

PROPOSAL FOR THE HARVEST AND EXPORT OF NATIVE FLORA

**UNDER THE ENVIRONMENT PROTECTION AND
BIODIVERSITY CONSERVATION ACT 1999**



**Submitted to:
Sustainable Fisheries
Department of the Environment and Heritage
Canberra ACT**

**By Kelp Industries Pty Ltd
King Island Tasmania
August 2004**

**PROPOSAL FOR THE HARVEST AND EXPORT OF NATIVE
FLORA
UNDER THE ENVIRONMENT PROTECTION AND
BIODIVERSITY CONSERVATION ACT 1999**

Organisation To Operate The Program

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General Manager

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Beach-washed Seaweed (*Durvillaea Potatorum*) King Island, Tasmania



Species Subject To The Proposal

Scientific Name: *Durvillaea Potatorum*

Common Name: Bull Kelp

Location Of The Proposed Kelp Collection

D. potatorum is currently being collected on the west coast of King Island between Cape Wickham in the north and approximately five kilometres due south of the Ettrick Beach. *D. potatorum* is also collected on the south coast of King Island from Surprise Bay to the east of Stokes Point. On the south east coast it is being collected from three areas around Red Hut Point, Grassy

Harbour and City Of Melbourne Bay. The areas are highlighted on the attached 1:100,000 map of King Island.

Distribution and Abundance of the Species

D. potatorum is endemic to the exposed rocky coasts of south-eastern Australia where it extends north to Bermagui in New South Wales and west to Robe in South Australia. It is found along the west coast of Tasmania, as far north as Bicheno on the east coast and around the western islands of Bass Strait. It is a dominant member of the intertidal and shallow sub-tidal zone extending to depths of between six and ten metres. The population on King Island represents about 9% of the total distribution for this species in south-eastern Australia.

Collection Procedures

Description of what specimens are to be Processed.

Large freshly detached plants. The plants are detached from their substrate by rough weather and cast onto the shore or into deep holes or gutters along the shore. The detached plants cannot re-attach and once cast onto the shore are dead or will die in the immediate future. Plant material that is too small or no longer fresh is of no commercial value and is not collected. *D. potatorum* is only one of many species of seaweed cast ashore on King Island but no other species are collected.

Method of kelp collection and details of who will deliver kelp.

There are approximately 45 active Bull Kelp collectors on King Island. Approximately 4 work full-time, 40 are weekend/part-time collectors. Kelp collectors must hold a DPIWE Marine Plant Licence, ABN, registered and insured trailers or trucks and hold a current Tasmanian driver's licence before registering with Kelp Industries Pty Ltd as a supplier. Kelp Industries Pty Ltd provide a cooperative public liability insurance to cover all kelp collectors registered on the database.

D. potatorum plants are collected by hand from the shore line and hauled onto trailers or trucks, parked on formed tracks, by a winch. In areas of high yield material kelp has been collected from deep gutters and holes by machines with a grab attachment. The machine is able to lift the cast plants and place them directly onto the trucks for transport to drying areas. This method has not been practiced for several years. All kelp collectors must hold a valid fishing licence (marine plant) and operate under a strict code of conduct. It must be noted that only small areas of coastline are accessible to harvesters due to access through private property and no available tracks. Most cast kelp is gathered from rocky shore areas with less than 10% gathered from sandy

beaches. Due to the high risk of getting a vehicle stuck in the sand the kelp gathered from sandy beaches is winched from vehicles parked on a formed track or road. The main beach where kelp can be collected is on the north end of British Admiral beach where the vehicles park in the car park and use a winch to pull the kelp from the sand. It is very rare for a collector to actually drive onto a sandy beach and when they do they only drive on the firm sand below the high tide mark. There has never been indication from any source that kelp gathering has had any impact on bird nesting sites since the industry commenced in 1975.

Historical and Current Fishing Effort

D. potatorum processing has increased from 773 tonnes dry weight in 1976 to a maximum of 4025 in 1989 (Table 1). The average tonnage processed for the past five years has been 2076 tonnes dry weight. The amount processed is determined by encumbered weather conditions.

YEAR	TONNES	YEAR	TONNES
1975			
1976	773.0	1990	3752.8
1977	2441.0	1991	2916.8
1978	2616.0	1992	2684.7
1979	2910.0	1993	2966.7
1980	2360.7	1994	2919.9
1981	2470.5	1995	3719.4
1982	1771.0	1996	3095.4
1983	1697.5	1997	3525.2
1984	2848.9	1998	3468.5
1985	2163.0	1999	3196.3
1986	2041.6	2000	2100.0
1987	2570.8	2001	2185.8
1988	3389.1	2002	1530.7
1989	4025.5	2003	1365.4

Table 1
History of *D. potatorum* Harvesting on King Island 1975 – 2003

Timing and Duration of Harvest Period

Cast kelp is collected year round. Traditionally more kelp is collected during and immediately after periods of strong westerly / south-westerly winds which occur during autumn, winter & spring. The strong winds combined with large ocean swells bring the detached kelp plants ashore. Less than 10% of detached plants actually wash ashore. (*Cheshire 1991*)

In some areas cast kelp can be washed back out to sea by wave and tide action soon after coming ashore

Protection Of Species Proposed To Be Collected

Is the species protected under State or Federal Legislation?

D. potatorum is only protected in marine reserves under the Tasmanian *National Parks & Wildlife Act 1970*.

Native plant species are subject to export control under the *Environmental Protection and Biodiversity Conservation Act 1999*.

Is the species found in marine reserves and national parks?

Not relevant. Only cast material is to be collected.

General Aims

Kelp Industries have been processing cast *D. potatorum* from the shores of King Island since 1976. The industry has always maintained an excellent working relationship with the relevant past and present State and Federal Departments that held jurisdiction over the resource as well as other parties such as Tasmanian Parks and Wildlife Service, King Island Council and land owners.

Subject to re-approval of this proposal, the intention of Kelp Industries Pty Ltd is to continue the processing of cast *D. potatorum* using the best practices to minimize environmental impact and ensure sustainability of the resource. Kelp Industries Pty Ltd have Organic certification and are working towards ISO 14,001 accreditation by mid 2005.

Whilst a Management Plan is still yet to be realised at State Level, the harvesting of *D. potatorum* on King Island falls under the jurisdiction of Tasmanian Department of Primary Industries, Water and Environment (DPIWE). The legislation applied is the Environmental Protection and Biodiversity Conservation Act 1999. Kelp Industries holds the sole Marine Plant Processors Licence for cast kelp from Crown areas around King Island (Attachment 1). Raw product is purchased from licensed collectors (example, Attachment 2) who deliver to the Netherby Road Factory.

Environmental Impact

Effects of harvesting on the species harvested.

Cheshire (1991; copy in Attachment 3) indicates “.... harvesting in the areas specified will have minimal impact on the species as a whole, due to its extensive distribution throughout the rest of south-eastern Australia.” And “Existing harvesting procedures are likely to have minimal impact On the population of *D. potatorum* Or [its] Habitats.”

Effects of harvesting on other species in the ecosystem.

The effects of harvesting on other species in the ecosystems have not been determined, however, Cheshire (1991) indicates that there “.... *is no evidence to suggest that the activities of Kelp Industries have caused any harm to the near-shore/coastal ecology of King Island.*” There is also an extensive literature on the role of beach wrack (cast seaweeds) on the ecology of sandy beach ecosystems which suggests that selective harvesting of individual plants is unlikely to impact beach systems where this is restricted to 50% of the total cast (Attachment 4 provides a summary and bibliography of relevant literature).

Will there be independent supervision of kelp collection?

The operation is subject to visits by an officer employed by the Tasmanian DPIWE and a locally based Tasmanian Parks and Wildlife Ranger.

Is there likely to be impact on other areas?

Whereas the collecting of cast *D. potatorum* is entirely shore based, it is fair to assume that noticeable impact (if any) would occur in these areas. This was recognised at the commencement of the industry and several methods were originally adopted to counteract such instances. The majority of coastal foreshore reservation access tracks traverse private property, with very few public access routes available for use. Most of these tracks were pre-existing from shingle extraction operations, mutton-bird harvesting, and recreational fishing and were not of a high standard. Kelp Industries factory operation

generates revenue from various aspects that was, is and will continue to be used for access track upgrading and maintenance to an acceptable standard. Since the conception of the industry in excess of \$850,000 has been utilised for this purpose, whilst also helping to reduce the impact of increasing tourism and general increased recreational use of the coastal areas.

Another tool of control is exercised via the fact the Kelp Industries holds the sole processing rights for *D. potatorum* on King Island. This allows collectors actions on the beach-front to be policed via a Code of Conduct (Attachment 5) that stipulates, at a local level, what the individual will and will not do if they wish to continue collecting. Granted, such a regime only operates successfully in a small and relatively captive community.

A wood fired furnace is used at the factory to dry the product prior to final processing. Environmental impacts on air quality are minimal due to a highly efficient design and high combustion temperatures of 1200 – 1500 degrees Celcius. Wood burned is classed as scrap and is sourced from farms clearing fence lines, Forestry Tasmania's King Island plantation thinnings, old macrocarpa and radiata pines cut down due to age and clearing under or near power lines.

Concerns were expressed by Environment Australia Biodiversity Group in 1999 as to possible impact of kelp collecting upon nesting *Thinornis rubricollis* (Hooded Plover) who frequent some sandy beach areas during the nesting season from September to March. Subsequent discussions on the matter were held to provide for inclusion into the relevant Declaration of Controlled Specimens that "Harvesting and transporting of kelp and/or equipment is prohibited from March to September (inclusive) on sandy beach areas except the north end of British Admiral Beach and any other sandy beach for which a representative from Tasmanian National Parks and Wildlife Service has verified in writing that harvesting would not be detrimental to nesting *Thinornis rubricollis*" (Attachment 6). It must be noted that very little harvesting is done on sandy beaches at any time of the year due to soft sand and the risk of becoming bogged.

Management Operations

Processing the plant material.

Once collected the plants are air dried on racks at the processing factory before being further dried by furnace heat inside the factory to 10% moisture content.

The material is then granulated and processed through different size mesh sieves to meet the range of order requirements (ie; coarse to fine grade).

Kelp Industries Pty Ltd products are now certified organic with NASAA (ref. attachment 8) and are also working towards ISO 14,0001 late 2005.

Monitoring Of The Species & Reporting

What are the maximum quantities of the species that can be collected without adversely affecting the survival in the collection area of the species proposed to be collected?

Kelp Industries has been processing *D. potatorum* since 1976 (Table 1).

The maximum quantities that can be processed will be dependant on the amount of plant material that is washed up. The collection of cast *D. potatorum* will have no adverse effects on the species because only detached plants are collected after being cast ashore. The ecological impact of kelp collection on the foreshore and intertidal zone is currently unknown although extensive literature is available against which these proposals can be evaluated (Attachment 3)

Outlining what methods will be employed to monitor the taking of the specimens.

Processed material entering commercial trade will be entirely restricted to legally obtained material. The Marine Plant Processor Licence, as issued to Kelp Industries by Tasmanian DPIWE, only permits purchase and possession of cast *D. potatorum* from a person holding a current Marine Plant Fishing Licence. A register of these persons is made available to Kelp Industries from Tasmanian DPIWE for cross reference. Due to the process utilising cast material only, the majority of problem endemic to wild harvest fisheries are not applicable. This is especially so where the amount of beach cast material generally far outweighs industry requirements.

Exports are monitored by the issue of permits by Environment Australia Management Authority. The availability of material is also determined by Tasmanian DPIWE when issuing Marine Plant Fishing Licences.

Any other biological and environmental monitoring proposed for the harvesting area.

None considered necessary at this stage.

John Hiscock
General Manager
Kelp Industries Pty Ltd

List of Attachments

Attachment 1 – 1:100,000 map showing harvest areas

Attachment 2 – Licensing under Section 67 of the Tasmanian DPIWE Living Marine Resources Management Act (Kelp Industries Processing Licence 2003/2004)

Attachment 3 – Licensing under Section 67 of the Tasmanian DPIWE Living Marine Resources Management Act [Sample Fishing (Marine Plant) Licence 2003/2004]

Attachment 4 – Copy of Cheshire Management Plan

Attachment 5 – Relevant literature on the ecological role of beach rack
(as per Cheshire Plan annexe)

Attachment 6 – Kelp Collector’s “Code of Conduct”, August 1999

Attachment 7 – Tasmanian NPWS Hooded Plover Habitat Letter

Attachment 8 – NASSA Certification

ATTACHMENT 2

TASMANIA

Long Name: Fisheries Management Act, 1995

FISH PROCESSING LICENCE

Application

Licensee Name:	KOLP INDUSTRIES PTY LTD PO BOX 314 CLARENCE	TAG	7255	Card no: 115224 Card id: 20072 Page: 1 of 2 Transaction: 140417 Transaction type: 05092004 1124 13 Description: Remove Super card
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Applicant: Natural person MR JOHN WILLIAM HISCOCK

Licence(s) valid from 1 September 2004 until 31 August 2005

Fish Processing Licence - Entitlement number 28

Valid from 1 September 2004 until 31 August 2005

Processing Place: 86 NETHERBY ROAD CURRIE TAS 7255

Plant Number
1153

Approved Wild Species: BURVILLEA POTATORUM

INFORMATION

This licence is subject to the conditions specified on this licence.

You should read the Conditions and you must have the nominated natural person (if applicable) and any and all supervisors read this licence and the Schedule of Conditions.

You must display a copy of this licence at each Processing Place and/or Storage Place listed on this certificate.

Note: This certificate may contain details that have been redacted from the certificate on which these licences previously appeared.
Issued for and on behalf of the Minister for Primary Industries, Water and Environment, Tasmania

ATTACHMENT 3

TASMANIA

Department of Primary Industries, Water and Environment

FISHING LICENCE AND FISHING CERTIFICATE

Licence No. 145		Holder MR SALV JERON HANSEN P.O. BOX 292 CURRIE TAS 7259		Tasmania, Australia Grade 2 1993 Issue Date 1/9/03 Expiry Date 31/8/04 Description Marine Plant	
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LICENCES ENJOINED ON THIS CERTIFICATE:

Licence(s) valid from 1 September 2003 until 31 August 2004

Fishing licence (marine plant)

Valid from 1 September 2003 until 31 August 2004

HARVEY BUDGETT LN - KING ISLAND

This fishing licence (marine plant) only authorises the holder to take and not keep seaweed of the species but keep (for) and pot/culture of King Island.

The holder of this licence must collect all fish and keep taken to the holder of a Fish Processing licence endorsed to collect keep seaweed on King Island.

Keep (not catch but keep) is defined as that keep no longer attached to the bottom or no longer in the water. This fishing licence (marine plant) does not authorise the holder to take but keep that is anchored to the bottom or in the water.

It is a condition of this licence that the holder must not enter public or private property without the prior approval of the manager or owner of that property. It is a condition of this licence that the holder must abide with an agreement between the holder and the manager or owner of the property.

This licence is also subject to the conditions specified in the Schedule overleaf.

This licence (marine plant) contains details of the holder valid from the certificate on which these details are only applied. Issued for and on behalf of the Minister for Primary Industries, Water and Environment, Tasmania

ATTACHMENT 4

PROPOSAL TO
THE AUSTRALIAN NATIONAL PARKS
AND WILDLIFE SERVICE
FOR THE MANAGEMENT OF THE
HARVESTING OF
Durvillaea potatorum (La Billardiere)
Areschoug
IN TASMANIA

Prepared by: Anthony Cheshire B.Sc. Ph.D.

1991

Section

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1. EXECUTIVE OVERVIEW

1.1 Introduction.

The aim of this report is to provide a Management Program for the harvesting of Durvillaea potatorum in Tasmania. This program is based on a review of the biological implications of harvesting drift or cast kelp from King Island in Bass Strait. The biological information on which this review is based is drawn from the 15 man years of research into the growth, reproduction and general biology of D. potatorum that has been undertaken throughout the south-eastern Australia (including King Island and Tasmania). In considering this report it should be recognised that the author (Dr. Anthony Cheshire) is working as a consultant to Kelp Industries Pty Ltd. In brief, the author's qualification to act in this manner is established by his doctoral dissertation (The Biology of Durvillaea potatorum, based of five years of intensive research. This work establishes the author as the leading authority in the field.

1.2 Scope of Report.

The specific aims of this report are –

- a) to review the procedures by which D. potatorum is harvested on King Island in Bass Strait ; and
- b) to discuss these activities in terms of their impact on the maintenance of populations of D. potatorum; and
- c) to expand this discussion into areas of possible future developments in the harvesting process; and

- d) to detail a Management Program for the harvesting of D. potatorum which meets the requirements of the Wildlife Protection (Regulation of Exports and Imports) Act 1982.

Appendix A includes a review of the basic biology of D. potatorum. In addition the Bibliography provides a guide to the relevant literature.

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1.3 Summary and Application of the Act.

under the Wildlife protection (Regulation of Exports and Imports) Act a management program approved by the Minister for Arts, Heritage and Environment is a prerequisite of the granting of permission for the commercial export of products if native Australian Wildlife originating from wild taken specimens.

The overall intent of the Act is it applies to the export of kelp harvested in Tasmania, is to ensure that the harvesting of D. potatorum will not have an irreversible effect on, or be detrimental to, the survival of the species, any sub-species or its habitat. The existing evidence would indicate that, throughout the range of D. potatorum in Australia, a single species exists and there is no justification for sub-division of the populations at the level of the sub-species (see Appendix A.40)

1.4 Summary of the proposed Management program.

- (i) Harvesting of D. potatorum shall be restricted to the collection of detached plants, which have been cast ashore on King Island.
- (ii) Harvesting shall be done in a manner, which does not interfere with attached plants. In particular, detached plants, which are lying amongst attached plants, shall not be collected.

(iii) Plants which are living attached to the substratum shall not be disturbed in any manner. Particularly they shall not be cut or harvesting, selectively thinned, pruned or in any way husbanded or cultivated.

(iv) Commercial harvesting operation shall only be undertaken by an individual or organisation licensed to do so under the Crown Lands Act of Tasmania (1976), or by an individual or organisation authorised to undertake harvesting by arrangement with an individual or organisation so licensed.

(v) Any individual or organisation involved in harvesting D. potatorum shall make available to the Designated Authority, upon request, information on

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the amount and collection sites of all harvested material.

(vi) Individuals or organizations licensed to harvest kelp shall make arrangements for an independent competent body to undertake, at three yearly intervals, assessments of the status of populations of D. potatorum on sample sites adjacent to areas of harvesting and sample sites in unharvested areas. Data relating to population structure and standing crop will be collected and analysed using the methods of Cheshire (1985). the results of such investigations will be related to the results obtained by Cheshire (1985) and any variations discussed and reviewed in terms of the harvesting procedures.

On King Island three sites should be sampled these being Fitzmaurice bay (northern end), Cape Wickham (western side) and Stokes Point (eastern side). The results of such assessments shall be provided to the Designated Authority within six months of completion.

(vii) If at any time evidence exists to indicate that the Program is not meeting either the requirements of the Act or the requirements of the industry, all parties involved in the Program shall meet the Australian National parks and Wildlife Service, to review the program.

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2. THE BIOLOGICAL IMPLICATIONS OF HARVESTING.

2.1 Discussion of the existing procedures.

Kelp Industries Pty Ltd have established and operate the only viable kelp harvesting industry in Australia. This industry has been running for over 10 years and in that time has made significant contributions to the economy of King Island. There is no evidence to suggest that the activities of Kelp Industries have caused any harm to the near-shore/coastal ecology of King Island. In 1979 the Kelp Harvesters Association (organisation of individuals who harvest kelp for Kelp

Industries) and Alginate Industries in Scotland, (now Kelco/AIL International Ltd) expressed an interest in the ecology of D.potatorum and provided funds for research to Monash University.

In discussion with the author of this report, senior management of Kelco/AIL International Ltd, London and Webster Ltd, Hobart (joint venture parents of Kelp Industries Pty Ltd) have demonstrated an understanding of the biology of D.potatorum and a concern for the preservation of this plant in its native environment. It is recognised by the partners in this venture that their company depends on the preservation of the native kelp stands as a source of raw materials and any disruption of this balance would harm their industry.

Finally, Kelp Industries have a standing investment of \$1.3M at King Island and elsewhere have expended approximately \$1M in process research on D.potatorum.

The harvesting procedures which have been used by Kelp Industries, currently the sole licensee, do not present any concerns in terms of the

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conservation of D.potatorum or the protection of its habitat. This statement is supported by the following:

- a) Kelp Industries are only concerned with the collection of D.potatorum plants which have been cast onto the beaches of King

Island. The harvesting process involves only the collection of the larger, freshly cast plants. A large proportion of the cast kelp is not collected, many plants or plant pieces are too small to be worth the effort, alternatively, the material may have begun to rot and thus is of no value. It should be noted that these plants are either dead or will die in the immediate future. The plant once detached from the substratum cannot re-attach, it does not have any future role as a member of a kelp stand nor is it able to influence or interact with any kelp plant in the kelp stand.

Some plants may, if they detach during the fertile season, release gametes. It is very unlikely that these gametes play a significant or even measurable role in the maintenance of the species (footnote 1). Once collected the kelp plants are removed from the beaches and taken to the processing plant.

- b) In evaluating the harvesting procedures presently used (and prescribed in this program) it should be noted that King Island populations of D.potatorum represent only a small component of the D.potatorum in Australia (covering approx. 9% of the distribution). Notwithstanding that current activities do not seem to pose any threat to the existing populations; any harvesting at King Island will have at worst, minimal impact on the species as a whole, due to the extent of its distribution throughout the rest of South-eastern Australia.

- (1) An analogy in this respect would be the value of pollen from trees which have been logged, as a potential source of future populations, this is quite obviously insignificant in real terms.

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In summary because no data exists to suggest that the King Island populations can be classified as a separate sub-species, the overall conservation of the species could be achieved by simply restricting the harvesting to King Island.

2.2 Discussions of alternative procedures (footnote 2).

Keeping in mind the manner in which kelps in other parts of the world are harvested, it is worth reviewing other scenarios which may be considered viable options for D.potatorum harvesting at a future date. it is important to review these options because, whilst existing procedures do not cause concern, there are practices which if implemented in the harvesting of D.potatorum, would impact the survival of the kelp stands.

Appendix A of this report discusses in some detail the delicate balance which exists between the adult canopy and the juvenile understorey in a D.potatorum stand. This balance is maintainable if, and only if, plants are undisturbed. Detachment of individuals, when it occurs in the native stand, is random. The juveniles in the understorey, whilst becoming more exposed, are generally still afforded some protection by adjacent adults. Any attempts to remove adult plants would disrupt this balance and endanger the existence of the entire stand. For this reason, removal of attached plants (especially the larger adults) is not permitted under the management program.

- (2) It should be stated that Kelp Industries do not foresee any likelihood of changing their existing harvesting procedures.

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Instead of removing entire plants it may be considered a viable option to cut lamina tissue from selected plants. This selective pruning, whilst not exposing juveniles, may provide a source of processable material. There are serious consequences of this action:

- a) Plants, once they lose lamina tissue, become hydrodynamically unbalanced. In the extreme conditions of violent wave action, they often detach due to a change in the distribution of stresses upon the supporting structures (i.e. the stipe and holdfast).
- b) Apical tissue is the primary region of growth and conceptacle production: pruning would thus reduce productivity and reduce reproductive potential. In both cases the impact on the native stands could be disastrous.

2.3 Summary and conclusion.

Existing harvesting procedures are likely to have minimal impact on the populations of D.potatorum or their habitat. Alternative harvesting procedures considered under this program have a significant potential to affect the viability of stands of

D.potatorum. prescriptions concerning the method and site of harvesting are therefore key elements of the management program. Within this program the prescriptions are designed to minimize the chance of any adverse impact on populations adjacent to harvesting sites and to prevent any impact on other populations. The protection of stands from interference would also ensure the future supply of cast plants.

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3. MANAGEMENT PROGRAM

3.1 What can be harvested.

“Harvesting of D.potatorum shall be restricted to the collection of detached plants which have been cast ashore on King Island.”

The aim of this prescription is to identify which plants may be removed and to ensure that harvesting activities are restricted to King Island thus preventing any impact on native populations in other areas.

3.2 How shall plants be harvested.

“Harvesting shall be done in a manner which does not interfere with attached plants. In particular, detached plants which are lying amongst attached plants, shall not be collected.”

This prescription would ensure that living populations are not disturbed “incidentally” to the harvesting process. It places a higher priority on preservation of the attached populations than on harvesting of detached plants.

3.3 Interference with attached populations.

“Plants which are living attached to the substratum shall not be disturbed in any manner. Particularly they shall not be cut for harvesting, selectively thinned, pruned or in any way husbanded or cultivated.”

Section 2 of this report discusses the implications of removing adult plants from a D.potatorum bed. This prescription is designed to preclude any possibility of causing damage to the existing populations. This is achieved by prohibiting any activity which would interfere with the natural balance within the D.potatorum population.

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3.4 Who shall be allowed to harvest D.potatorum.

“Commercial harvesting operations shall only be undertaken by an individual or organization licensed to do so under the Crown Lands Act of Tasmania (1976), or by an individual or organization authorized to undertake harvesting by arrangement with an individual or organization so licensed.”

This prescription allows entry into the industry to be controlled to ensure that commercial exigencies, resulting from a competitive environment, are prevented from

either obscuring or diluting individual responsibilities to the detriment of the conservation of D.potatorum.

The Tasmanian government has issued under section 41 of the Crown Lands Act (1976) a full license and sole right to Kelp Industries Pty Ltd for the harvesting of cast D.potatorum from all Crown areas around King Island. This licence was originally issued on 5/8/77 with a Supplemental Agreement dated June 1985 and covers the harvesting until 1994 with a further 5 year option lasting until 1999.

3.5 Reporting of harvest information.

“Any individual or organization involved in harvesting D.potatorum shall make available to the Designated Authority, upon request, information on the amount and collection sites of all harvested material.”

This prescription allows for monitoring of the amount and location of D.potatorum which is being harvested. This information could provide a basis for future reviews of prescriptions on harvesting.

3.6 Monitoring of native stands.

“Individuals or organizations licensed to harvest kelp shall make arrangements for an independent competent body to undertake, at three yearly intervals, assessments of the status of populations of D.potatorum on sample sites adjacent to areas of harvesting and sample sites in unharvested areas. Data relating to population structure and standing crop

will be collected and analysed using the methods of Cheshire (1985). The results of such investigations will be related to the results obtained by Cheshire (1985) and any variations discussed and reviewed in terms of the harvesting procedures.

On King Island three sites should be sampled these being Fitzmaurice Bay (northern end). Cape Wickham (western side) and Stokes Point (eastern side). The results of such assessments shall be provided to the Designated Authority within six months of completion.”

This prescription is designed to address the need for “adequate” periodic monitoring and assessment and assessment of the effects of the taking of specimens under the management program.” This is a difficult area to cover in a Management Program which deals with plants which are not only dead but are also removed (through being cast onto the beach) from their habitat.

The major element of this prescription is to identify the appropriate analyses to be undertaken and the data to be collected in order to provide information on population structures and standing crop. Results obtained may then be compared to the “baseline” data obtained and published by Cheshire (1985: chapter 5). If the results obtained indicate a significant change has occurred then further work should be undertaken to identify the causal factors.

3.7 Review procedures.

“If at any time evidence exists to indicate that the Program is not meeting either the requirements of the Act or the requirements of the Industry, all parties involved in the Program, shall meet with the Australian National Parks and Wildlife Service, to review the program.”

The requirements of both government and industry, as with our understanding of biological systems, changes. This prescription aims to provide a forum for review of the Management Program.

APPENDIX A. THE BIOLOGY OF DURVILLAEA POTATORUM

A.1 Taxonomy and Distribution

Along many exposed rocky coastlines of the temperate to sub-antarctic regions in the Southern Hemisphere, the larger brown alga Durvillaea is a dominant member of the intertidal and shallow sub tidal flora. The genus Durvillaea is generally classified within the Order Fucales and consists of four species, Durvillaea Antarctica (Chamisso) Hariot, Durvillaea chathamensis Hay, Durvillaea potatorum (La Billardiere) Areschoug and Durvillaea willana Lindauer (Hay 1979).

D.potatorum, the subject of this report, is endemic to the exposed rocky coasts of south-eastern Australian where it extends as far north as Bermagui on the New South Wales coast and west to Robe in South Australia (Womersley 1959). It is found along the west coast of Tasmania, as far north as Bicheno on the east coast and around the western islands of Bass Strait (Bennet and Pope 1960).

A.2 Description of D.potatorum

The plant is anchored to the rock by a discoid, conical or scutate holdfast. Above this there is a terete to slightly flattened stipe and the lamina may be variously perforated and proliferated. Within these confines the form of the plant is highly variable.

In most cases the holdfast is conico-discoid in shape. In many instances the holdfasts of juveniles which are growing close together coalesce forming a multi-stiped habit. The stipe can grade gradually or abruptly from the holdfast. This stipe grades into the lamina by becoming a flattened ellipse in section.

The lamina is planular, variously perforated and proliferated. Proliferations arise either from splitting of the primary blade or from secondary stipes. The basal region of the lamina has been termed the palm

(Naylor 1953) and in D.potatorum it is this region which is capable of initiating secondary stipes. Secondary stipes are similar in form to the primary stipe, they have many stress marks and in some cases arise from wound sites on the palm or primary stipe. Wound sites further up the primary lamina do not generally form proliferations with stipe like pedicals, but produce simple flat proliferations.

Perforations which occur in the lamina of this species appear to be associated with a slime mould infection of the lamina. This slime mould has been tentatively identified as being a species from the order Plasmodiophorales (Jahnke 1978). The infection causes necrosis of the surrounding tissue, the necrotic zone develops as an unpraised section on the lamina which is worn away leaving a hole.

A.3 Reproduction and growth.

Durvillaea exhibits a typical Fuclean life cycle. Plants are dioecious (separate male and female plants) and the reproductive structures (conceptacles) are found scattered over the fronds of mature plants. Each conceptacle contains either antheridia or cogonia; in a manner similar to certain other Fuclean algae Durvillaea has cogonia containing four eggs, and antheridia containing sixty four spermatozoids. Plants reach maturity at 2.5 – 3 years of age and thereafter produce conceptacles annually. The cogonia and atheridia mature and are released in the period June through to September.

Once released the female gamete exudes a pheromone (hormosirene) which attracts the male gaemete (Clayton pers. comm.). Fertilization occurs and the resultant germling quickly secretes a mucilaginous wall which aids it in attaching to the substratum. Subsequent divisions cause differentiation of the germling into a tiny plant (sporeling) having a defined holdfast, stipe and lamina. This sporeling continues to grow throughout its life.

There are two aspects to growth in D.potatorum. Firstly there are divisions

of the meristoderm (outer “skin” of cells). These divisions result in a broadening and thickening of the various structures of the plant. In addition there is a marked increase in division in the apex of the plant which gives an apical component to the growth (Rolley 1980). Increases in the biomass of individuals can be attributed primarily to increases in length (i.e. derived from the apical growth component). Increases in the width and thickness, due to the diffuse growth within meristoderm, largely act to strengthen the older portions of the plant and assist in accommodating the increased hydrodynamic stresses due to the overall increase in plant size.

A.4 The question of sub-species

In biological terms the definition of a sub-species is largely subjective. For D.potatorum it is believed that no sub-species exist. Cheshire (1985) presented an extensive analysis of morphological data from throughout the range of D.potatorum. The results from this analysis indicated that a major component (34%) of morphological variation could be attributed to gross habitat effects (wave force, depth and exposure), whilst another 22% was attributable to latitude and longitude. The balance of the variance in morphology is due to the differing age structures of the populations and random variation in the measurement procedures. Given that latitude and longitude correlate with other environmental gradients (e.g. light intensity or water temperature) it is considered that a very minor component, if any, of the morphological variation is a result of specific differentiation.

A.5 Population structure and dynamics

A mature population of D.potatorum contains plants from all sizes from new season sporelings (microscopic .. 10mm) to the largest adult plant (often exceeding 8m in length with a wet weight of up to 50kg). Unlike terrestrial plants, D.potatorum does not produce seeds. As discussed earlier, reproduction is through the fusion of a sperm and egg resulting in the development of an embryonic germling. A major consequence of this difference in life cycles is that reproductive potential is not stored in a seed bank. All reproductive potential is stored in a “sporeling” (equivalent to seedling) bank of small plants under the protective canopy of the older more mature individuals. Cheshire (1985) provides detailed figures for “age class” distributions in D.potatorum stands. These data illustrate the storage of reproductive potential in a “sporeling” bank and accounts for the high numbers of juvenile plants in the populations.

Typical biomass figures for D.potatorum are in the order of 20-2kg per square metre. This is similar to the biomass found for other species of the larger marine brown algae.

Cheshire (1985) proposed a model illustrating the interaction and inter-dependencies of the various components in a kelp bed ecosystem. an important aspect of that model is the importance of large adults in –

- a) protecting the small juveniles from direct wave force: and
- b) expanding the kelp bed through sweeping the substratum and providing free space for juvenile recruitment.

In his discussion Cheshire (1985) concludes that adults play a vital roll in maintaining and expanding the beds. Rolley (1980) made observations which parallel these discussions. In an experiment where adult plants were removed from an area it was noted that juveniles in the newly exposed area quickly died. Rolley (1980) concluded that the death of the understorey juveniles was a result of their being directly

exposed to the violent wave forces. It becomes apparent that a delicate balance exists in which the

survival of the bed depends on the preservation of the adult canopy.

In nature removal of adults does occur but this is primarily a random event and in general cover for the underlying juveniles is provided by adjacent adults.

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ATTACHMENT 5

Report on the Policy Document and Fishery Management Plan for the Taamanlan Marine Plant Resource

Prepared for: Jolly Industries Pty Ltd by: Anthony Lee-Site BSc, PhD MAFHO

The following document comprises terms of reference and the proposal for the Taamanlan Marine Plant Resource Policy Document and Fishery Management Plan. The following is a summary of the Policy Document and Fishery Management Plan prepared for Jolly Industries Pty Ltd by Anthony Lee-Site BSc, PhD MAFHO.

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Introductory letter

The purpose of this letter is to inform you of the proposal for the Taamanlan Marine Plant Resource Policy Document and Fishery Management Plan.

Paragraph 2 - Fisheries regulated through fishery specific Management plans

Key fisheries regulated through fishery specific Management plans include the following:

In 1991 the Australian National Marine Fisheries Agency (ANMFA) was established to manage the following fisheries:

Paragraph 3 - "there are now very few fisheries in Tasmania which could be considered to be fully prawn captured"

The following document comprises terms of reference and the proposal for the Taamanlan Marine Plant Resource Policy Document and Fishery Management Plan.

Part 1 - The Policy Document

1.1 Firing method

Now and the existing manager in place for *Discipline* gives details of the way in which the policy and systems for firing should be developed for business. This practice has been approved by ANZCA and is being passed on to be made available to other government organisations.

1.2 Firing system

This section is a detailed guide to the system for firing which is required to be implemented. It includes a list of the steps to be taken for the special cases of firing, such as firing on the grounds of incapacity or ill health. A further section will be added to the policy document to provide a detailed guide to the system for firing. The list of steps to be taken for firing is given in the following table.

1.3 Firing a duty and employment

The document is a guide to the way in which the policy should be implemented in practice.

1.4 Summary of objectives

The objectives of the document are to provide a guide to the way in which the policy should be implemented. The objectives are general, and do not include the objectives of the system for firing, which will be set out in the following sections. The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice. The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice.

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1.4.1 Maintaining business at acceptable levels

The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice. The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice.

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1.4.2 Maintaining staff at acceptable levels

The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice. The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice.

1.4.3 Commercial firing - objectives

The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice. The objectives of the system for firing are to provide a guide to the way in which the policy should be implemented in practice.

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2.4.7 Environmental Interactions

Land Use/cover, Ecosystems, and other elements are addressed through the MRC's efforts of a coordinated program of research which also has the major priority in the sustainable development of the Territory. It should be noted that the King Island

ATTACHMENT 6

KELP COLLECTORS CODE OF CONDUCT

1. ALWAYS KEEP TO ORIGINAL FORMED TRACKS.
2. ALWAYS LEAVE GATES AND PANELS AS FOUND.
3. DO NOT KELP FROM PRIVATE LAND WITHOUT PERMISSION FROM LANDOWNER OR NOMINATED OVERSEER.
4. IF ROCKS ARE USED FOR WHEEL CHOCKS, DO NOT LEAVE THEM ON TRACKS.
5. KEEP GATHERINGS AND STIPES ON BEACH SIDE OF TRACKS, NOT ON FARMERS LAND.
6. IF HEAPS ARE PULLED UP:
 - DO NOT BLOCK ACCESS FOR OTHERS.
 - DO NOT LEAVE FOR MORE THAN 48 HOURS.
 - IDENTIFY HEAP TO AVOID SALVAGE BY OTHER PERSONS.
7. SALVAGED KELP MUST BE PULLED UP PAST HIGH WATER MARK.
8. DO NOT DISTURB COASTAL FLORA OR FAUNA AT ANY TIME.
9. DO NOT DRAG KELP TAILS ALONG TRACKS OR ROADS, CUT TAILS OFF AT THE BEACH ONLY.
10. DO NOT LEAVE ANY RUBBISH AT THE BEACH OR ON PRIVATE LAND.
11. VERIFY YOUR OWNERSHIP WHEN SALVAGING KELP FROM DRYING RACKS.
12. WHEN ON KELP INDUSTRIES PTY LTD SITE, ENTER PAST UNLOADING RACKS ONLY,
TO CHECK YOUR HANGING KELP.
13. DO NOT EXCEED 15 KPH WHEN ON KELP INDUSTRIES SITE.



Department of Parks, Wildlife and Heritage

Env No
Dir No

17/01/2006 10:00

MEMO to: Geoff Sutton - Manager, Waste Unit (cc)ed the unit.

SUBJECT: Follow-up of items lost Ball Bay, June 2004 - update.

I have reviewed items lost in Ball Bay on 15/06/04 and to assist in the identification of the items I have prepared a list of items collected from the beach area of the flooded area:

1. 1000 - 1500 pieces of sea shells (mostly for most species)

2. 1000 - 1500 pieces of wood (mostly from wood shed)

3. 1000 - 1500 pieces of metal (mostly from metal shed)

4. 1000 - 1500 pieces of plastic (mostly from plastic shed)

5. 1000 - 1500 pieces of glass (mostly from glass shed)

6. 1000 - 1500 pieces of paper (mostly from paper shed)

7. 1000 - 1500 pieces of fabric (mostly from fabric shed)

8. 1000 - 1500 pieces of clothing (mostly from clothing shed)

9. 1000 - 1500 pieces of other items (mostly from other shed)

The items listed above are being collected from the beach area of the flooded area and are being stored in the shed area of the flooded area.

The items listed above are being collected from the beach area of the flooded area and are being stored in the shed area of the flooded area.

Geoff Sutton
Manager, Waste Unit

