



Australian Government

Department of the Environment, Water, Heritage and the Arts

Assessment of the
Southern Squid Jig Fishery

April 2010

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Disclaimer

This document is an assessment carried out by the Department of the Environment, Water, Heritage and the Arts of a commercial fishery against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition*. It forms part of the advice provided to the Minister for the Environment, Heritage and the Arts on the fishery in relation to decisions under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. The views expressed do not necessarily reflect those of the Minister for the Environment, Heritage and the Arts or the Australian Government.

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Table 1: Summary of the Southern Squid Jig Fishery

Publicly available information relevant to the fishery	<ul style="list-style-type: none"> • <i>Fisheries Management Act 1991</i> • <i>Southern Squid Jig Fishery Management Plan 2005</i> • Annual Status Report Southern Squid Jig Fishery July 2009 (2009 ASR) • Southern Squid Jig Fishery - At a glance http://www.afma.gov.au/fisheries/scallop_squid/squid_jig/at_a_glance.htm • (Draft) Southern Squid Jig Fishery Bycatch and Discarding Workplan July 2009 • Arrow Squid Fishery Harvest Strategy 2007 • Southern Squid Jig Fishery Management Arrangements December 2008 • Department of the Environment and Heritage Assessment of the Southern Squid Jig Fishery November 2004 • Draft assessment report - Southern Squid Jig Fishery and the Southern Squid Jig Fishery Management Plan (2004)
Area	The Southern Squid Jig Fishery (SSJF) includes Commonwealth waters from Fraser Island in Queensland to the South Australian/Western Australian border, including waters surrounding Tasmania (Figure 1). The 2009 Annual Status Report indicates that the majority of fishing occurs between Queenscliff and Lakes Entrance in Victoria, and south of Kangaroo Island off South Australia.
Fishery status	Arrow squid stocks have been rated as uncertain since 1994, as no formal stock assessment has been undertaken in the SSJF. Due to economic conditions, the level of effort and harvest in the fishery in recent years has been low. The Australian Fisheries Management Authority (AFMA) consider arrow squid stocks to be stable (2009 ASR).
Target Species	Arrow Squid (<i>Nototodarus gouldi</i>). Information on the biology of this species can be found in the 2004 assessment of the fishery located on the DEWHA website.
Byproduct Species	Mainly squid species (southern calamari, red ocean squid and southern ocean arrow squid). Up to 100 kg of fin fish species may be retained per trip.
Gear	Standard squid jigging machine (a device with barbless lures attached to 1 or more jig lines that are rotated by elliptical spools).
Season	All year. Most jig fishing occurs between February and July.
Commercial harvest	2007 - 802.3t 2008 - 179.5t 2009 - 307.6t
Value of commercial harvest 2007-08	\$0.2M in 2007-08, exports considered negligible.

Take by other sectors	<p>Substantial amounts of arrow squid (~700t combined in 2008) are caught as byproduct in the Commonwealth Trawl sector and the Great Australian Bight Trawl sector of the Southern and Eastern Scalefish and Shark Fishery (SESSF) (Wilson <i>et al.</i> 2009).</p> <p>Arrow squid is taken in small amounts in fisheries targeting southern calamari in Victorian, Tasmanian and South Australian state fisheries and as a small component of byproduct in the New South Wales Ocean Prawn Trawl Fishery.</p> <p>The recreational and indigenous harvest of arrow squid is considered to be negligible.</p>
Commercial licences issued	As at January 2010, there were 50 licence holders. Only 8 vessels fished during the 2009 fishing season.
Management arrangements	<p>The SSJF is managed by AFMA in accordance with the <i>Fisheries Management Act 1991</i> under the <i>SSJF Management Plan 2005</i>.</p> <p>Management methods include input controls:</p> <ul style="list-style-type: none"> • gear-based statutory fishing rights; and • annual Total Allowable Effort (TAE) proportioned between permit holders in the form of gear units. <p>The SSJF is also subject to management arrangements specified in the Arrow Squid Fishery Harvest Strategy. This harvest strategy specifies processes for monitoring and conducting assessments of the biological and economic conditions of the fishery. The harvest strategy covers the SSJF as well as sectors of the SESSF and other fisheries which may take arrow squid in Commonwealth managed waters¹. The harvest strategy uses a system of within-season monitoring against catch triggers for the jig and trawl sectors which require further assessment if reached.</p>
Export	Considered negligible in 2008.
Bycatch	<p>Due to the highly selective gear used in the fishery, bycatch is low. Small amounts of garfish, blue shark, barracouta and octopus are reported.</p> <p>The SSJF operates a Bycatch and Discarding Workplan. AFMA's 2006 ecological risk assessment (ERA) for the SSJF did not identify any high risk species to be addressed under the Bycatch and Discard Program.</p>
Interaction with Protected Species²	To date, no interactions with protected species have been reported from the SSJF. Interactions with seals, dolphins, seabirds and sharks are considered possible, but as squid jigging is a highly specific fishing gear the risk of interactions is considered low.
Ecosystem Impacts	The ecological risk assessment for the SSJF completed in 2006 indicated minimal risk of impact to the ecosystem. Squid jigging is a highly specific fishing gear that has low levels of byproduct, bycatch and benthic interactions. The impact on the ecosystem is therefore considered to be low.

¹ Under Offshore Constitutional Settlement (OCS) arrangements with South Australia and Victoria, arrow squid resources in inshore waters are managed by the Commonwealth.

² 'Protected species' means all species listed under Part 13 of the EPBC Act, including whales and other cetaceans and threatened, marine and migratory species.

Table 2: Progress in implementation of recommendations and conditions made in 2007 assessment of the SSJF

Recommendation	Progress	Recommended Action
<p>1. AFMA to inform DEH of any proposed amendment to the management regime for the SSJF, to enable DEH to evaluate any impact on the ecological sustainability of the fishery.</p>	<p>AFMA has advised that:</p> <ul style="list-style-type: none"> • The Fishery moved to the <i>Southern Squid Jig Fishery Management Plan 2005</i> using effort controls based on a set number of standard squid jigging machines allocated to a gear Statutory Fishing Right (SFR) on 1 January 2006. • A Harvest Strategy (HS) for the SSJF was developed in line with the Commonwealth Harvest Strategy Policy and implemented in 1 January 2008. The HS specifies decision rules which guide total allowable catch (TAC) setting and fishing effort in the fishery to ensure sustainability of the stock and fishing activity. • DEWHA was advised of both these developments. 	<p>DEWHA considers that this recommendation has been met. This requirement will continue to apply in an amended form. (Recommendation 2, Table 4)</p>
<p>2. AFMA to continue to cooperate with other relevant jurisdictions to pursue complementary management and research of shared stocks for squid target and by-product species, which may be affected by cross-jurisdictional issues.</p>	<p>AFMA has advised that:</p> <ul style="list-style-type: none"> • OCS arrangements are in place with South Australia and Victoria to manage squid resources in inshore areas as well as the relevant Commonwealth waters. • Currently, there is no arrangement with Tasmania. Plans are in progress to arrange for regular catch data updates so that the squid catch data is representative of the entire catch. • The current AFMA Policy on Apportionment of a Squid catch between the Squid Jig Fishery and the Commonwealth Trawl Sectors describes the arrangements that apply across these fisheries and provides a comprehensive approach to managing the take of squid from Commonwealth managed waters. • The HS uses a system of within-season monitoring against catch triggers for both the jig and trawl sector to ensure sustainability of squid stocks. • SquidMAC has two permanent observers from the Tasmanian and Victorian state fisheries agencies. 	<p>DEWHA considers that this recommendation has been met. This recommendation is ongoing in an amended form. (Recommendation 4, Table 4)</p>

<p>3. Within 2 years of completion of the Ecological Risk Assessment project, AFMA to identify and implement appropriate management strategies to address/mitigate impacts identified through the ecological risk assessment of the Southern Squid Jig Fishery.</p>	<p>AFMA has advised that:</p> <ul style="list-style-type: none"> • The Ecological Risk Assessment (ERA) for the SSJF was undertaken in 2005 and the final report completed in mid 2006. No indicators were identified that posed a threat to the environment as a consequence of jigging, thus only a Level 1 analysis was completed. • A draft Ecological Risk Management report was completed in April 2009. The report assessed the qualitative ecological risk to the marine ecosystems from the SSJF activities as negligible to minimal. 	<p>DEWHA considers that this recommendation has been met.</p>
<p>4. AFMA to continue to encourage and facilitate further research on arrow squid that will assist with the development of ecologically sustainable yield estimates.</p>	<p>AFMA has advised that:</p> <ul style="list-style-type: none"> • In 2008 a Depletion Analysis was completed to assist the Harvest Strategy. The findings from this research provided avenues for further analyses for the SSJF if required. • FRDC has agreed to fund a research project submitted by Dr George Jackson from the University of Tasmania on Arrow Squid – stock variability, fishing techniques, trophic linkages. The project commenced in 2006 and is expected to be completed in 2010. • AFMA in conjunction with the Southern Squid Jig Fishery Management Advisory Committee and Resource Assessment Group continue to promote research in the Southern Squid Jig Fishery. 	<p>DEWHA considers that this recommendation has been met.</p> <p>DEWHA recommends that AFMA continue collaborative efforts to improve knowledge of arrow squid as opportunities arise. (Recommendation 4, Table 4).</p>
<p>5. AFMA to develop, within 2 years, interim performance measures sufficient to detect significant declines in the abundance of squid.</p>	<p>AFMA has advised that:</p> <ul style="list-style-type: none"> • The HS uses a system of catch triggers, fishing effort triggers and catch per unit effort triggers that signal the need for assessment and review of management arrangements. Some of the catch triggers in the jig fishery are: • 3000t intermediate catch trigger or 30 standard vessels – requires a depletion analysis, increased investment in fishery monitoring and biological data collection. If there is no indication of depletion, fishing may continue up to the next limit. • 5000t limit catch trigger – requires further catches be suspended pending another depletion analysis. If there is no indication of depletion, a further, higher trigger limit may be considered. If there is depletion, catch or effort may be capped. • There are also criteria that signal excessive fishing effort during periods of low squid availability, and similar decision rules to the intermediate catch trigger apply in that case. 	<p>DEWHA considers that this recommendation has been met.</p> <p>In view of the lack of knowledge of the arrow squid resource and the absence of a formal stock assessment for the species, DEWHA considers that the employment of a harvest strategy capable of managing harvest of the variable stock, should economic conditions lead to increased fishing pressure, is a valuable safeguard and recommends ongoing complementary management of shared stocks across fisheries and across jurisdictions. (Recommendation 4, Table 4).</p>

<p>6. AFMA to ensure that adequate validation of logbook data on bycatch and protected species interactions is undertaken.</p>	<p>AFMA advises that:</p> <ul style="list-style-type: none"> • The squid jig method takes almost no by-product or by-catch and there have been no reported interactions with protected species. • AFMA continually monitors logbook data on bycatch and threatened, endangered and protected (TEP) species interactions. 	<p>DEWHA considers that this recommendation has been met.</p> <p>DEWHA notes the low level of fishing in the SSJF, that the results of the 2006 ERA for the SSJF indicate relatively low risks to bycatch species and of interaction with protected species, and that the Bycatch Action Plan and Bycatch and Discarding Workplan provide for the Observer Program to be re-instigated to provide fishery independent monitoring if fishing effort significant increases within the fishery.</p> <p>DEWHA expects that AFMA will report on actions undertaken to validate logbook data on bycatch and protected species interactions in the annual reports.</p>
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Table 3: The Department of the Environment, Water, Heritage and the Arts (DEWHA) assessment of the Southern Squid Jig Fishery (SSJF) against the requirements of the EPBC Act related to decisions made under Parts 13 and 13A

Please Note – the table below is not a complete or exact representation of the EPBC Act. It is intended as a summary of relevant sections and components of the EPBC Act to provide advice on the fishery in relation to decisions under Parts 13 and 13A. A complete version of the EPBC Act can be found on the DEWHA website.

Part 13

Division 1 Listed threatened species Section 208A Minister may accredit plans or regimes	DEWHA assessment of the SSJF
<p>(1) Minister may, by instrument in writing, accredit for the purposes of this Division:</p> <p>(a) a plan of management within the meaning of section 17 of the <i>Fisheries Management Act 1991</i>;</p> <p>if satisfied that:</p> <p>(f) the plan, regime or policy requires persons engaged in fishing under the plan, regime or policy to take all reasonable steps to ensure that members of listed threatened species (other than conservation dependent species) are not killed or injured as a result of the fishing; and</p> <p>(g) the fishery to which the plan, regime or policy relates does not, or is not likely to, adversely affect the survival or recovery in nature of the species.</p>	<p>The SSJF will be managed under the <i>Southern Squid Jig Fishery Management Plan 2005</i> made under the <i>Fisheries Management Act 1991</i>.</p> <p>The <i>Southern Squid Jig Fishery Management Plan 2005</i> requires that all reasonable steps are taken to avoid interactions with listed threatened species.</p> <p>The management plan for the SSJF was accredited in August 2005. Due to the highly selective nature of the fishing gear, the likelihood of interactions with listed threatened species is low. No interactions with listed threatened species have been recorded in the SSJF. Therefore, DEWHA considers the current operation of the SSJF is not likely to adversely affect the survival or recovery in nature of any threatened species.</p>

Part 13 (cont.)

Division 2 Migratory species Section 222A Minister may accredit plans or regimes	DEWHA assessment of the SSJF
<p>(1) Minister may, by instrument in writing, accredit for the purposes of this Division:</p> <p>(a) a plan of management within the meaning of section 17 of the <i>Fisheries Management Act 1991</i>;</p> <p>if satisfied that:</p> <p>(f) the plan, regime or policy requires persons engaged in fishing under the plan, regime or policy to take all reasonable steps to ensure that members of listed migratory species are not killed or injured as a result of the fishing; and</p> <p>(g) the fishery to which the plan, regime or policy relates does not, or is not likely to, adversely affect the conservation status of a listed migratory species or a population of that species.</p>	<p>The SSJF will be managed under the <i>Southern Squid Jig Fishery Management Plan 2005</i> made under the <i>Fisheries Management Act 1991</i>.</p> <p>The <i>Southern Squid Jig Fishery Management Plan 2005</i> requires that all reasonable steps are taken to avoid interactions with listed migratory species.</p> <p>The management plan for the SSJF was accredited in August 2005. Due to the highly selective nature of the fishing gear, the likelihood of interactions with listed migratory species is low. No interactions with listed migratory species have been recorded in the SSJF. Therefore, DEWHA considers the current operation of the SSJF is not likely to adversely affect the conservation status of a listed migratory species or a population of that species.</p>

Part 13 (*cont.*)

Division 3 Whales and other cetaceans Section 245 Minister may accredit plans or regimes	DEWHA assessment of the SSJF
<p>(1) Minister may, by instrument in writing, accredit for the purposes of this Division:</p> <p>(a) a plan of management within the meaning of section 17 of the <i>Fisheries Management Act 1991</i>;</p> <p>if satisfied that:</p> <p>(f) the plan, regime or policy requires persons engaged in fishing under the plan, regime or policy to take all reasonable steps to ensure that cetaceans are not killed or injured as a result of the fishing; and</p> <p>(g) the fishery to which the plan, regime or policy relates does not, or is not likely to, adversely affect the conservation status of a species of cetacean or a population of that species.</p>	<p>The SSJF will be managed under the <i>Southern Squid Jig Fishery Management Plan 2005</i> made under the <i>Fisheries Management Act 1991</i>.</p> <p>The <i>Southern Squid Jig Fishery Management Plan 2005</i> requires that all reasonable steps are taken to avoid interactions with cetaceans.</p> <p>The management plan for the SSJF was accredited in August 2005. Due to the highly selective nature of the fishing gear, the likelihood of interactions with cetaceans is low. No interactions with cetaceans have been recorded in the SSJF. Therefore, DEWHA considers the current operation of the SSJF is not likely to adversely affect the conservation status of a species of cetacean or a population of that species.</p>

Part 13 (cont.)

Division 4 Listed marine species Section 265 Minister may accredit plans or regimes	DEWHA assessment of the SSJF
<p>(1) Minister may, by instrument in writing, accredit for the purposes of this Division:</p> <p>(a) a plan of management within the meaning of section 17 of the <i>Fisheries Management Act 1991</i>;</p> <p>if satisfied that:</p> <p>(f) the plan, regime or policy requires persons engaged in fishing under the plan, regime or policy to take all reasonable steps to ensure that members of listed marine species are not killed or injured as a result of the fishing; and</p> <p>(g) the fishery to which the plan, regime or policy relates does not, or is not likely to, adversely affect the conservation status of a listed marine species or a population of that species.</p>	<p>The SSJF will be managed under the <i>Southern Squid Jig Fishery Management Plan 2005</i> made under the <i>Fisheries Management Act 1991</i>.</p> <p>The <i>Southern Squid Jig Fishery Management Plan 2005</i> requires that all reasonable steps are taken to avoid interactions with listed marine species.</p> <p>The management plan for the SSJF was accredited in August 2005. Due to the highly selective nature of the fishing gear, the likelihood of interactions with listed marine species is low. No interactions with listed marine species have been recorded in the SSJF. Therefore, DEWHA considers the current operation of the SSJF is not likely to adversely affect the conservation status of a listed marine species or a population of that species.</p>

Part 13 (*cont.*)

Section 303AA Conditions relating to accreditation of plans, regimes and policies	DEWHA assessment of the SSJF
(1) This section applies to an accreditation of a plan, regime or policy under section 208A, 222A, 245 or 265.	DEWHA recommends that the SSJF be accredited under sections 208A, 222A, 245 and 265.
(2) The Minister may accredit a plan, regime or policy under that section even though he or she considers that the plan, regime or policy should be accredited only: (a) during a particular period; or (b) while certain circumstances exist; or (c) while a certain condition is complied with. In such a case, the instrument of accreditation is to specify the period, circumstances or condition.	
(7) The Minister must, in writing, revoke an accreditation if he or she is satisfied that a condition of the accreditation has been contravened.	

Part 13A

Section 303DC Minister may amend list	DEWHA assessment of the SSJF
<p>(1) Minister may, by instrument in published in the Gazette, amend the list referred to in section 303DB (list of exempt native specimens) by:</p> <ul style="list-style-type: none">(a) including items in the list;(b) deleting items from the list; or(c) imposing a condition or restriction to which the inclusion of a specimen in the list is subject; or(d) varying of revoking a condition or restriction to which the inclusion of a specimen in the list is subject; or(e) correcting an inaccuracy or updating the name of a species.	
<p>(1A) In deciding whether to amend the list referred to in section 303DB (list of exempt native specimens) to include a specimen derived from a commercial fishery, the Minister must rely primarily on the outcomes of any assessment in relation to the fishery carried out for the purposes of Division 1 or 2 of Part 10.</p>	<p>The SSJF was assessed under Part 10 of the EPBC Act in November 2004. In conducting this assessment, DEWHA considered that actions taken in the fishery would not have an unacceptable or unsustainable impact on the environment in a Commonwealth marine area over a period of 5 years while AFMA implemented recommendations to improve the management of the fishery. Consequently, the <i>Southern Squid Jig Fishery Management Plan 2005</i> was accredited under section 33 of the EPBC Act.</p> <p>Since the previous assessment AFMA has completed an ecological risk assessment for the fishery and prepared a draft ecological risk management report, and the Arrow Squid Harvest Strategy has been implemented.</p>

<p>(1C) The above does not limit the matters that may be taken into account in deciding whether to amend the list referred to in section 303DB (list of exempt native specimens) to include a specimen derived from a commercial fishery.</p>	<p>It is not possible to exhaustively list the factors that you may take into account in amending the List of Exempt Native Specimens (LENS). The objects of Part 13A, which are set out below this table, provide general guidance in determining factors that might be taken into account. A matter that is relevant to determining whether an amendment to the list is consistent with those objects is likely to be a relevant factor.</p> <p>DEWHA considers that the amendment of the LENS to include product taken in the SSJF would be consistent with the provisions of Part 13A as:</p> <ul style="list-style-type: none"> • the fishery will not harvest any Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listed species; • there are management arrangements in place to ensure that the resource is being managed in an ecologically sustainable way (see Table 1); • the operation of the SSJF is unlikely to be unsustainable and threaten biodiversity within the next 5 years; and • the EPBC Regulations 2000 do not specify fish as a class of animal in relation to the welfare of live specimens.
<p>(3) Before amending the list referred to in section 303DB (list of exempt native specimens), the Minister:</p> <ul style="list-style-type: none"> (a) must consult such other Minister or Ministers as the Minister considers appropriate; and (b) must consult such other Minister or Ministers of each State and self-governing Territory as the Minister considers appropriate; and (c) may consult such other persons and organisations as the Minister considers appropriate. 	<p>The public comment period on the SSJF submission sought comment on the annual report for the SSJF and provided sufficient opportunity for consultation with other persons and organisations.</p> <p>A letter to the Hon Michael Egan, Chairman, AFMA, advises him of the intention to declare the fishery exempt from the export provisions of the EPBC Act.</p>
<p>(5) A copy of an instrument made under section 303DC is to be made available for inspection on the Internet.</p>	<p>The instrument for the SSJF made under sections 303DC will be gazetted and made available on the DEWHA website.</p>

Part 16

Section 391 Minister must consider precautionary principle in making decisions	DEWHA assessment of the SSJF
(1) The Minister must take account of the precautionary principle in making a decision under section 303DC and/or section 303FN, to the extent he or she can do so consistently with the other provisions of this Act.	The precautionary principle has been considered when making a decision to include specimens in the LENS.
(2) The precautionary principle is that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage.	

Objects of Part 13A

- (a) to ensure that Australia complies with its obligations under CITES and the Biodiversity Convention;
- (b) to protect wildlife that may be adversely affected by trade;
- (c) to promote the conservation of biodiversity in Australia and other countries;
- (d) to ensure that any commercial utilisation of Australian native wildlife for the purposes of export is managed in an ecologically sustainable way;
- (e) to promote the humane treatment of wildlife;
- (f) to ensure ethical conduct during any research associated with the utilisation of wildlife; and
- (h) to ensure the precautionary principle is taken into account in making decisions relating to the utilisation of wildlife.

Final recommendations to the Australian Fisheries Management Authority (AFMA) for the Southern Squid Jig Fishery.

The material submitted by the Australian Fisheries Management Authority (AFMA) indicates that the Southern Squid Jig Fishery (SSJF) operates in accordance with the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*, 2nd edition. DEWHA considers that the fishery is well managed and unlikely to have an unacceptable or unsustainable impact on the environment in the short to mid term. Recommendations have been developed to ensure that the risk of impact is minimised in the long term. Overall, DEWHA recognises that the management regime of limited effort, selective gear and the performance measures contained in the arrow squid harvest strategy suggest that the fishery is being managed in an ecologically sustainable way.

In making its assessment, DEWHA considers that the range of management measures are sufficient to ensure that the fishery is conducted in a manner that does not lead to over-fishing and that stocks are not currently overfished. Taking into account the management arrangements in place and the selective characteristic of the fishery operations, DEWHA considers that fishing operations are managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.

DEWHA is satisfied that the fishery will not be detrimental to the survival or conservation status of the taxon to which it relates in the short term. Similarly, it is not likely to threaten any relevant ecosystem in the short term. To contain and minimise the risks in the longer term a number of recommendations have been made.

DEWHA believes that product taken in the fishery should be exempt from the export controls of Part 13A of the EPBC Act, with that exemption to be reviewed in 5 years.

DEWHA considers that the operation of the fishery does not, or is not likely to, adversely affect the survival in nature of a listed threatened species or population of that species, or the conservation status of a listed migratory species, cetacean or listed marine species or a population of any of those species. DEWHA also considers that under the management plan operators are required to take all reasonable steps to avoid the killing or injuring of protected species. The level of interaction under current fishing operations is low. For these reasons, the management plan was accredited under Part 13 of the EPBC Act in August 2005 and DEWHA believes it appropriate to re-accredit the management regime for the fishery under Part 13 of the EPBC Act.

Recommendations are provided below with a brief explanation of the related issue/intent. Unless a specific time frame is provided in the recommendation each recommendation must be addressed within the life of the declaration (5 years).

Table 4: SSJF Assessment – Summary of Issues, Conditions and Recommendations April, 2010

	Issue	Recommendation
1	<p><u>General Management</u></p> <p>Export decisions relate to the arrangements in force at the time of the decision. In order to ensure that these decisions remain valid and export approval continues uninterrupted, DEWHA needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision. This includes operational and legislated amendments that may affect sustainability of the target species or negatively impact on by-product, bycatch, protected species or the ecosystem.</p>	<p>Recommendation 1: Operation of the fishery will be carried out in accordance with the <i>Southern Squid Jig Fishery Management Plan 2005</i> in force under the <i>Fisheries Management Act 1991</i></p> <p>Recommendation 2: The Australian Fisheries Management Authority (AFMA) to inform the Department of the Environment, Water, Heritage and the Arts (DEWHA) of any intended amendments to the management arrangements for the SSJF that may affect the assessment of the fishery against the criteria on which <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) decisions are based.</p>
2	<p><u>Annual Reporting</u></p> <p>It is important that reports be produced and presented to DEWHA annually in order for the performance of the fishery and progress in implementing the recommendations in this report and other managerial commitments to be monitored and assessed throughout the life of the declaration. Annual reports should follow Appendix B to the <i>Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Edition</i> (the Guidelines) and include a description of the fishery, management arrangements in place, research and monitoring outcomes, recent catch data for all sectors of the fishery, status of target stock, interactions with protected species, impacts of the fishery on the ecosystem in which it operates and progress in implementing DEWHA conditions and recommendations. Electronic copies of the Guidelines are available from the DEWHA website at http://www.environment.gov.au/coasts/fisheries/publications/guidelines.html</p>	<p>Recommendation 3: AFMA to produce and present reports to DEWHA annually as per Appendix B to the <i>Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Edition</i>.</p>

3	<p><u>Shared stocks</u></p> <p>As well as being a target species in the SSJF and a significant byproduct species in the Commonwealth Trawl and Great Australian Bight Trawl sectors of the Southern and Eastern Scalefish and Shark Fishery, arrow squid is harvested in variable amounts in Tasmanian waters and as a small component of byproduct in the New South Wales Ocean Prawn Trawl Fishery.</p> <p>In 2008 arrow squid stocks were assessed as not overfished, largely based on low catches in that year as a result of poor economic returns for arrow squid (Wilson <i>et. al.</i> 2009). However, world prices were expected to increase following a 90% decrease in the Argentinean catches in 2009 (SquidMAC June 2009).</p> <p>The main area of squid jig catches is off the Victorian coast between Queenscliff and Portland. Stocks of arrow squid are known to be highly variable between years and localities, being strongly influenced by environmental conditions. A depletion analysis completed in 2008 found that if heavy fishing pressure corresponded with low availability of squid, localised depletions were possible.</p> <p>A recommendation of the initial DEWHA assessment of the SSJF was for AFMA to continue to cooperate with other relevant jurisdictions to pursue complementary management and research of shared stocks for squid target and byproduct species, which may be affected by cross-jurisdictional issues.</p> <p>AFMA reports that arrangements under the Offshore Constitutional Settlement are in place with South Australia and Victoria for squid resources in inshore waters to be managed by the Commonwealth. In addition, AFMA's Arrow Squid Harvest Strategy implemented in January 2008 includes:</p> <ul style="list-style-type: none"> • a system of within-season monitoring of the jig and trawl fisheries against arrow squid catch; • effort and catch per unit effort triggers requiring further depletion analysis and data collection if reached, and • beyond certain catch triggers, temporary suspension of fishing in the SSJF. <p>In view of the lack of knowledge of the arrow squid resource and the absence of a formal stock assessment for the species, DEWHA considers that the employment of a harvest strategy capable of managing harvest of the variable stock, should economic conditions lead to increased fishing pressure, is a valuable safeguard.</p>	<p>Recommendation 4: AFMA to continue to cooperate with other relevant jurisdictions to pursue increased knowledge and complementary management of shared stocks of squid target and byproduct species across fisheries and across jurisdictions.</p>
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<p>There are currently no formal arrangements with Tasmania. The SSJF Management Advisory Committee (SquidMAC) in June 2009 noted high catches of arrow squid in Tasmanian state waters in early 2009, and noted that Tasmanian catches of squid are currently not taken into account in assessments of arrow squid stocks. SquidMAC recommended that AFMA make arrangements with Tasmania to gain regular updates on Tasmanian squid catches to contribute information to future depletion analyses and assessments of seasonal catches of arrow squid.</p> <p>DEWHA recommends that AFMA pursue inclusion of Tasmanian data in future assessments and analyses, and continue to liaise with all other jurisdictions where arrow squid is harvested to ensure that:</p> <ul style="list-style-type: none"> • all take of arrow squid is taken into account in stock assessments; • complementary management arrangements for arrow squid and byproduct squid species are employed where appropriate; and • collaborative research on arrow squid is pursued where appropriate. 	
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References

Wilson D, Curnotti R, Begg G and Phillips K (eds) 2009 *Fishery status reports 2008: status of fish stocks and fisheries managed by the Australian Government*. Bureau of Rural Sciences & Australian Bureau of Agricultural and Resource Economics, Canberra.

Acronyms

AFMA	Australian Fisheries Management Authority
ASR	Annual Status Report
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEH	Department of the Environment and Heritage
DEWHA	Department of the Environment, Water, Heritage and the Arts
EPBC	Environment Protection and Biodiversity
EPBC Act	<i>Environment Protection and Biodiversity Act 1999</i>
ERA	Ecological risk assessment
FRDC	Fisheries Research and Development Corporation
HS	Harvest Strategy
LENS	List of Exempt Native Specimens
OCS	Offshore Constitutional Settlement
SESSF	Southern and Eastern Scalefish and Shark Fishery
SFR	Statutory Fishing Right
SSJF	Southern Squid Jig Fishery
TAC	Total Allowable Catch
TAE	Total Allowable Effort
TEP	Threatened, endangered and protected