



Australian Government

Australian Fisheries Management Authority

 **SESSF Total Allowable  
Catch recommendations for the  
2016–17 fishing year**

## Introduction

This paper outlines AFMA Management's recommendations for total allowable catches (TACs) for species in the *Southern and Eastern Scalefish and Shark Fishery* (SESSF) for the 2016–17 fishing year, commencing 1 May 2016.

This paper is to provide you with an opportunity to consider AFMA Management's TAC recommendations before the South East Management Advisory Committee (SEMAC) TAC meeting in February 2016. If you have any questions or comments, please raise them with the relevant member of SEMAC (<http://www.afma.gov.au/fisheries/committees/south-east-management-advisory-committee-semac/>) or AFMA staff Marcus Finn for Trawl and Great Australian Bight on 02 6225 5484 or Ryan Keightley for Gillnet, Hook and Trap on 02 6225 5397. SEMAC will not be discussing Bight redfish and deepwater flathead which are considered by the Great Australian Bight Industry Association (GABIA) and the Great Australian Bight Management Advisory Committee (GABMAC).

The commentary below summarises some of the issues considered by SESSF Resource Assessment Groups (RAGs) and AFMA Management in making its TAC recommendations. Also relevant are stock assessment outcomes, harvest strategy control rules, TAC setting principles and rebuilding strategies.

This paper provides AFMA Management's current recommendations. It does not represent the views of the AFMA Commission and the Commission may make decisions that are different to the AFMA Management recommendations in this paper.



**Summary table of AFMA Management recommendations for quota species**

Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS – RCA <sup>1</sup>		
Alfonsino	0	1016	3	1070	54	0	0	0	1017 (3 <sup>rd</sup> year of a three-year MYTAC)	+1
Blue eye trevalla	269	335	4	444	0	32	2	0	410 (one-year TAC)	+75
Blue grenadier	1381	8796	1	8810	0	0	0	0	8810 (3 <sup>rd</sup> year of a three-year MYTAC)	+14
Blue warehou	16	118	4	0	0	0	0	0	118 (incidental catch TAC)	0
Bight redfish	219	2358	1	797	0	0	0	0	1179 (1 <sup>st</sup> year of a five-year TAC)	-1179
Deepwater flathead	661	1150	1	1112	0	0	0	0	1150 (3 <sup>rd</sup> year of a three-year MYTAC)	0
Deepwater shark (eastern)	25	47	4	47	0	0	0	0	47 (3 <sup>rd</sup> year of a three-year MYTAC)	0
Deepwater shark (western)	80	215	4	263	0	0	0	0	263 (3 <sup>rd</sup> year of a three-year MYTAC)	+48

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<sup>1</sup> RCA (Research Catch Allowance) is allocated for research and monitoring purposes. A total of 110 tonnes of orange roughy RCA is allocated to a 2016 acoustic survey of orange roughy, and is taken from the orange roughy – eastern and orange roughy – Pedra Branca allocations in proportion to the initial split of the eastern orange roughy RBC.



Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS – RCA <sup>1</sup>		
Elephantfish	61	163	4	306	46	6	162	0	92 (1 <sup>st</sup> year of a three-year MYTAC)	-71
Flathead	2838	2860	1	3334	0	238	214	0	2882 (3 <sup>rd</sup> year of a three-year MYTAC)	+22
Gemfish (eastern)	37	100	1	0	0	0	0	0	100 (incidental catch)	0
Gemfish (western)	72	183	4	247	0	0	0	0	247 (3 <sup>rd</sup> year of a three-year MYTAC)	+64
Gummy shark	1524	1836	1	2010	0	0	0	0	1836 (3 <sup>rd</sup> year of a three-year MYTAC)	0
Jackass morwong	123	598	1	563	0	8	81	0	474 (1 <sup>st</sup> year of a three-year MYTAC)	-124
John dory	66	169	3	203	10	21	5	0	167 (2 <sup>nd</sup> year of a three-year MYTAC)	-2
Mirror dory	225	437	4	491	74	5	87	0	325 (one-year TAC)	-112
Ocean perch	188	166	4	283	42	14	37	0	190 (3 <sup>rd</sup> year of a three-year MYTAC)	+24
Orange roughy (GAB Albany & Esperance)	0	50	1	0	0	0	0	0	50 (incidental catch TAC)	0

AFMA Management TAC recommendations for the 2016-17 fishing year



Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS – RCA <sup>1</sup>		
Orange roughy (Cascade)	0	500	1	500	0	0	0	0	500	0
Orange roughy (eastern)	6	465	1	512 (including Pedra Branca)	0	0	0	102	363 (2 <sup>nd</sup> year of a three-year MYTAC)	-102
Orange roughy (southern)	17	35 (Pedra Branca) 31 (incidental)	1		0	0	0	8	27 (Pedra Branca) 31 (incidental)	-8
Orange roughy (western)	29	60	1	0	0	0	0	0	60 (incidental catch TAC)	0
Smooth oreodory (Cascade)	0	150	4	150	0	0	0	0	150 (until catches reach 10t)	0
Smooth oreodory (other)	1	23	5	90	0	0	0	0	90 (1 <sup>st</sup> year of a three-year MYTAC)	+67
Oreodory, basket	98	128	4	128	0	0	0	0	128 (3rd year of a three-year MYTAC)	0
Pink ling	967	980	1	1240	0	45	51	0	1144 (1 <sup>st</sup> year of a three-year MYTAC)	+164
Redfish	78	100	1	0	0	0	0	0	100 (incidental catch TAC)	0

AFMA Management TAC recommendations for the 2016-17 fishing year



Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS – RCA <sup>1</sup>		
Ribaldo	140	355	4	355	0	0	0	0	355 (3rd year of a three-year MYTAC)	0
Royal red prawn	146	386	4	393	0	4	2	0	387 (3rd year of a three-year MYTAC)	+1
Sawshark	198	482	4	535	80	22	0	0	433 (1 <sup>st</sup> year of a three-year MYTAC)	-49
School shark	201	215	1	0	0	0	0	0	215 (incidental catch TAC)	0
School whiting	798	747	1	1660	0	757	35	0	868 (long-term TAC)	+121
Silver trevally	93	602	4	791	0	195	8	0	588 (3 <sup>rd</sup> year of three-year MYTAC)	-14
Silver warehou	368	2417	1	1958	0	0	0	0	1209 (1 <sup>st</sup> year of a three-year MYTAC)	-1209

AFMA Management TAC recommendations for the 2016-17 fishing year



## **SESSF Harvest Strategy Framework, stock assessment methods and TAC setting process**

The SESSF Harvest Strategy Framework (HSF) uses harvest control rules to determine a recommended biological catch (RBC) for each stock in the SESSF quota management system. HSF rules are then applied to the RBCs to derive the TAC recommendations by AFMA Management.

The HSF is available on the AFMA website at <http://www.afma.gov.au/sustainability-environment-harvest-strategies>.

### **Calculating the TAC**

#### *Step 1: Calculating a Recommended Biological Catch (RBC)*

The RBCs are developed by SESSF Resource Assessment Groups (RAGs). Under the HSF, stocks are assigned to one of four tier levels depending on how much information is known about them. Tier 1 stocks have the highest level of information and this information is used in a stock assessment model to estimate the size of the stock. Assessments for Tier 3 stocks are based on estimates of fishing mortality, Tier 4 stock assessments are based on catch per unit effort (CPUE) and Tier 5 assessments are used when only basic catch information is available. The Tier 2 level is no longer used.

#### *Step 2: Commonwealth RBCs*

For most species, the Commonwealth RBC (recommended biological catch for Commonwealth waters) is calculated by:

- applying a discount factor to RBCs for Tier 3 and Tier 4 species due to the lower level of certainty in these assessments. As a default, the RBCs are discounted by 5 per cent for Tier 3 species and 15 per cent for Tier 4 species, unless there is precaution afforded through other measures
- subtracting discarded catch and catch taken by other sectors or jurisdictions (e.g. state and recreational sectors or scientific surveys) from the RBC.

#### *Step 3: Total Allowable Catch (TAC)*

Under the large change limiting rules, the Commonwealth TACs are prevented from changing by large (more than 50 per cent) amounts from year to year.

Four species – blue warehou, gemfish (eastern), orange roughy and school shark – are subject to rebuilding strategies and incidental catch TACs. This means that there is no targeted fishing for these species. A rebuilding strategy is being developed for redfish in accordance with the *Commonwealth Fisheries Harvest Strategy Policy 2007* (HSP).

AFMA Management TAC recommendations for the 2016-17 fishing year

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## **Multi-year TACs**

A number of species are on multi-year TACs (MYTAC). When a multi-year TAC is set the RAGs develop review triggers to ensure that stocks remain within acceptable risk boundaries each year and are reassessed if necessary.

## **Research catch-effort allowance**

The AFMA Commission may allocate Research Catch Allowance (RCA) for research projects. The amount of RCA is determined in accordance with the *AFMA Research Catch and Effort Allowance Policy* and is allocated within the recommended sustainable catch of that species. Changes in amounts of research catch between fishing years may cause variations in multi-year TACs.

RCA for the Fishery Independent Surveys (FIS) is determined after the survey has taken place. That is, the actual FIS research catch of each quota species is deducted from the next year's TAC. There is a review trigger for this arrangement if the total catch (quota and/or non-quota species) for the FIS increases by 20 per cent above the previous total FIS catch. If the trigger is reached, catches will be reviewed with input from RAGs.

## **Overcatch and undercatch**

Overcatch and undercatch provisions can be set to allow flexibility between fishing years. The amount of quota over caught (or under caught) in a fishing year will be subtracted from (or added to) the operator's quota allocation for that species in the following fishing year. The RAGs make recommendations to the AFMA Commission on the overcatch and undercatch amounts to be applied.

## **Alternative target reference point**

TACs for most SESSF species currently reflect the target level for maximum economic yield (MEY) for that individual species by using an MEY proxy of 48 per cent of the unfished spawning biomass. However, the objective of maximising economic returns is better pursued by setting TACs for some secondary species (commercially less important and not generally targeted) at a biological target of 40 per cent of unfished spawning biomass.

As such, 40 per cent targets have been applied to ocean perch, ribaldo, elephantfish, john dory and sawshark. The aim is to achieve biologically sustainable catches but not unduly restrict the ability to achieve MEY for key target species. Other secondary species may move to alternative targets in future fishing years consistent with the HSP.





### 1.1. Alfonsino

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
0	1016	3	1070	54	0	0	0	1017 (3 <sup>rd</sup> year of a three-year MYTAC)	+1

When considered by SESSFRAG at its meeting in August 2015, Alfonsino had not met any triggers to review the existing multi-year TAC. Catches are zero as no targeted fishing has taken place.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 1017 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.2. Blue eye trevalla

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
269	335	4	444	0	32	2	0	410 (one-year TAC)	+75

Last year the Commission agreed to pause a step-down TAC for blue eye trevalla at 335 tonnes for the 2015–16 fishing year pending the outcome of a new Tier 4 assessment.

SlopeRAG adopted a new Tier 4 assessment in 2015 using a catch per hook analysis. This confirmed that the previous Tier 4 assessment was conservative in nature, and that blue eye trevalla are likely to be less depleted than the 2014 assessment indicated. In updating the assessment, the RAG analysed the effect of orca depredation on blue eye trevalla catch rates. The RAG recommended against using orca-influenced catch rates in the assessment because representative data were not available. However, the RAG noted that the RBC will be a conservative estimate because this data is omitted.

The RAG and AFMA Management do not recommend a multi-year TAC because catch rates have been variable and new research on stock structure is expected to be published next year. A discount factor is not recommended because the conservative estimate of the assessment and protection is afforded to the stock by fishing closures.

AFMA Management TAC recommendations for the 2016-17 fishing year



Consistent with the RAG’s advice, AFMA Management recommends that the TAC be set at 410 tonnes for one fishing year (2016–17). It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.3. Blue grenadier

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
1381	8796	1	8810	0	0	0	0	8810 (3 <sup>rd</sup> year of a three-year MYTAC)	+14

When considered by SESSFRAG at its meeting in August 2015, blue grenadier had not met any triggers to review the existing multi-year TAC and no concerns were raised in relation to the stock.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 8810 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.4. Blue warehou

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
16	118	4	0	0	0	0	0	118 (incidental catch TAC)	0

In 2015 blue warehou was listed as ‘Conservation Dependent’ under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

In considering RBC advice, ShelfRAG noted there was no evidence of targeting and catches were very low. The RAG pointed out that current catches, even with low recruitment, should not be impeding recovery. The RAG recommended continuing the incidental catch of 118 tonnes.

Consistent with the advice of ShelfRAG, AFMA Management recommends that the incidental TAC be set at 118 tonnes with no percentage determined for overcatch or undercatch.

AFMA Management TAC recommendations for the 2016-17 fishing year



### 1.5. Bight redfish

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
219	2358	1	797	0	0	0	0	1179 (1 <sup>st</sup> year of a five-year TAC)	-1179

Last year, the AFMA Commission determined a TAC for Bight redfish for the 2015–16 fishing year as the fourth year of a multi-year TAC. At the time, the Commission supported a GABIA recommendation to extend the three year multi-year TAC by one year to accommodate a fishery independent survey in 2014–15 and a new assessment for Bight redfish in 2015.

The new assessment was completed for Bight redfish in 2015. Based on improved data the new assessment resulted in a lower estimate of unfished biomass, but provided an estimate of current biomass substantially higher than the management target, suggesting a healthy stock.

Based on the outcomes of the assessment, GABRAG recommended a five year multi-year TAC based on the average five-year RBC of 797 tonnes. The application of the large change limiting rule results in a 2016–17 TAC recommendation of 1179 tonnes. Should the five-year MYTAC recommendation be supported by the AFMA Commission, TAC recommendations in subsequent seasons would be calculated using the 797 tonne RBC.

AFMA Management is recommending that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.6. Deepwater flathead

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
661	1150	1	1112	0	0	0	0	1150 (3 <sup>rd</sup> year of a three-year MYTAC)	0

Last year, the AFMA Commission determined a TAC for deepwater flathead for the 2015–16 fishing year based on a three year multi-year TAC recommendation.

AFMA Management TAC recommendations for the 2016-17 fishing year



When considered by GABRAG at its meeting on 23 November 2015, deepwater flathead had not met any triggers to review the existing multi-year TAC.

On that basis, AFMA Management recommends a continuation of the current TAC of 1150 tonnes for the 2016–17 fishing year, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.7. Deepwater shark (eastern)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
25	47	4	47	0	0	0	0	47 (3 <sup>rd</sup> year of a three-year MYTAC)	0

In considering deepwater shark (eastern), SlopeRAG noted there was no new information that would provide a basis for the RAG to change its previous advice. Accordingly, the RAG recommended that the multi-year TAC continue for the 2016–17 fishing year.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 47 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.8. Deepwater shark (western)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
80	215	4	263	0	0	0	0	263 (3 <sup>rd</sup> year of a three-year MYTAC)	+48

In considering deepwater shark (western), SlopeRAG noted there was no new information that would provide a basis for the RAG to change its previous advice. Accordingly, the RAG recommended that the multi-year TAC continue for the 2016–17 fishing year.

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On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 263 tonnes, continuing the third year of the existing three year multi–year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.9. Elephantfish

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
61	163	4	306	46	6	162	0	92 (1 <sup>st</sup> year of a three–year MYTAC)	–71

In 2015 SharkRAG considered an updated tier 4 assessment for elephantfish based on standardised gillnet CPUE, including discards. The RAG recommended an RBC of 306 tonnes and supported a multi–year TAC for three years with a discount factor of 15 per cent to be applied.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 92 tonnes as the first year of a three year multi–year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.10. Flathead

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
2838	2860	1	3334	0	238	214	0	2882 (3 <sup>rd</sup> year of a three–year MYTAC)	+22

At its meeting in August 2015, SESSFRAG noted that flathead catches and catch rates increased for both the Danish seine and trawl fleets:

- The 2014 flathead trawl CPUE had increased to within the review trigger bounds.
- Despite increasing catch rates, Danish seine CPUE remained below the trigger level.

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Although a review trigger was met for Danish seine, the RAG recommended deferring the Tier 1 flathead assessment until 2016 because trawl and Danish seine CPUE had increased and a new assessment for flathead was not a priority.

AFMA Management recommends a TAC for the 2016–17 fishing year of 2882 tonnes, continuing the third year of the existing three year multi–year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.11. Gemfish (eastern)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
37	100	1	0	0	0	0	0	100 (incidental catch)	0

This stock has been classified as overfished since the commencement of the Bureau of Rural Sciences (BRS) – now the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) – Stock Status Reports in 1992. Gemfish (eastern) is currently listed as conservation dependent under the EPBC Act and is under a rebuilding strategy. No targeting has been permitted since 2002.

Last year, the AFMA Commission determined an incidental catch TAC of 100 tonnes for gemfish (eastern) for the 2015–16 fishing year. The incidental catch TAC was set for one year with a recommendation to review data and consider doing a Tier 1 assessment during 2015. However, SESSFRAG did not consider there were sufficient data to update the Tier 1 assessment and ShelfRAG recommended that an assessment be considered for 2016.

ShelfRAG recommended maintaining the existing multi–year TAC of 100 tonnes as there was no additional information that would provide a basis for the RAG to change its previous advice.

Consistent with RAG advice AFMA Management recommends a 100 tonnes incidental TAC with no percentage determined for overcatch or undercatch.



### 1.12. Gemfish (western)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
72	183	4	247	0	0	0	0	247 (3 <sup>rd</sup> year of a three-year MYTAC)	+64

Gemfish (western) occur within the Commonwealth Trawl Sector (CTS), the Gillnet, Hook and Trap (GHAT) and the Great Australian Bight (GAB) Trawl Sector. Gemfish (western) caught under CTS and GHAT concessions must be covered with quota, while the GAB Trawl Sector that operates in the western part of the fishery is managed under a trigger limit.

The current review trigger for gemfish (western) in the CTS and GHAT is based on CPUE. When considered by GABRAG at its meeting held on 23 November 2015, it was agreed that the estimate of CPUE suggests that gemfish (western) may have broken out over the predicted CPUE.

GABRAG noted that although the gemfish (western) CPUE may have broken out due to high levels of discarding, landed catches remained low. Given the planned stock assessment in 2016, the low catches and apparently healthy status of the gemfish (western) stock, GABRAG recommended that the current multi-year arrangements remain in place for the 2016–17 fishing season.

AFMA Management recommends a TAC for gemfish (western) of 247 tonnes for the 2015–16 fishing year, the third year of a three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.13. Gummy shark

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
1524	1836	1	2010	0	0	0	0	1836 (3 <sup>rd</sup> year of a three-year MYTAC)	0

In 2015, SharkRAG reviewed the review triggers for the gummy shark multi-year TAC and noted that none had been met.

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The RAG noted that more smaller and larger fish are caught on longlines than on gillnets. If this is sustained and more large breeding shark continue to be caught than has been estimated in the stock assessment model, it could reduce the RBC. AFMA and SharkRAG will continue to monitor size frequency data and the size selectivity review trigger, and an updated assessment model scheduled in 2016 will account for any change in size selectivity.

SharkRAG noted that there are no sustainability concerns with the RBC for the 2016–17 fishing year and that the current TAC was set below the RBC.

On that basis, AFMA Management recommends that the TAC be continued at 1836 tonnes for the 2016–17 fishing year. AFMA Management also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

#### 1.14. Jackass morwong

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
123	598	1	563	0	8	81	0	474 (1 <sup>st</sup> year of a three-year MYTAC)	–124

In 2015, an updated Tier 1 stock assessment was conducted for jackass morwong east and west. ShelfRAG accepted the assessment as the base case for both the east and the west but noted that there had been reductions in effort in the west and there was some uncertainty around how well the assessment for the western part of the stock was reflecting abundance.

The assessment estimated the eastern stock at 36 per cent of unfished spawning biomass and the western stock at 69 per cent of unfished spawning biomass. Based on the new assessment the RAG recommended an RBC in the east of 314 tonnes and in the west of 249 tonnes, providing a total RBC of 563 tonnes for 2016–17 fishing year. It recommended adopting a three year multi-year TAC.

AFMA Management recommends a multi-year TAC commencing during the 2016–17 fishing year of 474 tonnes. AFMA Management also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.





### 1.15. John dory

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
66	169	3	203	10	21	5	0	167 (2 <sup>nd</sup> year of a three-year MYTAC)	-2

In 2015, ShelfRAG noted there was no additional information that would provide a basis for the RAG to change its previous advice and recommended that the current multi-year TAC for john dory continue.

Consistent with this advice, AFMA Management recommends a TAC of 167 tonnes in the 2016–17 fishing year, the second year of a three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.16. Mirror dory

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
225	437	4	491	74	5	87	0	325 (one-year TAC)	-112

In 2015, ShelfRAG reviewed an updated Tier 4 assessment for mirror dory. The RAG considered discards for the eastern stock and recommended including weighted average of discards in the catch and catch rate. Given the low level of discards of western stock, discards were not included in the western assessment.

On the basis of the eastern and western Tier 4 assessment, ShelfRAG agreed on an RBC of 491 tonnes. ShelfRAG did not recommend a multi-year TAC given the apparent cyclical nature of mirror dory stock status and catches, and concerns that a multi-year TAC would not be able to respond to relatively rapid changes in biomass.



Consistent with ShelfRAG advice, AFMA Management recommends the TAC be set at 325 tonnes for the 2016–17 fishing year. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.17. Ocean perch

Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS		
Ocean Perch (based on offshore)	188	166	4	283	42	14	37	0	190 (3 <sup>rd</sup> year of a three-year MYTAC)	+24

Ocean perch is assessed as two stocks, inshore and offshore. Inshore ocean perch is defined as those catches from depths of 0 – 200 m. The inshore stock is generally regarded as a bycatch species (80 per cent discards) while the offshore stock is occasionally discarded.

Ocean perch is currently on the second year of a three year multi-year TAC. At its meeting of 27–28 October 2015, ShelfRAG noted that no triggers to review the existing multi-year TAC had been met and there was no additional information that would provide a basis for the RAG to change its previous advice. The RAG recommended that the RBC remain unchanged.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 190 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.18. Orange roughy – General

The 2006 *Orange Roughy Conservation Programme* has been reviewed and was replaced by the 2015 *Orange Roughy Rebuilding Strategy* (the Strategy). Under the Strategy, only stocks of orange roughy that are above the limit reference point of 20 per cent of the unfished biomass are able to targeted.



### 1.19. Orange roughy – GAB Albany & Esperance

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
0	50	1	0	0	0	0	0	50 (incidental catch TAC)	0

The current arrangements for orange roughy in the area of the Great Australian Bight Trawl Sector include; no commercial targeting of orange roughy, an incidental catch TAC in the GAB Albany & Esperance areas, research catch allowance within research zones, an incidental catch trigger of 10 tonnes outside the research zones and closures over recognised orange roughy seamounts.

GABRAG recommended maintaining the incidental catch TAC for GAB Albany & Esperance at 50 tonnes to cover incidental catch on the basis that this posed little risk to the stock.

GABRAG recommended that the Orange Roughy Research Program in the GAB trawl sector be continued in 2016–17 and that 200 tonnes of research allowance be available for this purpose as the level of research catch posed little risk to the long term recovery of the species.

Consistent with GABRAG advice, AFMA Management recommends maintaining the incidental catch TAC for orange roughy GAB Albany & Esperance at 50 tonnes with no provision for undercatch or overcatch. It also recommends an additional 200 tonnes research catch allowance be set that can be used under the Orange Roughy Research Program.

### 1.20. Orange roughy (Cascade Plateau)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
0	500	1	500	0	0	0	0	500	0

In 2015, SlopeRAG recommended continuing the 500 tonnes TAC for the 2016–17 fishing year, noting low effort and a consequent lack of new data.

Consistent with SlopeRAG’s advice, AFMA Management recommends that the TAC be maintained at 500 tonnes for the 2016–17 fishing year. AFMA Management also

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recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.21. Orange roughy (eastern)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
6	465	1	512 (including Pedra Branca)	0	0	0	102	363 (2 <sup>nd</sup> year of a three-year MYTAC)	–102

At its meeting on 28–29 October 2015, SlopeRAG noted that orange roughy (eastern) catches were within the three year eastern zone TAC of 465 tonnes, and recommended maintaining the current multi-year TAC. SlopeRAG supported keeping the current undercatch and overcatch arrangements.

The RAG supported conducting an acoustic biomass survey for orange roughy during 2016. Noting biological and financial requirements of the survey the RAG recommended a 110 tonnes research catch allowance be allocated to support a 2016 acoustic optical survey. The 110 tonne research catch allowance is taken from the orange roughy (eastern) and orange roughy (southern – Pedra Branca) zones in proportion with the split of the initial RBC allocation. This results in a research catch allowance of 102 tonnes sourced from the orange roughy (eastern) TAC.

It was noted that the research catch allowance would be deducted from the TAC and SlopeRAG recommended closing commercial fishing in survey areas during July while the survey is being completed. This is to ensure that impacts of commercial fishing on fish behaviour are minimised and that the survey is consistent with previous surveys.

Consistent with SlopeRAG’s advice, AFMA Management recommends that the TAC be set at 363 tonnes for the 2016–17 fishing year. AFMA Management also recommends that the percentage for undercatch be determined at 100 per cent and overcatch be determined at 10 per cent.



### 1.22. Orange roughy (southern) including Pedra Branca

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
17	35 (Pedra Branca) 31 (incidental)	1		0	0	0	8	27 (Pedra Branca) 31 (incidental)	–8

Orange roughy (southern) is on the second year of a three year multi-year TAC. The 2016–17 TAC consists of two components; 27 tonnes for the Pedra Branca area (being assessed as part of the eastern stock) and 31 tonnes for incidental catches for the remainder of the zone.

The RAG noted that the southern zone outside of the Pedra Branca area continues to be managed under incidental TACs, and found there was no additional information that would provide a basis for the RAG to change its previous TAC advice. The RAG recommended that the southern zone orange roughy multi-year TAC remain unchanged. A 110 tonne research catch allowance that is set aside to support a 2016 orange roughy survey is taken from the orange roughy (eastern) and orange roughy (southern – Pedra Branca) zones in proportion with the split of the initial RBC allocation. This results in a research catch allowance of 8 tonnes being sourced from the Pedra Branca component of the orange roughy (southern) TAC.

Consistent with SlopeRAG’s advice, AFMA Management recommends that the TAC for orange roughy (southern) be set at 58 tonnes for the 2016–17 fishing year. AFMA Management also recommends no undercatch or overcatch be determined.

### 1.23. Orange roughy (western)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
29	60	1	0	0	0	0	0	60 (incidental catch TAC)	0

Orange roughy (western) is on a three year incidental catch multi-year TAC of 60 tonnes.

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SlopeRAG considered that the current incidental multi-year TAC for orange roughy (western) would allow for landing any unavoidable incidental catch and not impede the recovery of the stock. Accordingly, SlopeRAG recommended that the 60 tonne TAC be maintained for the 2016–17 fishing year.

AFMA Management recommends that the TAC for orange roughy (western) be set at 60 tonnes for the 2016–17 fishing year. AFMA Management also recommends no undercatch or overcatch be determined.

#### 1.24. Smooth oreodory – Cascade Plateau

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
0	150	4	150	0	0	0	0	150 (until catches reach 10t)	0

SlopeRAG has previously advised that current low effort and catches of smooth oreodory on the Cascade Plateau meant that a Tier 4 assessment for this stock would not be reliable. The RAG recommended maintaining the TAC of 150 tonnes until catches reach at least 10 tonnes at which time the fishery would be reviewed.

Consistent with SlopeRAG’s advice, AFMA Management recommends that the TAC be set at 150 tonnes for the 2016–17 fishing season and the TAC only be reassessed once the 10 tonne trigger is reached. AFMA Management also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

#### 1.25. Smooth oreodory – other

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
1	23	5	90	0	0	0	0	90 (1 <sup>st</sup> year of a three-year MYTAC)	+67

Smooth oreodory is often caught as bycatch when targeting orange roughy. Deepwater closures have been influential on catches of this species, with most historical catch coming from areas that are now closed. However, with the opening of the Pedra Branca area to orange roughy fishing in 2015, catches of smooth oreodory increased.

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SlopeRAG noted that, due to a recent history of low catches, a Tier 4 assessment was not reliable and smooth oreodory were assessed using a Tier 5 depletion based stock reduction analysis for the first time in 2015.

A comparative analysis was completed using Tier 1 and Tier 5 assessments for flathead. The analysis indicated that for flathead, that has a known biomass estimated by an accepted Tier 1 stock assessment, a subsequent Tier 5 depletion based analysis displayed a relatively large level of inherent precaution. In effect this works as a discount factor within the assessment and resultant RBCs.

The RAG supported the Tier 5 assessment and considered there was no sustainability concern with an RBC of 90 tonnes. The RAG noted that under the large change limiting rule the maximum the TAC could be is 34.5 tonnes, but because the existing TAC of 23 tonnes was set based on limited information when the deepwater area of the fishery was closed to protect orange roughy, the RAG recommended that the large change limiting rule not apply.

AFMA Management recommends that a three year multi-year TAC be applied to smooth oreodory, with a 2016–17 TAC of 90 tonnes. AFMA Management also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.26. Oreodory (basket)

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
98	128	4	128	0	0	0	0	128 (3 <sup>rd</sup> year of a three-year MYTAC)	0

The oreodory basket consists of spikey oreodory, warty oreodory, black oreodory and rough oreodory. The oreodory basket is currently in the third year of a three year multi-year TAC.

In 2015, SlopeRAG found there was no additional information that would provide a basis for the RAG to change its previous advice. The RAG recommended that the RBC continue.

On that basis AFMA Management recommends a TAC for the 2016–17 fishing year of 128 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.



### 1.27. Pink ling

Species	2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
					Discount	State	Discard	FIS		
Pink Ling	967	980	1	1240	0	45	51	0	1144 (1 <sup>st</sup> year of a three-year MYTAC)	+164

At its October 2015 meeting, SlopeRAG accepted an updated pink ling stock assessment which included an additional two years of data and additional sensitivity testing.

#### *Western stock*

Standardised trawl catch rates have been showing an upward trend since 2007 and the model indicated that there is good recent recruitment feeding into the fishery. The RAG considered a range of constant catch projections (under average recruitment scenarios) and noted there is low risk to sustainability in the next five years for annual catches in the range 500–900 tonnes. The RAG agreed a RBC for the western stock of 990 tonnes.

#### *Eastern stock*

SlopeRAG accepted the final eastern pink ling base case stock assessment presented out-of-session in November 2015, noting the estimated current eastern zone spawning stock biomass of 30 per cent of unfished biomass, providing an RBC of 250 tonnes.

The RAG agreed an RBC of 250 tonnes noting constant catch projections suggest that catches below 550 tonnes pose low risk of the eastern stock biomass going below the limit reference point. However, for constant catches of 550 tonnes per year or higher, the time taken for the eastern stock to rebuild to the management target of maximum economic yield increases substantially (to beyond 2050).

Noting that pink ling is managed under a single global TAC AFMA Management recommends a TAC of 1240 tonnes, with a notional maximum catch target for the eastern stock of 500 tonnes. AFMA Management’s position is that establishing management arrangements to keep eastern catches below 500 tonnes maintains risks to the stock within the parameters defined by the HSP, and also retains an appropriate timeframe for rebuilding to the management target. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

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### 1.28. Redfish

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
78	100	1	0	0	0	0	0	100 (incidental catch TAC)	0

In 2014 ShelfRAG accepted a Tier 1 stock assessment which predicted that the 2015 biomass of redfish would be 11 per cent, below the limit reference point of 20 per cent of unfished biomass. This means that the RBC is 0 and there can be no targeted fishing for redfish. A rebuilding strategy is being prepared as required by the HSP. The RAG noted that the model predicted the stock to rebuild above the limit reference point within five years (within one mean generation time of 16.7 years) regardless of whether total mortality was 50 tonnes, 100 tonnes or 150 tonnes.

Consistent with ShelfRAG advice, AFMA Management recommends an incidental catch TAC of 100 tonnes based on the RAG’s estimate of incidental catches. It also recommends that no undercatch and overcatch be determined.

### 1.29. Ribaldo

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
140	355	4	355	0	0	0	0	355 (3rd year of a three-year MYTAC)	0

Currently ribaldo is on the second year of a three year multi-year TAC. When considered by SlopeRAG ribaldo had not met any triggers to review the existing multi-year TAC and the RAG found there was no additional information that would provide a basis for the RAG to change its previous advice. The RAG recommended that the RBC remain unchanged.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 355 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

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### 1.30. Royal red prawn

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
146	386	4	393	0	4	2	0	387 (3rd year of a three-year MYTAC)	+1

Currently royal red prawn is on the second year of a three year multi-year TAC. When considered by ShelfRAG, royal red prawn had not met any triggers to review the existing multi-year TAC and the RAG found there was no additional information that would provide a basis for the RAG to change its previous advice. The RAG recommended that the RBC remain unchanged, resulting in a 2016–17 TAC recommendation of 387 tonnes.

AFMA Management recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.31. Sawshark

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
198	482	4	535	80	22	0	0	433 (1 <sup>st</sup> year of a three-year MYTAC)	–49

In 2015 SharkRAG accepted a Tier 4 assessment using the trawl catch per unit effort series as the index of abundance. Discards were not included as they were relatively stable over time. The RAG noted that, with discards included, the RBC is more precautionary.

The RAG noted that separating sawshark catches by species (common sawshark and southern sawshark) did not make a notable difference to the RBC proposal.

The RAG noted there were no concerns with the sawshark stock and recommended an RBC of 535 tonnes. The RAG supported a multi-year TAC for three years with a discount factor of 15 per cent to be applied. The RAG supported undercatch and overcatch provisions up to 10 per cent.



On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 433 tonnes, the first year of a three year multi–year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### 1.32. School shark

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
201	215	1	0	0	0	0	0	215 (incidental catch TAC)	0

The 2012 stock assessment model update for school shark was adopted by SharkRAG in 2013. It indicated that the school shark stock was below its limit reference point of 20 per cent of unfished biomass meaning an RBC of 0 tonnes and no targeted fishing. However, the RAG noted that the model was subject to significant uncertainty, primarily because the index of abundance for school shark was not reliable. Work is now being undertaken to develop a reliable index of abundance for school shark using genetic analysis.

For the 2016–17 fishing year SharkRAG recommended school shark catches be restricted to a level that covers unavoidable bycatch and discards.

SharkRAG considers the best estimate of unavoidable bycatch including discards is 215 tonnes. This is based on landed catch from 2011 and estimates of discards of nine per cent. The RAG did note that as the stock rebuilds it is likely that the unavoidable catch could increase. However, the RAG noted that without an updated assessment there is little basis to increase the unavoidable bycatch TAC.

SharkRAG noted that there are continuing positive signs suggesting that school shark is rebuilding, including an overall increasing trend in trawl CPUE and increased pupping in an historically important pupping area (Pittwater TAS). This is consistent with anecdotal evidence and catch reports from industry that school shark abundance is increasing.

SharkRAG expressed concern over the potentially high catch of school shark by State fisheries and would like a reliable measure of total catch along with information on size frequency. The RAG strongly recommended that species–specific catches are reported for sharks and that efforts are made to ensure the state catch of school shark is minimised.

SharkRAG noted concerns about total mortality given increasing discards, and questioned whether there is sufficient information on post–release mortality considering AFMA implemented a management measure to release all live caught school shark. The RAG supported pursuing research on the survivability of released sharks and recommended including this as a high priority in the AFMA research plan for 2016–17.



SharkRAG recommended an incidental catch TAC of 215 tonnes for the 2016–17 fishing year.

Consistent with SharkRAG advice, AFMA Management recommends an incidental catch TAC for school shark be set at 215 tonnes for the 2016–17 fishing year with no overcatch and undercatch provision. To support the 215 tonnes incidental catch TAC, AFMA management is proposing:

- continuing the existing gummy shark TAC (1836 tonnes), which is below the maximum TAC available under the HSF
- continuing to apply a school shark to gummy shark catch ratio
- continuing the existing condition for the release of all live caught school shark
- monitoring discards and applying further management measures if total mortality is likely to exceed levels that support rebuilding of the stock.

### 1.33. School whiting

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
798	747	1	1660	0	757	35	0	868 (long-term TAC)	+121

School whiting is managed under a long-term RBC of 1660 tonnes and is monitored each year against indicators for any significant risks to the stock. ShelfRAG set a long-term RBC because the spawning biomass of school whiting is particularly sensitive to recruitment.

When considered by ShelfRAG school whiting had not met any triggers to review the existing multi-year TAC and the RAG found there was no additional information that would provide a basis for the RAG to change its previous advice. The RAG recommended that the RBC remain unchanged.

AFMA Management recommends that the TAC for the 2016–17 fishing year be set at 868 tonnes. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.



### 1.34. Silver trevally

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
93	602	4	791	0	195	8	0	588 (3 <sup>rd</sup> year of three-year MYTAC)	-14

Silver trevally is currently on the second year of a three year multi-year TAC.

When considered by ShelfRAG silver trevally had not met any triggers to review the existing multi-year TAC and the RAG found there was no additional information that would provide a basis for the RAG to change its previous advice.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 588 tonnes, continuing the third year of the existing three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.

### Silver warehou

2014–15 Catch (t)	2015–16 agreed TAC (t)	Tier	2016–17 RBC (t)	Deductions (t)				AFMA 2016–17 TAC recommendation (t)	Change from 2015–16 (t)
				Discount	State	Discard	FIS		
368	2417	1	1958	0	0	0	0	1209 (1 <sup>st</sup> year of a three-year MYTAC)	-1209

Silver warehou standardised CPUE has continued to decline and is at historically low levels. However, there are no major changes in other indicators (size composition, age composition, area of the fishery, or depth distribution of the catch).

SlopeRAG considered an updated Tier 1 assessment for silver warehou at its 2015 meetings. The model was updated from the last assessment (2012) to include discards, two additional years of recruitment and the inclusion of the FIS abundance indices. The 2016 assessment estimated a spawning stock biomass of 40 per cent of virgin stock biomass.

The assessment suggests that the biomass has been increasing for the last three years. However, the RAG advised that the increase in biomass towards the end of the series

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should be treated with some caution as this is a result of the model imposed average recruitment from 2013 onwards, when recruitment is unable to be estimated.

Accordingly, SlopeRAG accepted as its best estimate the base case assessment giving a biomass estimate of 40 per cent of unfished biomass and an RBC of 1958 tonnes. However, the RAG noted concern that recent recruitment (over the past nine years) was lower than average and may result in the assessment being overly optimistic about the state of the stock. SlopeRAG therefore recommended a multi-year TAC based on a low recruitment constant catch scenario.

SlopeRAG considered constant catch scenarios under lower recruitment and noted that the biomass would fall over the next five years if catches were in excess of 600 tonnes. Recognising the constraints of the large change limiting rule the RAG recommended stepping down to the poor recruitment scenario RBC of 604 tonnes in two years.

The RAG briefly considered whether the observed decline in recruitment constituted a downward shift in the productivity of the stock. The RAG agreed it required additional direct evidence in addition to the indirect evidence of recent lower estimated recruitment to indicate such a shift. The RAG therefore agreed that reference points should remain unchanged.

On that basis, AFMA Management recommends a TAC for the 2016–17 fishing year of 1209 tonnes, the first year of a three year multi-year TAC. It also recommends that the percentage for undercatch and overcatch be determined at 10 per cent.



## Non-quota species

Section 15 of the *Southern and Eastern Scalefish and Shark Management Plan 2003* provides that AFMA may determine a TAC for non-quota species.

Boarfish and orange roughy within the East Coast Deepwater Trawl (ECDWT) Sector are the only species for which non-quota TACs are currently set. The non-quota TACs for these two species act as a trigger limit with the main management strategy being to limit targeting of boarfish and orange roughy in this sector. If catches exceed the non-quota species TACs for the fishing year the fishery (sector) will be closed.

Due to low fishing effort in the ECDWT Sector, SlopeRAG recommended the trigger limits for these species continue at their present level of boarfish 200 tonnes and orange roughy 50 tonnes.

Consistent with the RAG advice AFMA Management recommends the TACs for ECDWT boarfish and orange roughy be maintained at previous amounts as per the table below.

The RAG reviewed and supported maintaining current triggers.

Non-quota species	Total Allowable Catch	
Boarfish	200 tonnes	whole weight (trigger limit)
Orange roughy	50 tonnes	whole weight (trigger limit)

