus*	
465048	Balistidae	Titan triggerfish	*Balistoides viridescens*	
465900	Balistidae	Triggerfishes general	*Balistid sp.*	
258004	Berycidae	Bight redfish	*Centroberyx gerrardi*	Red snapper-bight redfish, nannygai and swallowtail
258003	Berycidae	Redfish	*Centroberyx sp.*	Red snapper-bight redfish, nannygai and swallowtail
258005	Berycidae	Swallowtail	*Centroberyx lineatus*	Red snapper-bight redfish, nannygai and swallowtail
258006	Berycidae	Yelloweye redfish	*Centroberyx australis*	Red snapper-bight redfish, nannygai and swallowtail
346037	Caesionidae	Blue fusilier	*Caesio teres*	
346050	Caesionidae	Doubleline fusilier	*Pterocaesio digramma*	
346061	Caesionidae	Lunar fusilier	*Caesio lunaris*	
346018	Caesionidae	Yellowtail fusilier	*Caesio cuning*	
346000	Caesionidae/ Lutjanidae	Fusiliers, Jobfishes	*Caesionidae/Lutjanidae*	Lutjanidae
337072	Carangidae	Black pomfret	*Parastromateus niger*	
445001	Centrolophidae	Blue-eye trevalla	*Hyperoglyphe antarctica*	Hapuku/Bass groper/ Trevalla/Grey banded cod
365066	Chaetodontidae	Western Talma	*Chelmonops curiosus*	
377004	Cheilodactylidae	Blue morwong	*Nemadactylus valenciennesi*	Queen snapper (blue morwong)
374011	Cirrhitidae	Ornate hawkfish	*Paracirrhites hemistictus*	
311063	Epinephelidae	Birdwire rockcod	*Epinephelus merra*	Serranidae/Epinephelidae
311150	Epinephelidae	Blackspotted rockcod	*Epinephelus malabaricus*	Serranidae/Epinephelidae
311100	Epinephelidae	Breaksea cod	*Epinephelides armatus*	Serranidae/Epinephelidae
311047	Epinephelidae	Camouflage grouper	*Epinephelus polyphekadion*	Serranidae/Epinephelidae
311022	Epinephelidae	Chinaman rockcod	*Epinephelus rivulatus*	Serranidae/Epinephelidae
311083	Epinephelidae	Coral rockcod	*Cephalopholis miniata*	Serranidae/Epinephelidae
311041	Epinephelidae	Duskytail groper	*Epinephelus bleekeri*	Serranidae/Epinephelidae
311152	Epinephelidae	Eightbar grouper (Grey Banded cod)	*Hyporthodus octofasciatus*	Hapuku/Bass groper/ Trevalla/Grey banded cod
311021	Epinephelidae	Flowery rockcod	*Epinephelus fuscoguttatus*	Serranidae/Epinephelidae
311062	Epinephelidae	Frostback rockcod	*Epinephelus bilobatus*	Serranidae/Epinephelidae
311007	Epinephelidae	Goldspotted rockcod	*Epinephelus coioides*	Serranidae/Epinephelidae
311061	Epinephelidae	Queensland groper	*Epinephelus lanceolatus*	Serranidae/Epinephelidae
311042	Epinephelidae	Radiant rockcod/ Comet grouper	*Epinephelus radiatus/ morrhua*	Serranidae/Epinephelidae
311010	Epinephelidae	Rankin cod	*Epinephelus multinotatus*	Serranidae/Epinephelidae
311045	Epinephelidae	Tomato rockcod	*Cephalopholis sonnerati*	Serranidae/Epinephelidae

Species code	Family name	Common Name	Scientific Name	Category one demersal group
311070	Epinephelidae	Whitespotted grouper	*Epinephelus caeruleopunctatus*	Serranidae/Epinephelidae
311009	Epinephelidae	Yellowspotted cod	*Epinephelus areolatus*	Serranidae/Epinephelidae
311015	Epinephilidae	Banded grouper	*Epinephelus amblycephalus*	Serranidae/Epinephelidae
311012	Epinephilidae	Barcheek coral trout	*Plectropomus maculatus*	Coral trout and Coronation trout
311014	Epinephilidae	Blacktip rockcod	*Epinephelus fasciatus*	Serranidae/Epinephelidae
311079	Epinephilidae	Bluespotted coral trout	*Plectropomus laevis*	Coral trout and Coronation trout
311136	Epinephilidae	Bluespotted rockcod	*Cephalopholis cyanostigma*	Serranidae/Epinephelidae
311008	Epinephilidae	Brownbarred rockcod	*Cephalopholis boenak*	Serranidae/Epinephelidae
311078	Epinephilidae	Common coral trout	*Plectropomus leopardus*	Coral trout and Coronation trout
311060	Epinephilidae	Convict grouper	*Epinephelus septemfasciatus*	Serranidae/Epinephelidae
311142	Epinephilidae	Flagtail rockcod	*Cephalopholis urodeta*	Serranidae/Epinephelidae
311057	Epinephilidae	Greasy rockcod	*Epinephelus tauvina*	Serranidae/Epinephelidae
311011	Epinephilidae	Highfin grouper	*Epinephelus maculatus*	Serranidae/Epinephelidae
311138	Epinephilidae	Leopard rockcod	*Cephalopholis leopardus*	Serranidae/Epinephelidae
311086	Epinephilidae	Maori rockcod	*Epinephelus undulatostriatus*	Serranidae/Epinephelidae
311081	Epinephilidae	Passionfruit coral trout	*Plectropomus areolatus*	Coral trout and Coronation trout
311082	Epinephilidae	Peacock rockcod	*Cephalopholis argus*	Serranidae/Epinephelidae
311074	Epinephilidae	Plump grouper	*Epinephelus trophis*	Serranidae/Epinephelidae
311068	Epinephilidae	Potato rockcod	*Epinephelus tukula*	Serranidae/Epinephelidae
311145	Epinephilidae	Purple rockcod	*Epinephelus cyanopodus*	Serranidae/Epinephelidae
311904	Epinephilidae	Radiant rockcod/ Comet grouper	*Epinephelus radiatus/ morrhua*	Serranidae/Epinephelidae
311058	Epinephilidae	Rankin cod	*Epinephelus multinotatus*	Serranidae/Epinephelidae
311149	Epinephilidae	Snubnose grouper	*Epinephelus macrospilos*	Serranidae/Epinephelidae
311162	Epinephilidae	Vermicular cod	*Plectropomus oligacanthus*	Coral trout and Coronation trout
311064	Epinephilidae	Wirenet rockcod	*Epinephelus hexagonatus*	Serranidae/Epinephelidae
311166	Epinephilidae	Yellowedge coronation trout	*Variola louti*	Coral trout and Coronation trout
311903	Epinephilidae		*Ephinephelus microdon/ areolatus/bilobatus*	Serranidae/Epinephelidae
278000	Fistulariidae	Flutemouths	*Fistulariid sp.*	
439002	Gempylidae	Gemfish	*Rexea solandri*	
320001	Glaucosomatidae	Northern pearl perch	*Glaucosoma buergeri*	
320000	Glaucosomatidae	Western Australian dhufish	*Glaucosoma hebraicum*	Western Australian dhufish
350012	Haemulidae	Brown sweetlips	*Plectorhincus gibbosus*	
350021	Haemulidae	Giant sweetlips	*Plectorhinchus albovittatus*	
350007	Haemulidae	Goldspotted sweetlips	*Plectorhinchus flavomaculatus*	
350018	Haemulidae	Manyline sweetlips	*Plectorhinchus multivittatus*	

Species code	Family name	Common Name	Scientific Name	Category one demersal group
350003	Haemulidae	Painted sweetlips	*Diagramma labiosum*	
350014	Haemulidae	Spotted sweetlips	*Plectorhinchus chaetodonoides*	
350020	Haemulidae	Striped sweetlips	*Plectorhinchus lessonii*	
350000	Haemulidae	Sweetlips	*Haemulidae*	
261024	Holocentridae	Samurai squirrelfish	*Sargocentron ittodai*	
261027	Holocentridae	Smallmouth squirrelfish	*Sargocentron microstoma*	
261000	Holocentridae	Squirrelfishes, general	*Holocentrid sp.*	
384999	Labridae	Baldchin groper	*Choerodon rubescens*	Baldchin groper and tuskfish
384010	Labridae	Blackspot tuskfish	*Choerodon schoenleinii*	Baldchin groper and tuskfish
384072	Labridae	Blue tuskfish	*Choerodon cyanodus*	Baldchin groper and tuskfish
384005	Labridae	Bluespotted tuskfish	*Choerodon cauteroma*	Baldchin groper and tuskfish
384045	Labridae	Foxfish	*Bodianus frenchii*	Foxfish and pigfish
384038	Labridae	Humphead maori wrasse	*Cheilinus undulatus*	Protected species
384904	Labridae	Pigfishes, general	*Bodianus spp.*	Foxfish and pigfish
384004	Labridae	Purple tuskfish	*Choerodon cephalotes*	Baldchin groper and tuskfish
384054	Labridae	Saddleback pigfish	*Bodianus bilunulatus*	Foxfish and pigfish
384901	Labridae	Tuskfish	*Choerodon sp.*	Baldchin groper and tuskfish
384002	Labridae	Western blue groper	*Achoerodus gouldii*	Western blue groper
384001	Labridae	Western pigfish	*Bodianus vulpinus*	Foxfish and pigfish
351001	Lethrinidae	Blue-spotted emperor	*Lethrinus punctulatus*	Emperors (Lethrinidae)
351014	Lethrinidae	Drab emperor	*Lethrinus ravus*	Emperors (Lethrinidae)
351000	Lethrinidae	Emperors, general	*Lethrinidae*	Emperors (Lethrinidae)
351021	Lethrinidae	Goldspot seabream	*Gnathodentex aureolineatus*	Emperors (Lethrinidae)
351006	Lethrinidae	Grass emperor	*Lethrinus laticaudis*	Emperors (Lethrinidae)
351004	Lethrinidae	Longnose emperor	*Lethrinus olivaceus*	Emperors (Lethrinidae)
351027	Lethrinidae	Mozambique bream	*Wattsia mossambica*	Emperors (Lethrinidae)
351911	Lethrinidae	Nor-west snapper (large/small)	*Lethrinus sp.*	Emperors (Lethrinidae)
351910	Lethrinidae	Nor-west snapper small	*Lethrinus sp.*	Emperors (Lethrinidae)
351015	Lethrinidae	Ornate emperor	*Lethrinus ornatus*	Emperors (Lethrinidae)
351022	Lethrinidae	Paddletail seabream	*Gymnocranius euanus*	Emperors (Lethrinidae)
351007	Lethrinidae	Redspot emperor	*Lethrinus lentjan*	Emperors (Lethrinidae)
351009	Lethrinidae	Redthroat emperor	*Lethrinus miniatus*	Emperors (Lethrinidae)
351005	Lethrinidae	Robinson's seabream	*Gymnocranius grandoculis*	Emperors (Lethrinidae)
351900	Lethrinidae	Seabream	*Gymnocranius sp.*	Emperors (Lethrinidae)
351008	Lethrinidae	Spangled emperor	*Lethrinus nebulosus*	Emperors (Lethrinidae)
351012	Lethrinidae	Spotcheek emperor	*Lethrinus rubrioperculatus*	Emperors (Lethrinidae)
351010	Lethrinidae	Swallowtail seabream	*Gymnocranius elongatus*	Emperors (Lethrinidae)
351002	Lethrinidae	Threadfin emperor	*Lethrinus genivittatus*	Emperors (Lethrinidae)

Species code	Family name	Common Name	Scientific Name	Category one demersal group
351014	Lethrinidae	Variegated emperor	*Lethrinus variegatus*	Emperors (Lethrinidae)
351013	Lethrinidae	Yellowtail emperor	*Lethrinus atkinsoni*	Emperors (Lethrinidae)
346008	Lutjanidae	Bigeye snapper	*Lutjanus lutjanus*	Tropical snappers and seaperch (Lutjanidae)
346034	Lutjanidae	Blackspot snapper	*Lutjanus fulviflamma*	Tropical snappers and seaperch (Lutjanidae)
346044	Lutjanidae	Bluestriped snapper	*Lutjanus kasmira*	Tropical snappers and seaperch (Lutjanidae)
346003	Lutjanidae	Brownstripe snapper	*Lutjanus vitta*	Tropical snappers and seaperch (Lutjanidae)
346041	Lutjanidae	Checkered snapper	*Lutjanus decussatus*	Tropical snappers and seaperch (Lutjanidae)
346017	Lutjanidae	Chinamanfish	*Symphorus nematophorus*	Tropical snappers and seaperch (Lutjanidae)
346005	Lutjanidae	Crimson snapper	*Lutjanus erythropterus*	Tropical snappers and seaperch (Lutjanidae)
346010	Lutjanidae	Darktail snapper	*Lutjanus lemniscatus*	Tropical snappers and seaperch (Lutjanidae)
346049	Lutjanidae	False fusilier	*Paracaesio xanthura*	Tropical snappers and seaperch (Lutjanidae)
346006	Lutjanidae	Fiveline snapper	*Lutjanus quinquelineatus*	Tropical snappers and seaperch (Lutjanidae)
346913	Lutjanidae	Flagfish/Spanish flag	*Lutjanus vitta/ quinquelineatus/ carponotatus/lutjan*	Tropical snappers and seaperch (Lutjanidae)
346038	Lutjanidae	Flame snapper	*Etelis coruscans*	Tropical snappers and seaperch (Lutjanidae)
346002	Lutjanidae	Goldband snapper	*Pristipomoides multidens*	Tropical snappers and seaperch (Lutjanidae)
346030	Lutjanidae	Golden snapper	*Lutjanus johnii*	Tropical snappers and seaperch (Lutjanidae)
346027	Lutjanidae	Green jobfish	*Aprion virescens*	Tropical snappers and seaperch (Lutjanidae)
346025	Lutjanidae	Indonesian snapper	*Lutjanus bitaeniatus*	Tropical snappers and seaperch (Lutjanidae)
346911	Lutjanidae	Jobfish	*Pritstipomoides sp.*	Tropical snappers and seaperch (Lutjanidae)
346015	Lutjanidae	Mangrove jack	*Lutjanus argentimaculatus*	Tropical snappers and seaperch (Lutjanidae)
346016	Lutjanidae	Maori snapper	*Lutjanus rivulatus*	Tropical snappers and seaperch (Lutjanidae)
346012	Lutjanidae	Moses snapper	*Lutjanus russelli*	Tropical snappers and seaperch (Lutjanidae)
346028	Lutjanidae	Paddletail	*Lutjanus gibbus*	Tropical snappers and seaperch (Lutjanidae)
346058	Lutjanidae	Pale ruby snapper	*Etelis radiosus*	Tropical snappers and seaperch (Lutjanidae)
346910	Lutjanidae	Perch, red maroon sea perch	*Lutjanus sp.*	Tropical snappers and seaperch (Lutjanidae)
346029	Lutjanidae	Red bass	*Lutjanus bohar*	Tropical snappers and seaperch (Lutjanidae)

Species code	Family name	Common Name	Scientific Name	Category one demersal group
346004	Lutjanidae	Red emperor	*Lutjanus sebae*	Tropical snappers and seaperch (Lutjanidae)
346032	Lutjanidae	Rosy snapper	*Pristipomoides filamentosus*	Tropical snappers and seaperch (Lutjanidae)
346014	Lutjanidae	Ruby snapper	*Etelis carbunculus*	Tropical snappers and seaperch (Lutjanidae)
346001	Lutjanidae	Rusty jobfish	*Aphareus rutilans*	Tropical snappers and seaperch (Lutjanidae)
346007	Lutjanidae	Saddletail snapper	*Lutjanus malabaricus*	Tropical snappers and seaperch (Lutjanidae)
346007	Lutjanidae	Saddletail snapper	*Lutjanus malabaricus*	Tropical snappers and seaperch (Lutjanidae)
346019	Lutjanidae	Sharptooth jobfish	*Pritstipomoides typus*	Tropical snappers and seaperch (Lutjanidae)
346000	Lutjanidae	Snappers, other	*Lutjanidae*	Tropical snappers and seaperch (Lutjanidae)
346011	Lutjanidae	Stripey snapper	*Lutjanus carponotatus*	Tropical snappers and seaperch (Lutjanidae)
346031	Lutjanidae	Tang's snapper	*Lipocheilus carnolabrum*	Tropical snappers and seaperch (Lutjanidae)
346057	Lutjanidae	Timor snapper	*Lutjanus timoriensis*	Tropical snappers and seaperch (Lutjanidae)
346040	Lutjanidae	Yellowlined snapper	*Lutjanus rufolineatus*	Tropical snappers and seaperch (Lutjanidae)
340001	Menidae	Razor moonfish	*Mene maculata*	
361002	Microcanthidae	Footballer sweep	*Neatypus obliquus*	
465039	Monacanthidae	Black reef leatherjacket	*Eubalichthys bucephalus*	
465003	Monacanthidae	Leatherjacket, mosaic	*Eubalichthys mosaicus*	
465038	Monacanthidae	Modest leatherjacket	*Thamnaconus modestoides*	
465006	Monacanthidae	Ocean jacket	*Nelusetta ayraudi*	
465005	Monacanthidae	Velvet leatherjacket	*Meuschenia scaber*	
224003	Moridae	Bearded rock cod	*Pseudophycis barbata*	
224005	Moridae	Largetooth beardie	*Lotella rhacina*	
224901	Moridae	Ribaldo	*Mora moro*	
287003	Neosebastidae	Bighead gurnard perch	*Neosebastes pandus*	
287006	Neosebastidae	Thetis fish	*Neosebastes thetidis*	
228002	Ophidiidae	Pink ling	*Genypterus blacodes*	
228008	Ophidiidae	Rock ling	*Genypterus tigerinus*	
369002	Opleganthidae	Knifejaw	*Oplegnathus woodwardi*	
466000	Ostraciidae	Boxfish/Cowfish	*Ostraciidae*	
466003	Ostraciidae	Shaw's cowfish	*Aracana aurita*	
466016	Ostraciidae	Western smooth boxfish	*Anoplocapros amygdaloides*	
466010	Ostraciidae	Whitebarred boxfish	*Anoplocapros lenticularis*	
367000	Pentacerotidae	Boarfish	*Pentacerotidae*	
367002	Pentacerotidae	Giant boarfish	*Paristiopterus labiosus*	
367003	Pentacerotidae	Longsnout boarfish	*Pentaceropsis recurvirostris*	
367001	Pentacerotidae	Yellowspotted boarfish	*Paristiopterus gallipavo*	

Species code	Family name	Common Name	Scientific Name	Category one demersal group
337076	Platycephalidae	Deepwater flathead	*Neoplatycephalus conatus*	
316009	Plesiopidae	Southern blue devil	*Paraplesiops meleagris*	
311170	Polyprionidae	Bass groper	*Polyprion americanus*	Hapuku/Bass groper/ Trevalla/Grey banded cod
311006	Polyprionidae	Hapuku	*Polyprion oxygeneios*	Hapuku/Bass groper/ Trevalla/Grey banded cod
365000	Pomacanthidae	Angelfish, general	*Pomacanthid sp.*	
365080	Pomacanthidae	Blue angelfish	*Pomacanthus semicirculatus*	
365029	Pomacanthidae	Multibar angelfish	*Paracentropyge multifasciata*	
326000	Priacanthidae	Bigeye	*Priacanthus sp.*	
326005	Priacanthidae	Lunartail bigeye	*Priacanthus hamrur*	
326001	Priacanthidae	Spotted bigeye	*Priacanthus macracanthus*	
457001	Psettodidae	Australian halibut	*Psettodes erumei*	
313003	Pseudochromidae	Lined dottyback	*Labracinus lineatus*	
287040	Pteroidae	Common lionfish	*Pterois volitans*	
386028	Scaridae	Blackvein parrotfish	*Scarus rubroviolaceus*	Parrotfish (Scaridae)
386001	Scaridae	Bluebarred parrotfish	*Scarus ghobban*	Parrotfish (Scaridae)
386022	Scaridae	Darkcap parrotfish	*Scarus oviceps*	Parrotfish (Scaridae)
386023	Scaridae	Greencheek parrotfish	*Scarus prasiognathos*	Parrotfish (Scaridae)
386030	Scaridae	Greenfin parrotfish	*Chlorurus sordidus*	Parrotfish (Scaridae)
386009	Scaridae	Marbled parrotfish	*Leptoscarus vaigiensis*	Parrotfish (Scaridae)
386000	Scaridae	Parrotfish	*Scaridae*	Parrotfish (Scaridae)
386020	Scaridae	Steephead parrotfish	*Chlorurus microrhinos*	Parrotfish (Scaridae)
386027	Scaridae	Surf parrotfish	*Scarus rivulatus*	Parrotfish (Scaridae)
287000	Scorpaenidae	Scorpionfishes	*Scorpaenidae*	
287072	Scorpaenidae	Western red scorpionfish	*Scorpaena sumptuosa*	
361004	Scorpididae	Sweep, sea	*Scorpis aequipinnis*	
287093	Sebastidae	Bigeye ocean perch	*Helicolenus barathri*	
311037	Serranidae	Banded seaperch	*Hypoplectrodes nigroruber*	Serranidae/Epinephelidae
311003	Serranidae	Barber perch	*Caesioperca rasor*	Serranidae/Epinephelidae
311044	Serranidae	Barramundi cod	*Cromileptes altivelis*	Serranidae/Epinephelidae
311135	Serranidae	Blowhole perch	*Caesioscorpis theagenes*	Serranidae/Epinephelidae
311005	Serranidae	Harlequin fish	*Othos dentex*	Serranidae/Epinephelidae
311132	Serranidae	Leopard wirrah	*Acanthistius pardalotus*	Serranidae/Epinephelidae
311133	Serranidae	Orangelined wirrah	*Acanthistius paxtoni*	Serranidae/Epinephelidae
311098	Serranidae	Red seaperch	*Hypoplectrodes cardinalis*	Serranidae/Epinephelidae
311182	Serranidae	Red-lined seaperch	*Caesioperca sp.*	Serranidae/Epinephelidae
310000	Serranidae	Sea perches, general	*Caesioperca sp.*	Serranidae/Epinephelidae
311035	Serranidae	Western wirrah	*Acanthistius serratus*	Serranidae/Epinephelidae
311085	Serranidae	Whitelined rockcod	*Anyperodon leucogrammicus*	Serranidae/Epinephelidae
311199	Serranidae	Wirrahs, general	*Acanthistius sp.*	Serranidae/Epinephelidae
311000	Serranidae/ Epinephelidae	Cod, general	*Serranidae/Epinephelidae*	Serranidae/Epinephelidae
353006	Sparidae	Frypan bream	*Argyrops spinifer*	

Species code	Family name	Common Name	Scientific Name	Category one demersal group
353001	Sparidae	Snapper	*Pagrus auratus*	Pink snapper
353000	Sparidae	Snappers/Bream general	*Sparidae*	
353002	Sparidae	Yellowback bream	*Dentex spariformis*	
287049	Synanceiidae	Estuarine stonefish	*Synanceia horrida*	
287022	Synanceiidae	Pacific monkeyfish	*Erosa erosa*	
287089	Synanceiidae	Reef stonefish	*Synanceia verrucosa*	
118028	Synodontidae	Common saury	*Saurida tumbil*	
118004	Synodontidae	Fishnet lizardfish	*Synodus sageneus*	
118001	Synodontidae	Largescale saury	*Saurida undosquamis*	
118000	Synodontidae	Lizardfishes/ Grinners, general	*Synodontidae*	
118002	Synodontidae	Painted grinner	*Trachinocephalus myops*	
118023	Synodontidae	Variegated lizardfish	*Synodus variegatus*	
288010	Triglidae	Eye gurnard	*Lepidotrigla argus*	
288000	Triglidae	Gurnard	*Triglid sp*	
288006	Triglidae	Latchet	*Pterygotrigla polyommata*	
288001	Triglidae	Red gurnard	*Chelidonichthys kumu*	
288002	Triglidae	Spiny gurnard	*Lepidotrigla papilio*	
400007	Uranoscopidae	Marbled stargazer	*Uranoscopus bicinctus*	
400000	Uranoscopidae	Stargazer	*Uranoscopus sp.*	
269001	Veliferidae	Common veilfin	*Metavelifer multiradiatus*	
264004	Zeidae	John Dory	*Zeus faber*	
264003	Zeidae	Mirror Dory	*Zenopsis nebulosus*	

Appendix 8 Catches (By Weight And Area) of Key Indicator Species

To	Fiona Crowe
From	Director of Research
Subject	Estimation of weights of fish without a length-WEIGHT conversion for estimation of catches by RECREATIONAL fishers in the wcdsf for catch-share ALLOCATION CONSIDERATIONS
File No	RS38/09-3
CC	Lindsay Joll, Kevin Donohue, Rod Lenanton, Brent Wise, David Fairclough, Brett Molony
Date	22nd July 2009

Dear Fiona,

This memo is to provide advice from the Research Division to yourself and IFAAC in regard to the WCDSF. Specifically, this memo outlines approaches to address the issue of how to incorporate recreational catches of fish without a weight-conversion from length data in order to consider these catches in the current allocation process.

We propose several options for consideration by yourself and IFAAC;

1. **Pro-rata using catch numbers:** Estimates of the numbers of fish captured by species are available from creel surveys of recreational fishers. Only a minority of species lack a length-weight relationship (LWR). The 'missing' weight data can be estimated via;

$$\textbf{Total "missing" weight} = \frac{\textbf{Total number of fish without a LWR x Total weight of fish with a LWR}}{\textbf{Number of fish with a LWR}}$$

This approach and assumes that the catches of fish without a LWR consists of a range of species with a range of LWRs that is represented by the 'global' length-weight relationship.

2. **Applying an 'assumed' weight for each individual fish without a LWR:** This approach simply uses a fixed weight pre fish without an LWR. Mr Norm Halse suggested a weight of 600 g (0.6 kg) per fish without an LWR. Alternate weights per fish without an LWR have also been proposed including a lower weight (e.g. 250 g or 0.25 kg per fish without an LWR) or a mean weight of fish with an LWR (approximately 522 g). The lower weight (250 g) was suggested as fish without a LWR are likely to be small and rare relative to the species more-commonly targeted and captured by recreational fishers.

These approaches assume that all fish without an LWR are the same weight and there is a risk of over-estimating or under-estimating catches, although the direction of the bias will remain unknown.

3. **Exclude fish without a LWR from the allocation process:** This is the most-simple approach and clearly identifies that these data are missing.

This approach implicitly assumes that the catches of fish without a LWR contribute a minor component of the total recreational catch across the bioregion. It should be noted that fish without a LWR do not make up any component of the commercial catches.

Summary

The following table shows the summary estimates of the weight of fish without a LWR and the percent contribution to catches.

Approach	Estimated weight (kg)	Estimated percentage of total catch (%)
Pro-rata	89,508	19.96
Assumed weight – 600 g	37,457	9.45
Assumed weight – 250 g	15,607	4.17
Assumed weight – 522 g	32,575	8.32
Exclusion	0	0

Recommendations

1. That this information be noted and considered before advising IFAAC.
2. That each approach has advantages and disadvantages.
3. That other approaches can also be considered. For example, using only the weights of catches for the three indicator species, or the top 10 species per zone from both commercial and recreational sectors, could be used to monitor allocations. [This approach for monitoring allocations still uses the entire demersal list of species to make the initial allocation]. This is a similar philosophical approach to using the three indicator species to monitor the status of the entire suite of demersal species in the west coast.
4. That in terms of monitoring allocations into the future, that monitoring the top three species is the easiest, most rapid and most robust (least uncertain) of any method, followed by monitoring the top 10 species, then those without an LWR. This is a critical consideration given the resources available and the likely frequency of monitoring allocations for the west coast and for other bioregions into the future (e.g. Gascoyne).
5. Research will be available to explain in more detail the advantages and disadvantages of each alternative approach at the IFAAC meeting of the 23rd July 2009.

Rick Fletcher

DIRECTOR FISHERIES RESEARCH

Appendix 9 Catches (by Weight and Area) of Key Indicator Species in 2005/06

Zone	Common name	WCDSFIMF (tonnes)	JASDGDLF (tonnes)	WCDGDLF (tonnes)	CSLP (tonnes)	Charter estimates (tonnes)	Recreational creel survey estimates (tonnes)	Phone diary estimates (tonnes)
Kalbarri	Baldchin Groper	2.9		0.8		1.0	1.4	1.5
Abrolhos	Baldchin Groper	18.2		0.4		4.2		6.9
Midwest	Baldchin Groper	10.7		1.4		0.6	18.7	33.5
Metro	Baldchin Groper	2.8		1.2		1.3	7.5	10.8
South	Baldchin Groper	0.0	0.1			0.0	0.1	1.8
No zone	Baldchin Groper					2.2		
Total	**Baldchin Groper**	**34.7**	**0.1**	**3.7**		**9.2**	**27.7**	**54.6**
Kalbarri	Pink Snapper	109.3		2.6		1.4	2.4	0.5
Abrolhos	Pink Snapper	86.5		2.7		5.1		3.6
Midwest	Pink Snapper	45.4		3.7		0.5	9.6	14.0
Metro	Pink Snapper	37.3		3.7	0.7	7.5	13.0	6.5
South	Pink Snapper	24.5	6.0			0.5	15.3	28.0
No zone	Pink Snapper					2.2		
Total	**Pink Snapper**	**303.1**	**6.0**	**12.8**	**0.7**	**17.2**	**40.3**	**52.7**
Kalbarri	WA Dhufish	7.8		1.1		0.9	1.6	
Abrolhos	WA Dhufish	39.1		2.0		4.8		3.0
Midwest	WA Dhufish	60.5		5.9		1.2	71.0	63.5
Metro	WA Dhufish	37.0		6.1		7.0	58.2	65.3
South	WA Dhufish	37.7	10.0		0.0	2.8	55.2	92.1
No zone	WA Dhufish				0.0	3.8		
Total	**WA Dhufish**	**182.1**	**10.0**	**15.1**	**0.0**	**20.5**	**186.0**	**223.9**
Grand total	**Key indicator species**	**519.9**	**16.1**	**31.5**	**0.7**	**46.9**	**253.9**	**331.3**

The phone-diary screening process identifies non-fishers and fishers. However:

1. Some non-fishers may actually fish and
2. Some non-fisher boats may have been sold during the survey and may have been used for fishing by the new owners.

Separating non-fishers from fishers

The phone diary survey assumes that non-fishers identified in the screening survey did not fish.

This analysis may understate catch and effort since some of these respondents may have fished.

Appendix 10 Memorandum from Director of Research, Regarding Estimation of the Recreational Catch from the West Coast Bioregion Using Creel and Phone Diary Methods

To	Lindsay Joll, Deputy Director, Integrated Fisheries Management
From	Dr Rick Fletcher, Director Fisheries Research
Subject	Estimation of the recreational catch from the West Coast Bioregion using creel and phone-diary methods
File No	RS 38/09
Date	22 October 2009

Background

The Integrated Fisheries Advisory Committee and various stakeholders have raised the issue of the comprehensiveness of the creel surveys of recreational boat-based fishing in the West Coast Bioregion and therefore the accuracy of the estimates of total catch that are generated by this method.

1.1.1.1 The creel survey method only records fish landed at boat ramps between the hours 9:00 am and 5:00 pm; catch landed outside these hours or at locations that are not surveyed (e.g. boats launched from beaches and those kept in pens/ moorings), were also not covered by this survey. Due to these known structural limitations of the creel survey design, the creel-based method will result in an underestimation of the recreational catch. These limitations were identified in Fisheries Research Report 177.

The Research Division has been requested to provide estimates of the level of underestimation that is generated by using the current creel survey methodology.

Determining the level of underestimation

There a number of lines of evidence that can be used to provide indications of the level that the creel surveys underestimate total catch. The most valuable of these is that during 2005/06 two different survey methods were used by the Research Division to estimate the recreational catch. So, in addition to completing a creel survey, a phone diary survey was also completed. This provides the opportunity to directly compare the estimates between these two independent methods.

1.1.1.2 Phone/diary survey methodology - The owners of registered recreational power boats in the West Coast Bioregion were initially screened to ascertain which owners intended to fish from their boats in 2005/06. A subsample of those intending to fish (and who consented to participate in the survey) were sent diaries to record their catch during 2005/06. They were contacted monthly by phone to obtain catch information for any fishing trips during the previous month.

This method provides overall catch estimates for the entire bioregion that include all fishing times (i.e. covers the full 24 hours in a day) and all locations (i.e. includes boats that were not launched/retrieved at public boat ramps). It therefore does not suffer the same time and location limitations that affect the creel survey method. One limitation for the phone diary survey is the smaller sample sizes compared to the creel survey can potentially limit the scope of the outputs generated.

The other main line of evidence comes from monitoring the activity at the Hillarys Boat ramp using remote video technology.

Comparison of survey methods

Due to the sampling design and sample sizes for each of the surveys, the comparison between the methods can only be made at the level of the whole bioregion. Similarly, it would not be appropriate to generate a specific comparison of the estimates from the two methods at the level of individual species.

Two comparisons are provided, one generated using a regression method and the other compared the estimates of total effort between the survey methods.

1.1.1.3 Regression Method

A regression analysis was applied to the two sets of catch estimates for the ten most commonly caught demersal species or species groups (see Figure 1) based on comparing bioregional catch-estimates (numbers of fish kept) for: (i) dhufish, (ii) baldchin groper, (iii) pink snapper, (iv) breaksea cod, (v) blue morwong (queen snapper), (vi) emperors, (vii) red fish (bight redfish), (viii) sea sweep, (ix) sergeant baker and (x) foxfish. These demersal species collectively comprise >95 per cent of the recreational demersal catch (as per the list agreed by IFAAC) in terms of both numbers and weight so are highly representative of the suite of demersal species caught by recreational boat fishers.

The regression analysis comparison calculated that the catch estimates from the phone diary survey were, on average, 19 per cent higher (50 per cent CI 13-26 per cent; 95 per cent CI: 1 to 38 per cent) than those obtained using the creel survey. This is indicated by the catches of most species tending to lie above the dashed1:1 line.

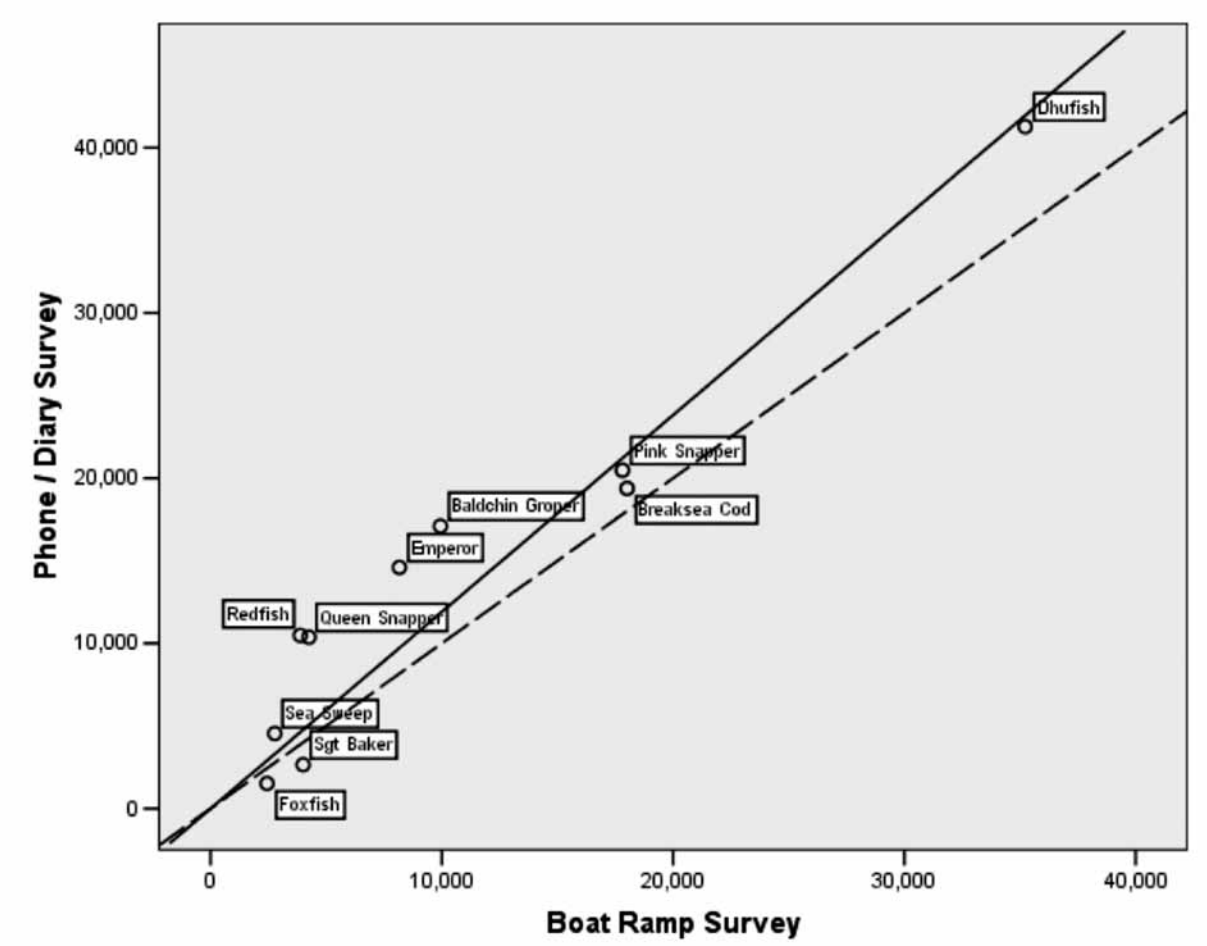


Figure 1. Comparison of catch estimates (numbers) from the creel and phone/diary surveys for ten demersal species across the whole West Coast Bioregion in 2005/06. These ten species represent >95 per cent of the demersal catch of boat based fishers in this bioregion. The solid line represents the regression line. The dashed line displays the 1:1 line as a reference for the level of difference.

Difference in total effort levels

There were also differences in the estimates of total effort between the two surveys. The creel-based survey estimated a 14 per cent lower level of total effort compared to the phone diary survey.

Boat-retrieval comparison at Hillarys Boat Harbour

The trial use of video cameras to remotely estimate boat retrievals at public boat ramps was undertaken as part of an FRDC project. This confirmed that a significant number of boat retrievals can fall outside of the period covered by the creel survey (i.e. outside of 9:00 am to 5:00 pm). The FRDC project is still underway so full comparisons are not yet available. A preliminary comparison of boat retrieval information for 2005/06 has shown that over this full year only 60 – 70 per cent of boat retrievals occurred between 9:00 am and 5:00 pm. Although the remote camera method cannot ascertain which of these boats had been fishing for demersal scalefish, it is likely that some proportion of these trips would have been. It must also be noted that the proportion of trips outside of the core creel survey hours is unlikely to be the same at all boat ramps or launching points.

Summary

All the lines of evidence confirm that a material level of boating activity and fishing occurs outside of the scope of the current creel survey methodology. Therefore, the creel survey estimates of the catch of demersal fish by boat based recreational fishers are being underestimated by a material level.

Advice

There is uncertainty associated with the precise level of underestimation generated by creel surveys. Furthermore, the precise level is likely to vary among years due to environmental conditions and the average has the potential to drift through time as fishing patterns change.

The "point" estimate generated by the regression method of the level of underestimation by the creel survey method was 19 per cent. However, given the uncertainty in this point estimate (50 per cent CI 13-26 per cent), a more convenient value, such as 20 per cent, could be used for the current IFAAC deliberations.

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