



Australian Government

Department of the Environment

Assessment of the

**SOUTH AUSTRALIAN BEACH-CAST MARINE ALGAE
FISHERY**

June 2015

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Disclaimer

This document is an assessment carried out by the Department of the Environment 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 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 or the Australian Government.

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TABLE 1: SUMMARY OF THE SOUTH AUSTRALIAN BEACH-CAST MARINE ALGAE FISHERY

<p>Key documents relevant to the fishery</p>	<ul style="list-style-type: none"> ▪ South Australian <i>Fisheries Management Act 2007</i> ▪ South Australian Fisheries Management (General) Regulations 2007 ▪ South Australian Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013 ▪ South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000
<p>Area</p>	<p>Harvesting in the South Australian Beach-Cast Marine Algae Fishery is currently permitted along 101.6 kilometres (km) of coastline (Figure 1) from Cape Jaffa to Rivoli Bay in the southeast of the state. The harvesting is a land based exercise from South Australian sandy beaches.</p> <p>Within this coastal extent, areas excluded from harvesting comprise 34 km which are adjacent to conservation parks or reserves (coast delineated in grey on Figure 1) leaving a balance of 67.6 km which is nominally available for harvest. Within this 67.6 km extent a further 17.0 km (coast delineated in red on Figure 1) is removed from harvesting, thereby limiting harvesting to 50% of the total coastal extent of the fishery. The 17.0 km has been chosen to complement existing arrangements and to ensure that there are areas of beach in the fishery that are not harvested. The remaining 50.6 km of beach in the area of the fishery is available for harvesting (coast delineated in green on Figure 1).</p> <p>While taking into account the large fishery licence area, the majority of harvesting occurs primarily along the Beachport foreshores.</p>

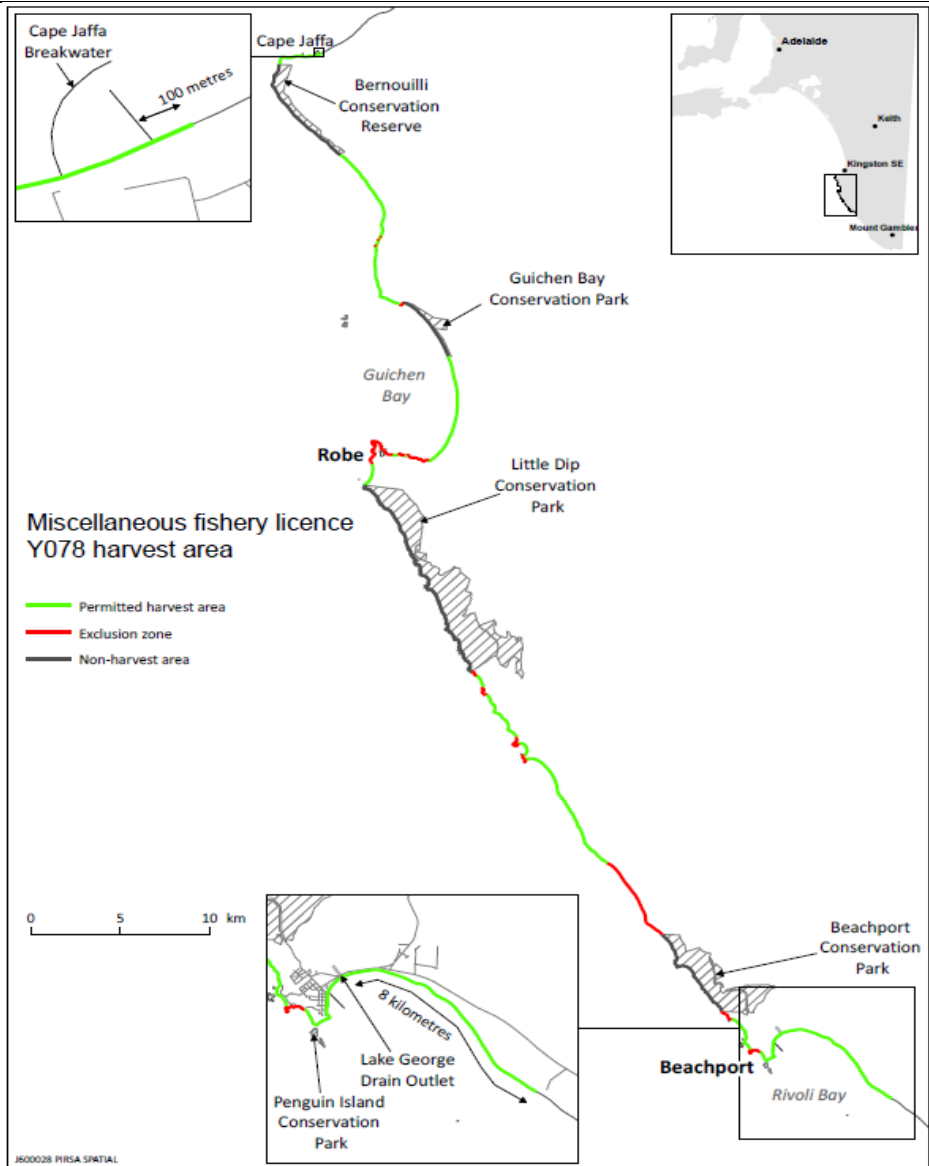


Figure 1: Map detailing permitted and restricted areas of wrack harvest for Miscellaneous Fishery licence Y078.

A request to extend the licence area for harvesting from Beachport to the Victorian border (adding potentially 100 km) is being considered by the Department of Primary Industries and Regions (PIRSA) under an exploratory and developmental permit (see Table 1: Commercial licences issued). The proposed extension of the license area does not form part of this assessment, as it would occur under a separate licence.

Target Species

The South Australian Beach-Cast Marine Algae Fishery targets specific macroalgae found within the volume of seagrass and macroalgae that has detached from the ocean substrate and been carried by water movement to accumulate on the shoreline. This is collectively referred to as wrack. This seagrass and macroalgae cannot reattach and will eventually desiccate and die.

	<p>The licence conditions permit the harvesting of a broad division of macro-algal materials: Chlorophyta (green algae), Phaeophyta (brown algae), or Rhodophyta (red algae). However, the accumulation and composition of beach-cast wrack can be highly variable. For the purpose of export, the fishery primarily targets a brown macroalgae called <i>Durvillaea potatorum</i>, although other brown and red algal species, including <i>Ecklonia radiata</i>, <i>Macrocystis pyrifera</i> and <i>Gracilaria spp.</i> are also collected.</p>
Fishery status	<p>According to PIRSA, there is currently no information from which to determine ecologically sustainable wrack harvest levels. There are also no historical records of wrack biomass, composition or turnover rates for any beach in South Australia due to the sporadic and infrequent distribution of the harvest material (SARDI Miscellaneous Fishery Report, 2013; PIRSA, 2014). Consequently, the fishery status remains undetermined.</p>
Byproduct Species	<p>There is no by-product species in this fishery. Licence holders may only harvest beach-cast macro-algal wrack pursuant to their licence.</p> <p>PIRSA monitors a list of the species harvested through the monthly catch and effort log book that each licence holder is required to provide.</p>
Gear	<p>Other than vehicle restrictions imposed by local councils (e.g. hours of operation or restricting beach access to existing formalised ramps or tracks), no limits apply to the type of machinery that may be used in harvesting wrack.</p> <p>Current practice in the fishery is for wrack to be typically harvested using forwarders equipped with a specifically modified 'grapple' that allows it to pick up wrack whilst minimising sand disturbance. The material is then loaded onto trucks or trailers for removal.</p>
Season	<p>Harvesting wrack within the areas allocated is sporadic, carried out opportunistically whenever significant quantities of wrack are deposited on the foreshore. As a result, the majority of harvesting takes place during winter and spring when peak accumulations occur after storms or periods of strong wind (PIRSA, 2014).</p>
Commercial harvest	<p>In 2013, an estimated 100 tonnes (t) wet weight (up to 20 t dry weight) was harvested by a license holder and exported to China as a product sample. In 2014, an estimated 200 t wet weight (up to 40 t dry weight) was harvested and exported to China for product samples to trial processing equipment.</p> <p>It is expected that commercial harvest in the fishery is planned to significantly increase, potentially tenfold, subject to wrack availability within the fishery area.</p>
Value of commercial harvest	<p>Not available.</p>

<p>Take by other sectors</p>	<p>PIRSA has from time to time allowed local councils and a small number of operators to clear wrack build-up on beaches in the fishery area through Ministerial exemptions. The South Australian Department of Environment, Water and Natural Resources (DEWNR) is involved in the management of wrack removal for amenity purposes. Currently, there are no active exemptions.</p> <p>Local councils and DEWNR are also involved in the management of the recreational harvest of wrack. There is currently no estimate of product taken recreationally but this is considered to be very small. There are also no known documented historical accounts of Aboriginal use of wrack.</p>
<p>Commercial licences issued</p>	<p>There are currently two non-transferrable Miscellaneous Fishery licences which permit the harvest of wrack from the southeast of South Australia (PIRSA, 2014). The Department's assessment only covers one of those licenses, for the company that is seeking export approval under the EPBC Act.</p> <p>The other Miscellaneous Fishery licence (Y080) is managed by PIRSA under the same management regime, but harvesting under this licence is not for export purposes. PIRSA has not sought assessment or export approval for that license. This assessment does not consider ecological impacts caused by the Miscellaneous Fishery licence (Y080).</p> <p>In December 2013, PIRSA introduced the Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013. These regulations provide provisions for the issuing of permits for exploratory and developmental fishing activities for species not currently fished commercially and for undertaking fishing activities in new areas. This will allow permit holders to harvest wrack in areas not currently allocated to the two Miscellaneous Fishery licence holders. Current management arrangements do not specify a limit to the number of permits allowed for exploratory and developmental wrack harvest.</p> <p>A request to extend the licence area for harvesting wrack from Beachport to the Victorian border (adding potentially 100 km) is being considered by the Department of Primary Industries and Regions (PIRSA) under an exploratory and developmental permit.</p>
<p>Management arrangements</p>	<p>The South Australian Beach-Cast Marine Algae Fishery is managed by PIRSA in accordance with the South Australian <i>Fisheries Management Act 2007</i>, the South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000 and the South Australian Fisheries Management (General) Regulations 2007.</p> <p>The South Australian Beach-Cast Marine Algae Fishery is managed with input controls, including:</p> <ul style="list-style-type: none"> • limited entry (two non-transferable licences) • harvest area limited to less than 50% of the total licensed area at all times (enforced through exclusion zones)

	<p>Licences are also subject to the following conditions:</p> <ul style="list-style-type: none"> • no harvesting activity may be conducted in an area of an aquatic reserve proclaimed under the South Australian <i>Fisheries Management Act 2007</i> (included in the 50% exclusion zones) • no harvesting activity is to be conducted on a beach that is adjacent to land owned or managed by the South Australian Minister for Environment and Heritage • wrack harvest will be conducted between the low water mark and up to a point no closer than 4 m from the toe of any dunes or any dune vegetation (whichever reaches farthest down the beach profile) • the removal of sand from beaches is prohibited. <p>PIRSA has informed the Department that new licence conditions are being drafted to clarify proposed management arrangements and a code of practice (COP) will be developed by the licence holder, in collaboration with PIRSA and other SA agencies, within three months of the issue of the licence (see Table 4: Recommendation 1).</p>
Export	<p>The marine algae will be exported to China.</p> <p>The export of beach-cast marine algae is expected to grow substantially as the international market develops.</p>
Bycatch	<p>The South Australian Beach-Cast Marine Algae Fishery has no bycatch in terms of what is traditionally considered bycatch in marine based fisheries. There are organisms within the wrack that are removed during harvest, including small amounts of finfish, shells, sea cucumber, sea urchin, crabs, octopus and star fish.</p> <p>Given the low risk of bycatch, there are no reporting requirements for licence holders, except for interactions with Threatened, Endangered or Protected Species (TEPS).</p> <p>No risk assessment has been conducted to determine the vulnerability of bycatch species in the fishery.</p>
Interaction with Protected Species¹	<p>The coastal area between Cape Jaffa to Rivoli Bay, South Australia, has been identified as important habitat for a number of EPBC Act listed migratory shorebirds, including the Curlew Sandpiper which was recently listed under <i>Environment Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act) as critically endangered (Christie and Jessop 2007; Bamford et al. 2008). Under the EPBC Act, 'important habitat' is defined by the proportion of a migratory species' population that uses the habitat. According to these criteria, where the number of shorebirds using the identified habitat is greater than 1% of the total of that shorebird population, the habitat is considered</p>

¹ 'Protected species' means all species listed under Part 13 of the EPBC Act, including whales and other cetaceans and listed threatened, listed marine and listed migratory species.

internationally important, while a population greater than 0.1% is considered nationally important.

Based on this definition, several migratory shorebird species have been identified within the licensed harvest area of the South Australian Beach-Cast Marine Algae Fishery that exceed national or international thresholds for significant population numbers. The curlew sandpiper (Lake George 3528 - 1.9%), sharp-tailed sandpiper (Lake George 4500 – 2.8%), ruddy turnstone (Rivoli Bay 616 – 1.7%), red-necked stint (Lake George 9000 – 2.8%) and sanderling (Beachport 266 – 1.2% and Rivoli Bay 1108 – 5%) all exceed the threshold for internationally significant numbers ($\geq 1\%$) (Australian Government 2009). Double-banded plover and Pacific golden plover also exceed the threshold of nationally significant numbers ($\geq 0.1\%$) (Christie and Jessop 2007). The Department considers these threshold criteria the best way to identify important sites in the absence of sufficient data for more rigorous methods.

Migratory shorebirds arrive from September onwards on their way to non-breeding grounds in South Australia. They demonstrate high site fidelity and use a mosaic of sites from Cape Jaffa to Rivoli Bay for feeding and roosting through summer until they depart on migration from March/April. The only exception amongst these listed migratory birds is the double-banded plover, which migrates from New Zealand to Australia in winter (arrives April/May, departs September).

Beach-cast wrack is an important foraging and roosting habitat for migratory shorebirds, including the critically endangered Curlew Sandpiper, as it contains essential macrofauna food items (amphipods and larvae) and provides camouflage and protection from inclement weather. Any changes to these macrofaunal communities will likely affect predator communities, including insects and birds.

In addition to migratory shorebirds, some areas available for harvest by the fishery are identified as sites of high conservation significance for the threatened *Thinornis rubricollis* (hooded plovers), which is a species prone to disturbance and vulnerable to breeding failure (TSSC, 2014). The main periods of mortality are at the egg and chick stages. Although adult survival rate is relatively high (approximately 90%), hatching success for the hooded plover (eastern) varies from about 17% to 31%, with mortalities mainly caused by human disturbance, predation and inundation by high tides (TSSC, 2014). The Department considers it important for PIRSA, during the seasonal closure, to implement measures to ensure that the hooded plover is not deterred from harvest sites due to the harvesting operations, particularly when this species is nesting and/or caring for dependent young from September to March (inclusive).

Harvesting in the fishery is sporadic, being carried out opportunistically whenever significant quantities of wrack are deposited on the foreshore. The Rivoli Bay area is considered by operators to be important to the harvest operations because it is accessible to

machinery and convenient for surveying harvest opportunities. The majority of the harvest has historically been sourced from the Rivoli Bay site, which is a site of national and international importance for migratory shorebirds dependent on beach-cast wrack for feeding and roosting. Other than vehicle restrictions imposed by local councils, no limits apply to the type of equipment that can be used to harvest wrack (see **Table 4: Condition 4** for proposed gear restrictions during seasonal closures).

Under current management arrangements, any interaction between the licence holders and TEPS must be lodged with the South Australian Research and Development Institute. There have been no reported interactions with TEPS under the Miscellaneous Fishery Licence (PIRSA, 2014). However, the likely indirect impacts on listed migratory shorebirds, typically unnoticed, are also of primary concern. The use of heavy machinery and repeated human disturbance to important habitat is considered likely to have a detrimental impact on shorebird behaviour, including disruption to the foraging and roosting behaviour (Burger *et al.* 2004). Photos of the harvest operation, provided to the Department through public comments, depict an extensive disturbance to beach environments when the fishery uses heavy machinery to harvest wrack.



Figure 2: Beach-cast wrack amassed for collection at Rivoli Bay. The material is loaded onto trucks or trailers for removal.



Figure 3: Post-harvest of beach-cast wrack at Rivoli Bay.

To address concerns related to the monitoring and compliance of harvest restrictions, PIRSA has established year round exclusion zones to restrict harvest operations to approximately 50% of the licensed area. This spatial management strategy combines existing exclusion zones with the proposed exclusion zones in the revised submission. While spatial closures can be an effective management approach, it is important that exclusion zones effectively represent important habitat for migratory shorebirds and include sites identified as nationally and internationally important habitat for migratory shorebirds (see **Table 4: Condition 4**).

Taking into account the anticipated growth in the industry, an absence of scientific data, potential accumulative impacts on listed migratory shorebirds and a lack of formal management arrangements that explicitly address these factors, it is important that any expansion be managed carefully to minimise adverse environmental impacts (see **Table 4: Condition 4, Condition 5 and Recommendation 1**).

Ecosystem Impacts

The accumulation and decomposition of beach-cast wrack is an important contributor to the productivity of terrestrial and marine ecosystems. Consisting of seaweed and seagrasses, bacteria, meiofauna (small benthic invertebrates that live in both marine and fresh water environments usually between 50µm and 500µm) and beach macrofauna (same as meiofauna but larger than 1mm), beach-cast wrack represents a vital source of carbon and nutrients for the wider food web dynamics, including beach and near-shore communities (Griffiths & Stenton-Dozey 1981; Koop & Griffiths 1982; Lenanton *et al.* 1982; Robertson & Hansen 1982; Griffiths *et al.* 1983; Duong 2008, as seen in PIRSA, 2014). The large supply of particulate organic matter released during wrack breakdown also supports marine

	<p>communities, including some that lead to commercially important fish species. This suggests that the removal of wrack material from beaches may have implications for other fisheries that are dependent upon nearshore productivity (PIRSA, 2014). In addition to providing a significant food resource, the decomposition of wrack is also an important contributor to the nutrient cycle, which supports the fertility and stability of substrates behind the foredunes and sustains nearshore primary and secondary production in coastal waters (Kirkman & Kendrick 1997).</p> <p>It is unknown whether existing harvesting operations may significantly impact the coastal and nearshore ecosystems in areas where banks of wrack are cleared, but the risk is considered low under current harvest levels. While there remains approximately 51 km of exclusion zones interspersed across the licence area, there is little information on whether wrack is abundant in these areas. It is important that PIRSA carefully manage the fishery (including any expansions to the fishing area) to avoid, at the local level, complete removal of beach-cast wrack to avert negative impacts such as coastal erosion, disruption to terrestrial and marine food webs and interfering with nutrient cycles (see Table 4: Condition 5).</p> <p>The Giant Kelp Marine Forests of South East Australia are protected under the EPBC Act as a threatened ecological community (listed as endangered). Giant kelp (<i>Macrocystis pyrifera</i>) forests are located in the waters of the south east of South Australia and some of the kelp is harvested as beach-cast wrack by the fishery.</p> <p>Giant kelp plants that have detached from the substrata and washed ashore (wrack) are, however, excluded from the definition of the ecological community and therefore do not trigger the need for referral under national environmental law.</p>
<p>Impacts on CITES species</p>	<p>No specimens listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are permitted to be harvested by the South Australian Beach-Cast Marine Algae Fishery. Therefore, no assessment of the operation's impact on specimens listed under CITES has been conducted.</p>
<p>Impacts on World Heritage property/Ramsar site</p>	<p>There are no World Heritage or Ramsar sites within the vicinity of the harvest areas. The nearest World Heritage and Ramsar site to the Fishery's harvest area is approximately 64 km from Beachport. Therefore, no assessment of the South Australian Beach-Cast Marine Algae Fishery's impacts on World Heritage properties or Ramsar sites has been conducted.</p>

Table 2 – Assessment against the *Guidelines for the Ecologically Sustainable Management of Fisheries 2nd Edition*

MANAGEMENT REGIME

<p>The management regime does not have to be a formal statutory fishery management plan as such, and may include non-statutory management arrangements or management policies and programs. The regime should:</p>	
<ul style="list-style-type: none"> Be documented, publicly available and transparent 	<p>There is no specific management plan for this fishery. However, the management arrangements for the fishery, as outlined in the South Australian <i>Fisheries Management Act 2007</i>, South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000, South Australian Fisheries Management (General) Regulations 2007, South Australian Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013 and licence conditions for both licence holders, are public documents.</p>
<ul style="list-style-type: none"> Be developed through a consultative process providing opportunity to all interested and affected parties, including the general public 	<p>The Department of Primary Industries and Regions (PIRSA) achieves the objectives of the South Australian <i>Fisheries Management Act 2007</i> through the development of management arrangements for aquatic resources in consultation with stakeholders.</p> <p>In 2015, members of the community and relevant shorebird experts were invited to attend an Ecological Risk Assessment Workshop, hosted by PIRSA, to discuss an Exploratory and Developmental Fishery application for new areas to harvest beach-cast wrack. The workshop also discussed proposed changes to the current fishery management arrangements based on advice and recommendations by the Commonwealth Department of the Environment. The information from this workshop helped formulate the revised submission for the Department's assessment of the fishery under Part 13A.</p>
<ul style="list-style-type: none"> Ensure that a range of expertise and community interests are involved in individual fishery management committees and during the stock assessment process 	<p>There is no formal fishery management committee or stock assessment process.</p> <p>The harvesting of wrack is subject to restrictions relevant to specific locations.</p>

	<p>Such restrictions have been developed in consultation between PIRSA, the Department of Environment, Water and Natural Resources (DEWNR), the Department of Planning, Transport and Infrastructure, the Department of State Development, and Local Governments.</p> <p>In 2015, PIRSA hosted a workshop where proposed changes to the fishery management arrangements were discussed with interested stakeholders and key public members. The information from this workshop helped formulate the revised submission for the Department's assessment of the fishery under Part 13A.</p>
<ul style="list-style-type: none"> • Be strategic, containing objectives and performance criteria by which the effectiveness of the management arrangements are measured 	<p>The management objectives of the fishery are contained within the South Australian <i>Fisheries Management Act 2007</i> and relevant regulations and licence conditions. Performance of these management objectives is monitored through compliance programs and monthly logbook returns, which is entered and stored with the South Australian Research and Development Institute. This information is confidential under provisions in the South Australian <i>Fisheries Management Act 2007</i> but is available from PIRSA on request.</p>
<ul style="list-style-type: none"> • Be capable of controlling the level of harvest in the fishery using input and/or output controls 	<p>Harvest in the fishery is restricted by exclusion zones where no harvest activity can occur. The exclusion zones reduce the harvest operation to approximately 50% of the licensed area at all times. The criteria for selecting exclusion zones is based on existing state park restrictions, vehicle access, areas identified as bird habitat and areas within 100 metres (m) of any water course that flows onto or across the beach. While the Department considers this spatial management strategy an effective way to address concerns related to monitoring and compliance of harvest restrictions, it is crucial that exclusion zones adequately represent areas with high conservation significance (see Condition 4, Table 4).</p> <p>In addition to the exclusion zones, wrack harvest will be conducted between the low water mark and up to a point no closer than 4 m from the toe of any dunes or any dune vegetation (whichever reaches farthest down the beach profile). The removal of sand from beaches is also prohibited.</p>

<ul style="list-style-type: none"> • Contain the means of enforcing critical aspects of the management arrangements 	<p>PIRSA's compliance measures include random and targeted inspections and reliance on reports from stakeholders (logbooks) (see Recommendation 1).</p>
<ul style="list-style-type: none"> • Provide for the periodic review of the performance of the fishery management arrangements and the management strategies, objectives and criteria 	<p>No periodic review of the management performance is scheduled. However, management arrangements can be reviewed at any time.</p> <p>In 2015, PIRSA hosted a workshop where proposed changes to the fishery management arrangements were discussed with interested stakeholders and key public members. The information from this workshop helped formulate the revised submission for the Department's assessment of the fishery under Part 13A.</p>
<ul style="list-style-type: none"> • Be capable of assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species lives and the fishery operates 	<p>Currently, there is no fishery-independent monitoring on which to assess the potential impacts from the fishery on migratory shorebirds or the wider ecosystem. However, PIRSA has advised that new licensing arrangements may provide a basis for this to be undertaken.</p> <p>Under the current management arrangements, interactions between the fishery and Threatened, Endangered and Protected Species (TEPS) are monitored through monthly logbook returns provided by operators. While no interactions with TEPS in the fishery have been reported, decline of migratory shorebird populations worldwide is primarily linked to the modification and loss of habitat, rather than direct interaction (Australian Government 2009).</p> <p>In 2000, an environmental impact study was conducted by a private consultant prior to approval being granted by PIRSA for the existing Beachport harvest area. However, this study has not been provided to the Department due to confidentiality reasons.</p> <p>In 2014, PIRSA amended the submission for export approval based on a workshop they hosted to discuss the environmental risks posed by the harvest operation.</p>
<ul style="list-style-type: none"> • Requires compliance with relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, 	<p>There are currently no applicable plans to which the South Australian</p>

and bycatch action strategies developed under the policy	Beach-Cast Marine Algae Fishery needs to be subject.
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PRINCIPLE 1 – A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover.

Objective 1: The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability.	
<p>Information requirements</p> <p>1.1.1 There is a reliable information collection system in place appropriate to the scale of the fishery. The level of data collection should be based upon an appropriate mix of fishery independent and dependent research and monitoring.</p>	<p>1.1.1 The target species has detached from the ocean substrate and been carried by water movement to accumulate on the shoreline, where it will eventually desiccate and die. Given that the target species cannot be reattached to the ocean substrate and the primary stock is not harvested, Principle 1 is considered not applicable.</p>
<p>Assessment</p> <p>1.1.2 There is a robust assessment of the dynamics and status of the species/fishery and periodic review of the process and the data collected. Assessment should include a process to identify any reduction in biological diversity and /or reproductive capacity. Review should take place at regular intervals but at least every three years².</p> <p>1.1.3 The distribution and spatial structure of the stock(s) has been established and factored into management responses.</p> <p>1.1.4 There are reliable estimates of all removals, including commercial</p>	<p>1.1.2 As per 1.1.1.</p> <p>1.1.3 As per 1.1.1.</p> <p>1.1.4 As per 1.1.1.</p>

² Review should be undertaken by the relevant management authority in a transparent way.

<p>(landings and discards), recreational and indigenous, from the fished stock. These estimates have been factored into stock assessments and target species catch levels.</p> <p>1.1.5 There is a sound estimate of the potential productivity of the fished stock/s and the proportion that could be harvested.</p>	<p>1.1.5 As per 1.1.1.</p>
<p>Management responses</p> <p>1.1.6 There are reference points (target and/or limit), that trigger management actions including a biological bottom line and/or a catch or effort upper limit beyond which the stock should not be taken.³</p> <p>1.1.7 There are management strategies in place capable of controlling the level of take.</p> <p>1.1.8 Fishing is conducted in a manner that does not threaten stocks of by-product species. (Guidelines 1.1.1 to 1.1.7 should be applied to by-product species to an appropriate level)</p> <p>1.1.9 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>1.1.6 As per 1.1.1.</p> <p>1.1.7 As per 1.1.1.</p> <p>1.1.8 As per 1.1.1.</p> <p>1.1.9 As per 1.1.1.</p>
<p>Objective 2: Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes.</p>	
<p>Management responses</p>	

³ Reference points can allow for seasonal fluctuations in stock recruitment and other areas of uncertainty.

<p>1.2.1 A precautionary recovery strategy is in place specifying management actions, or staged management responses, which are linked to reference points. The recovery strategy should apply until the stock recovers, and should aim for recovery within a specific time period appropriate to the biology of the stock.⁴</p> <p>1.2.2 If the stock is estimated as being at or below the biological and / or effort bottom line, management responses such as a zero targeted catch, temporary fishery closure or a 'whole of fishery' effort or quota reduction are implemented.</p>	<p>1.2.1 As per 1.1.1.</p> <p>1.2.2 As per 1.1.1.</p>
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⁴ Strategies require that recovery should take place within specified times with certain degrees of probability.

PRINCIPLE 2 – Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem⁵

Objective 1: The fishery is conducted in a manner that does not threaten bycatch species.	
<p>Information requirements</p> <p>2.1.1 Reliable information, appropriate to the scale of the fishery, is collected on the composition and abundance of bycatch.</p>	<p>2.1.1 The South Australian Beach-Cast Marine Algae Fishery has no bycatch in terms of what is traditionally considered bycatch in marine based fisheries. There are, however, organisms within the wrack that are removed during harvest, including small amounts of finfish, shells, sea cucumber, sea urchin, crabs, octopus and star fish. Depending on the harvest methods employed (e.g. hand-collection or forwarders), removal of organisms during harvest may be substantial.</p> <p>PIRSA advises that these potential bycatch species use beach-cast wrack opportunistically, rather than depend on it for survival. Furthermore, intermittent exclusion zones throughout the harvest area ensure that organisms within the wrack are not at risk. Given the low risk in terms of bycatch, PIRSA only requires reporting by licence holders of interactions with TEPS. No data is collected on the composition and abundance of other bycatch.</p>
<p>Assessments</p> <p>2.1.2 There is a risk analysis of the bycatch with respect to its vulnerability to fishing.⁶</p>	<p>2.1.2 Given the nature of potential bycatch, a risk assessment has not been conducted.</p>
<p>Management responses</p> <p>2.1.3 Measures are in place to avoid capture and mortality of bycatch species unless it is determined that the level of catch is sustainable (except in relation to endangered, threatened or protected species). Steps must be taken to develop suitable technology if none is</p>	<p>2.1.3 Given the nature of the fishery, no measures are in place to avoid capture and mortality of bycatch species.</p>

⁵ The issues addressed under the principle are those that define components of ecosystem integrity.

⁶ The vulnerability of a bycatch species may be its vulnerability to fishing technology (eg its catchability), or its vulnerability in terms of ecological impact (e.g. loss of predators or prey).

<p>available.</p> <p>2.1.4 An indicator group of bycatch species is monitored.</p> <p>2.1.5 There are decision rules that trigger additional management measures when there are significant perturbations in the indicator species numbers.</p> <p>2.1.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>2.1.4 Given the nature of the fishery, no indicator group of bycatch species is monitored.</p> <p>2.1.5 See 2.1.4</p> <p>2.1.6 See 2.1.4</p>
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<p>Objective 2: The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities.⁷</p>	
<p>Information requirements</p> <p>2.2.1 Reliable information is collected on the interaction with endangered, threatened or protected species and threatened ecological communities.</p>	<p>2.2.1 The South Australian Beach-Cast Marine Algae Fishery is active within sites identified as important habitats for a range of listed migratory shorebirds (See Table 1: Interaction with Protected Species).</p> <p>Currently, there is no ongoing fishery-independent monitoring of the impact of the fishery on migratory shorebirds. Licence holders complete and lodge with</p>

⁷ 'Protected' species are those which warrant a higher degree of conservation and for which explicit legislative or other mechanisms exist, e.g. they may be categorised under separate legislation as 'endangered', 'threatened' or 'protected'.

(wrack) are, however, excluded from the definition of the ecological community and therefore do not trigger the need for referral under national environmental law. Hence, there has been no assessment of the impact of the fishery on threatened ecological communities.

Management responses

2.2.4

There are measures in place to avoid capture and/or mortality of endangered, threatened or protected species.

2.2.5

There are measures in place to avoid impact on threatened ecological communities.

2.2.6

The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.

2.2.4

A number of measures have been implemented to mitigate potential impacts to migratory shorebirds and to protect nesting or aggregation sites. PIRSA restricts harvest operations to approximately 50% of the licensed area at all times. Other restrictions placed upon harvest activity include: no harvesting activity is to take place within four metres of the foredunes; the removal of any sand must be avoided; existing ramps or access tracks may only be used to access the beach and TEPS log books must be completed and lodged when any interactions occur.

2.2.5

See 2.2.3

2.2.6

The South Australian Beach-Cast Marine Algae Fishery operates in areas recognised as nationally and internationally important habitat for several listed shorebirds (see section 2.2.1). The Department considers that the Conditions listed in **Table 4** are important to ensuring the management arrangements are effective.

PIRSA has advised the Department that new licence conditions are being drafted to clarify proposed management arrangements and that a code of practice (COP) will be developed by the licence holder, in collaboration with PIRSA and other SA agencies, within three months of the issue of the licence (see **Table 4: Recommendation 1**).

Objective 3: The fishery is conducted in a manner that minimises the impact of fishing operations on the ecosystem generally.	
<p>Information requirements</p> <p>2.3.1 Information appropriate for the analysis in 2.3.2 is collated and/or collected covering the fisheries impact on the ecosystem and environment generally.</p>	<p>2.3.1 In 2000, an environmental impact study was conducted for the Beachport harvest area. However, this study has not been provided to the Department due to confidentiality reasons.</p> <p>While no other analysis of risks has been completed for the South Australian Beach-Cast Marine Algae Fishery, PIRSA hosted a workshop earlier this year where proposed changes to the fishery management arrangements were discussed with interested stakeholders. The information from this workshop helped formulate the revised submission for the Department's assessment of the fishery under Part 13A.</p>
<p>Assessment</p> <p>2.3.2 Information is collected and a risk analysis, appropriate to the scale of the fishery and its potential impacts, is conducted into the susceptibility of each of the following ecosystem components to the fishery.</p> <p>(a) Impacts on ecological communities</p> <ul style="list-style-type: none"> • Benthic communities • Ecologically related, associated or dependent species • Water column communities <p>(b) Impacts on food chains</p> <ul style="list-style-type: none"> • Structure • Productivity/flows <p>(c) Impacts on the physical environment</p> <ul style="list-style-type: none"> • Physical habitat • Water quality 	<p>As per 2.3.1</p>

<p>Management responses</p> <p>2.3.3 Management actions are in place to ensure significant damage to ecosystems does not arise from the impacts described in 2.3.1.</p> <p>2.3.4 There are decision rules that trigger further management responses when monitoring detects impacts on selected ecosystem indicators beyond a predetermined level, or where action is indicated by application of the precautionary approach.</p> <p>2.3.5 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>2.3.3 A number of management actions are in place to reduce significant damage to related ecosystems, such as prohibiting harvest within four metres of the foredune, prohibiting harvest below the low water mark, prohibiting the removal of sand from the beach area, limiting vehicle access to established roads/ramps and establishing exclusion zones within the licence area.</p> <p>2.3.4 There are no decision rules which trigger further management response.</p> <p>2.3.5 As per 2.3.4</p>
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Table 3: The Department of the Environment’s assessment of the South Australian Beach-Cast Marine Algae Fishery against the requirements of the EPBC Act related to decisions made under Part 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 Part 13A. A complete version of the EPBC Act can be found at <http://www.comlaw.gov.au/>.

Part 13A

Section 303BA Objects of Part 13A
<p>(1) The objects of this Part are as follows:</p> <ul style="list-style-type: none">(a) to ensure that Australia complies with its obligations under CITES⁸ 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.

⁸ Convention on International Trade in Endangered Species of Wild Fauna and Flora

Part 13A

Section 303DC Minister may amend list	The Department's assessment of the South Australian Beach-Cast Marine Algae Fishery
<p>(1) Minister may, by instrument 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 or 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>The Department recommends that specimens derived from species harvested in the South Australian Beach-Cast Marine Algae Fishery, other than specimens that belong to species listed under Part 13 of the EPBC Act, be included in the list of exempt native specimens while the South Australian Beach-Cast Marine Algae Fishery is subject to a declaration as an approved wildlife trade operation.</p>
<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>No assessment of the South Australian Beach-Cast Marine Algae Fishery has been carried out under Part 10 of the EPBC Act.</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 list exhaustively the factors that you may take into account in amending the list of exempt native specimens. The objects of Part 13A, which are set out above 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>The Department considers that the amendment of the list of exempt native specimens to include product taken in the South Australian Beach-Cast Marine Algae Fishery wildlife trade operation would be consistent with the provisions of Part 13A (listed above) 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 South Australian Beach-Cast Marine Algae Fishery, with the conditions proposed to be placed on the WTO declaration (see Table 4), is unlikely to be unsustainable and threaten biodiversity within the next 3 years, and ▪ the Environment Protection and Biodiversity Conservation Regulations 2000 do not specify the harvested specimens 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 Department considers that the consultation requirements have been met.</p> <p>On 10 August 2004, the then Minister for the Environment and Heritage wrote to all fisheries ministers seeking their views on inclusion of product derived from commercial fisheries in the list of exempt native specimens, while subject to declaration as approved wildlife trade operations. Responses in support of the proposal were received from all state and territory fisheries ministers and the Commonwealth minister.</p> <p>The application from the South Australia Department of Primary Industries and Regions (PIRSA) was released for public comment from 17 April 2014 to 23 May 2014. The public comment period sought comment on:</p> <ul style="list-style-type: none"> ▪ the proposal to amend the list of exempt native specimens to include product derived from the South Australian Beach-Cast Marine Algae, and ▪ PIRSA's application for the South Australian Beach-Cast Marine Algae Fishery

	<p>10 comments were received and have been considered as part of the Department's assessment.</p> <p>On 23 December 2014, PIRSA provided the Department with a revised application. The revised application was provided on 11 February 2015 to all parties who had initially submitted comments.</p> <p>Again, 10 comments were received on the revised application and have been considered as part of the Department's assessment.</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 South Australian Beach-Cast Marine Algae Fishery made under section 303DC will be gazetted and made available through the Department's website.</p>

<p>Section 303FN Approved wildlife trade operation</p>	<p>The Department's assessment of the South Australia Beach-Cast Marine Algae Fishery</p>
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<p>(2) The Minister may, by instrument published in the <i>Gazette</i>, declare that a specified wildlife trade operation is an approved wildlife trade operation for the purposes of this section.</p>	
<p>(3) The Minister must not declare an operation as an approved wildlife trade operation unless the Minister is satisfied that:</p> <p>(a) the operation is consistent with the objects of Part 13A of the Act; and</p> <p>(b) the operation will not be detrimental to:</p> <p>i. the survival of a taxon to which the operation relates; or</p> <p>ii. the conservation status of a taxon to which the operation relates; and</p> <p>(ba) the operation will not be likely to threaten any relevant</p>	<p>The Department considers that the operation of the South Australian Beach-Cast Marine Algae Fishery is consistent with objects of Part 13A (listed above) as:</p> <ul style="list-style-type: none"> ▪ the fishery will not harvest any CITES listed species ▪ there are management arrangements (see Table 1) accompanied with appropriate conditions (see Table 4) to ensure that the resource is being managed in an ecologically sustainable way, and ▪ with the conditions in place (see Table 4), the operation of the South Australian Beach-Cast Marine Algae Fishery is unlikely to be unsustainable and threaten biodiversity within the next 3 years. ▪ the Environment Protection and Biodiversity Conservation Regulations 2000 do not specify the harvested specimens in relation to the welfare of live specimens. <p>The Department considers that the South Australian Beach-Cast Marine Algae Fishery will not be detrimental to the survival or conservation status of a taxon to which it relates within the next 3 years, given the management measures and the conditions proposed to be placed on the WTO declaration (see Table 4), which include:</p> <ul style="list-style-type: none"> ▪ limited entry (two non-transferable licences) ▪ logbook reporting ▪ monitoring and data collection ▪ temporal and permanent closure zones, and ▪ gear restrictions. <p>The Department considers that the operation of the South Australian Beach-Cast Marine Algae Fishery during the period of the</p>

<p>ecosystem including (but not limited to) any habitat or biodiversity; and</p> <p>(c) if the operation relates to the taking of live specimens that belong to a taxon specified in the regulations – the conditions that, under the regulations, are applicable to the welfare of the specimens are likely to be complied with; and</p> <p>(d) such other conditions (if any) as are specified in the regulations have been, or are likely to be, satisfied.</p>	<p>recommended declaration as an approved wildlife trade operation is not likely to threaten any relevant ecosystem including (but not limited to) any habitat or biodiversity, given the management measures and the conditions proposed to be placed on the WTO declaration (see Table 4), which include:</p> <ul style="list-style-type: none"> ▪ limited entry (two non-transferable licence) ▪ logbook reporting ▪ monitoring and data collection ▪ temporal and permanent closure zones, and ▪ gear restrictions. <p>There are no live specimens being taken for the purpose of the export operation.</p> <p>No other conditions are specified in relation to commercial fisheries in the EPBC Regulations.</p>
<p>(4) In deciding whether to declare an operation as an approved wildlife trade operation the Minister must have regard to:</p> <p>(a) the significance of the impact of the operation on an ecosystem (for example, an impact on habitat or biodiversity); and</p>	<p>The Department considers that the South Australian Beach-Cast Marine Algae Fishery will not have a significant impact on any relevant ecosystem within the next 3 years, given the management measures and the conditions proposed to be placed on the WTO declaration (see Table 4), which include:</p> <ul style="list-style-type: none"> ▪ limited entry (two non-transferable licence) ▪ logbook reporting ▪ monitoring and data collection ▪ temporal and permanent closure zones, and ▪ gear restrictions.

<p>(b) the effectiveness of the management arrangements for the operation (including monitoring procedures).</p>	<p>The management arrangements and conditions that will be employed for the South Australian Beach-Cast Marine Algae Fishery are likely to be effective.</p> <p>At least 50% of the licence area is excluded from the fishery operations, as a precautionary measure to provide potential sanctuary for migratory shorebirds and avoid broader ecosystem impacts. In addition to the exclusion zones, temporal closures will occur in areas considered nationally and/or internationally important for migratory shorebirds from September to March (inclusive) when the majority of shorebirds are present. To ensure that effectiveness of these mitigations, PIRSA and industry will facilitate studies and/or surveys to monitor and assess potential impacts from the fishery on listed migratory birds.</p>
<p>(5) In deciding whether to declare an operation as an approved wildlife trade operation the Minister must have regard to:</p> <p>(a) whether legislation relating to the protection, conservation or management of the specimens to which the operation relates is in force in the State or Territory concerned; and</p> <p>(b) whether the legislation applies throughout the State or Territory concerned; and</p> <p>(c) whether, in the opinion of the Minister, the legislation is effective.</p>	<p>The South Australian Beach-Cast Marine Algae Fishery will be managed under the South Australian <i>Fisheries Management Act 2007</i>, the South Australian Fisheries Management (General) Regulations 2007 and the South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000.</p> <p>The South Australian <i>Fisheries Management Act 2007</i> applies throughout South Australian waters.</p> <p>The legislation is likely to be effective.</p>
<p>(10) For the purposes of section 303FN, an operation is a wildlife trade operation if, and only if, the operation is an operation for the taking of specimens and:</p>	

(d) the operation is a commercial fishery.

The South Australian Beach-Cast Marine Algae Fishery is a commercial fishery.

Section 303FR Public consultation	The Department's assessment of the South Australia Beach-Cast Marine Algae Fishery
<p>(1) Before making a declaration under section 303FN, the Minister must cause to be published on the Internet a notice:</p> <ul style="list-style-type: none"> (a) setting out the proposal to make the declaration; and (b) setting out sufficient information to enable persons and organisations to consider adequately the merits of the proposal; and (c) inviting persons and organisations to give the Minister, within the period specified in the notice, written comments about the proposal. 	<p>The Department considers that consultation requirements of the EPBC Act for declaring a fishery an approved wildlife trade operation have been met. A public notice, which set out the proposal to declare the South Australian Beach-Cast Marine Algae Fishery an approved wildlife trade operation and included the submission, was released for public comment which closed on 23 May 2014 with 10 submissions received (Attachment C1).</p> <p>On the 23 December 2014, PIRSA provided the Department with a revised submission (Attachment A), which was released on 11 February 2015 to all interested parties who had initially submitted comments. Again, 10 public comments were received and have been considered as part of the Department's assessment (Attachment C2).</p>
<p>(2) A period specified in the notice must not be shorter than 20 business days after the date on which the notice was published on the Internet.</p>	<p>A public notice, which set out the proposal to declare the South Australian Beach-Cast Marine Algae Fishery a wildlife trade operation and included the submission was released for public comment on 17 April 2014 and closed on 23 May 2014, a total of 25 business days.</p> <p>The revised submission provided to the Department on 23 December 2014 was released to all interested parties who had initially submitted comments. These interested parties were provided a second public comment period from 11 February 2015 to 3 March 2015, a total of 14 business days.</p>
<p>(3) In making a decision about whether to make a declaration under section 303FN, the Minister must consider any comments about the proposal to make the declaration that were given in response to the invitation in the notice.</p>	<p>The public comments received on the submission are included at Attachment C1 and C2 of the brief. The Department's assessment has considered the public comments received on the submission.</p>

Section 303FT Additional provisions relating to declarations	The Department's assessment of the South Australia Beach-Cast Marine Algae Fishery
(1) This section applies to a declaration made under section 303FN, 303FO or 303FP.	A declaration for the South Australian Beach-Cast Marine Algae Fishery will be made under section 303FN.
<p>(4) The Minister may make a declaration about a plan or operation even though he or she considers that the plan or operation should be the subject of the declaration only:</p> <p>(a) during a particular period; or (b) while certain circumstances exist; or (c) while a certain condition is complied with.</p> <p>In such a case, the instrument of declaration is to specify the period, circumstances or condition.</p>	<p>The standard conditions applied to commercial fishery wildlife trade operations include:</p> <ul style="list-style-type: none"> • operation in accordance with the management regime • notifying the Department of changes to the management regime, and • annual reporting in accordance with the requirements of the Australian Government <i>Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition</i>. <p>The wildlife trade operation instrument for the South Australian Beach-Cast Marine Algae Fishery specifies the standard and any additional conditions applied.</p>
(8) A condition may relate to reporting or monitoring.	One of the standard conditions relates to reporting.
(9) The Minister must, by instrument published in the <i>Gazette</i> , revoke a declaration if he or she is satisfied that a condition of the declaration has been contravened.	
(11) A copy of an instrument under section 303FN, or this section is to be made available for inspection on the Internet.	The instrument for the South Australian Beach-Cast Marine Algae Fishery made under sections 303FN and the conditions under section 303FT will be gazetted and made available through the Department's website.

Part 16

Section 391 Minister must consider precautionary principle in making decisions	The Department's assessment of the South Australia Beach-Cast Marine Algae Fishery
(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.	Having regard to the precautionary management measures in place in the fishery, summarised in Table 1, the Department considers that the precautionary principle has been accounted for in the preparation of advice in relation to a decision under section 303DC and section 303FN.
(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.	

The Department of the Environment's final conditions and recommendations to the South Australian Department of Primary Industries and Regions for the South Australian Beach-Cast Marine Algae Fishery

The material submitted by the Department of Primary Industries and Regions South Australia (PIRSA) demonstrates that the management arrangements for the South Australian Beach-Cast Marine Algae Fishery, with the conditions proposed to be placed (see Table 4), meet most of the requirements of the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries 2nd Edition*.

The Department recognises that the licence holder may only harvest unattached beach-cast wrack from the foreshore between the low water mark and up to a point no closer than 4 m from the toe of any dunes or any dune vegetation (whichever reaches farthest down the beach profile) in allocated areas. As such, the Department considers that overall the management regime for the South Australian Beach-Cast Marine Algae Fishery, with the conditions proposed to be placed on the declaration (see Table 4), aims to ensure that harvesting operations are conducted to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.

Management measures in place in the fishery include:

- limited entry (two non-transferable licences);
- logbook reporting;
- monitoring and data collection;
- temporal and permanent closure zones, and
- gear restrictions.

Public comments

The Department has considered the submissions received during the public comment periods, which express concern with:

- the potential impacts that harvest operations may have on the habitat of migratory and protected shorebird species;
- the potential impacts that harvest operations may have on other recreational and commercial fisheries;
- the fishery allowing 100% of the wrack material within the permissible harvest area to be collected, potentially depriving shorebirds of critical habitat; and
- nationally and internationally important habitat for migratory shorebird species is not adequately reflected in the fishery's closure zones.

Proposed conditions and recommendations which address the comments, where appropriate, are contained in Table 4.

Ecosystem Impacts

The Department considers that there is an ongoing need for PIRSA to:

- ensure sufficient areas of potentially significant habitat for migratory shorebird species are protected within the permitted harvest area, through adjusting the exclusion zones accordingly;
- undertake monitoring and research on the short and long-term ecological impact posed by the fishery to all relevant terrestrial and coastal ecosystems;
- ensure that a sufficient level of ongoing independent monitoring is in place to evaluate the effect of harvesting on protected species and ensure compliance; and

- undertake research into the distribution and quantity of beach-cast wrack in the harvest area.

To address these issues, the Department has proposed conditions, developed in consultation with PIRSA, to which the recommended declaration of the South Australian Beach-Cast Marine Algae Fishery as an approved wildlife trade operation would be subject. In addition, a recommendation to help improve the management of the fishery has been developed. A detailed discussion of the issues, conditions and recommendation is included in Table 4 of this report.

The Department also considers that until it can be demonstrated that these issues have been adequately addressed, declaration of the harvest operations of the South Australian Beach-Cast Marine Algae Fishery as an approved wildlife trade operation for three years, until 18 May 2018, is appropriate. The Department considers that the declaration should be subject to the conditions listed in Table 4. To contain and minimise the risks in the longer term the recommendation outlined in Table 4 has been made.

Table 4: SA Beach-Cast Marine Algae Fishery Assessment – Summary of Issues, Conditions and Recommendations June, 2015

Issue	Condition
<p><u>General Management</u></p> <p>Export decisions relate to the arrangements in force at the time of the decision. To ensure that these decisions remain valid and export approval continues uninterrupted, the Department of the Environment 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 byproduct, bycatch, EPBC Act protected species or the ecosystem.</p>	<p>Condition 1:</p> <p>Operation of the South Australia Beach-Cast Marine Algae Fishery will be carried out in accordance with the <i>South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000</i> and the <i>South Australian Fisheries Management (General) Regulations 2007</i> in force under the <i>Fisheries Management Act 2007</i>.</p> <p>Condition 2:</p> <p>The Department of Primary Industries and Regions South Australia (PIRSA) to inform the Department of the Environment of any intended material changes to the South Australia Beach-Cast Marine Algae Fishery management arrangements that may affect the assessment against which <i>Environment Protection and Biodiversity Conservation Act 1999</i> decisions are made.</p>

<p><u>Annual Reporting</u></p> <p>It is important that reports be produced and presented to the Department annually in order for the performance of the fishery and progress in implementing the conditions and 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 'Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Edition' 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 EPBC Act protected species, impacts of the fishery on the ecosystem in which it operates and progress in implementing any conditions and recommendations. Electronic copies of the guidelines are available from the Department's website at http://www.environment.gov.au/resource/guidelines-ecologically-sustainable-management-fisheries</p>	<p>Condition 3:</p> <p>PIRSA to produce and present reports to the Department of the Environment annually as per Appendix B of the <i>Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Ed.</i></p>
<p><u>Seasonal Closure and Reduced Harvest</u></p> <p>Christie and Jessop (2007) and Bamford et al. (2008) identify the coastal area between Cape Jaffa to Rivoli Bay, South Australia, as important habitat for migratory shorebirds. Under the EPBC Act, 'important habitat' is defined by the proportion of a migratory species' population that uses the habitat. According to these criteria, where the number of shorebirds using the identified habitat is greater than 1% of the total of that shorebird population, the habitat is considered internationally important, while a population greater than just 0.1% is considered nationally important.</p> <p>Based on this definition, several migratory shorebird species have been identified within the licenced harvest area of the South Australia Beach-Cast Marine Algae Fishery that exceed national or international thresholds for significant population numbers. The curlew sandpiper (Lake George 3528 - 1.9%), sharp-tailed sandpiper (Lake George 4500 – 2.8%), ruddy turnstone (Rivoli Bay 616 – 1.7%), red-necked stint (Lake George 9000 – 2.8%) and sanderling (Beachport 266 – 1.2% and Rivoli Bay 1108 – 5%) all exceed the threshold for internationally significant numbers ($\geq 1\%$) (Australian Government 2009).</p> <p>Double-banded plover and Pacific golden plover exceed the threshold of nationally significant numbers ($\geq 0.1\%$) (Christie and Jessop 2007). These threshold criteria are</p>	<p>Condition 4:</p> <p>PIRSA to take all reasonable steps to mitigate adverse impacts on migratory shorebirds by the South Australia Beach-Cast Marine Algae Fishery operations (harvesting and/or transporting of beach-cast wrack), including through:</p> <ul style="list-style-type: none"> a) implementing a management strategy that ensures at least 50% of the licence area is excluded from the fishery operations at all times; b) avoiding the removal of all non-target species from the harvest area; c) a seasonal closure from January to March (inclusive) each year, on sandy beaches along Wrights Bay, Nora Creina, Stinky Beach and Rivoli Bay area (including the 8 kilometres

considered the best way to identify important sites in the absence of data sufficient for more rigorous methods. Migratory shorebirds arrive from September onwards to their non-breeding grounds in South Australia. They demonstrate high site fidelity and use a mosaic of sites from Cape Jaffa to Rivoli Bay for feeding and roosting through summer until they depart on migration from March/April. The double-banded plover migrates from New Zealand to Australia in winter (arrives April/May, departs September). Beach-cast wrack is an important foraging and roosting habitat for migratory shorebirds, as it contains essential macrofauna food items (amphipods and larvae) and provides camouflage and protection from inclement weather. Any change to these macrofaunal communities will likely affect predator communities, including insects and birds.

The Department considers it important that at least 50% of the licence area is excluded from the fishery operations, as a precautionary measure to avoid broader ecosystem impacts. In addition to providing a significant food resource for the macrofauna and predator communities, particulate matter from decomposing beach-cast wrack also provides food for offshore species, including fish and benthic coastal communities. Furthermore, accumulated beach-cast wrack can stabilise coastal ecosystems and may contribute to the fertility and stability of substrates behind the foredunes. Harvesting operations may impact the coastal and nearshore ecosystems in areas where large banks of beach-cast wrack are cleared.

The Department notes PIRSA's advice, however, that seagrass is not the target for harvest for the Y078 license and hence removal of the proposed marine algae wrack pursuant to this licence is not considered to be a risk to stabilisation of fore dunes. PIRSA has also advised that harvest is prohibited within four metres of fore dunes.

The use of heavy machinery and repeated human disturbance of important habitat can also have a detrimental impact on shorebird behaviour, including disruption to the foraging and roosting behaviour. To ensure there is not a negative impact on listed migratory shorebirds, the Department considers it important that heavy machinery should not be used in areas considered nationally and/or internationally important for migratory shorebirds from September to March (inclusive) when the majority of shorebirds are present.

south east of the Lake George inlet) to the Beachport Conservation Park closure zone;

- d) a seasonal closure from September to December (inclusive) each year, in Rivoli Bay from the Beachport Conservation Park Closure zone to the beach access point at Blowhole Rd (including the Lake George inlet and town beach);
- e) prohibiting heavy machinery for harvest and/or transport purposes in all seasonal closure areas from September to December (inclusive) on sandy beaches along Wrights Bay, Nora Creina, Stinky Beach and Rivoli Bay area (including the 8 kilometres south east of the Lake George inlet) to the Beachport Conservation Park closure zone; and
- f) prohibiting harvest operations within 100 metres either side of an area where *Thinornis rubricollis* (hooded plovers) are nesting or caring for dependent young from September to March (inclusive) on sandy beaches along Wrights Bay, Nora Creina, Stinky Beach and Rivoli Bay area (including the 8 kilometres south east of the Lake George inlet) to the Beachport Conservation Park closure zone (inclusive).

PIRSA has advised of the following arrangements to address these impacts

- total closure of areas important to shorebirds from 1 January to 31 March inclusive to allow for migratory birds to undertake natural activities undisturbed;
- a seasonal closure from 1 September to 31 December (inclusive) for harvest of marine algae in Rivoli Bay from the Beachport Conservation Park Closure zone to the beach access point at Blowhole Rd (including the Lake George inlet and town beach);
- prohibiting heavy machinery for harvest and/or transport purposes in all seasonal closure areas from September to December (inclusive).

Some areas available for harvest by the fishery are identified as sites of high conservation significance for the threatened *Thinornis rubricollis* (hooded plovers), which is a species prone to disturbance and vulnerable to breeding failure (TSSC, 2014). The Department considers it important for PIRSA, during the seasonal closure, to implement measures to ensure that the hooded plover is not deterred from harvest sites due to the harvesting operations, particularly when this species is nesting and/or caring for dependent young from September to March (inclusive). In this regard, it is important that PIRSA regularly liaise with government and non-government agencies and other relevant groups to identify the potential presence of hooded plovers in harvest areas whenever harvesting occurs in closure zones. Where a hooded plover is identified as nesting or caring for dependent young from September to March (inclusive), a designated buffer zone must be established that prohibits the fishery's operations from occurring within 100 metres of the nesting site.

A code of practice (COP) will be developed by the licence holder in collaboration with PIRSA, the SA Department of Environment, Water and Natural Resources and the SA Department of State Development. The COP will sit outside the legislative framework and will describe standard practice related to training requirements for staff involved in harvesting activities with regard to bird identification and mitigation methods for reducing interactions with shorebirds. For example agreed minimum harvest distance from any nesting shorebird, or shorebirds with dependant young, and maximum safe driving

<p>speeds on beaches.</p> <p>Reducing the extent or duration of the seasonal closure could be considered in consultation with the Department, should data from monitoring and surveys demonstrate that fishery operations will not negatively impact migratory shorebirds.</p>	
<p><u>Monitoring and Research</u></p> <p>As discussed under Condition 4, the SA Beach-Cast Marine Algae Fishery is active within sites identified as important habitats for migratory shorebirds. The Department considers it important that PIRSA and industry facilitate studies and/or surveys to monitor and assess potential impacts from the fishery on listed migratory birds. PIRSA should consider any relevant research and survey results when developing management arrangements for harvesting of beach-cast macro algae to minimise any impacts on listed migratory birds and appropriately address any problems that may be identified.</p> <p>Currently in the fishery, there is no ongoing fishery-independent monitoring of the impact of the fishery on migratory birds. However, PIRSA has suggested that new licensing arrangements may provide a basis for this to be undertaken. Regular monitoring of shorebird populations will assist in determining the level of impact of harvest activity. Although there is some information on the protected bird species of concern, a comprehensive long term survey or study on protected bird species within the harvest areas would help provide more detailed data on the status of these birds.</p> <p>In addition to impacts caused by harvesting the resources used by listed shorebird species, Condition 4 also notes the ecological benefit of beach-cast wrack as a significant resource for the broader terrestrial and coastal ecosystems. Currently, the management regime does not adequately consider the fishery’s potential impact to other ecosystems, including Marine Parks that are adjacent to the harvest area. According to PIRSA, there is currently no research basis from which to determine ecologically sustainable wrack harvest levels. In the absence of sufficient data or published research to support the long-term sustainability of the harvest operation within the broader ecological network, the Department considers it important that PIRSA and industry also facilitate studies to assess potential impacts from the fishery on the broader ecosystem.</p> <p>The Department has been advised that licence conditions will require daily reporting of</p>	<p>Condition 5:</p> <p>PIRSA, in collaboration with the Department of Environment, Water and Natural Resources, industry and where possible, the community to:</p> <ul style="list-style-type: none"> a) implement a monitoring program to annually assess the impact of the South Australia Beach-Cast Marine Algae Fishery on migratory shorebirds; and b) continue to support research with the aim of understanding and effectively managing the ecological risk posed by the fishery to shorebirds and all relevant terrestrial and coastal ecosystems. <p>Any data obtained from the monitoring program (excluding commercial in confidence data) must be included in the annual report sent to the Department of the Environment and should be available to the South Australia Department of Environment, Water and Natural Resources.</p>

catch and activity by the licence holder. Reporting will also require photos to be provided of harvest area before and after harvest. This information will form part of a monitoring program. The licence holder will also be required to complete records of any interactions with threatened, endangered or protected species, including shorebirds in the Wildlife Interaction Logbook. For the benefit of monitoring migratory bird activity this will include bird sightings and alarm flights as well as negative bird interactions.

The management policy for harvest of beach-cast seagrass and marine algae will include a research strategy listing a range of research activities for addressing aspects of the operation identified through the ESD risk assessment as medium to high risk, including impacts on shorebirds and trophic level impacts on the ecosystem. Research activities will be appropriate to the level of operations, level of risk and funds available.

The Department has also been advised that a code of practice (COP) will be developed by the licence holder in collaboration with SA Government. The COP will sit outside the legislative framework and will describe options for collaborative monitoring with relevant groups with expertise in shorebirds in the local area.

Issue	Recommendation
<p><u>Management Policy</u></p> <p>Currently, there is no formal management plan specific to the South Australian Beach-Cast Marine Algae Fishery. The management framework is primarily governed by the <i>South Australian Fisheries Management (Miscellaneous Fishery) Regulations 2000</i> and the <i>South Australian Fisheries Management (General) Regulations 2007</i>, which preside under the <i>South Australian Fisheries Management Act 2007</i>.</p> <p>PIRSA has introduced exploratory and developmental fishing permits to facilitate the ongoing sustainable development of South Australia’s aquatic resources and develop new commercial fisheries based on new species or areas not part of an existing fishery. PIRSA has received an application seeking a permit for the harvest of beach-cast marine algae in areas not already assigned to either of the existing two Miscellaneous Fishery licence holders. These permits will additionally be governed through the recently implemented <i>Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013</i>. To date, PIRSA has not issued any permits for exploratory and developmental wrack harvest.</p> <p>In 2015, PIRSA drafted new management arrangements in response to concerns regarding the fishery’s potential impact to relevant shorebirds and ecosystems. The Department considers this a positive development towards identifying and addressing potential management risks within the fishery’s current management arrangements. However, in considering the significance of the harvest area, the projected increase in harvest activity, and the lack of data on shorebird populations and possible impacts, the Department considers that formal and specific management arrangements for beach-cast wrack harvest should be developed.</p> <p>As such, the Department recommends that PIRSA work to develop and implement a comprehensive management policy for the South Australian Beach-Cast Marine Algae Fishery prior to further expansion of the fishery. This recommendation, in addition to</p>	<p>Recommendation 1:</p> <p>PIRSA to work to develop new management arrangements to be implemented before any new exploratory and developmental licence for the harvesting of wrack is permitted. New management arrangements should address Conditions 4 and 5 and include precautionary management strategies to control the level of harvest and latent effort in the fishery and ensure appropriate compliance. The management arrangements should include a description of:</p> <ul style="list-style-type: none"> • the fishery, • biology of key species, • ecosystem, • objectives and goals for management, • management arrangements • research • compliance and monitoring.

Issue	Recommendation
<p>Condition 4 and 5, should be reflected within the fishing licences as the appropriate management mechanism. The Department further recommends that the new management arrangements be in place prior to issuing any new exploratory and developmental permits.</p> <p><u>Complementary arrangements</u></p> <p>A range of complementary arrangements are identified as being of benefit to mitigating the wide range of anthropogenic impacts on shorebirds. As these issues relate to all users of beaches in South Australia identified as important for shorebirds and require changes to legislation outside of the <i>Fisheries Management Act 2007</i> these issues are for consideration as whole-of-state and local government initiatives.</p> <p>These may be informed by the relevant coastal management plan and/or other plans for migratory and resident shorebirds.</p>	

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