Intertidal and Subtidal Benthic Marine Algae of the Falkland Islands
March 2010
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1. Introduction

The Falkland Islands are an archipelago of 776 islands situated in the South Atlantic Ocean approximately 300 miles from the coast of mainland South America and 700 miles from mainland Antarctica. Despite occupying the same position in the southern hemisphere as the UK does in the northern, the Islands are surrounded by cool south Atlantic waters contributing to the sub Antarctic climate. Although there are climatic similarities with the Shetland Islands these similarities do not extend to the marine flora of the islands. Unlike the seaweeds of the British Isles those of the Falklands are much less studied and documented, with a composition differing considerably to its northern counterpart.

Marine benthic algae, frequently referred to as seaweed, are a common feature of the coastline of the Falkland Islands. They occupy vast areas of the rocky littoral zone extending to depths of 40m highly visible from both land and air. However, despite their obvious presence they are generally considered to be a less appealing subject of study and little is known of their diversity and distribution around the Falkland Islands. Their importance is often overlooked with more focus placed on the more charismatic marine species. However, seaweeds provide a visible transition from terrestrial to marine ecosystems and are tolerant of emersion and submersion, their canopies providing food and shelter for a number of marine organisms.

2. Survey Objectives

The lack of current knowledge on the diversity of marine algae in the Falklands has instigated further studies in this area to gain an increased understanding of their distribution, composition and general diversity. Due to the relatively remote situation of the Falkland Islands there are likely to be a number of regional, endemic and cosmopolitan species.

The investigation aims to produce a comprehensive species list for the diversity of seaweed of the Falkland Islands and valuable baseline data for future monitoring and assessment. Therefore a number of outputs have been proposed:

- Conduct surveys at a number of intertidal and subtidal sites with varying environmental conditions
- Production of a comprehensive species list
- Description of the Falklands seaweed diversity in terms of composition and distribution.
- Literature review to encompass all previous historical data records.
- Production of a biological reference collection of specimens, including herbarium material and a photographic collection of various in-situ, macroscopic and microscopic images to assist with a species guide book.

3. Literature Review

There is currently limited literature focusing on the diversity of seaweeds of the Falkland Islands with few surveys conducted, most of which occurred during the late 1800's and early 1900's. More recent publications are scarce and provide limited species records. Algaebase, an internet based catalogue of worldwide seaweed distribution, provided a number of references spanning over a time period from 1849 (Harvey) to 2006 (Hommersand) with a total of 19 references. Many of these only cite a single species although some include more extensive records.
One of the earliest publications by Cotton (1915) provides the most comprehensive species list to date and provides a good insight into the general levels of seaweed diversity from a variety of locations around the Falklands. Similar species list were later produced by Kylin and Skottsberg in 1919, Papenfuss in 1964, although these are far less extensive, and more recently by Margaret Clayton in 2002 although this list is not thought to be complete.

Cotton (1915) details the floral collections of Mrs Vallentin between 1909 and 1911 who concentrated her collections within the western Islands of the Falklands. During her work she produced a herbarium consisting of 400 mounted specimens collected primarily from West Point Island, Roy Cove and Shallow Bay. Vallentin (Cotton, 1915) also documented findings on the general levels of seaweed abundance with particular reference to drift Kelp found in the littoral, reporting quantities of 6 feet high, 10-15 yards wide and stretching for hundreds of yards. Such large areas of drift were dominated by Lessonia, Durvillea and Macrocystis and have continued to dominate areas of the upper shore at several locations. Although this is a common sight during severe storms Vallentin makes further accounts of the kelp mucilage forming a slick on the sea surface dense enough to effectively calm the crest of the wave. Most of this drift is not utilised and although has limited impact does produce a noxious odour.

The most recent study of seaweed within the Falklands was conducted by Clayton during December 2002 to January 2003 with the intention of producing a scientific checklist of the seaweeds of the Falkland Islands including an illustrated guide book to the common species and an accompanying herbarium. Although not yet complete many specimens are being prepared for the Falkland Islands National Herbarium and Natural History Museum in London and will provide a more current account of the seaweed composition.

Claytons work describes the marine flora of the Falkland Islands as comparable to that of Antarctica, the sub Antarctic islands and South America (unpubl). From unpublished reports Clayton makes reference to previously unrecorded species as well as the possibility of species new to science. Currently collections of more than 350 specimens of seaweed are still in the process of identification which far exceeds historical records. These include both intertidal and subtidal specimens from Cape Pembroke, Berkeley Sound, Stanley, The Canache, Sea Lion Island, Weddell Island, Hill Cove, Roy Cove, Pebble Island, Ruggles Bay, Darwin and Port Sussex.

During February and March of 2010 additional surveys were conducted to re-assess the current species diversity levels of both intertidal and subtidal seaweed. These findings are documented within this report.

4. Methodology

In total 9 sites were sampled for seaweed species located within the areas of Stanley Harbour, Port William, Berkeley Sound and Saunders Island. Collecting localities are indicated in Figures 1 and 2 further details are provided in Table 1. Sites were chosen based on their accessibility, differing habitat types and general environmental conditions. Most surveys were concentrated within the area of Port William and consisted of both intertidal and subtidal collections depending on the location.
Table 1: Site locations including habitat and date sampling commenced.

<table>
<thead>
<tr>
<th>Location</th>
<th>Habitat</th>
<th>Survey Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couchon Island</td>
<td>Subtidal</td>
<td>31/10/10</td>
</tr>
<tr>
<td>Beatrix point</td>
<td>Subtidal</td>
<td>02/11/10</td>
</tr>
<tr>
<td>Hells Kitchen</td>
<td>Subtidal</td>
<td>04/11/10</td>
</tr>
<tr>
<td>Sparrow Cove</td>
<td>Subtidal</td>
<td>24-02-10</td>
</tr>
<tr>
<td>Kelly’s Rocks</td>
<td>Subtidal</td>
<td>03-03-10</td>
</tr>
<tr>
<td>Whale Bone Cove</td>
<td>Intertidal</td>
<td>27-02-10 &amp; 16-03-10</td>
</tr>
<tr>
<td>Stanley Harbour</td>
<td>Intertidal</td>
<td>01-03-10</td>
</tr>
<tr>
<td>Hookers Point</td>
<td>Intertidal</td>
<td>28-02-10</td>
</tr>
<tr>
<td>Saunders Island</td>
<td>Intertidal</td>
<td>08-03-10</td>
</tr>
</tbody>
</table>

Figure 1: Map of the Falkland Islands indicating the main area of seaweed species collection and additional site of opportunistic collection.

Figure 2: Individual site locations of seaweed species collections around the areas of Stanley Harbour, Port William and Berkeley Sound.
4.1 Field Methods

There are no detailed methodologies on the collection of intertidal or subtidal algae. Vallentin describes her surveys as ‘beach combing’ with additional accounts of subtidal dredging extending the collections to drift specimens. Although this survey has also utilised a general beach combing approach it has been limited to attached specimens only to ensure full confidence in the levels of algal diversity. Each location was scoured for seaweed species ensuring all subhabitats were included, such as crevices, caves and rockpools, covering as large an area as possible. On each subsequent survey only additional and previously uncollected species were removed for continued identification. Therefore the final species list is a cumulative species list for the Falklands rather than individual comprehensive site specific species lists.

The collection of seaweed within the intertidal sites was achieved during low tide, collecting for approximately two hours covering the full extent of the littoral zone, from the sublittoral fringe to the terrestrial boundary. At such time site descriptions were noted to record general location, overall appearance, topography, habitats and subhabitats and other related parameters.

Subsequent to specimen collections samples were identified using both compound and stereo microscopes using a variety of identification guides and existing herbarium specimens from previous studies. All specimens were identified where possible to species level encompassing all morphological forms including microscopic epiphytic forms. Where the specimens were of sufficient size they were prepared for pressing.

4.2 Procedure for Preparing Herbarium

The fresh specimens were cleaned of sand particles, rocks, shells, mud and other adhering materials and epiphytes. Each specimen for pressing was placed in a clean tray containing fresh water (this prevents salt crystals forming when dry). Paper was submerged fully in the tray of water below the specimen, which was then spread to fully display its morphological characteristics. After mounting the specimen on the herbarium sheet, sheet was slowly lifted and tilted to one side to allow water to drain gradually without disturbing the mounted specimen. If required the specimen could be adjusted once removed from the water using forceps or a needle. The mounted specimen was placed on paper towels to removed excess water and muslin cloth placed over the entire specimen. Additional paper towels were placed on top of the herbarium sheet. This was repeated with each specimen piling the herbarium sheets one above the other and placing them between two wooden blocks of the press. The press was tightly squeezed using appropriate ties. Blotting papers were change after the first two hours and at 24 hours intervals after the initial replacement. The process of replacing blotting papers was repeated till the specimen was free of moisture. Once the specimen was dried the muslin cloth was gradually peeled away from the specimen which due to the presence of phycocolloid (a natural glue) in the seaweed remained attached to the herbarium sheet. However, if the specimen was not fully stuck to the herbarium sheet glue was used to properly secure them.

Each sheet was carefully labelled including location of collection, species name and authority, family, order, date of collection, collector and any other important ecological details. The label was firmly fixed to the lower right-hand corner of the herbarium sheet.
5. Site Locations and Descriptions

**Sparrow Cove**
Sheltered shallow sloping sublittoral area, primarily sandy or silty substrate with little firm substrate for attachment therefore limited species diversity. Many of the foliose red species were drift. There were small patches of algae attached to small rocks including species of Ulva, Lessonia and many filamentous reds. On closer examination of the specimens collected there appeared to be a few epiphytic species present. Not a diverse algae habitat with the intertidal appearing sandy and cobbly and with limited exposure to wave action.

**Whale Bone Cove**
This is a very sheltered bay with considerable drift. The area consists of a shallow sloping predominately sandy substrate scattered with large slabs of rock and very shallow rockpools. Opportunistic algae such as Enteromorpha dominated within the sandy area. Towards the north of the bay there were much larger areas of rocky outcrops but with few rockpools and relatively devoid of algal diversity. Much of the shore was dominated by a few species and was greatly affected by sand scour. Due to the lack of sublittoral hard substrate there was no kelp zone present and also no characteristic upper shore green algae diversity.

**Hookers Point**
Moderately exposed shore dominated by flat rocky platforms. Much of the area was dominated by mussels and barnacles which tend to compete with the algae for attachment. Despite the variety of rockpools many were dominated by calcareous algae which covered much of the submerged intertidal. There was a distinct kelp zone consisting of Durvillaea, Lessonia and Macrocystis. The general level of diversity was low consisting mainly of finer filamentous forms such as Ceramium and Spongomonopha.

**Stanley Harbour**
A sheltered shore with limited extent and very shallow sloping. Primarily a soft sedimentary shore scattered with large rocks and some areas of rocky outcrops. Rockpools were scarce and often very muddy and the shore showed high levels of drift particularly on the upper shore. There was no kelp zone due to the soft substrate but a low diversity of species could be found within the more extensive rocky areas and pools.

**Kelly’s Rocks**
A subtidal site within a relatively sheltered area close to the Tussuck Islands. This area was dominated by Macrosystis beds with some foliose red algae attached to the base. There wasn't a high diversity of species present most of which consisted of red species with no obvious green species and very few brown species. Much of the substrate was covered with calcareous red algae.

**Saunders Island**
A couple of sites were briefly surveyed the first was at the neck and consisted of an area of rocky platforms gently sloping to a sandy substrate which was moderately exposed. Lessonia was visible only as it broke the surface water, there were no real rockpools and only a few species present. The second site was at the settlement in a very sheltered rocky bay, this had some shallow rockpools but most were quite turbid. There was a little drift but some species could be found in the pools. The algae was dominated by finer filamentous or foliose forms such as Ulva, Enteromorpha and Ceramium. Not a particularly diverse shore.
**Couchon Island**
A shallow subtidal site at between 5m and 10m depth situated at the south western point of the Island. This site did not appear to be highly diverse in terms of seaweed but had a good covering of foliose and filamentous reds primarily attached to the basal holdfasts of macrocystis. The substrate was generally of shingle and small rocks with less firm substrate.

**Beatrix point**
This subtidal site was located at the mouth of Port William on a peninsula on the northern side. The area was densely populated with Macrocytis attached to stable firm rocky ridges. The ridges provided an number of subhabitats including very overhangs and crevices. The base of the Macrocytis was covered in red, green and brown species. A large wall was also present approximately 5m in depth and extending for several meters. The provided an ideal habitat with sheltered from the currents allowing a number of foliose, filamentous and calcareous red species.

**Hells Kitchen**
This subtidal site was also located on the northern side of Port William on a small peninsula at the mouth just south of a small bay. The site also consisted of stable rock ridges with a number of overhangs and crevices and dense forests of Macrocytis. The typical flora consisted of Desmarestia species, filamentous, foliose and encrusting red algae and some species of Ulva and Monostroma.

### 6. List of Species

**Chlorophyta**

**Acrochaete leptochaete** (Huber) R. Nielsen

*Historic records.* None

*Notes.* Identified within the cells of Ceramium sp.

**Acrosiphonia arcta** (Dillwyn) Gain

*Historic records.* Vallentin (Cotton, 1915) recorded as *Cladophora arcta*.

**Blidingia minima** (Nageli ex Kutzing) Kylin

*Historic records.* None

**Bryopsis hypnoides** J.V. Lamouroux

*Historic records.* None

*Notes.* Previous records identify B. plumose or B. rosea, specimens identified during the recent study showed branching to be spirally arranged.

**Cladophora albida** (Nees) Kutzing

*Historic records.* None

*Notes.* Identification requires confirmation

**Cladophora falklandica** (J.D. Hooker & Harvey) J.D. Hooker and Harvey

*Historic records.* Vallentin (Cotton, 1915) located at Berkeley Sound and Roy Cove, and Taylor (1939)

**Cladophora subsimplex** Kutzing

*Historic records.* Vallentin (Cotton, 1915)

**Codium effusum** (Rafinesque) Delle Chiaje

*Historic records.* Vallentin (Cotton, 1915) located at Roy Cove

**Codium fragile** (Suringar) Hariot

*Historic records.* Vallentin (1915) located at Port William, West Point Island, Shallow Bay, Berkeley
Sound, St Salvador Bay, Roy Cove, Port Stanley and King George Sound.

Notes. Present in large abundances as drift algae at several localities on Saunders Island.

**Derbesia marina** (Lyngbye) Solier

*Historic records.* None

**Monostroma sp.** Thuret

*Historic records.* Clayton and Wiencke (2002) identified *Monostroma hariotii*

Notes. Most species lost their colouration rapidly subsequent to collection acquiring a distinct black colour.

**Rhizoclonium sp.** Kutzing

*Historic records.* None

**Ulothrix speciosa** (Carmichael ex Harvey in Hooker) Kutzing

*Historic records.* None

**Ulothrix subflaccida** Wille

*Historic records.* None

**Ulva bulbosa** Suhr

*Historic records.* None

Comments. Identification was based on a small specimen found growing epiphytically on *Ceramium* sp.

**Ulva compressa** Linnaeus

*Historic records.* Vallentin (Cotton, 1915)

**Ulva flexuosa** Wulfen

*Historic records.* None

**Ulva intestinalis** Linnaeus

**Ulva lactuca** Linnaeus

*Historic records.* Vallentin (Cotton, 1915)

**Ulva linza** Linnaeus

*Historic records.* Vallentin (Cotton, 1915)

**Ulva prolifera** O.F. Miller

*Historic records.* None

**Ulva rigida** C. Agardh

*Historic records.* Taylor (1939)

**Phaeophyta**

**Acinetospora crinita** (Carmichael) Kornmann

*Historic records.* None

**Adenocystis utricularis** (Bory de Saint-Vincent) Skottsberg

*Historic records.* Vallentin (Cotton, 1915)

**Caepidium antarcticum** J Agardh

*Historic records.* Vallentin (Cotton, 1915)

**Chordaria linearis** (J.D. Hooker and Harvey) A.D. Cotton

*Historic records.* Vallentin (Cotton, 1915)

**Cladostephus spongiosus** (Hudson) C. Agardh

*Historic records.* Vallentin (Cotton, 1915)

**Colpomenia peregrine** Sauvageau
Historic records. Vallentin (Cotton, 1915)

*Corycus lanceolatus* (Kutzing) Skottsberg

*Historic records.* Vallentin (Cotton, 1915)

*Desmarestia confervoides* (Bory de Saint-Vincent) M.E. Ramirez & A.F. Peters


*Comments.* Synonyms also include *D. Willii* which has also been recorded Vallentin (Cotton, 1915) & Clayton and Wiencke (2002)

*Desmarestia ligulata* (Stackhouse) J.V. Lamouroux

*Historic records.* Vallentin (Cotton, 1915)

*Durvillaea Antarctica* (Chamisso) Hariot

*Historic records.* Vallentin (Cotton, 1915)

*Ectocarpus constanciaea* Hariot

*Historic records.* Vallentin (Cotton, 1915)

*Ectocarpus falklandicus* Skottsberg

*Historic records.* Vallentin (Cotton, 1915)

*Ectocarpus siliculosus* (Dillwyn) Lyngbye

*Historic records.* Vallentin (Cotton, 1915)

*Halopteris sp.*

*Historic records.* None

*Comments.* May have been confused with *Stypocaulon sp.*

*Geminocarpus geminatus* (J.D. Hooker & Harvey) Skottsberg

*Historic records.* Vallentin (Cotton, 1915)

*Gononema ramosum* (Skottsberg) Kuckuck & Skottsberg

*Historic records.* Vallentin (Cotton, 1915) & Skottsberg 1907

*Hincksia granulosa* (Smith) P.C. Silva

*Historic records.* None

*Hincksia sp.*

*Historic records.* None

*Leathesia diffformis* J.E. Areschoug

*Historic records.* None

*Lessonia vadosa* Searles

*Historic records.* None

*Comments.* There is current confusion over the species and diversity of *Lessonia* identified in the Falkland Islands. Previous records have identified four different species, including *L. flavicans*, *L. frutescens*, *L. nigrescens* and *L. trabeculata*

*Macrocystis pyrifera* (Linnaeus) C. Agardh

*Historic records.* Vallentin (Cotton, 1915) & Van Tussenbroek (1993)

*Myriotrichia/Litosiphon*

*Historic records.* None

*Comments.* Yet to be fully identified

*Ralfsia sp.*

*Historic records.* Clayton and Wiencke (2002), Papenfuss (1964) & Skottsberg (1921)

*Comments.* Previous records have identified *R. australis*, current surveys were not able to identify to species.
**Scytosiphon lomentaria** (Lyngbye) Link

*Historic records.* Vallentin (Cotton, 1915)

**Sphacelaria** sp.

*Historic records.* Vallentin (Cotton, 1915)

**Stypocaulon funiculare** (Montagne) Kutzing

*Historic records.* Vallentin (Cotton, 1915)

**Comments.** Previous records have identified S. rigidula but small specimen restricted identification to species

**Rhodophyta**

**Acrochaetium secundata** (Lyngbye) Nageli

*Historic records.* None

**Acrochaetium secundata** (Lyngbye) Nageli

*Historic records.* None

**Aglaothamnion bipinnatum** (P.L. Crouan & H.M. Crouan) Feldman & G. Feldman

*Historic records.* None

**Ahnfeltia plicata** (Hudson) E.M. Fries


**Anotrichium furcellatum** (Agardh) Baldock

*Historic records.* None

**Ballia callitrichia** (C. Agardh) Kutzing

*Historic records.* Vallentin (Cotton, 1915) & Kylin and Skottsberg (1919)

**Bangia fusco-purpurea** (Dillwyn) Lyngbye

*Historic records.* None

**Bostrychia intricata** (Bory de Saint-Vincent) Montagne

*Historic records.* Vallentin (Cotton, 1915), Kylin and Skottsberg (1919) & Harvey (1849)

**Bostrychia scorpiodes** (Hudson) Montagne

*Historic records.* None

**Callithamnion gaudichaudii** C. Agardh

*Historic records.* Vallentin (Cotton, 1915) & Papenfuss (1964)

**Callithamnion tetragonum** (Withering) S.F. Gray

*Historic records.* None

**Callophyly variegata** (Bory de Saint-Vincent) Kutzing

*Historic records.* Vallentin (Cotton, 1915) & Kylin and Skottsberg (1919)

**Camontagnea oxyclada** (Montagne) Pujals

*Historic records.* None

**Catenella caespitosa** (Withering) L.M. Irvine

*Historic records.* Vallentin (Cotton, 1915) & Kylin and Skottsberg (1919)

**Ceramium diaphanum** (Lightfoot) Roth

*Historic records.* Vallentin (Cotton, 1915)

**Ceramium obsoletum** C.Agardh

*Historic records.* None
Ceramium strictum Harvey

*Historic records.* None

Ceramium virgatum Roth

*Historic records.* Vallentin (Cotton 1915) & Kylin and Skottsberg (1919)

Chondria macrocarpa Harvey

*Historic records.* Kylin and Skottsberg 1919

Colaconema davesii (Dillwyn) Stegenga
Rhodochorton purpurea (Lightfoot) Rosenvinge

*Historic records.* None

Corallina officinalis Linnaeus

*Historic records.* Vallentin (Cotton, 1915)

Cryptopleura ramosa (Hudson) L. Newton

*Historic records.* None

Dasya or Heterosiphonia?

Delesseria sp.

Erythrotrichia carnea (Dillwyn) J. Agardh

*Historic records.* None

Gelidium crinale (Hare ex Turner) Gaillon

*Historic records.* Vallentin (Cotton, 1915)

Gigartina skottsbergii (Setchell & N.L. Gardner

*Historic records.* Clayton and Wiencke (2002)

*Comments.* According to algaebase this species has not yet been subject to full verification.

Griffithsia Antarctica J.D. Hooker & Harvey


*Comments.* Also known as the synonym Bornetia antarctica

Hildenbrandia sp. lecanierieri Hariot

*Historic records.* Vallentin (Cotton, 1915) & Kylin and Skottsberg (1919)

Iridaea cordata (Turner) Bory de Saint-Vincent

*Historic records.* Vallentin (Cotton, 1915) & Kylin and Skottsberg (1919)

Lithophyllum sp.

*Historic records.* Vallentin (Cotton, 1915) & Papenfuss (1964)

*Comments.* Previous records have identified L. falklandicum, identification to species was not possible during this survey

Osmundea truncata (Kutzing) K.W. Nam

*Historic records.* None

*Comments.* Identification to species is uncertain

Phycodrys quercifolia (Bory de Saint-Vincent)
Skottsberg

*Historic Records.* Vallentin (Cotton, 1915), Clayton & Wiencke, 2002 and Kylin & Skottsberg, 1919

Phyllophora sp???

*Historic records.* Vallentin (Cotton, 1915)

*Comments.* It is unknown which species was identified by Vallentin and correct identification has not been clarified for the current survey

Phymatolithon sp.

*Historic records.* None
**Piconiella plumosa** (Kylin) J.De Toni

*Historic records.* Vallentin (Cotton, 1915) and Kylin & Skottsberg, 1919

**Plocamium secundatum** (Kutzing) Kutzing


**Polysiphonia atlantica** Kapraun & J.N. Norris

*Historic records.* None

**Polysiphonia denudata** (Dillwyn) Greville ex Harvey

*Historic records.* None

**Polysiphonia furcellata** (C. Agardh) Harvey

*Historic records.* None

**Porphyra umbilicalis** Kutzing

*Historic records.* Vallentin (Cotton, 1915)

**Ptilonia magellanica** (Montagne) J. Agardh


**Rhodochorton purpurea** (Lightfoot) Rosenvinge

*Historic records.* None

**Rhodothamniella floridula** (Dillwyn) Feldmann

*Historic records.* None

**Sarcothalia dochotoma** (J.D. Hooker & Harvey) Leicester.

*Historic records.* None

7. Herbarium and Reference Material

Approximately 100 specimens of benthic marine algae were pressed and documented within the herbarium. These will be retained with the Shallow Marine Survey Group for continued reference and to add to the reference material being catalogued. Each herbarium specimen is identified using current nomenclature and authority with additional records of location, general habitat, date, collector and additional notes where relevant.

Figure 3: *Ulva linza* herbarium specimen with label.
Additional photographs of algal species were collected during diving and within the laboratory, that may also be used in the future for guides and identification material.

8. Preliminary Observations

Many of the records detailed above appear to be new to the area. However studies of the southern coastline of Chile have shown them to be present at several locations of which latitudes coincide with those of the Falkland Islands. This may be attributed to a number of possibilities; previously unidentified, lack of historical data records, new species to the area indicating shifts in geographic boundaries and/or species introductions. Enteromorpha was highly abundant on most shores but has only been recorded by Vallentin during previous surveys. Enteromorpha bulbosa was described by Clayton et al (1997) as the most common and wide spread species of Enteromorpha within the
Antarctic but until this survey has not yet been recorded in the Falklands. This shows discontinuities in species records and geographic distributions primarily as a consequence of limited research.

In general the green algae showed a larger proportion of plants that are common throughout a range of geographic locations extending over the all coastal regions, particularly species of *Enteromorpha*, *Ulva*, *Cladophora*, *Rhizoclonium* and *Chaetomorpha*. These are often classified as cosmopolitan species. However some species were also restricted to the subantarctic regions.

The brown algae are less well distributed exhibiting geographic preferences, with a lesser proportion identified within temperate or northern shores. However species of *Ectocarpus*, *Scytosiphon*, *Pilayella*, *Punctaria* and *Colpomenia* have been described in a wider geographic context. The most characteristic seaweed of the Falkland Islands was the giant kelp species, *Macrocystis pyrifera*. This species formed extensive beds in many shallow coastal waters with large floating canopies. *Macrocystis sp.* is of limited geographic distribution and is a significant species within the shallow marine environment serving as the foundation to a much more diverse habitat provided through its large basal attachment and extensive blades. Unlike many other temperate waters, *Desmarestia* was the dominant genus replacing the more common fucoids, a feature also characteristic of the Falkland Islands.

Similar large scale geographic patterns are also followed with the red algae with only some algae extending their distribution range beyond the subantarctic up the Chilean coast and South Australia. Those red species known to have a greater geographic distribution include the genera *Porphyra*, *Ceramium*, *Corallina* and *Gigartina*. The main forms dominating the intertidal and subtidal were the foliose (flat leaf-like) forms and filamentous forms which often clothed the subtidal and were present in high diversities.

The number of species recorded during the current surveys, although not finalised, is lower than those recorded in the early 1900’s. However at this stage they do provide a good indication of the level of diversity of seaweed species and provide evidence of a long term change in species composition as well as current baseline data. Many historical species have also been amalgamated due to taxonomic changes over the years.

Although taxonomic composition has varied between the current and historic records the number of green species has remained constant and is very similar for the brown species. The largest difference in species richness is attributed to the red species. This is likely to be due to the limited geographic range visited within the current study compared with Vallentin (Cotton, 1915) and the time scale over which the study was conducted. Further field studies would be likely to reveal a much higher red algal diversity particularly from the sublittoral fringe.

**8.1 Continued work**

The herbarium produced within this study includes approximately 100 specimens, however, many of these are still yet to be identified with a number also requiring verification of identification. This will be an on-going process that is likely to entail the assistance of other specialist in the field of algal taxonomy.

At this stage further relevant literature is also being sort to validate some of the preliminary findings and assist with explanations of geographical distributions.
9. Acknowledgments

This work has been achieved through the financial support of the South Atlantic Invasive Species Project (RSPB) and from the commitment of the Shallow Marine Survey Group and their desire to establish records of marine biodiversity from within the surrounding shallow habitats. Dr Wells would like to offer her thanks and appreciation to all who have given their time to assist with the field work of this project.

10. References


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